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# COLOR IN ARCHITECTURE

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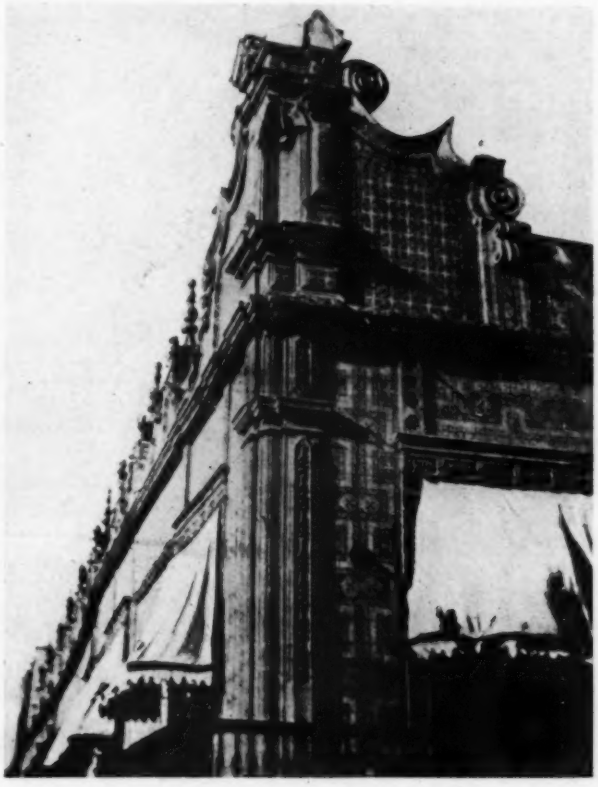
EVERY building erected necessarily presents a color scheme. The following pages aim to give some of the broad fundamental principles of the successful use of color through employment of the materials which must be the medium of its expression in architecture. Literature that is of practical help in this relation is unfortunately quite limited. A number of works exist on the phenomena of color, the laws of harmony and theory of complementary shades, among which Chevruel's work, translations of which may be found in our public libraries, is perhaps the most useful in its complete and exhaustive treatment of the subject. This existing literature, however, is all so highly technical and scientific in its nature that there is need of a simple statement of the basic principles of application in architecture and the use of available mediums.

The first necessity is a correct interpretation of the term "color." In the employment of the word there is much confusion of thought, "color" being too frequently used to define only an expression in polychrome design and usually to denote the treatment of detail in shades of green, blue, yellow, etc. The term polychrome is also used sometimes to describe contrasts of tone in one color or in black and white which may also be used to enrich ornament or define pattern.



Polychrome treatment of a tile house in Mexico City

This is a characteristic detail of the lavish use of polychrome in blue, orange, green and white coloring for paneled surfaces with carved stone trim. Shadow also plays a pronounced part in the chromatic effect together with brilliant coloring in the awnings and other accessories

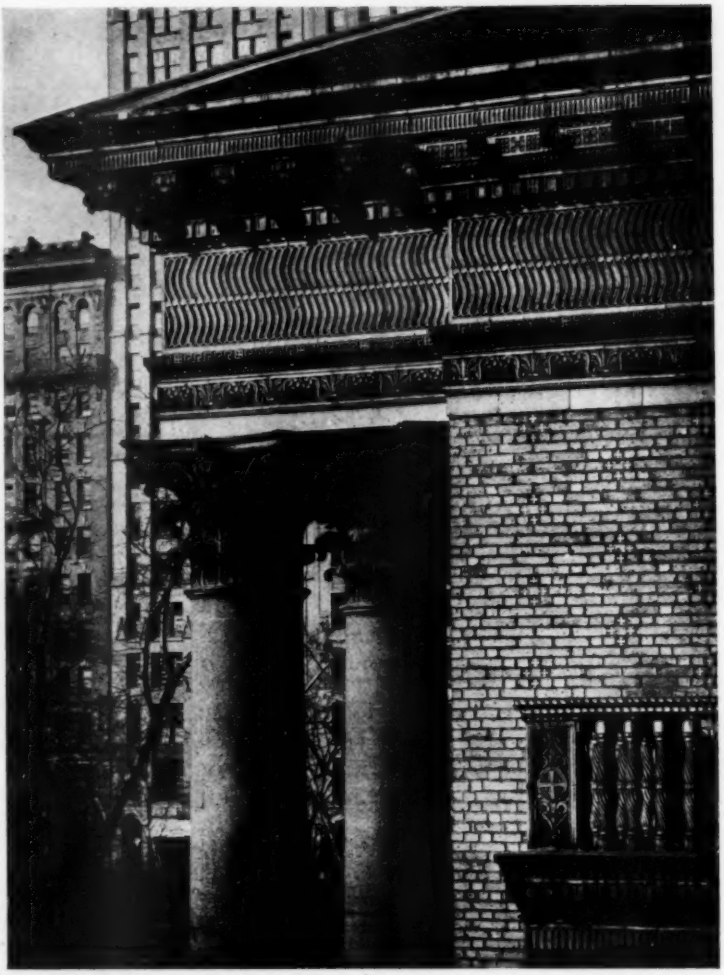
Consideration of the subject should start with recognition of the term "color" as covering any possible result in the use of any material, whether in one or in several colors. There is no material employed in architecture which has not color, whether it be any of the varieties of natural stones, marble, brick, terra cotta or even cement. All have a certain chromatic interest proceeding from the nature of the elements composing them even where no artificial color interest is introduced in manufacturing or finishing processes. White and black which are not colors in the strict meaning of

the term nevertheless have a positive interest which may be described as chromatic and for the purposes of this article will be included under the term color as hereafter used.

The statement that every building erected presents a color scheme is something more than the trite expression of an undisputed fact. It brings into view the law of association in mental process which must be taken into account in solving the color problems of architectural design.

### Influence of Familiar Examples: Sincerity

To realize the importance of this factor apply a test easily open to the resident of any average American city. Stroll through any of the streets and note the number of familiar buildings which have not heretofore registered on your consciousness an impression of any chromatic interest. You will be surprised to note the gamut of color represented in these familiar instances, taking the street as a whole. Here are a few colors noted in the space of one city block in the midtown business section of New York, referring only to materials used in construction and excluding awnings, signs, and other accessories: red, green, blue, yellow, brown, gray, purple, black and white, in quantity, and in great variety of each color.

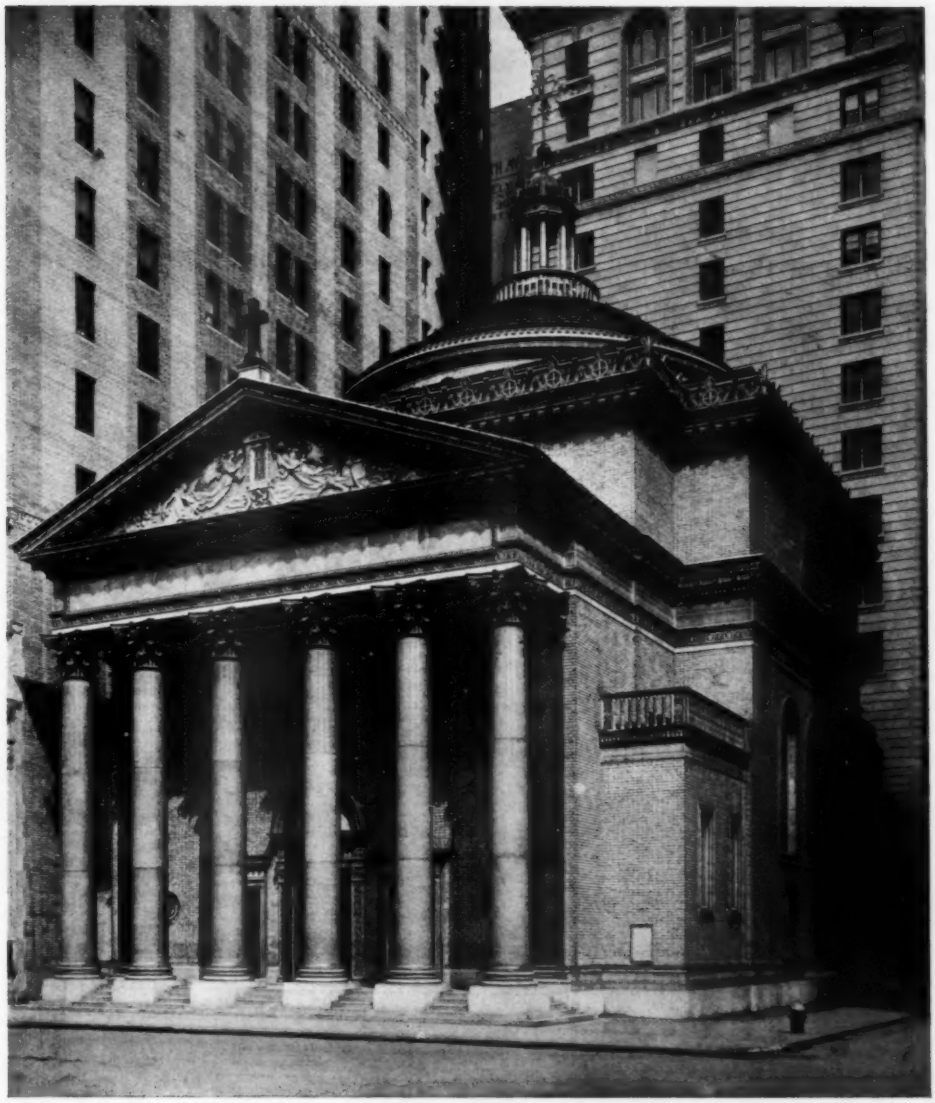


**Detail of entablature, Madison Square Presbyterian Church**

Polychrome coloring was employed with great richness in this feature. Blue, green, yellow, sienna and gold were distributed throughout relief harmonizing with the rich warm gray of the brick wall below and serving as a transition to the culminating use of color in the pediment

To mention the effect, or non-effect, upon consciousness, of one very positive color by way of illustration. Red greets us on every hand in the façades of brick buildings and is dismissed as not illustrating any use of color from its prevalence as a familiar commonplace. The attitude of mind would be markedly different were the same color, identically, to be used as a field for the walls of a stucco dwelling, or such a modification of it as would register on the eye an equal intensity of prevailing color to that occasioned by the brick and mortar joint together. Here we would have the impression of a "color stunt" and probably a quite ugly one at that. Now why? Cement can be artificially colored and given an interesting broken texture. Delicate pink, a modification of red, would not offend. This, and various shades of yellow and gray are beautiful and perfectly legitimate in stucco. Why not red, and as bright as obtainable in any brick? Red walls are beautiful when expressed in skillful brick design. Why not in stucco? There is nothing in the laws governing the harmonious relation of colors in the abstract and their application to structural form which forbids.

The answer is to be found in our habit of associating certain color effects with certain materials and no effective study can proceed which ignores this as a powerful factor in solving the problems of chromatic treatment. But it does not follow that we are bound by it against any departure from the sphere of familiar things nor that



**Madison Square Presbyterian Church, New York City**

McKim, Mead & White, Architects

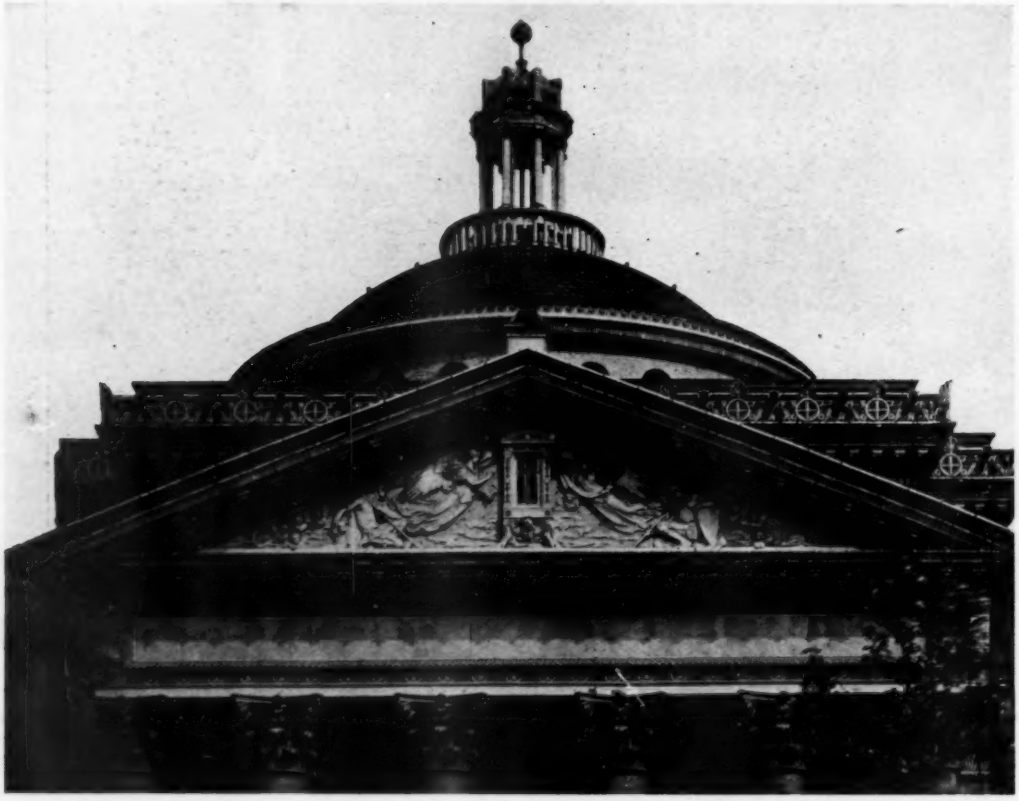
An epochal modern achievement in the successful relation of brick, granite, marble and terra cotta. Points in its successful treatment are noted in the illustration of details

doing so necessarily involves something more startling and bizarre than what we already have in "safe" conservative examples of design. Looked at with new eyes some of these are pretty pronounced chromatic "stunts" measured by the standards of abstract color relationships.

But the use of color in architecture cannot be reduced to the abstract and be determined by any pure theory of color and the principles of harmony alone. In architecture color cannot be disassociated from the problems of formal expression and the significance in this of the materials used. The nature of material should be evident. This is enforced by the principles of organic constructional design. The materials should retain and show the characteristics with which nature and necessary process endow them or admit applying to them fittingly, as in the case of paint upon wood. Manufactured products having definitely marked characteristics in color enforced by essential process, like brick, terra cotta and various ceramics should hold to these qualities of coloring and those which the mind will instinctively recognize as appropriate to their nature. Without observance of this the first great principle of all vital design, sincerity, cannot be realized.

### Quality as an Element of Color

Granting the correct interpretation of the term color to mean the chromatic interest of an entire building we are brought to the question of how far we can proceed to a consideration of the uses of color from the sound basis of sincerity defined in the preceding chapter as the first principle for observance. Before attempting any outline of the further principles of use to be observed there remains the fundamental matter of appreciating the meaning of the term "quality" as applied to color, since without this no observance of the principles of harmony and contrast in the relationship of colors to one another enables a result satisfying to the cultivated æsthetic sense. As a rule professional readers need no definition of the term as generally used in art; those who may be less familiar with the use of color may identify "quality" as "that characteristic in which unpleasant harsh-



Pediment of Madison Square Presbyterian Church where color treatment of terra cotta culminated in the strong contrast of white upon blue in the tympanum with touches of sienna and gold. The paneled face of architrave was in richly colored marble framed in terra cotta, the capitals and ceiling of porch being likewise developed in rich polychrome, blue predominating

ness and crudity are not only avoided, but the effects produced are attended with a positive charm not readily described. Perhaps the word sympathy may express it. This quality may be found in colors of the strongest brilliance and carrying power as well as in tints of the subtlest delicacy."* The term may also denote the qualification of one color toward the characteristics of another. Broadly, however, it refers to the characteristic which gives any color an appeal to the cultivated æsthetic sense.

Recognition of what constitutes "quality" in a single shade unrelated to other colors is the first essential to realizing it in a complex of many colors occurring in the terms of a design. Both in his scholastic training and subsequent practice the architect is obliged, however, to work largely in black and white and this does not tend to his visualizing in terms of color. A course of landscape sketching in color pursued systematically through later practice as many architects indeed do for recreation, would go far to equipping the designer with that sensitive appreciation of qualities, tones and values of color which would vivify his creations with the color quality they sometimes do not possess. Close study of the extreme subtleties of nature's color palette under varying conditions is the best training of the color sense yet afforded by any line of study, providing only that the follower of architecture continues to recognize the necessary self-assertion of the mediums of the latter art, considered as material, and does not allow his point of view in that relation to be swamped by the painter's disregard of it in realizing the effects of pictorial composition. An analogy to this exists in the respective problems of presentation encountered by the painter and the sculptor. One works from the standpoint of simulating form and the other from the standpoint of actually realizing it. The architect, like the

**The Fulton Theatre, New York City**

Henry B. Herts, of Herts & Robertson, and Hugh Tallant, Architects

Harmony and richness are well exemplified in the treatment of this building. The material used was terra cotta throughout excepting the painted panel under cornice which is in colored cement, and the reveals of arched doorways which are in highly colored glass Mosaic. Diaper pattern of walls is developed in deep amber yellow and ivory with blue spots at the intersections of lattice, this blue being recalled in the brackets, soffit and fret ornament of the cornice. The design illustrates splendidly a consistent use of material in a color scheme of the most positive character

**From an article by the writer in The Architectural Record of January, 1907.*

sculptor, must realize in tangible form and must preserve this expression against any tendency to obscure this in the application of color which the aims of the painter might entail.

### Form Should Remain Dominant

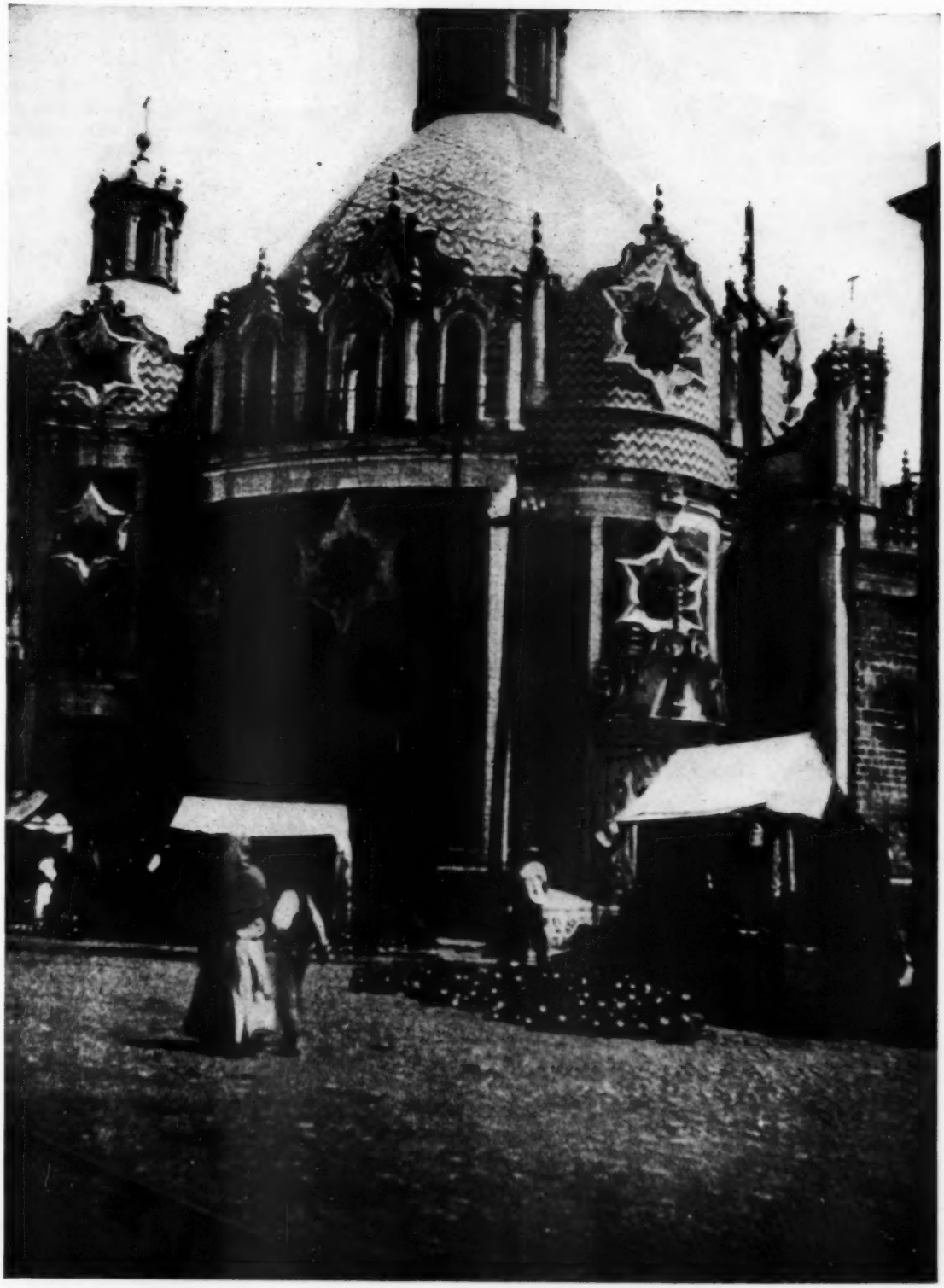
This brings us to the second principle in an intelligent use of color in architecture — that form must remain dominant and coloration emphasize and sustain this dominance. Here an analogy may best be drawn from the problem of the mural painter in properly preserving the sense of wall surface and not making holes of his wall panels. The mural decorations of Puvis de Chavannes illustrate the complete observance of this principle in their masterly subordination to the requirements of surface and architectural form.

It is in this point that much of what has been written casually on the subject in relation to architecture proceeds eventually up a side track and halts dead against the bumper of an inflexible formula. We have it that color should not be employed upon supporting members as its use tends to obscure form and destroy the sense of supporting function. In any proper understanding of the term "color" how is its use to be avoided in these members? Color is everywhere with us in every material used and on the theory propounded a brick pier conveys no sense of support and the use by the late Stanford White of richly colored granite for the columns of the portico of the Madison Square Presbyterian Church in New York was a chromatic misapplication. Theories are useful when they are the servants and not masters of thought and action. All we can safely deduce in this relation is the general principle that the choice and application of colors must not tend to destroy the sense of support where it should remain evident. Just what use of color will or will not do so in a given instance remains for the eye to determine by trial. It is easy to conceive that contrasting colors applied horizontally to a column would so break its vertical continuity of appearance as to destroy the sense of its mass and supporting function when a vertical use of the same colors might not do so. Also that the use of a single pronounced dark color for a detached column against a background of the same color might so lose the column to sight that the surmounting entablature would be left hanging in the air.

"Assumption of the Virgin" Altar piece in enameled terra cotta by Andrea Della Robbia, Metropolitan Museum of Art, New York City

An example of Andrea's work now in America. The heads of the Virgin, one cherub and three of the standing figures are modern restorations. These restorations suggest the ready possibility of approximating the splendid effects of original Robbia sculpture in modern terra cotta. The coloring of this example is the characteristic use of white figures on a blue ground with touches of other color in the minor details

The first step should be a color sketch for the effect in ensemble of the whole building. This should precede final scale drawings and full size details. Some architects find a colored cardboard model preferable. It is also best to have duplicate plaster casts made of certain full size models of important detail and work out the color scheme to finality on these. This involves very little extra expense to the architect and is highly desirable as color may have to be intensified in the full size to approximate the relational effects indicated in the small scale model or drawing, delicate indications in the latter sufficing in its small scale but becoming ænemic if matched in full size. Coloring of full size casts when employed can be with tempera or ordinary oil paints but in all such cases a series of colored terra cotta samples in the form of small tile blocks should be at hand for approximating the



Holy Well—Guadalupe

*(From Beaume's Picturesque Mexico)*

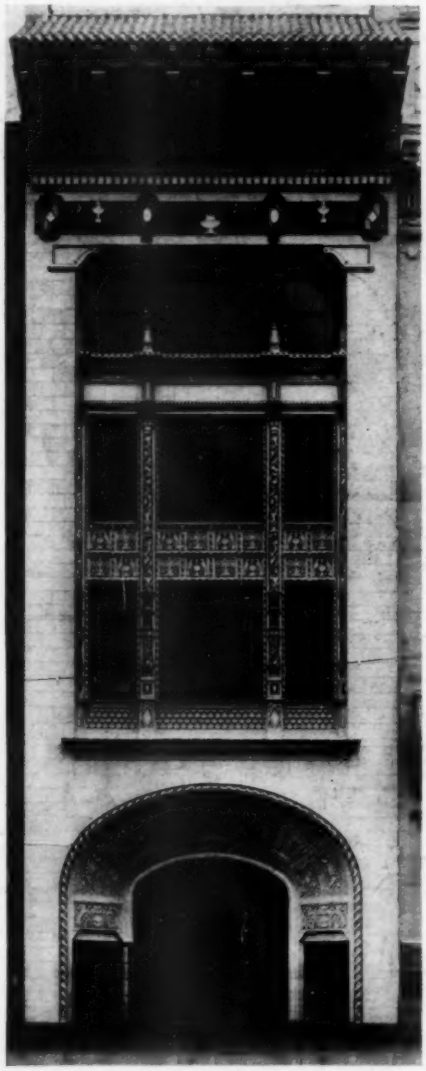
qualities of color obtainable under ceramic process. Where effect of full glaze instead of matt finish is desired this may be accomplished by varnishing afterward.

It also remains for the eye to determine by trial the effectiveness of color relations upon form as these may occur in frieze, pediment, cornice, architrave and all other elements of structural design. Similarly the theory of complementary colors and their mutually enhancing effect is a resource to be employed within the broad reservation that what constitutes taste and will yield that jealously cherished objective, "safety" of design in its visual aspect, is something that no rule can assure.

There can be no progress however if timidity is to rule in this regard. With the wealth of successful precedent existing in the lavish use of polychromy by the ancient Greeks, the rich resources for inspiration also to be found in the terra cotta architecture of Renaissance Italy, not to mention the ceramics of Moresque Spain and the superb instances of oriental tile work in Persia it is difficult to see why a more confident and widespread employment of color has not been attempted in contemporary architecture. The materials exist in the resources of modern manufacture in very much broader degree and public acceptance of the result is merely a matter of its familiar presence.

### Unity of Chromatic Ensemble

Unity is another fundamental principle in successful color design. Such an application of color as would tend to destroy the appearance of structural function would, of course, violate the requirements of formal design however the use of color might hold together as mere chromatic composition. Considered in the latter relation purely, unity may be assured either by the proportional dominance of some one shade to which all others are consistently keyed in subordination or the result may be obtained by a distribution of two or more colors that combine in a textural presentation as one color of some generally prevailing cast. Of this latter character are the turquoise appearing domes of certain Persian Mosques which are really in polychrome tile of intricate pattern. In polychrome schemes this principle of coloring for the field masses carries better assurance of unity than a preponderant mass of perfectly plain color broken only at wide intervals by units of design in other colors which recall themselves by repetition. Here there is introduced the chance that too wide separation or the differing qualities of various materials may not hang well together, and will tend to dissect the design. A design embodying the use of terra cotta panels in marble, stone or brick walls will hold together perfectly if well done while uses of trim differing markedly from wall surfaces both in color and texture are, of course, customary and achieve the same result. In fact, such differences may be necessary to avoid monotony and properly express structural design but in general it will be found true that in polychrome schemes unity is best realized by carrying the colors used in polychrome ornament throughout the field also in some degree or manner duly subordinating their appearance there to the prevailing mass shade and to the focal points in their use occurring in the features of polychrome ornament. Sometimes this may transpire in the normal variations of the mass of field color occurring in the shade of each unit, as with certain kinds of brick, natural stones, marble, and terra



**Edison Shop, 473 Fifth Avenue, New York City**

**Shape & Bready, Architects**

This building is on the whole a most notable and successful instance of polychrome coloring. The window opening features are developed richly in gold with polychrome treatment focusing in the frieze above, and space under the projecting eaves. Material is terra cotta and would have exhibited a more consistent use of this medium had the arched entrance been conceived less in the spirit appropriate for stone design

**Entrance in polychrome terra cotta, Children's Hospital, San Francisco, California**

**Bliss & Faville, Architects**

This doorway illustrates a very free adaptation of Della Robbian precedent. The colors used are light and dark creams with white for relief, against backgrounds of buff, with touches of red in the dentils. Background of figure panel, gray green. Twisted columns, twisted molding in arch and discs of frieze, green. No attempt appears to have been made to hold literally to the customary use and distribution of color found in original Della Robbian terra cotta work. The latter is almost wholly in bright enamels, the art of producing matt finished enamels here used being then unknown

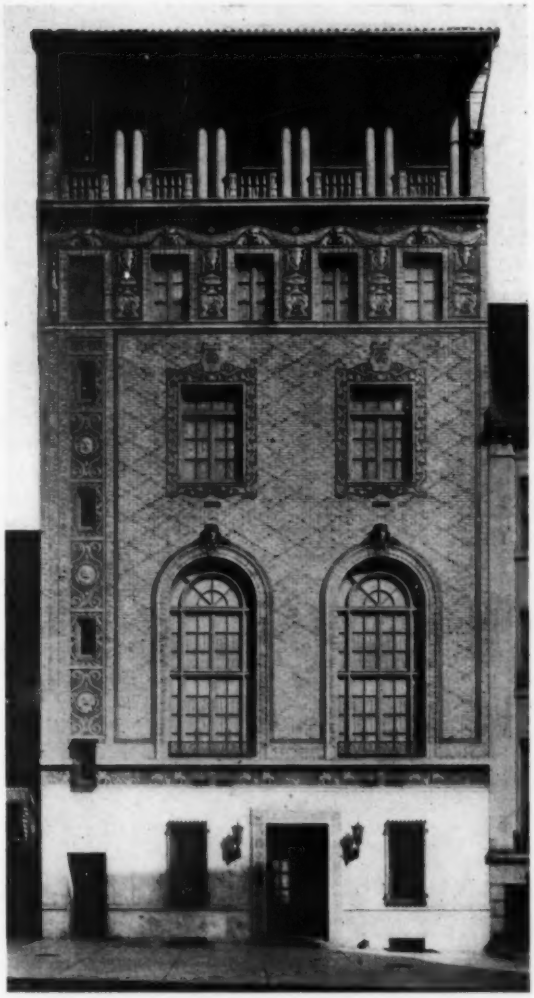
cotta, which recall corresponding shades in the ornamental features occasioned by shadow. Again, as with terra cotta, when this is used for ashlar as well as ornamental detail, it may be had through many of the varieties of mottled finish obtainable in terra cotta whereby the colors, or some one prevailing tint among them, may be carried through the field in this way. As a treatment such mottling partakes of the character of the brush work employed in the school of painting popularly known as "impressionistic" and exemplified in the paintings of Claude Monet and the American Painter Childe Hassam.

Much the same distributive effect occurs in the black and white mottlings of various stones, granite particularly, and it is doubtless this consideration which to some degree dictates the tendency of many architects to demand imitations of granite in terra cotta. Color mottlings more distinctively ceramic can be had however in terra cotta and admit a richer interest than that of black and white or their blending into sombre gray effect.

Obviously it will be recognized that mere physical distribution of color alone in this or any repetitive way will not hold a chromatic result together if the colors employed are out of key with each other. The relationship of individual color notes and masses of color to each other in what may be called the octaves of composition has to be considered and nothing struck out of key.

### Harmony and Richness

With unity assured the fullest chromatic richness becomes possible without offense to the eye or the most conservative æsthetic taste. What offends is not brilliance and richness of coloring. It is harshness and lack of harmony. An oriental rug may carry the splendors of an Ara-



**The Chalif Studios, 163 West 57th Street, New York City**

**G. A. & H. Boehm, Architects**

This building is an example of a very successful polychrome treatment. The base is soft Dover marble of an ivory shade, the walls above being manganese brick in warm gray with architraves, paneling and frieze of polychrome terra cotta treated in ivory, golden yellow, soft sienna red and light green. Relief in the main is very flat. The whole ensemble is in beautiful harmony illustrating admirable restraint and an appreciation of subtle values

bian treasure chest in amethyst, ruby and sapphire coloring yet take its place perfectly without clash in any soberly quiet interior. So may the front of a building in the grayest of conservative city streets.

Harmony as a basic requirement is necessarily bound up with any unity of effect and in the use of pure and unqualified colors is a matter of well defined law. As the finest relations in this respect occur in the joint use of intermediate and qualified shades no set rules can be formulated as to colors which will and will not harmonize when placed together. Harmony is a complex result and proportionate use for one thing plays a great part in it. Beyond saying that colors must exhibit consistent "quality" it is impossible to say what will and will not harmonize among them. I know of no two colors which cannot be so qualified in character that, while still justifying their original designations, they cannot be made to harmonize, even such unlikely combinations as brown and pink.

In general it is well however for uses of color to proceed conservatively in the employment of a few simple shades of familiar harmonious quality until mastery of more complex relations has been obtained through eye practice but we should dismiss at once that form of timidity which reduces the positiveness of coloring to washed out versions of colors in the hope that their weakness will avoid offense and give a "safe" result. The most ænemic version of any color in the palette may exhibit a harsh and unpleasing quality. In water color, for instance, a raw harsh blue will remain a raw harsh blue, dilute it with water as we may.

In this connection, atmosphere and sunlight are often good friends to a composition reflecting these characteristics. The carrying power of certain colors as appearing in samples of material at close hand will often be found to vary widely under these influences, tending in the main toward reduction of intensity, as in the case of blues at a height and the mellowing and pulling of all together into agreeable harmony.

### Application of Color to Ornament

In general it will be found that polychromatic treatment of ornament admits, and in most cases, makes preferable, a lower relief modeling than would be advisable for the same form if executed in monochrome. In the latter, shadow must be relied upon to define pattern to greater or less degree. With a colored background relief ornament is thrown into definition by color contrast mainly. The presence of too much shadow blending with the usually darker color of the background tends to soften and in some cases obliterate definiteness of pattern. It may also tend to obliterate form. Modeling therefore should proceed with the view to the use of color contemplated, especially in a polychrome feature. This may involve the question also of separating adjoining shades of strong contrasting colors with a fillet, carrying the ground color between them after the manner frequently pursued in polychrome ornament by the ancient Greeks; or in ceramic mediums, by raised edge terminations to certain spaces sufficient to arrest the flow of glaze in firing without showing actual separation to the eye.

Various refinements may be employed to give or emphasize the significance of retreating and advancing surfaces. It is a well known axiom of the painters' studios that "indoors, lights are cool and shadows warm; outdoors, lights warm and shadows cool." The application to problems of exterior and interior color treatment in architecture is evident. Similarly adjoining masses of color may be made to assume greater or less degrees of warmth by contrast of qualities in this regard. They may even be given an appearance of a different cast of coloring, a vivid spot of red, for instance, which is the complement of green, intensifying the latter or imparting a greenish cast to an adjoining gray.

(*To be continued*)

# THE RELATION OF PIPE ORGANS TO ARCHITECTURE

BY CALEB W. CAMERON*

## Part II—Public Halls, Auditoriums and Theatres

### Public Halls

THE installation of organs in buildings of this type has been, in this country, a comparatively recent departure, but in England there are some fine instruments, such as that in Albert Hall, and other public halls.

These installations have had a tremendous influence on the tonal construction of the instrument, for such an installation must be designed for concert work, and equipped to interpret properly and present the intent of composers of not only the classical schools, but adequately to meet the demands of the orchestral and operatic schools as well.

Here again acoustics are a prominent factor, and, for the best possible results, the organ should be massed together at the rear of the stage or platform, and the console placed well forward thereon.

A thoroughly typical installation of this character is that at Finney Chapel, Oberlin College, Oberlin, Ohio, which is very successful. (Fig. 1.)

Fig. 1. Finney Chapel, Oberlin College, Oberlin, Ohio

In this type of building we find that music is the controlling idea, hence the limitations which so often hamper the Architect in church work are wholly absent.

The proscenium arch should be kept as high as possible, to prevent "pocketing" of tone, and, if it can be done, the ceiling over the stage and the main portion of the hall should be at the same level.

An especially fine example of this is to be found in the illustration of Grace Hall, Williams College, Williamstown, Mass., (Fig. 2.), the organ being behind the stage, the openings high up and grilled, and the console movable.

The chambers should unquestionably be structural, as described in the section covering Church Installations, and before they are laid out, the size and character of the instrument should be determined, for that will govern the size and layout of the several chambers to be provided for.

As such a hall is frequently used for other than musical purposes, thought must be given to having the platform or stage entirely free and clear.

A console, placed in front of and below the stage, is a continual source of annoyance to a speaker, and he is ever conscious of something between him and his audience, and of a constant effort to "get across." There is a lot of psychology in this, and there are two solutions. One is to have the console on the stage and movable, (Fig. 2), or place it permanently on a platform, about eight feet square, in the orchestra pit or immediately in front of the stage, where the console may be lowered into the space below whenever desired.

This last is by far the best, and has been done in the Public Auditorium at Cleveland, Ohio. (Fig. 3.)

The echo division of the organ in the Cleveland Auditorium is behind the grilled openings which are to be seen at the top of the rear gallery, and is three hundred feet (300′) distant from the console. (Fig. 4.)

*Of Skinner Organ Company

The side walls of the stage or platform should be continuous with the ends of the organ chamber, or as nearly so as possible, else there will be at either side of the proscenium arch a pocket. In that event, the faces of those walls should be treated ornamentally, and perforated.

### Auditoriums

WHILE in the main what has been said before will apply here, yet we have, in this type of room, and especially in school buildings, quite a different problem to meet.

The writer had the good fortune to be, for a number of years, an Assistant to C. B. J. Snyder, F. A. I. A., who has been since 1891 Superintendent of School Buildings in the City of New York. During that time some fifteen High Schools were planned and erected, and it was at my suggestion and recommendation that the Board of Education of that City adopted the policy of making proper preparation for, and installation of organs in the auditoriums of those buildings.

In most of these buildings it was possible to locate the chambers at the rear of the stage, but when the Drama began to take a place in the student life of these schools, and the stage had to be equipped with scenery, drops, flies, etc., the organ was necessarily forced out into chambers on either side of the proscenium arch, the openings therefrom being screened, and treated architecturally.

In monumental or memorial buildings it is often impossible or undesirable to apportion space in the main interior for the chambers. In such a case the chamber can be located in the story above, and the tone deflected downward through the auditorium ceiling, with remarkably satisfactory results, providing that the perforated area is of generous dimensions. (Fig. 5.)


Fig. 2. Grace Hall, Williams College, Williamstown, Mass.

### Theatres

WITHIN the past ten years, the value of the organ as an adjunct to theatres has come to be realized and the organ is now regarded as almost a necessity. For "Picture Houses" it is a necessity, but, as the end which the owner has frankly in view is one of a financial character, the installations which have hitherto been made have frequently suffered from the lack of appreciation on his part, of their fundamental needs. Art and profit are not synonymous.

There are, however, in this type of building, matters which are axiomatic—

(a)—the organ should not be located "back stage" or in the wings;

(b)—it should not be placed under the stage;

(c)—it should always be placed in two, or more, chambers; surely in two:

(d)—the openings from the chambers must be *in front* of the proscenium arch;

*There can be no argument about any of the foregoing.*

If the organ is placed "back stage," the tone is caught in the wings and by the pocket which is formed between the lower member of the proscenium arch and the ceiling of the stage, and it is lost before it gets across the orchestra pit.

If placed on either side of the stage in the wings, it is even worse off than before, for the tone will "back and fill" across the stage, and we have another failure.

To put it under the stage is deliberately to consign it to strangulation, and to choke it with dirt—another ghastly failure.

The chambers, *of which there must be at least two,* should be above the boxes, (if there are boxes), and as high as possible, and the fronts must be open from floor to ceiling. These openings can be ornamentally screened or grilled, but masses in the plaster grilling should be avoided, and the openings as many and large as can be had.

The floors should be of concrete, and the walls and ceilings plastered with Keene's Cement, well smoothed, and all corners rounded.

As to height of ceilings, one chamber may be not less than twelve feet (12′—0″), and the other at least eighteen feet (18′—0″) high, and as to the floor area, each should be about twelve feet, six inches, by at least ten feet in depth (12′—6″ x 10′—0″), and *this means a rectangular area.* This would be ample for a house seating 1500 to 2000. In a larger house the area of the chambers should be increased proportionately.

Where there is a large foyer shut off from the main auditorium, a small chamber can be advantageously located opening into it, and a section of the organ located there, which would reproduce the music which was being played inside, but this section of the instrument must be soft and unobtrusive in character.

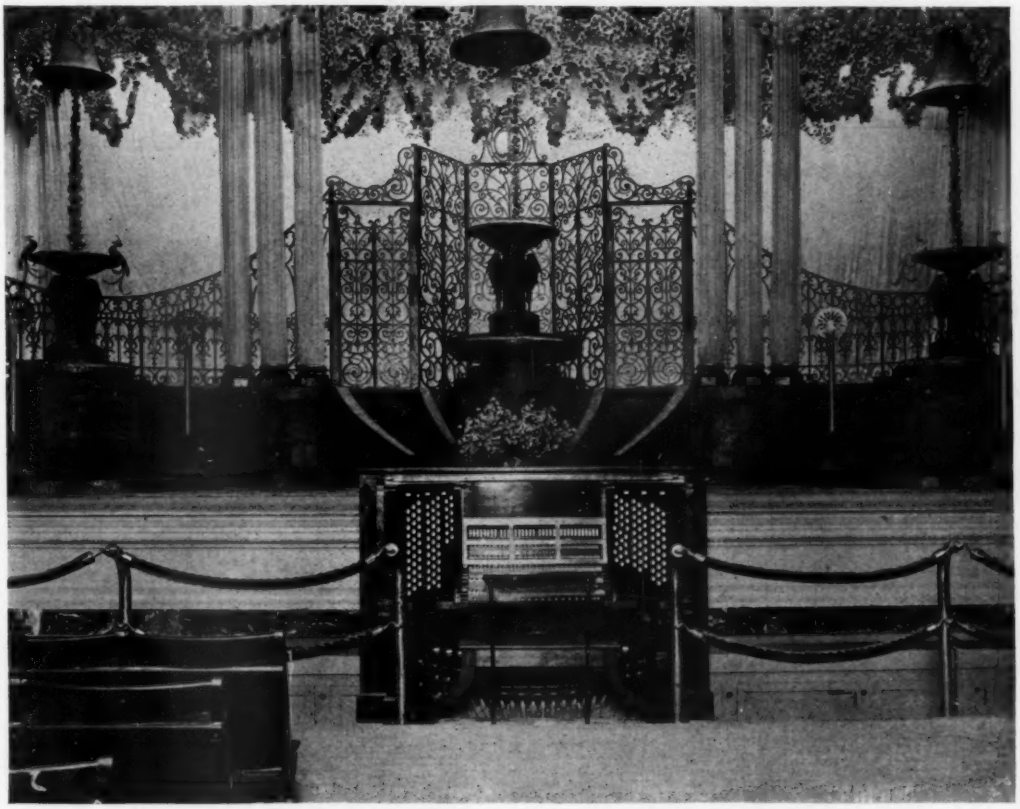


Fig. 3. Console and Platform, Public Auditorium, Cleveland, Ohio

Echo divisions must be in a separate chamber at the rear of the house, high up, (See Fig. 4), preferably close to the projection booth.

The wind conductors from the blower room to each chamber should be installed under the sheet-metal contract. These would be of 26 guage g. i. pipe, 12″ in diameter, sleeved in the direction the

Fig. 4. Public Auditorium, Cleveland, Ohio
J. H. MacDowell, Architect

wind goes, with all joints soldered, and one 3″ dia. g.i. pipe, same guage, and as above, from the blower room to the console location.

In the electric contract there should be provided two inch (2″) conduits from the console location to each chamber, and a power wire must be brought in to the blower room. A "BX" wire must be run from the console to the remote-control self-starting apparatus in the blower room, and the latter must be provided.

These all should be installed as the construction proceeds, thus avoiding much unnecessary cutting and patching, and as they *must* go in some time, that is the logical time to do the work.

The hanging of heavy velour draperies in front of the chamber openings is the surest method of killing the organ, yet I have recently seen this done; only, to make sure, the draperies were double velour, in order to get an "artistic effect." The "effect" was attained, but the hangings had to be removed in short order.

If draperies are an integral part of the interior decoration, then they must be of the sheerest and thinnest fabric, simply heavy enough to carry out the color scheme.

The location of the console is most important. The organist must see the screen, the conductor, and be able to hear the organ as the audience hears it, and yet the console must not interfere with the view of the screen by any of the audience. It is usually placed on the extreme left of the orchestra.

If it could be placed in front of the balcony, on a small platform outside of and on a level with the lower member of the balcony front, there is no question but that that would be the best position; for the organist would then hear the organ just as does the audience, and his ability to see the screen and conductor would be assured. There would also be a saving of thirty-six square feet (36′) in the orchestra pit, which is always cramped and crowded. (Fig. 6.)

In the usual location, since the opening from the chamber on that side is behind the organist, and between him and the audience, he has little chance to hear that section, to say nothing of the distraction caused by the instruments which are playing right in his ear.

An organ, properly built, takes time for construction, and each one has to be built specially for the place it is to fill, so the contract should

(*Concluded on Page* 244)

# ·EDITORIAL·COMMENT·

**THE CHANGING CHARACTER** of occupancy has been the bane of cities. It has made millionaires of a few property owners and paupers of many. It creates slums, lowers the standards of living, causes congestion in places and leaves "twilight zones" between congested areas where property remains stationary in value for taxing purposes while it depreciates in income-producing value. The invention of the elevator made possible the skyscraper and all the evils due to changing character of occupancy were then intensified.

Garden cities are not a general enough means of relief. Zoning seems to be necessary to the stabilization of values. In time, a city that is correctly zoned will have no slums, as in such a city the stabilization of the uses of land will tend toward uniformity in income value. In such a city the "shoe-string" real estate manipulator will disappear together with his brother parasite, the speculative builder. In cities where good zoning laws are in effect and are enforced, the results have been so satisfactory that they are being studied with a view to their adoption in cities now in what might be termed the "puppy stage."

Real estate men and building managers, through their national organizations, have completed a study of office buildings. It has been proven that office buildings become obsolete at an average age of thirty-five years. Few modern office buildings yield a satisfactory return after they are twenty years old. Changing character of occupancy in the various districts into which cities are divided by the speculative builders is largely a reason for this obsolescence. Zoning is urged as a cure for this evil waste. It is a commendable step forward by men whose fingers are ever on the pulse of the world of finance.

In the week in which the findings of the real estate men were made public, a decision was announced by the Supreme Court of Illinois on the subject of city zoning. The decision declared: "An ordinance is void which prohibits one citizen from conducting a particular business in a certain locality, and permits another to engage in the same character of business in the same locality merely because the latter had established his business before the ordinance was passed." The judges evidently did not pause to consider the evils which good zoning laws will end and that a beginning must be made some time and somewhere. However, it is not a sign of good citizenship to criticize the courts. A campaign of education should be conducted, the objectives of which will be judges who live in the world but who apparently are not of it.

**A REPORT, PRESENTED** at Portland, Ore., before the General Convention of the Episcopal Church, and signed, among other members, by Bertram G. Goodhue and Ralph Adams Cram, has been the cause of extended editorial comment in the daily press. "Paying for an altar, a window or a rood screen," states the report "does not give the donor the right to impose his own taste upon posterity." And it continues, "Aesthetic infallibility does not inhere in a bishop."

The statement that "in all parts of the country millions have been unwisely spent" will be unanimously concurred in by architects. Comments the *New York Times,* editorially:

> "Clearly the time has come to apply the new principles of self-government to the building of churches. What is needed is not so much a personal dictator—a pictorial Judge Landis, an architectural Will Hays or a sculpturesque Augustus Thomas—as a commission of churchmen and architects that shall improve the taste of the donor, curb the artistic hospitality of wardens and vestry, even direct the feet of the Bishop in the way they should go. Hitherto, folk who have been properly brought up have thought it incumbent upon them not to say out loud what they think, by and large, of church architecture. But, backed by the authority of this report, they may now express a hope that in the future a pair of too aspiring spires shall not give the rude populace occasion to dub the edifice behind them the Church of the Holy Toothpicks; that a sculptured Gabriel, overflamboyant with his trump, shall not suggest to the ungodly a Church of the Holy Bean Blower."

The *New York Tribune,* reviewing this report, goes deeper and more understandingly into the development of church architecture. The rivalry in building so much stressed was not the reason for the artistic excellence of thirteenth century churches. That rivalry might have been as to relative size, or the richness of decorative treatment, but the design of the fabric and the motives of its decoration were in the hands and under the control of the clergy who at that time knew ecclesiastical art better than any other class and had the power to control its development. The *Tribune* states:

> "That much debated thirteenth century, long scorned as a period of crass ignorance, now much rehabilitated and by some regarded as the 'greatest of centuries,' had anything but an art controlled from above. The taste and enthusiasm that built Chartres Cathedral and

all the other great churches of the period welled up from below; they were in the eye and hand of stonecutter and window builder quite as much as in the brain of the great designers. Rivalry between cities was one great stimulus; Chartres vied with Bourges and Rheims with Amiens—their people working with might and main—exactly as if all the citizens of New York should fall to upon their greatest church in an effort to outbuild Boston. Religion was the center of life. It sent knights and children alike careering off on crusades. It sent towering aloft the most wonderful buildings since the Parthenon, pulsing with life and great beauty."

Von Ogden Vogt in his book "Art and Religion" reviewed by Mr. Allen B. Pond, in THE AMERICAN ARCHITECT, issue of February 1, has dealt with this subject in the very finest way.

"Is art the offspring of religion, or has it been a willing handmaid in many times and many places" asks Mr. Pond in his review of Mr. Vogt's book. Continuing Mr. Pond writes:

"Were religion and art one and the same thing to primitive man and did they become differentiated in man's thought only when, after many years, he had reached a relatively advanced stage in his efforts at philosophical analysis? And even if art—or should one say artistry?—was invariably intertwined with religious expression and observance in the life of primitive man and, for that matter, of man far beyond the stage where he can fairly be characterized as primitive, is this historic intertwining to be interpreted as a proof either that art is or ever was substantially identical with religion, or even that art is only one aspect of a larger somewhat which we call religion? And if the adaptability of a certain subject matter to the purposes of both art and religion—coupled with an occasional unavoidable emotional contemporaneity—is not a sufficient explanation of the historic intertwining of art and religion, are we to find the key in the fact that both spring into being and attain to fullness of life in the field of emotion—of feeling and imagination—rather than in the field of the intellectual faculties, and that in the field of feeling and imagination they travel in part on the same emotional paths?"

The insistence of rich and zealous donors who "know nothing about art, but know what they like," is responsible for much of our poor architecture, and is not solely confined to ecclesiastical work. We have memorials all over the country which in their sheer ugliness are a disgrace to communities. How shall we curb these rich, misguided people? It's best thoroughly to understand that the fault does not lie with architects or other artists. These men must live. They undoubtedly protest up to the point where further protest means loss of a commission. The arrogance and self-sufficiency of wealth are responsible for most of our artistic ills, and more so in church architecture than any other type.

Music—Terra Cotta Frieze Panel, Boston Opera House

Bela Pratt, Sculptor—Wheelwright & Haven, Architects

HOUSE OF JOSEPH P. KNAPP, ESQ., SOUTHAMPTON, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

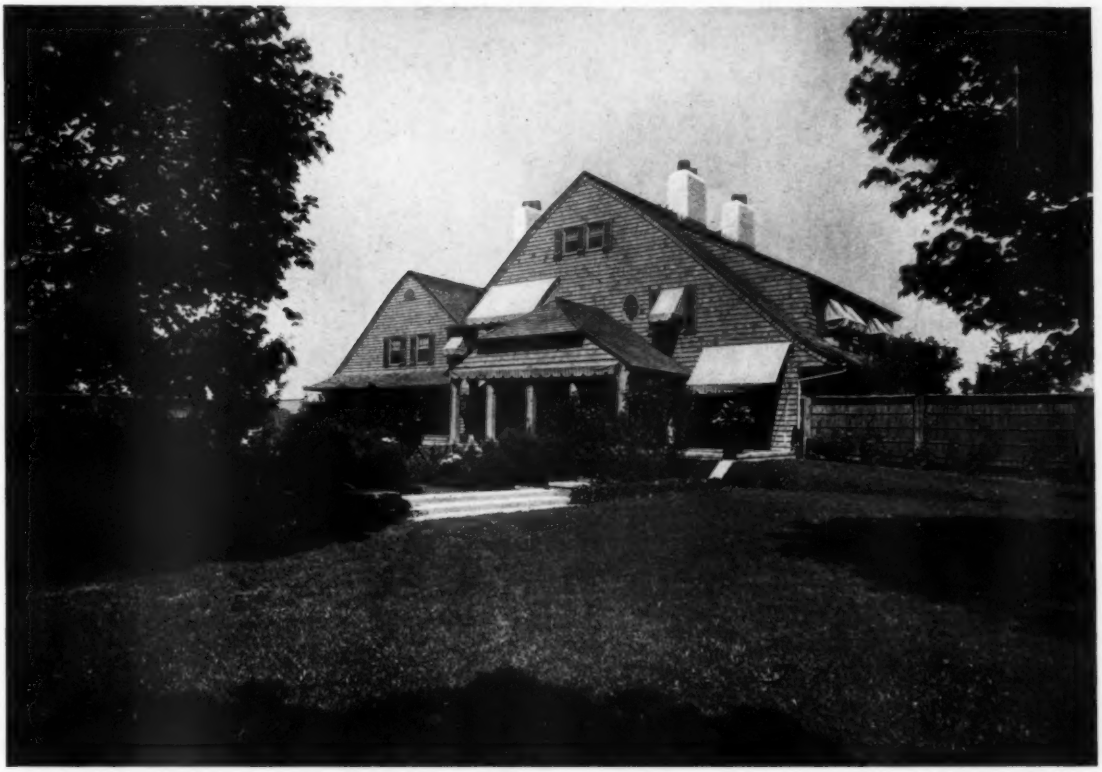
HOUSE OF JOSEPH P. KNAPP, ESQ., SOUTHAMPTON, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

DETAIL OF MAIN ENTRANCE

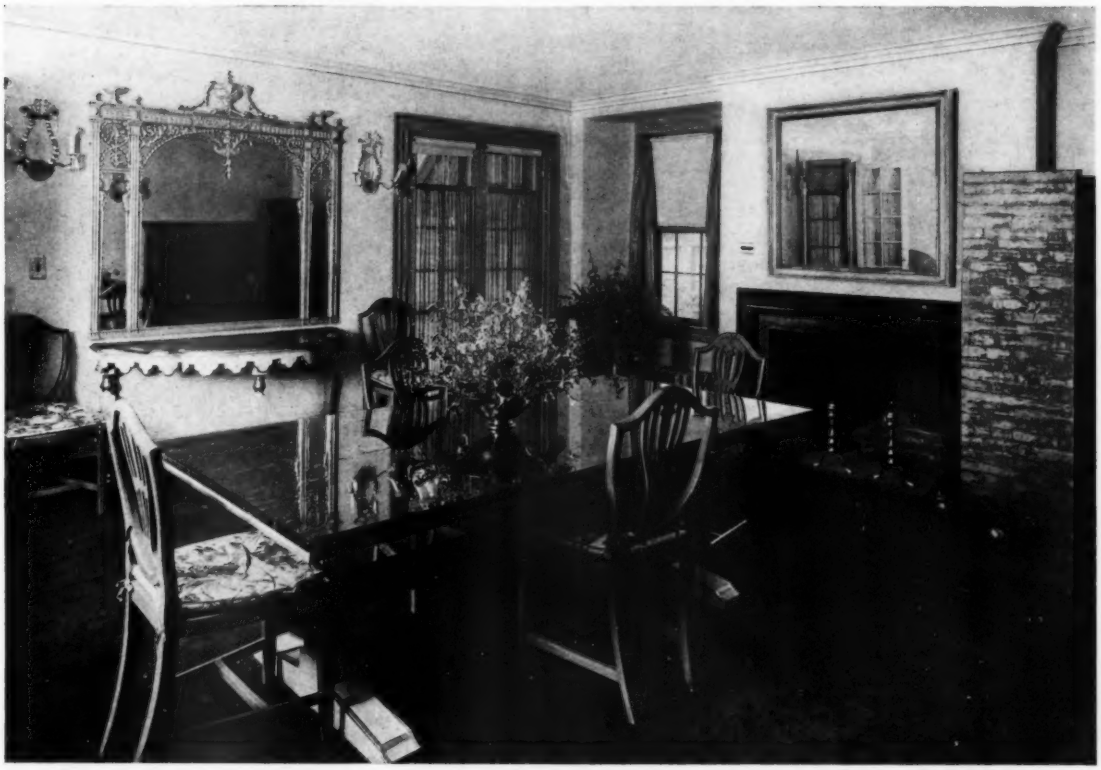
HOUSE OF JOSEPH P. KNAPP, ESQ., SOUTHAMPTON, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

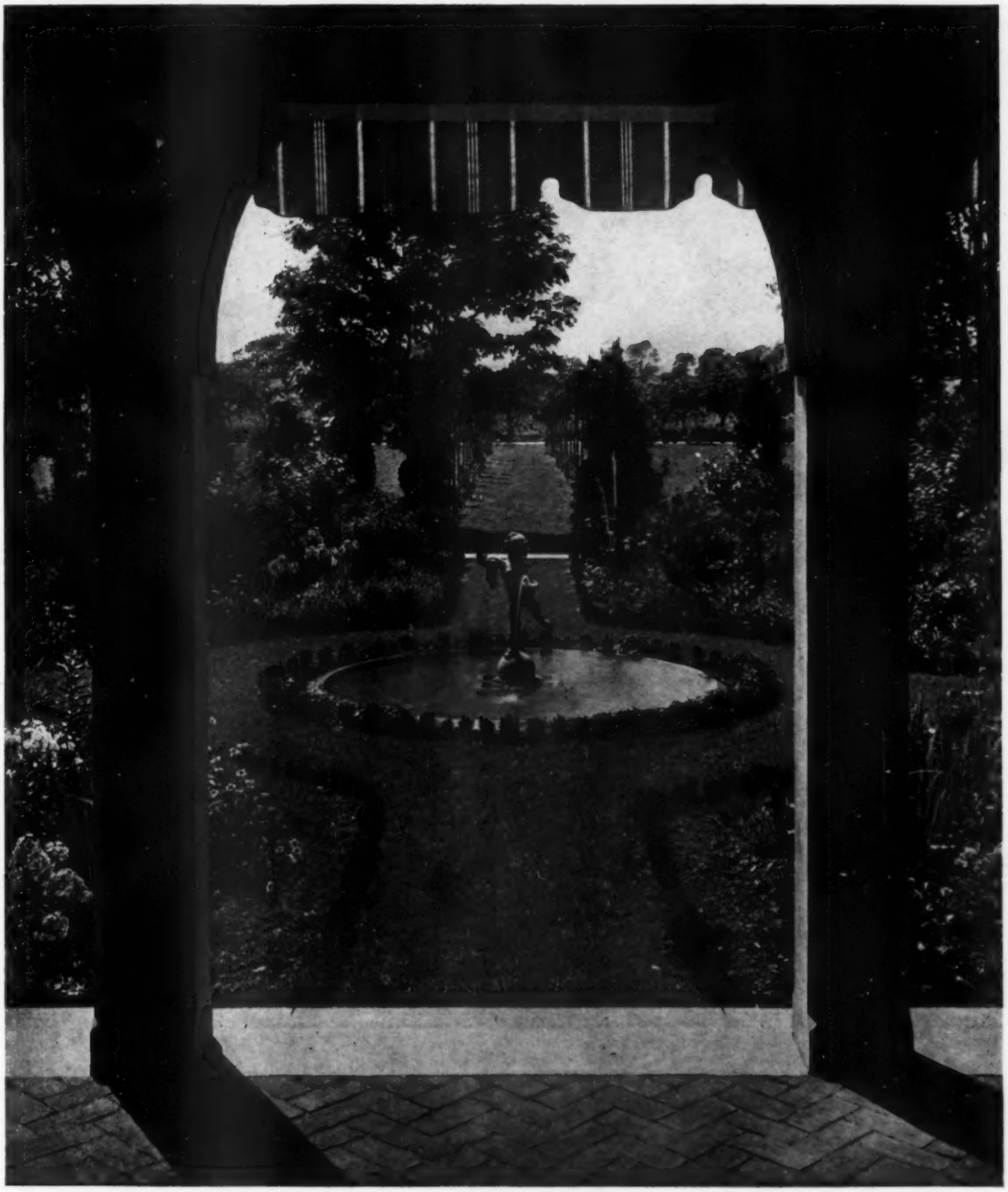


HOUSE OF JOSEPH P. KNAPP, ESQ., SOUTHAMPTON, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT



HOUSE OF JOSEPH P. KNAPP, ESQ., SOUTHAMPTON, L. I., N. Y.
FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT



VIEW FROM HOUSE

HOUSE OF JOSEPH P. KNAPP, ESQ., SOUTHAMPTON, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

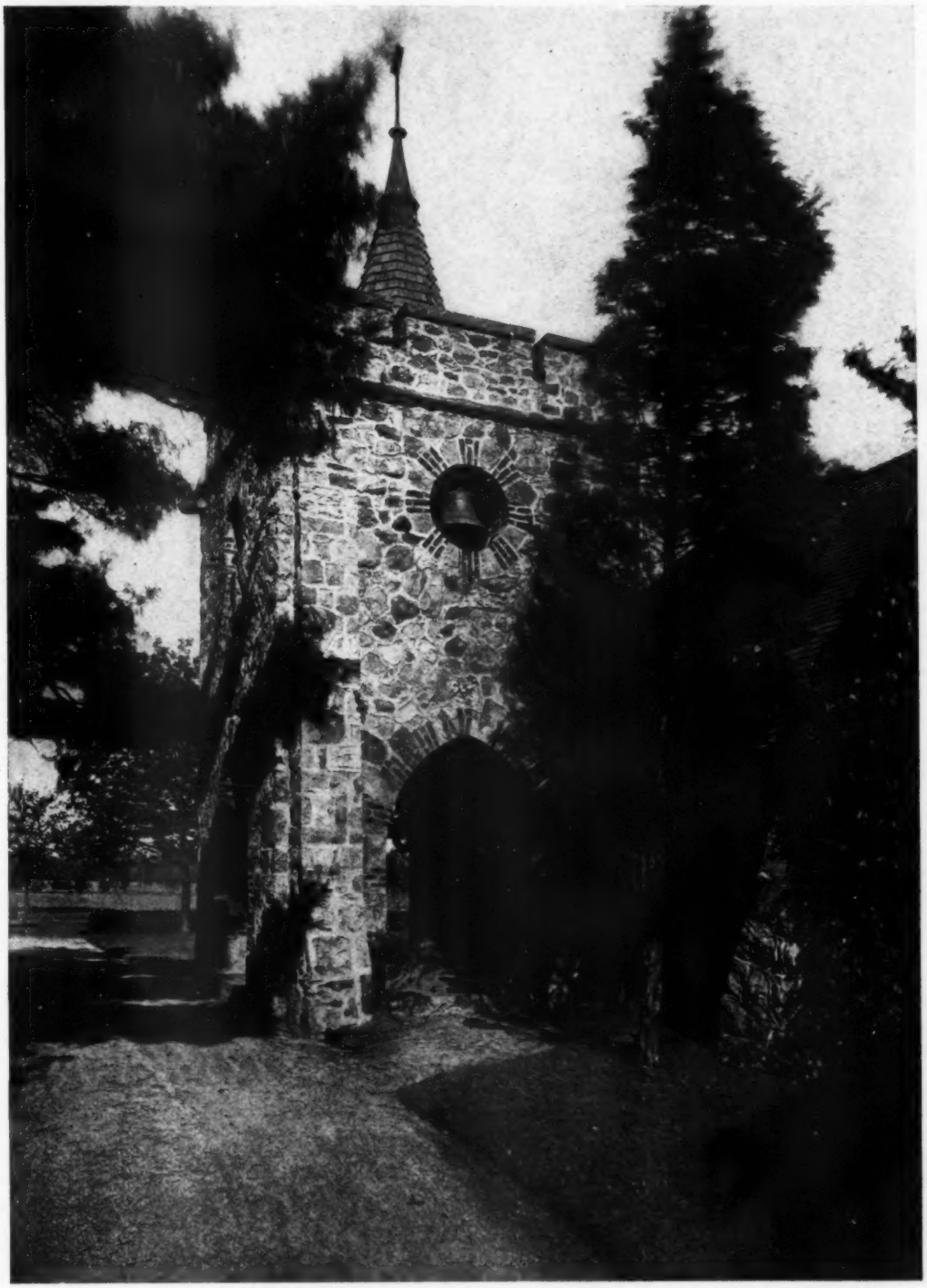
VIEW IN GARDEN

HOUSE OF JOSEPH P. KNAPP, ESQ., SOUTHAMPTON, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

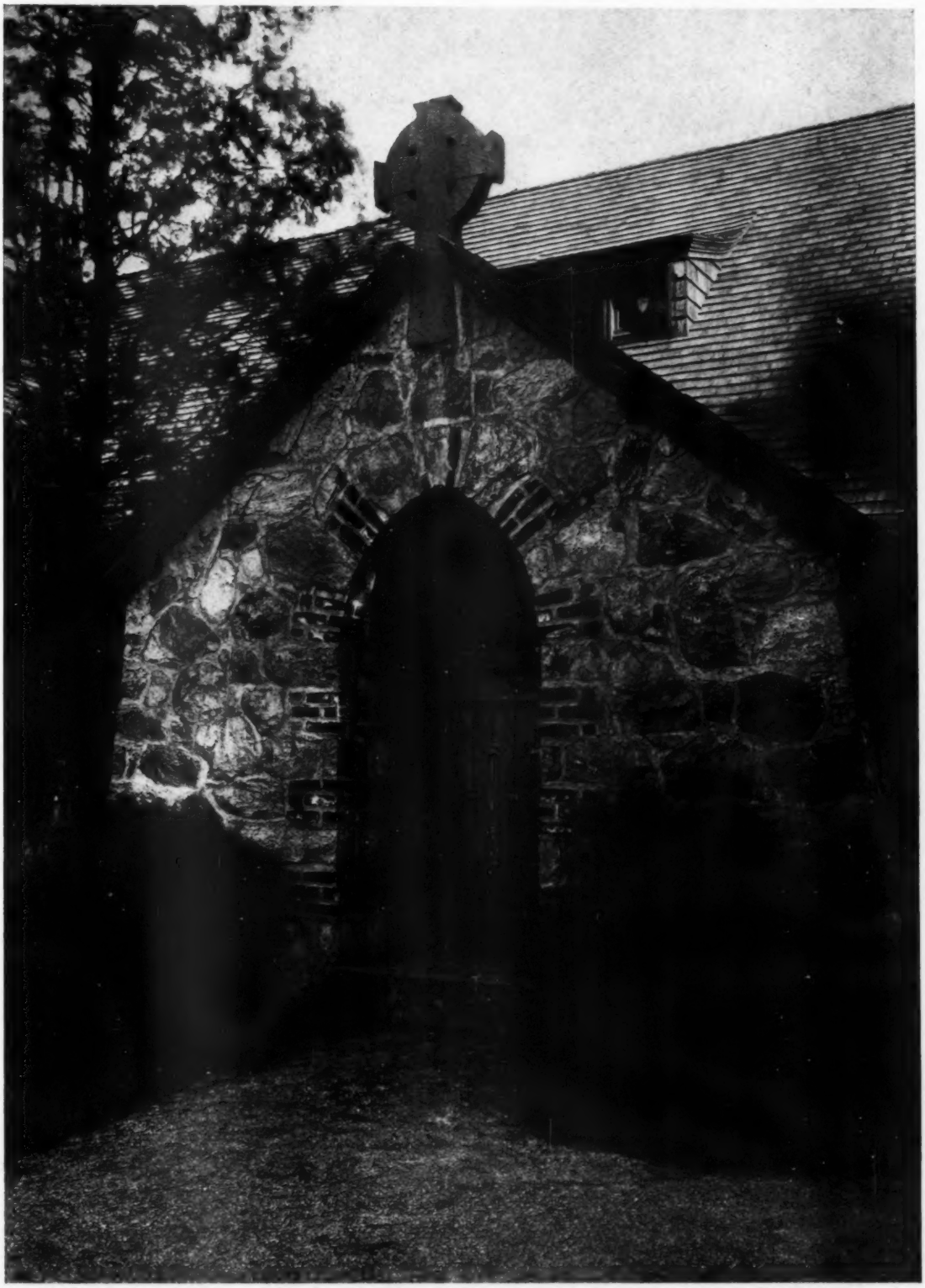
CHAPEL AT WESTBURY, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT



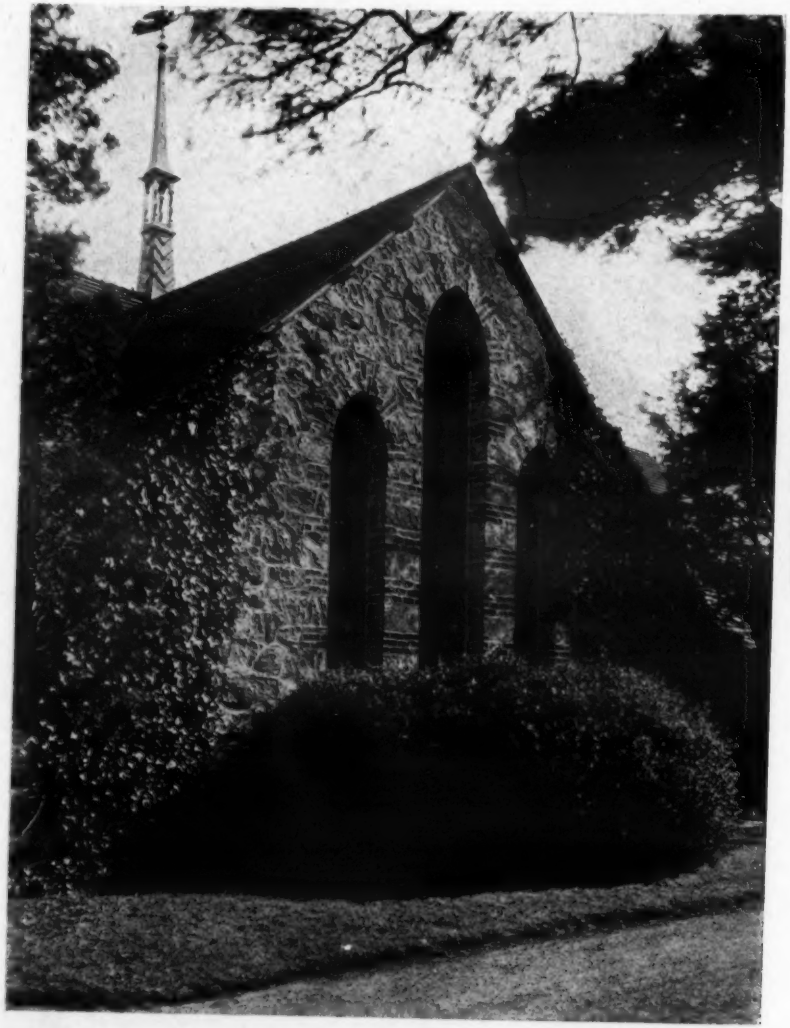
CHAPEL AT WESTBURY, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT



CHAPEL AT WESTBURY, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT



CHAPEL AT WESTBURY, L. I., N. Y.

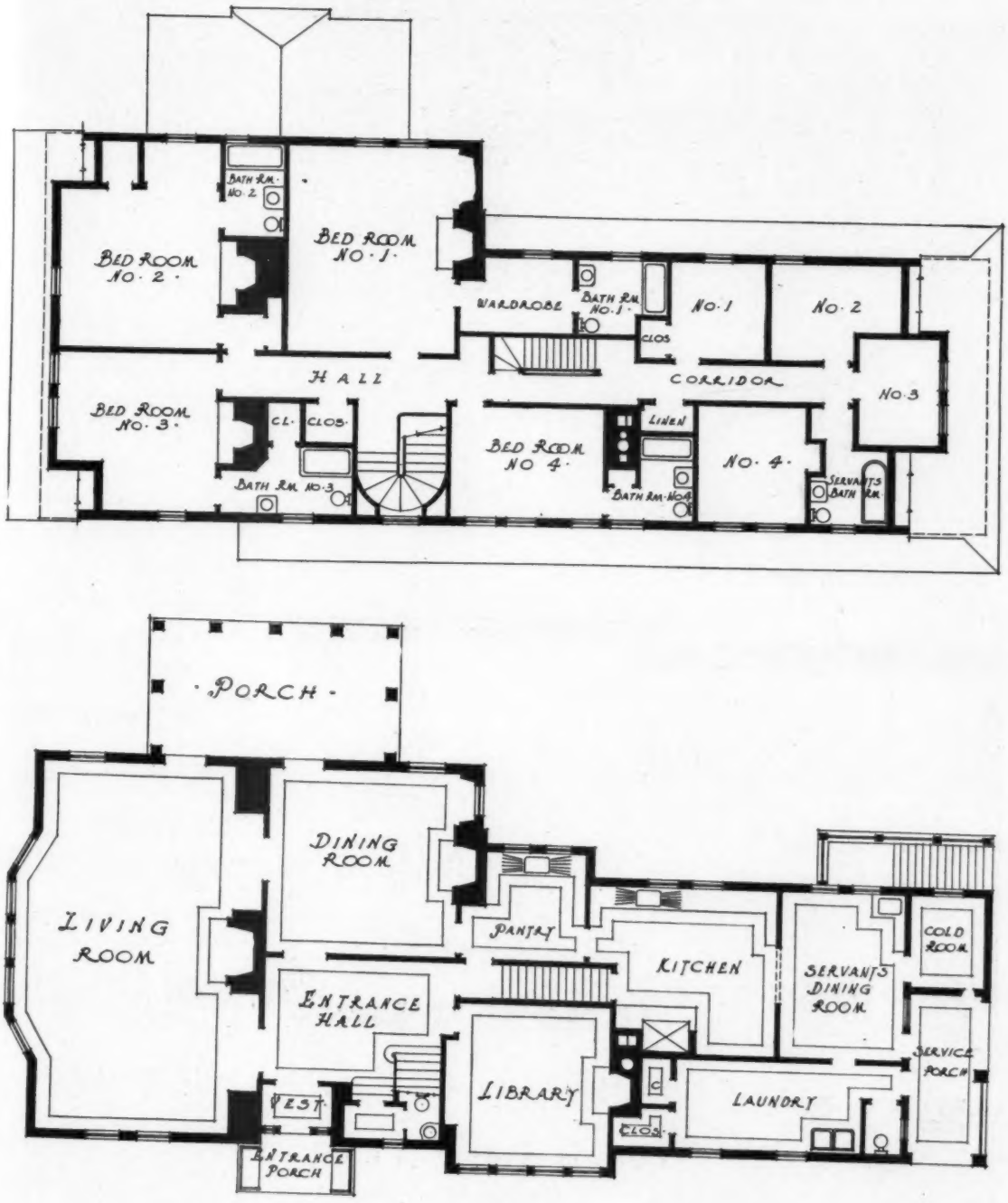
FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

MAGDALEN COLLEGE GATES, CAMBRIDGE

ST. JOHN'S COLLEGE GATES

A HOUSE IN CHORISTER SQUARE, SALISBURY, ENGLAND

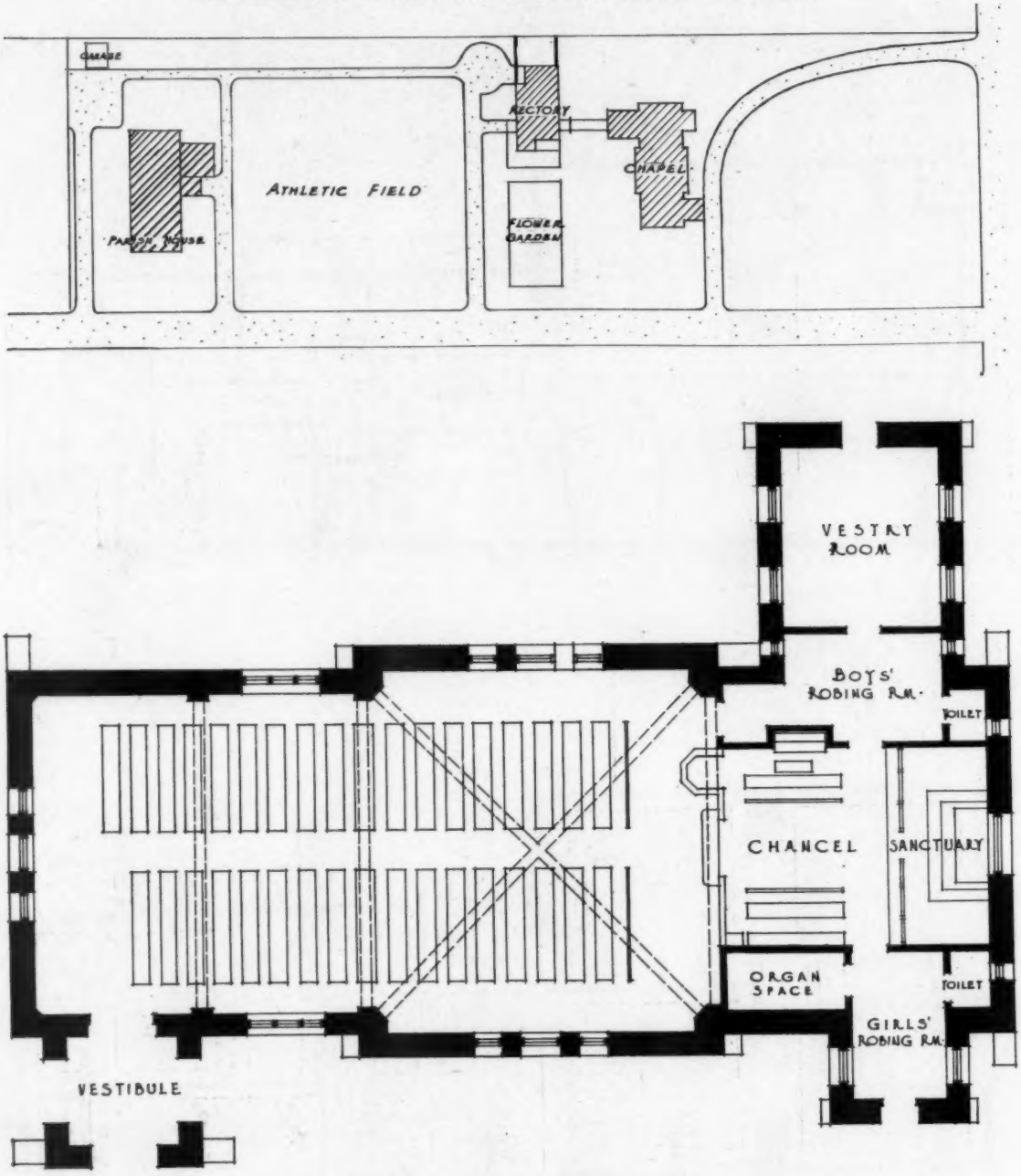
*(From Photographs by Robert M. Blackall)*




HOUSE OF JOSEPH P. KNAPP, ESQ., SOUTHAMPTON, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

*(For illustrations of this house see Plate Section)*




CHAPEL AT WESTBURY, L. I., N. Y.

FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

*(For illustrations of this chapel see Plate Section)*

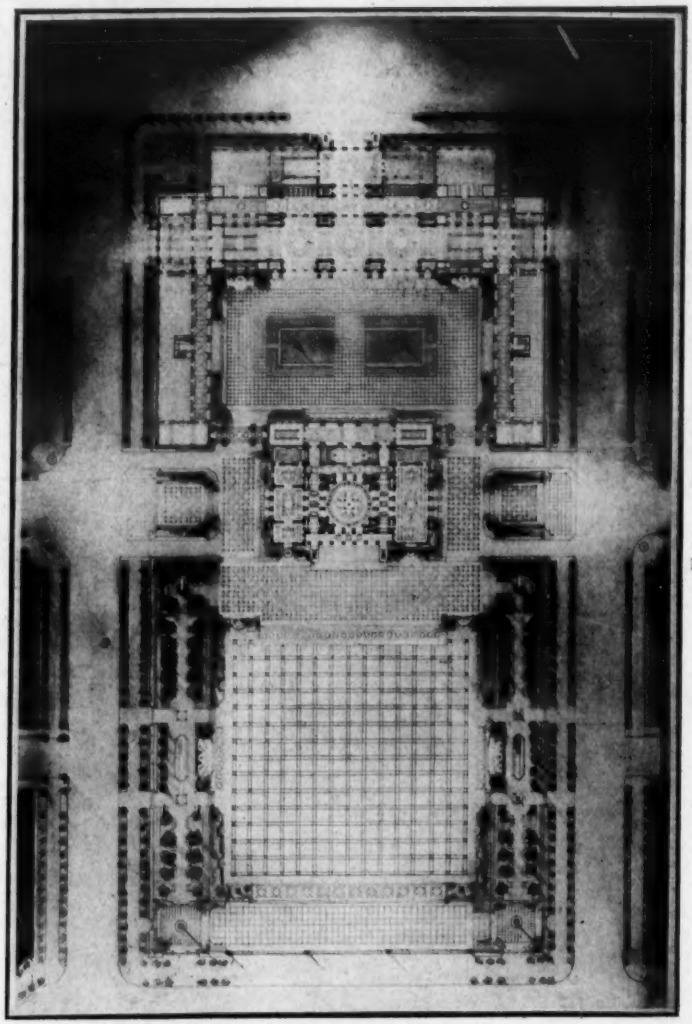
PRIZE AND FIRST MEDAL

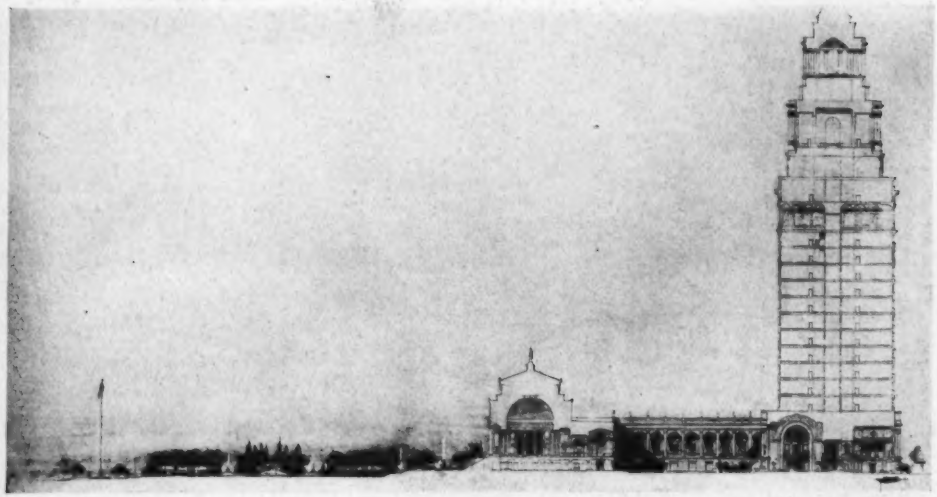
ROGER BAILEY

PATRONS—PROF. E. V. MEEKS AND MR. O. FAELTON

FINAL COMPETITION—15TH PARIS PRIZE—A CITY HALL

SOCIETY OF BEAUX-ARTS ARCHITECTS





PRIZE AND FIRST MEDAL

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FINAL COMPETITION—15TH PARIS PRIZE—A CITY HALL

SOCIETY OF BEAUX-ARTS ARCHITECTS

E. W. BURKHARDT

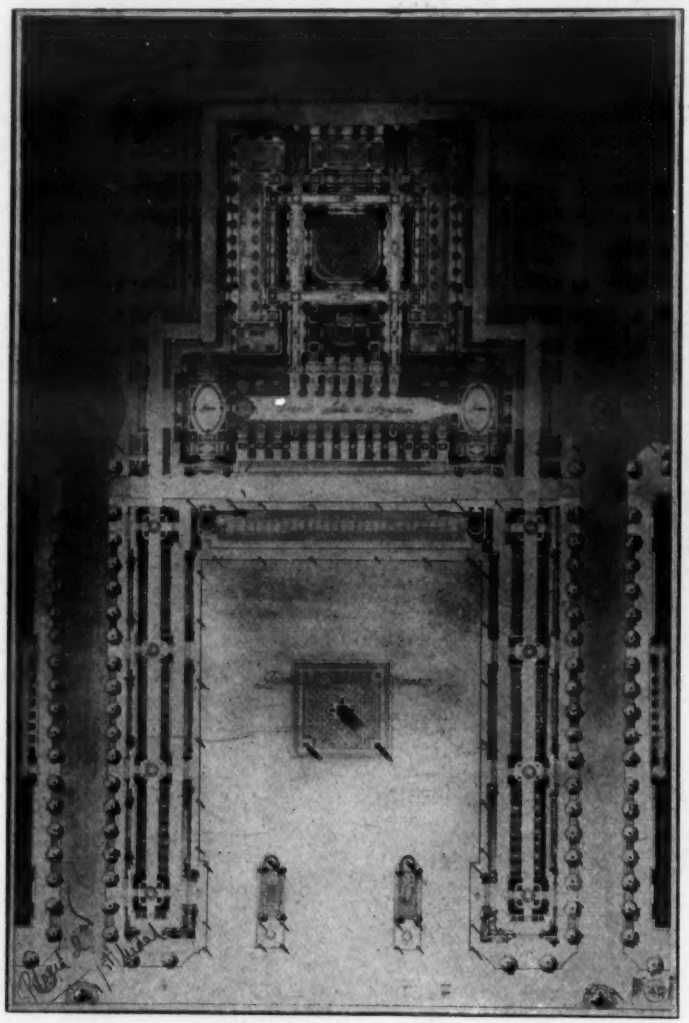
PLACED SECOND—FIRST MEDAL

COLUMBIA UNIVERSITY

PATRONS—M. PREVOT, H. W. CORBETT

FINAL COMPETITION—15TH PARIS PRIZE—A CITY HALL

SOCIETY OF BEAUX-ARTS ARCHITECTS



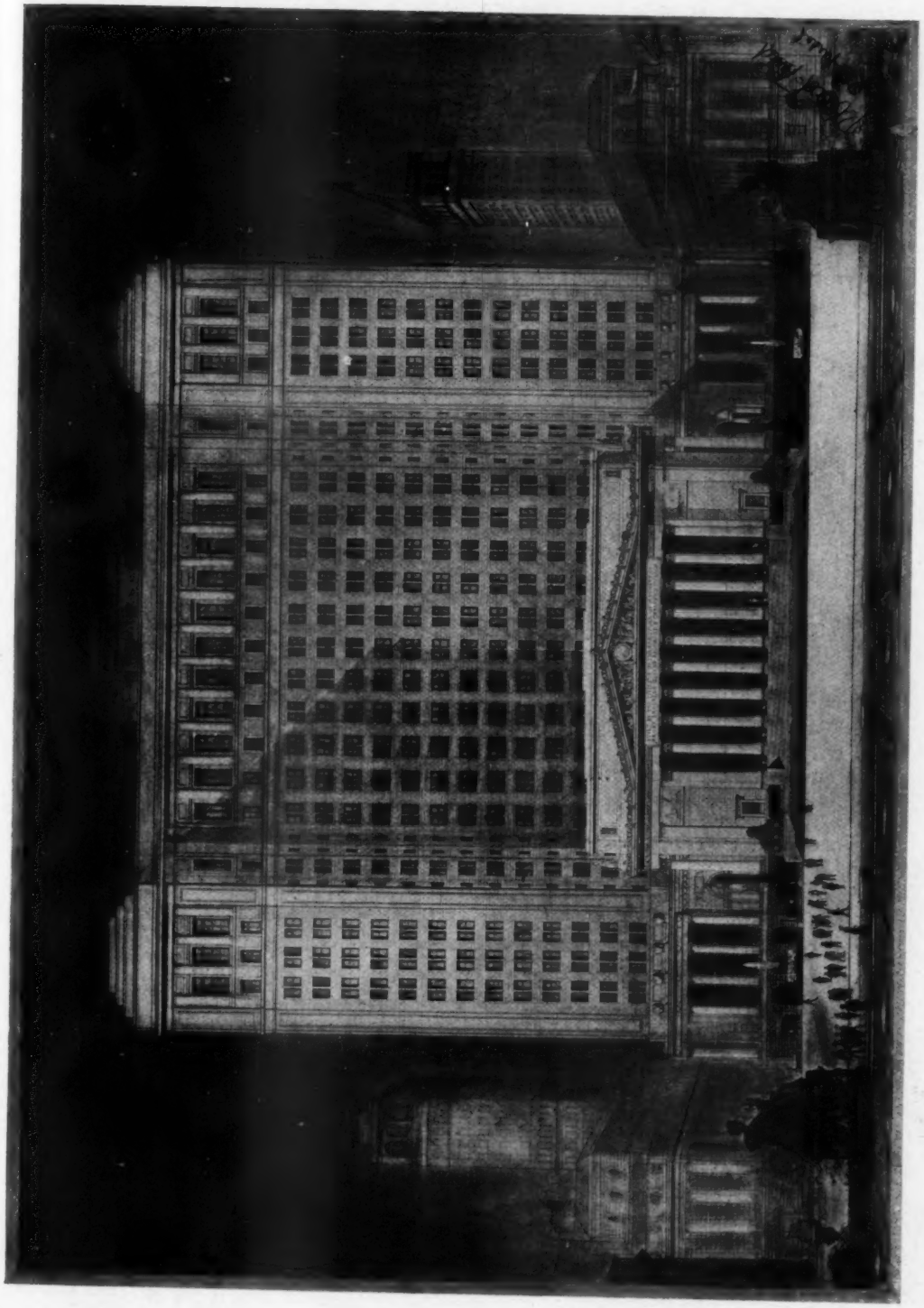
PLACED SECOND—FIRST MEDAL

E. W. BURKHARDT — COLUMBIA UNIVERSITY

PATRONS—M. PREVOT, H. W. CORBETT

FINAL COMPETITION—15TH PARIS PRIZE—A CITY HALL.

SOCIETY OF BEAUX-ARTS ARCHITECTS



PLACED THIRD—SECOND MEDAL
FINAL COMPETITION—15TH PARIS PRIZE—A CITY HALL
SOCIETY OF BEAUX-ARTS ARCHITECTS

L. FENTNOR

PATRON—F. C. HIRONS

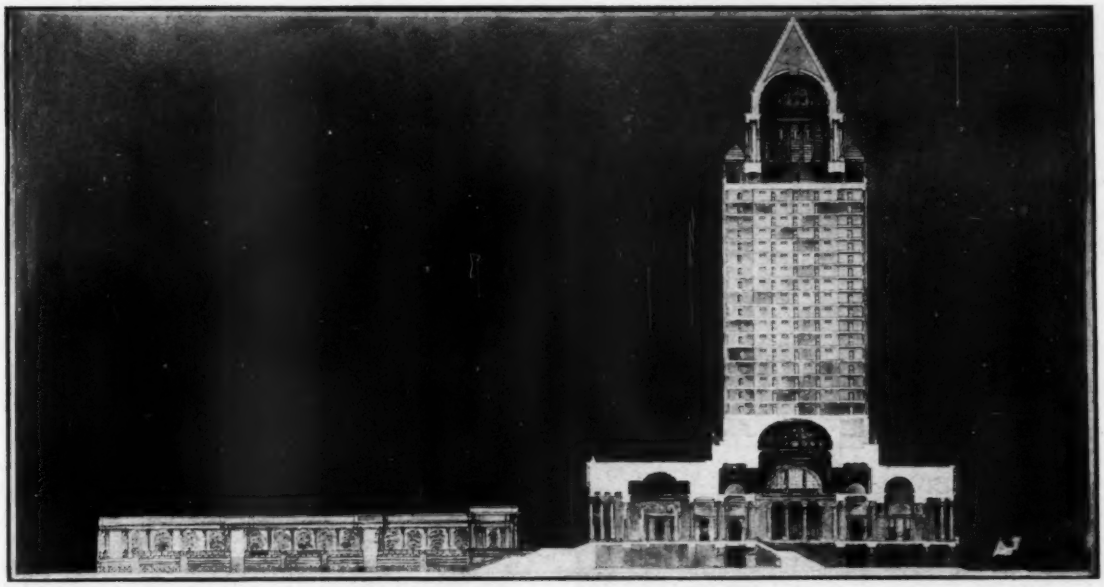
PLACED THIRD—SECOND MEDAL

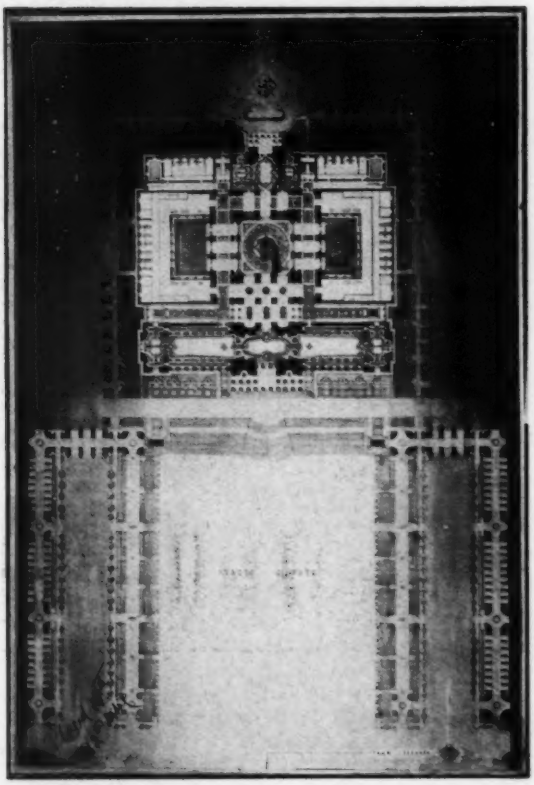
PATRON—F. C. HIRONS

L. FENTNOR

FINAL COMPETITION—15TH PARIS PRIZE—A CITY HALL

SOCIETY OF BEAUX-ARTS ARCHITECTS





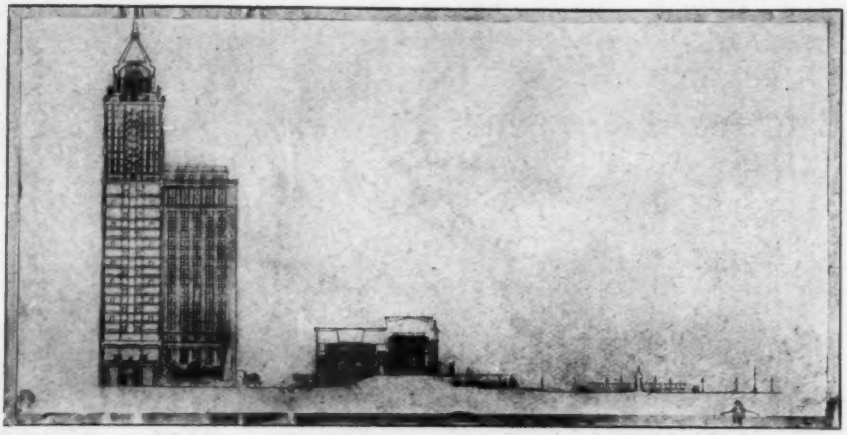
PLACED FOURTH—SECOND MEDAL

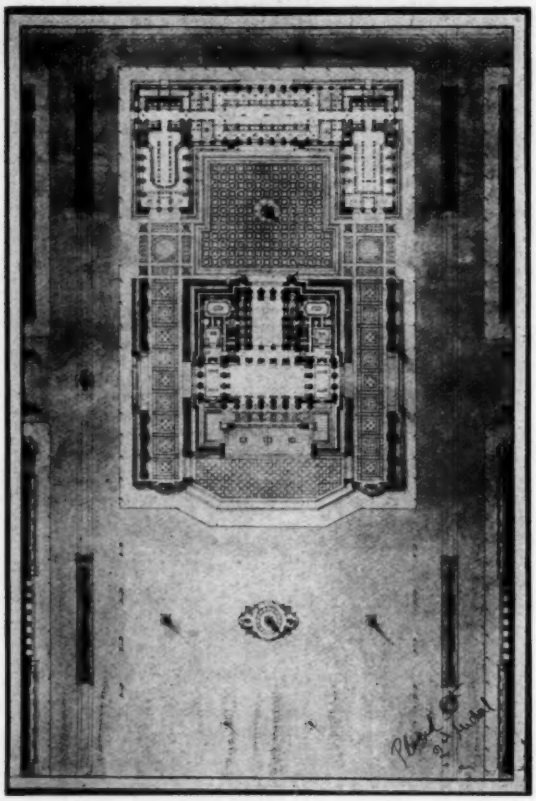
J. G. SCHUHMANN, JR. COLUMBIA UNIVERSITY

PATRONS—M. PREVOT, H. W. CORBETT, J. V. VAN PELT

FINAL COMPETITION—15TH PARIS PRIZE—A CITY HALL

SOCIETY OF BEAUX-ARTS ARCHITECTS





PLACED FIFTH—SECOND MEDAL

E. L. BABITSKY

JOHN HUNTINGTON POLYTECHNIC INSTITUTE

PATRON—W. J. WYNKOOP

FINAL COMPETITION—15TH PARIS PRIZE—A CITY HALL

SOCIETY OF BEAUX-ARTS ARCHITECTS

# NOTES ON THE ILLUSTRATIONS

## Work from the Office of John Russell Pope, Architect

IN an appreciative article on American architecture in a recent issue of *The Architectural Review,* of London, Mr. H. M. Fletcher states:— "There are certain characteristics which may therefore be recognized as American;—lucidity, courage, certainty." In no phase of the development of architecture in this country are these characteristics more insistently shown than in domestic architecture.

In developing a plan that would fit the daily convenience of American ways of living, architects have developed types of design of constantly increasing artistic excellence. In every section of this country this steady perfection of our domestic architecture is present. It is not only the man of large means who is building houses in the country, but there is a constantly increasing number who, seeking the out of door life for themselves and the members of their families, build houses that while far short in cost of those that are dignified as "estates" are artistically as good, and have received the same thoughtful study as have the more expensive dwellings.

The house at Southampton designed by the office of John Russell Pope, architect, is a fine example of conscientious designing and planning. It has apparently received the same thoughtful and artistic study as the pretentious "manor houses" that Mr. Pope has built for many clients all over the East, and in some Western locations. In this house, the general silhouette, the placing of materials and the planting, all make a most attractive ensemble. In fact, it is in the artistic use of materials, in exactly the same way as the easel painter uses color, that Mr. Pope gets his strong appeal. This house belongs exactly where it is placed. Its every detail inside and out suggests those elements of refined gentility that have become the outstanding feature of our domestic architecture.

It's a pity that we cannot always have in architectural practice the fine display of architecture as an art that is proclaimed in this instance. Architects are human, they seek the largest possibilities. When they have "arrived" they desire identification with only the largest work. They may take smaller commissions, and they undoubtedly do, but those they rarely lend for publication. The conscientious artist architect does not treat each subject with reference to the amount of money there may be in it. The present house is perhaps one of the least expensive that THE AMERICAN ARCHITECT has been permitted to illustrate as from Mr. Pope's office. Yet, if one turns back to the many pretentious structures designed by Mr. Pope and illustrated in this journal, he will not find that there is any more artistic expression of the use of materials than is here shown.

It is this conscientious effort on the part of the big men in our profession that achieves a result that prompts Mr. Fletcher to characterize us lucid and courageous, and with a certainty that makes it unnecessary to offer apologies for shortcomings.

No less fortunate an example of skillful use of material is the small chapel by Mr. Pope's office, also shown in this issue.

In both the house and chapel, the planting and the artistic surroundings have had the most careful consideration. And, to quote a remark overheard at one time by the writer, these are simply examples of "the hand of God, reverently treated by the hand of man." That is really the secret not only of good planting and general arrangement of grounds, but it is also the secret of that fine use of materials in building that marks the difference between commonplace building and suburban architecture as developed in this country.

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### Holy Well at Guadalupe, Mexico

THE splendid polychrome dome of this ancient edifice, illustrated on page 221, is one of many examples to be found throughout Mexico, mainly, however, in Puebla. Brilliant orange, green and blue coloring was employed for the dome tiles and recalled in the wall and parapet features above cornice and in the tile bands framing the plain wall surfaces below. The soft mellow stone used for the entrance and remaining architectural trim glows with a wealth of rich shadow coloring.

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# SOCIETY OF BEAUX-ARTS ARCHITECTS

DIRECTOR OF THE INSTITUTE, LLOYD WARREN

ARCHITECTURE, RAYMOND M. HOOD SCULPTURE, JOHN GREGORY

INTERIOR DECORATION, ERNEST F. TYLER MURAL PAINTING, ERNEST C. PEIXOTTO

OFFICIAL NOTIFICATION OF AWARDS

JUDGMENT OF AUGUST 15TH, 1922

FINAL COMPETITION FOR THE 15TH PARIS PRIZE

OF THE

SOCIETY OF BEAUX-ARTS ARCHITECTS

PROGRAM

The Annual Committee on the Paris Prize

proposes as subject of this Competition:

"A CITY HALL"

A City Hall is the chief edifice of a city and should unite perfectly the necessary and the beautiful. It should have sufficient room to house the administration spaciously, in a manner fitting to a great municipality, and architecturally to give a dignified expression of its purpose and of its plan.

In former times such a building dominated its city, by size, height, or the richness of its material and decoration. Today, office buildings or hotels may easily dwarf it and other means than mere height and size must be used to give it distinction. The site and approaches are of great importance.

In modern cities the business administration has grown to very great proportions; new departments have been created and the older ones have enlarged to meet the more complex needs of our civilization. Because of their interdependence it is preferable to keep these offices under one roof.

With the broadening of our international relationships another function of the government has developed in the last few years, to such an extent as to suggest an interesting treatment of the city hall which has not previously been envisaged and which gives a particular character to this program. The Mayor, on behalf of the citizens, may frequently be called on to receive delegations, or the most eminent statesmen and warriors, from the great foreign nations, and occasionally to bestow the freedom of the city. This should be done impressively, in keeping with the dignity of a great metropolis, a great center of art and commerce, one of the most important in the country. It seems preferable to give to this function a separate building, distinct from the administration, although in connection with it.

The group will be erected on a lot 400 x 400 facing a public square suitably treated for the great crowds which will gather in it at times. This public square will also be 400 x 400. The reception building will face this park and also be on the axis of a large transversal avenue. The arrangement of the other avenues reaching the square is left to the liberty of the competitors.

There are, therefore, two principal divisions:

No. 1. Reception
No. 2. Administration

The second floor plans of the group and the plan of the park are all that is required.

The portion devoted to the Reception will consist of a 1st floor, a 2nd floor and, if so desired, a relatively unimportant 3rd floor. The second floor will show the monumental staircase, the Mayor's Suite and the salons for the important receptions, with all their necessary dependencies.

The Administration will be housed in a maximum of 17 stories, but crowning motives may rise above this if so desired. The second floor will hold the offices of the Tax Collector, the Assessor and the Marriage Bureau, with the circulations and dependencies necessary. The total floor area in the 17 stories should be a minimum of 400,000 sq. ft.

JURY OF AWARDS:—F. L. Ackerman, L. Ayres, R. P. Bellows, P. P. Cret, J. M. Howells, J. H. Hunt, J. G. Rogers, H. R. Sedgwick and H. O. Milliken, Chairman.

NUMBER OF DRAWINGS SUBMITTED:—5.

AWARDS

Prize and First Medal:—Roger Bailey; Patrons—Prof. E. V. Meeks and Mr. O. Faelton, Bronxville, N. Y.

Placed Second and First Medal:—E. W. Burkhardt, Columbia University, N. Y. C.; Patrons—M. Prevot and H. W. Corbett.

Placed Third and Second Medal:—L. Fentnor; Patron—Mr. F. C. Hirons, N. Y. C.

Placed Fourth and Second Medal:—J. G. Schuhmann, Jr., Columbia University, N. Y. C.; Patrons—M. Prevot, H. W. Corbett and J. V. Van Pelt.

Placed Fifth and Second Medal:—E. L. Babitsky, John Huntington, Poly. Institute, Cleveland, Ohio; Patron—Mr. John Wynkoop, N. Y. C.

The comments of the Jury have been reported by the Chairman in the following paragraphs:—

DRAWINGS OF ROGER BAILEY—PRIZE AND PLACED FIRST

The jury was of the opinion that these drawings presented most clearly a solution in which the relations and proportions of the main elements had been most carefully thought out. The treatment of the circulation was very good; the easy access to the smaller building and to the office building from all parts of the city, the placing of the elevators for the tower, allowing a very practical division of office space, the simple and beautiful relation of the park to the group. There was felt to be a slight over-refinement of poche, the plan not giving quite adequate expression of the solids on elevation. The charm of the smaller building might to advantage have been carried up into the tower; the sketch showed a more homogeneous group in mass. The indication of the tower on plan was not sufficiently accused and in reality the oblong office building would prejudice the effect of the tower from certain points of view.

DRAWINGS OF E. W. BURKHARDT—PLACED SECOND

These drawings were felt to have a very fine agreement in scale and were more consistent in this respect than any of the competitors. A certain heaviness was noted which is more in keeping with older methods of construction than with modern building. The plan was compact and permitted direct communication between the two divisions, a very good and well worked out solution. The circulation was a little constricted and the entrance of honor not quite frank enough. The general feeling of the architecture was not as sympathetic as in some other cases. The section showed that a very impressive effect would be had by a visitor going from the reception to the administration.

DRAWINGS OF L. FENTNOR—PLACED THIRD

This plan showed great ability and a clear solution of the scheme adopted. The presentation and the beauty of the poche were highly commended. The plan was considered more decorative than strong in outline, and the pediment of the reception building gave an impression of intended depth rather than width. The reentrant form

of the administration building and its slightly commercial character were criticised.

DRAWINGS OF J. G. SCHUHMANN, JR.—PLACED FOURTH

The jury regretted that the fine quality of this elevation was so slightly connected with the plan. It was noticed at once that the mass of the tower apparently rested on the vaults of the great hall. The elevators were felt to be inadequate and not placed to the best advantage and the separation of administrative services on the principal floor adversely commented on. The fine termination of the tower, which would count well from every angle, and the strength and solidity of the rendering were very favorably mentioned.

DRAWINGS OF E. L. BABITSKY—PLACED FIFTH

This was a very frank treatment, well studied and well presented. The wings of the office building would block the view of the tower from both sides except at a great distance, and the park and building site were not sufficiently realized as a single composition. The services of the reception building were well placed but the grand stairway was over developed. In the administration the elevator and services were hardly placed to the best advantage.

That all the logeists had given hard and careful thought to their projets from sketch to completion was evident, the general level being rather exceptionally high, and the diversity of parti showed original thought. The judgment brings out the fundamental importance of good planning and of the necessity for an intensive study of the proper requirements in order to make a clear and logical reply to them. The simpler and more direct the plan is, the less likely is one to find difficulty in the elevations. The evident intention of the program was that the study should be concentrated on the plot of 400 x 800 and its approaches. This the winning designer recognized. Any treatment beyond those dimensions was permissible but entirely secondary, so that the designs which largely depended for the effect of their settings on what might happen on either side of the public space were not as favorably considered.

Modern methods of steel construction have changed the expression of elevation in plan, and many of the older conventions which made plans easily readable have had to be scrapped. Several of the plans submitted show a hesitation in the method of indicating the higher portions of the office building or tower, others exaggerate the wall thickness beyond what is necessary for appearance or solidity.

In general, the importance of the sketch or esquisse in this and other work of the kind is insufficiently realized by students. It is like the first sketch or description given to a client. Small size simplifies the problem to a point where details are not confusing and where the expression of an idea is reduced to its simplest terms. If the sketch is clear and simple later difficulties are lessened, and the study of detail falls into its proper place. Such a sketch can hardly be well made unless the program has been thoroughly understood and the solution thought out before recourse to pencil and paper, which, after all, are only the means of noting or transmitting a mental image.

For this reason an analysis of the sketches themselves follows:—

The winner improved his esquisse by making the plan more homogeneous. He, however, suppressed the frank expression of his tower in plan and was forced to raise it in elevation to a point where it was almost at variance with his sketch. Lack of sufficient study of space requirements. The second sketch is in many ways the best, and was little changed in the rendering. With such a good start further study on the character of the elevation would have easily given a more beautiful building and brought it closer to winning. The third sketch had a proper conception of the square as a whole and the facade expressed the plan more successfully than the rendered drawing. Great difficulty was experienced by the fourth in getting a workable plan out of his sketch; the possibilities were strained to the breaking point and the indicated treatment of the square was certainly not improved by the introduction of motives which blocked the avenues. The fifth sketch also would lead one to believe that the square and the buildings had been conceived as a whole, and that the elevators were placed under the tower. The indicated facade was more homogeneous than the rendered one.

**Building for the Central States Life Insurance Co., St. Louis, Mo.**

*(From the Original Painting by Tom P. Barnett)*

## The Relation of Pipe Organs to Architecture

(*Continued from Page* 228)

be awarded at least seven months prior to the date of proposed completion.

Plastering in the chambers should be finished as early as possible, so that all dampness is elim-

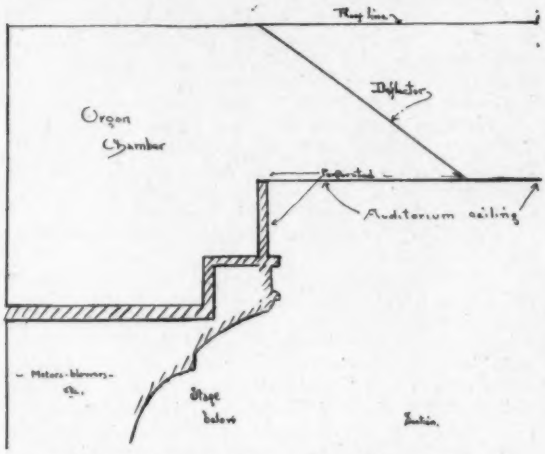


Fig. 5 Organ Chamber above ceiling with tone deflector

inated before installation of the instrument is begun, and final tuning and voicing, which is done after erection, calls for a condition of quiet in the premises which is often difficult to obtain.

It is not unreasonable, therefore, to say that the success of the installation of an organ depends, primarily, upon the Architect, and he will always

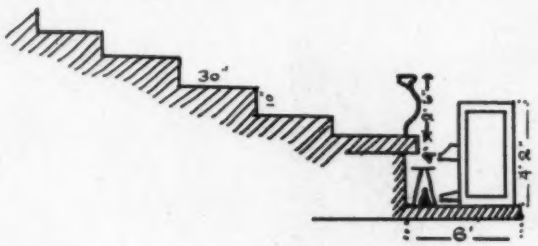


Fig. 6

find a willingness and readiness on the part of the organ builders, cheerfully to give any information which he may wish, and to co-operate with him in arriving at the best possible solution of the problem at hand. No two situations are alike, and it is safe to say that there is always some way to overcome what at first may seem to present an insuperable situation.

(*To be continued*)

## Movement to List New York's Historical Trees

THE New York State College of Forestry, Syracuse University, is seeking to learn which are the most important trees, historically, in the State. Ten dollars will be paid by the college to the person submitting a photograph of the most important historical tree.

Four prizes of $5 each will be paid to those who submit photographs of trees that rank second, third, fourth and fifth in importance. Five prizes of $2 each will be paid for photographs of the next five ranking trees. Each photograph must be accompanied with a brief statement of the events, dates, etc., that have made the tree in the picture famous.

There are many trees in the State of New York noted for their historical associations. Trees identified with great statesmen and soldiers; trees that have witnessed the passing of victorious armies; trees that have been identified with the establishment of the principles of our Government; trees that have been planted by men of note or under which some poet or inventor found inspiration.

## International Housing Congress in Rome

AN International Housing Congress will be held in Rome from September 21 to 26. The program will be as follows:

General situation of the housing problem in the various countries, especially with regard to cheap houses for the people, since the International Congress held at The Hague (September, 1913).

State action and intervention in order to meet the insufficiency of houses and lodgings. Special and necessary contributions and efforts to be made to make up the difference between interest on invested capital and house rent.

Uniformity of terminology for the purpose of facilitating statistical comparisons. Studies and reports on the most suitable means and efforts to solve the various housing problems.

Suggestions, communications and demonstrations concerning the various materials to be used and the selection of building systems, with a view to reducing as much as possible the cost of houses, not neglecting, however, the aesthetic feature of the house.

The Executive Committee will be very glad to receive prints, publications, drawings, etc., which will represent the best recent work in housing in this country.

The fee for membership to the Congress is 50 Italian lire. Address the Executive Committee 101 Via del Clementino, Rome, for further information.

# LEGAL DEPARTMENT

Conducted by

CLINTON H. BLAKE, Jr., of the New York Bar

IN an article which appeared in the March 1, 1922, issue of THE AMERICAN ARCHITECT AND THE ARCHITECTURAL REVIEW, I considered the question of the discharge of the architect and his right to compensation and damages, in the event of his discharge. I find that, in at least one instance, a part of the above article has been misunderstood. Lest there may be any misunderstanding on the part of others, I wish to make perfectly clear, if I have not yet done so, the points which I had in mind, and the correct rule of law governing the right of the architect to compensation, in the event of his discharge by the client.

In the article referred to, I stated that, in the absence of an agreement providing otherwise, it was not the law that the architect could necessarily collect only the proportionate amount of his compensation which had accrued, up to the time of his discharge, and discussed his right to claim, under certain conditions and in the absence of an agreement, the full amount of damages to which he would be entitled, on the basis of his right to complete in full the work which he was employed to do. In this connection, I said:

"If an architect be employed to prepare plans and specifications for, and to superintend the erection of, a given building under an agreement that he shall receive as compensation a specified commission based on the total cost of the job, the owner cannot avoid his obligation to pay the architect his full fee on the total cost of the building as erected, by discharging him before the work is finished and continuing it to completion without him."

I then went on to discuss the question of the architect's compensation, as affected by the schedule of charges of the American Institute of Architects, and in this connection pointed out that the provision, for instance, that one-fifth of the architect's fee shall be payable when the preliminary sketches are submitted, does not mean that, if the employment of the architect be dispensed with and he be discharged, without cause, at that point, the one-fifth amount is necessarily a proper and full measure of the sum which he is entitled to receive. It is this latter statement especially which has been misunderstood.

In making the statement regarding the right of the architect to collect full compensation, in the event of his improper discharge and in referring to the fact that his fee would not necessarily be measured by the proportionate amount set forth in the Institute Schedules at the time of his discharge, I had in mind, as stated in the article, a case where there was no special agreement to a different effect, and where the Institute Schedules were involved, as distinguished from the standard form of Institute contract between client and architect. I also had in mind a case of discharge, rather than the suspension or abandonment of the work.

I find that, in reading the article, it has been assumed in the instance which I have mentioned, that it was my opinion that, under the Institute form of contract, the architect, if the work be abandoned, at the point where the one-fifth portion of the fee has accrued, is not limited in his recovery to this amount, and that this installment payment is not, under such conditions, if made to him at that point in the work, a payment in full for his work, but is merely a payment on account of the total fee, and that the contract is an entire contract covering the building operation as a whole. This, of course, is not correct.

The Institute form of contract is a very different thing from the schedules of charges of the Institute, and specifically provides, in article five, that:

"Should the execution of any work designed or specified by the Architect, or any part of such work be abandoned or suspended, the Architect is to be paid in accordance with or in proportion to the terms of Article 6 for the services rendered on account of it up to the time of such abandonment or suspension."

This clause is not as clear in some ways as it might be, but I think there can be no great question that, read in conjunction with Article 6, which sets out the amounts payable to the architect at the different stages of the work, the effect is clearly to limit the recovery of the architect, in the case of the abandonment or suspension of the work, to the specific proportion of his fee which has then accrued under the terms of Article 6.

Of course, the abandonment or suspension of the work may be a very different thing from the discharge of the architect. If the work be abandoned or suspended, but thereafter proceeded with and completed, has the architect originally employed a claim for damages other than the proportionate amount due him under Articles 5 and 6, (at the time of the suspension or abandonment) in the event that he is not employed to complete the work? In other words, has he the right, if the work is completed, to continue to act as the architect thereof?

If he is not employed to complete the work, has he a claim for damages when the work is completed by another? If he is discharged, without any cause given on his part, before the work is completed, and the work is later proceeded with to completion, is the obligation of the client to the architect different from his obligation, where the work is abandoned or suspended and later completed? How would the rights of the architect differ, if at all, in the case of the completion of the work in accordance with his plans and specifications, and the case where the work is completed after his discharge, but in accordance with plans and specifications prepared by others? Where the work is abandoned or suspended, does the obligation of the client to the original architect differ, where the building is completed on the basis of plans prepared by this architect from the case where it is completed under new plans prepared by a new architect? These are all questions which may arise at any time in the practice of the architect, and which are related in a general way, and some of them very closely, to the general questions discussed in this article and in the article in the March 1 issue. I shall deal with them in succeeding articles.

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## LEGAL DECISIONS

AN architect was employed under a contract providing that he should furnish preliminary sketches for a specified percentage of the cost of the building, payable on the acceptance of the sketches; that he should provide complete working drawings and specifications for an additional percentage, payable on the completion of the drawings and specifications, and that he should supervise the construction of the building for an additional percentage, payable in the usual way pro-rata on the architect's certificates issued during the progress of the work. It was conceded that the preliminary sketches had been made and accepted prior to the execution of the contract covering the compensation. The client abandoned the project and stopped the work. It also appeared that the architect, without the knowledge of the owner, had acted as the representative of various furnishers and contractors, and received a certain compensation from them, and that he had, in accordance with a custom which was proven, but without the knowledge of the owner, contracted with engineers to have the latter prepare specifications covering the mechanical equipment of the building, with the understanding that, if they obtained a contract for the actual work on the building, they would make no charge for their services in preparing these specifications. The Court held that the contract was a severable contract containing various items of work with a separate price apportioned to each item, and that the architect might recover for one of these items, namely, for the work done prior to the abandonment, but not for the other items of work not completed at that time. The Court further held that the architect, in acting as the representative of furnishers and contractors, was guilty of a breach of duty to his employer, and that in the agreement which he made with the engineers, notwithstanding the proof of custom, the agreement being without the knowledge of the owner, he thereby lost his right to compensation for the furnishing of complete working specifications and for the superintending of the construction of the building.

*Audubon Building Co. v. F. M. Andrews Co.*, 187 *Federal* 254.

A CARPENTER brought an action against the defendant to recover the price of a house built for the latter. The Court found that the contract had been substantially performed, that there were some omissions and deviations but that the defects, such as they were, did not impair the structure as a whole and that they were of such a character that they could be remedied without causing any material damage to the balance of the building, and that in the alternative the owner could be compensated for them without inflicting any injustice upon him by allowing him a deduction from the contract price in his settlement with the contractor. The Court held that, under these conditions, substantial performance of the contract had been had and the contractor might recover the full amount due, less such deductions as were necessary to compensate the owner in making good the omissions, defects and deviations from the work as it should have been actually performed.

*Roseburr v. McDaniel* (*Supreme Court Arkansas, 227 S. W. Rep.* 397).

WHERE a contract is entire and for personal services of an architect only, and there is a total breach of it on the part of the client, the measure of damages to the architect is what he would have earned if he had been allowed to complete the contract, as agreed, in full, less the amount which it would have cost him to perform it according to its terms.

*School District of Omaha v. McDonald*, 68 *Nebraska* 610.

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# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## THE VENTILATION OF HOUSES AND APARTMENTS

BY G. C. POLK

HAVING perfected means for the ventilation of places of public assembly and working rooms of factories, authorities on ventilation have turned their attention to improving living conditions in the average dwelling, this including houses and apartments.

The necessities are pure air in proper quantities at a comfortable temperature. Experiments have shown that comfort is obtained when air coming in contact with the skin is felt to be moving. This is true even when air is vitiated and when it is at a relatively high temperature. The problem resolves itself into causing the air within rooms to move and to provide for the introduction of fresh air and the expulsion of used air at a minimum of expense. Any system that ignores dust, the bugbear of careful housewives, is bound to fail.

A fan in the kitchen of the home is a necessity and not a mere luxury

The window alone enters into the scheme of things only on perfect days, of which there are too few, and must be disregarded on days when the wind is in the wrong quarter or when it brings clouds of dust into the house. In summer when temperatures at times become unendurable it is often the case that the wind comes laden with dust. Closed windows only partially exclude dust and they cause suffering because of high temperature and lack of a current of air.

In winter when it becomes close and hot within and there is a high wind outside the same conditions exist as in summer. On the other hand when it is cool within the house and auxiliary heat is used, such as that furnished by a gas or electric stove, the full benefit cannot be enjoyed until there is a uniform distribution of the warmed air. The obvious thing to do is to employ a fan electrically operated. The heat from auxiliary heating appliances is usually radiant heat and should be directed towards some surface which will be heated and supply currents of rising warm air. These the fan can play upon and direct to distant parts of the room, soon establishing uniformity of temperature and a movement of air which will be felt by the skin.

Such devices are merely air stirrers and proper ventilation is not obtained until there is an entry of air at a number of places and a discharge at one place, all without the creation of drafts. Fresh air must be pulled in and vitiated air must be thrown out, this requiring the installation of a fan at one or more windows. The first window thus to be utilized is a kitchen window. Aesthetic considerations have much to do with the selection but common sense plays the greater part.

The kitchen is filled with smoke, greasy fumes and cooking odors three times each day for considerable periods of time. The air not only is contaminated but a greasy film is deposited on the walls, curtains, furniture and fixtures. If the air moves in the wrong direction the whole house becomes smelly and greasy. The greasy film is a most pervading thing and one man who used the upper shelves of kitchen cupboards as a storage place for books until he had enough to warrant the purchase of a book case, found to his surprise that the grease went through very small cracks indeed. Tenants of apartments who are compelled to keep goods in closets which appear to be well closed are often disgusted, when moving time comes, at the feeling of the articles they

kept there or the feeling of the covers in which the articles were wrapped.

Obviously the selection of a kitchen window for the installation of the first fan is wise. Open windows and doors make it difficult to keep the gas flame burning. The fan makes the housewife independent of the whims of the winds and it continuously exhausts a volume of air carrying with it all odors, smoke and grease. When the air passes out of the kitchen window it draws air through the kitchen from other rooms in the house. These in turn obtain fresh air through crevices around doors and windows or from open doors and windows. The result is a steady flow of air from every window and door, to and through, the kitchen. This not only ventilates the whole house but prevents the entrance into other rooms of smoke, odors and greasy fumes from the kitchen.

The money cost of ventilation in factories may be computed but that it pays is shown by the greater output and increased efficiency of the workers. In such a scheme the open window and door can play no part for the ventilation system is designed with a view to bringing definite quantities of air into rooms at definitely fixed points and discharging it at certain other points. The cost of ventilating dwellings becomes in a short time part of the general expense of running the home and is not felt. The apparatus operates only at the times the need is felt and for many days in the year this amounts to not more than three to five hours each day. The first cost of such a fan is not high and the cost of operation is at all times under perfect control.

A few years ago the wiring of houses was based on lighting requirements only. Today houses are being wired for power as well as for light because of the constant increase in number of appliances operated electrically. With the increased sale of power fans has come a recognition that something larger than the ordinary fan, which stirs air, might be appreciated and some manufacturers tentatively offered fans which could be installed in windows of kitchens, smoking rooms, bedrooms, etc. Although on the market but a comparatively short time there has arisen a considerable demand. This is so great that in many recent plans for houses and apartments, provision has been made for fans which will throw out vitiated air and which may be reversed in motion for drawing in outside air when needed. These arrangements sometimes consist in specifying that a fan be installed in certain windows while other architects have provided special openings. In one such plan bulls-eye openings have been provided with metal louvres which may be opened by chains from the inside. The fans are to be set in these bulls-eyes and on the inside are hinge opening doors made of colored glass.

Such designs are expected to become usual in the future. The ventilation of houses and apartments solely by fans, to the complete exclusion of doors and windows will never come about. The use of fans however in all kitchens may be looked for within a very short time, now that fan manufacturers supply them in special frames and fittings at low prices. Following use in the kitchen they will be used in other rooms, for people everywhere are now regarding as necessary everything that adds to comfort and convenience.

In plans recently completed for some medium size houses a ventilating fan was specified for each kitchen and for one room on the opposite side of the house from the kitchen. For each window there was provided an air screen, such as is sold in all large department stores. Whenever a fan is to be operated to carry out air an adjustable air screen, which is made of fine cloth in a frame, will be placed in each sash underneath the partially opened window; as many windows being thus opened as the need for fresh air demands. The screens partially solve the dust problem, which demands for a full solution stopping or screening the space between the upper edge of the lower sash and the lower edge of the upper sash, something which may readily be accomplished. The fortunate occupants of such houses may create currents of air at will in any direction without regard to the prevailing wind. One fan may be exhausting air and the other fan supplying fresh air from the outside. For the ordinary single family house two fans are a luxury as a single fan in the kitchen will do all that is necessary. Two fans however will be very comfortable on hot summer nights as the current of air thus produced will be felt in every room, after one learns how to arrange door openings to direct the air at will through any room.

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### The Cleveland Zone Plan

THE Cleveland Chamber of Commerce has issued in pamphlet form the report of the Committee on City Plan, approved by the Board of Directors, June 14, 1922. The report contains, Zoning—What it is and what it does; Zoning in other places; The Legal and Physical Phases of the Cleveland Zoning Ordinance; Principles and Methods Employed in the Preparation of the Cleveland Zone Plan; Cleveland's Planning Problem with Recommendations; Brief of Ordinance; Three maps showing, respectively, Use, Height and Area districts. It should be useful to architects who are interested in zoning laws.

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# PAINT AS A FACTOR IN ILLUMINATION

IN a rough way all men assume that white is the best color to use when light is needed. When white is considered to be too glaring and a softer tone is desirable it is well understood that in departing from white those colors are best in which yellow predominates. The value of color for the purpose of obtaining pleasant appearing walls and ceilings may be stated quantitatively. It depends upon the percentage of light reflected.

The figures presented in the following table are the results of a considerable number of tests by different authorities and are representative average values.

| Color | Percentage of Light Reflected |
|---|---|
| White—new | 82 to 89% |
| White—old | 75 to 85% |
| Cream | 62 to 80% |
| Buff | 49 to 66% |
| Ivory | 73 to 78% |
| Gray | 17 to 63%* |
| Light green | 48 to 75% |
| Dark green | 11 to 25% |
| Light blue | 34 to 61% |
| Pink | 36 to 61% |
| Dark red | 13 to 30% |
| Yellow | 61 to 75% |
| Dark tan | 30 to 46% |
| Natural wood brown stain | 17 to 29% |
| Light wood varnish | 42 to 49% |

In using such a table it must be stated that there does not exist a standard terminology among paint manufacturers. A tint may be known by one name to one manufacturer and have another name on the color card of another manufacturer. Many of us who occasionally do a little painting at home know that when a job is started it must be completed with the colors made by one manufacturer. Many have had the embarrassing experience of starting to paint household things a certain color and underestimate the amount of paint required, only to find when the job is partly done that we must wait a week for a new supply of paint to come from the factory, or, change the color scheme and use colors of another maker. It is with such things in mind that the above table is diffidently presented. To make it useful there should be an accompanying color card to identify the tints. In addition to the difficulty with the terminology the chemical composition or method of mixing the paint will have an effect on its ability to reflect light. A slight variation may be caused by an alteration in the oil content.

The coefficient of reflection varies with time. There is comparatively little choice between good white paints when fresh. Exposure to normal daylight conditions soon shows that some are better than others. The freshly scraped surface of a block of magnesium carbonate has a coefficient of reflection of 98 per cent, this being higher than for any known pigment. As comparative average values for properly prepared and freshly mixed samples, the following figures apply:

| Paint | Coefficient of Reflection | |
|---|---|---|
| | New | After Aging One Year |
| Lithopone | 0.86 | 0.80 |
| Flat enamel (magnesia bearing) | 0.85 | 0.82 |
| Gloss enamel | 0.83 | 0.83 |
| White lead and oil | 0.83 | 0.75 |
| Calcimine type | 0.82 | 0.75 |

Lithopone is a white pigment prepared by simultaneously precipitating Zinc Sulphide and Barium Sulphate in approximately the proportions of 30% of the former to 70% of the latter. In order to confer upon this precipitate the physical properties characteristic of Lithopone, it is necessary to give it special treatment in the way of drying, roasting, quenching in water, drying again, and disintegrating to a fine, white pigment. It is the latter product which the trade knows as Lithopone.

A much more intimate mixture of the Zinc Sulphide and Barium Sulphate is obtained by precipitating them together than can be obtained by mechanically mixing these two ingredients, and the properties of the resulting pigment are entirely different.

A typical analysis of Lithopone runs as follows:

| | |
|---|---|
| $BaSO_4$ | 69.0 to 70.5% |
| Total Zn as ZnS | 27.5 to 28.5% |
| Moisture | 0.0 to 0.3% |
| Water Soluble Salts | 0.0 to 0.5% |

A recent writer in *Scientific American* stated that Lithopone is one of the most popular white pigments known, and it would find even greater application if it were not for one disadvantage that it possesses, namely, that it discolors when exposed to light. A surface painted white with lithopone and exposed to the sunlight will soon darken. Almost as old as the pigment itself are the attempts to counteract this deficiency in some way. A great deal of research has been done on this subject with varying degrees of success. Just exactly what happens is not positively understood, but the conditions governing the darkening of lithopone seem to be fairly well understood. It

** Grays vary remarkably depending on the way they are prepared. A gray made by mixing lamp black with white paint has a low coefficient of reflection. A gray made by mixing red and green paint with white base has a relatively high coefficient of reflection. It is known as a warm gray in this case.*

is known that small traces of certain impurities, particularly of chlorides of iron, cobalt, nickel, etc., accelerate the darkening process very considerably.

In the French journal *La Revue de Chimie Industrielle,* 1922, 109, there is described a very interesting and apparently perfectly effective method of avoiding the darkening of lithopone that does not contain any impurities. It is claimed that the ultra-violet rays in sunlight are responsible for the blackening of surfaces painted with lithopone paint and exposed to the sunlight. Certain materials are not affected by these rays and do not permit them to pass through their substance. Oxide of zinc, alumina, *blanc fixe* are examples of such materials. These are white in color and when added to the lithopone so that each particle of the latter is surrounded with an impenetrable and unaffected coating of alumina or zinc oxide, the resulting pigment is not impaired in any way; its color is just as good and its covering power just as effective, but it will not darken on exposure to light. Practical tests with such a product have proved to be altogether satisfactory. The standard paint specifications of the United States Government require that samples of Lithopone submitted for test must be free from liability to darken with age, therefore it must be possible to specify such material with certainty of receiving it.

During the day windows are primary sources of light. When the sun is not shining lamps must be depended upon. The ceiling and wall surfaces in a room are secondary sources of light, receiving and reflecting window light or lamplight. A slight increase in the reflection coefficient of a ceiling may greatly increase the effective illumination, thus increasing efficiency of the workers, whatever the hour, and reducing the expense for artificial light.

Not only is the color of the ceiling important, but the actual finish must also be considered. A glossy surface reflects images of the lamp filament and glare is introduced, causing eye strain. A flat or matt finish is therefore essential. A thin coating of white paint through which a dark surface may be seen has the same effect as a thin coating of enamel on a reflector. In other words, the light gets through the surface and becomes absorbed unless this surface is thick.

It is safe to say that differences between well painted white ceilings and ordinary light buff or similar colored ceilings give increase of between 20 and 30 per cent in illumination where semi-indirect or similar lighting systems are in use. This is really a conservative figure.

The selection of a paint must therefore be guided by the effect of aging upon the pigment. With the tables here given a fairly good estimate may be made of the time which will elapse before the cost of additional lighting will be equal to the cost of repainting. A number of paint manufacturers have produced pigments for the purpose of "painting for light" and it is not difficult to arrange color schemes which will be pleasing and at the same time hold the lamp expense down to a reasonable minimum.

The ceiling should be white, or a very light cream, ivory, buff or green. The walls may be a somewhat darker tint to about four feet above the floor. For this height a darker color may be used which will not look too unsightly when touched with soiled hands or other objects which cause disfigurement. Not only will a properly painted room effect a desirable economy in lighting bills, but it helps improve the morale of the workmen.

Many years ago it was customary to paint machinery in bright colors and workmen took pride in keeping everything clean and bright. A stage of drabness succeeded the somewhat ornate, showy period and machines were painted black or a steel gray. Within quite recent years there has been another swing towards giving workmen pleasant rooms in which to work and it has gone to the extent of using light colored paints on all machinery and equipment. The result has been a marked reduction in accidents, for many accidents in shops occur because of lack of light. Men also take time now to clean their machines where but a few years ago, such time was considered to be wasted. The time spent in keeping the machines clean is paid for in the smaller amount of oil used for lubrication. Oil no longer flows too profusely over machines which are painted in a light color.

Paint performs three useful functions in that it is used to preserve surfaces to which it is applied, it is used to improve the appearance of surfaces and it is used to reduce the cost of artificial lighting. It is only indifference, or ignorance, which allows men to use paint for but one of the three useful functions it performs so well. For preservative purposes the best paints unfortunately are dark colored. To hide them requires pigments with good hiding power and several coats must be applied in order to do this. Fortunately for the expense item it is seldom that the function of paint as a surface preserver is required on the interior of buildings. Every tint which has a good coefficient of reflection is available for decorative use and interior painting therefore may be ornamental at the same time it is used to render available the largest possible amount of natural or artificial light.

The writer is indebted for much of the foregoing information to a pamphlet entitled "Effect of Color of Walls and Ceilings on Resultant Illumination," by A. L. Powell of the Lighting Service Department of the Edison Lamp Works of the General Electric Company.

## When Preservative Treatment of Wood Is An Economy

ALTHOUGH any set of timbers may be made more resistant to decay by preservative treatment, such treatment may not always be economical, even though the timbers are to be exposed to the most severe fungus attack. If the timbers are to be in service for a short time only, durability is unimportant, and any kind of preservative treatment would obviously be a waste of money. If, on the other hand, the wood is naturally of low durability and is to be used in a permanent location, it is easy for preservative treatment to show great savings. Between these two extremes there are any number of instances in which it is a more difficult problem to determine whether or not preservative treatment will pay.

If a timber user knows the average life that treated and untreated timbers are giving and the cost of each in place, he can easily compute, with the use of the following table, the relative annual costs of maintaining the two. A mine operator may have found, for example, that untreated timbers are giving an average life of two years and that their cost in place is $6 per set. Assuming an interest rate of 7 per cent, the table shows that timbers which need replacement every two years cost annually $0.553 on every dollar of their cost in place. For the $6 set, then, the annual maintenance cost would be six times $0.553, or $3.32. Treated timbers, the user may find, give an average life of fourteen years and cost $7.50 per set in place. The annual charge on timbers with a fourteen-year life is found in the table to be $0.116 on each dollar of their cost in place. The annual cost of maintaining the $7.50 treated set, therefore, would be 7.5 times $0.116, or $0.87. Preservative treatment, then, would save this user annually $2.45 per set.

If a timber user knows the cost of treated and untreated timber and the average life of the untreated timber only, he can estimate how long treated timber would have to last to be as cheap as untreated timber. In the case discussed above, the untreated timber cost $6 in place; the treated, $7.50; and the untreated timber was lasting two years. The annual charge on the untreated set was found to be $3.32, and since the annual charge on the $7.50 treated set is to equal this, we may set up the equation, $7.5 \times y = \$3.32$; then y (the annual charge on one dollar expenditure) $= \$3.32 \div 7.5$, or $0.443. Referring again to the table and looking along the 7 per cent interest rate row, we find that an annual charge of $0.443 on the dollar falls between the 2-year and 3-year columns and evidently at a point equivalent to about a 2¾-year life. It can readily be seen from this that if treatment adds only ¾ of a year to the life of the timbers, it would pay for itself, and the user could be sure from the experience of others that it would add much more than this and would therefore be profitable.

If untreated timber is giving long life, treatment might not result in great savings. However, very often it might be possible to substitute for such timber a treated lower-grade material that would give as long or longer life with an annual maintenance charge which would compare very favorably with that of the better-grade untreated timber.

There are several advantages arising out of the use of treated timber which should not be overlooked, although they may not seem so important as cutting down maintenance costs. As decaying timbers are highly inflammable, preservative treatment, by keeping the wood sound, reduces the fire hazard. Then, a well preserved timber maintains high strength over a long period of time, while a

### Annual Charges On Each Dollar of Cost of Timbers in Place

| Interest Rate | Life in Years Before Replacement | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
| 4% | 1.04 | 0.530 | 0.362 | 0.275 | 0.225 | 0.191 | 0.166 | 0.148 | 0.132 | 0.123 | 0.114 | 0.106 | 0.100 | 0.094 | 0.086 | 0.079 | 0.073 | 0.069 | 0.065 | 0.062 | 0.060 | 0.058 |
| 5% | 1.05 | 0.538 | 0.367 | 0.282 | 0.231 | 0.197 | 0.173 | 0.155 | 0.140 | 0.129 | 0.120 | 0.112 | 0.106 | 0.101 | 0.092 | 0.085 | 0.080 | 0.076 | 0.072 | 0.069 | 0.067 | 0.065 |
| 6% | 1.06 | 0.545 | 0.374 | 0.288 | 0.237 | 0.203 | 0.179 | 0.161 | 0.148 | 0.135 | 0.126 | 0.119 | 0.112 | 0.107 | 0.098 | 0.092 | 0.087 | 0.083 | 0.079 | 0.076 | 0.074 | 0.070 |
| 7% | 1.07 | 0.553 | 0.381 | 0.295 | 0.243 | 0.209 | 0.185 | 0.167 | 0.153 | 0.142 | 0.133 | 0.128 | 0.121 | 0.116 | 0.109 | 0.103 | 0.097 | 0.092 | .088 | 0.086 | 0.083 | 0.081 |
| 8% | 1.08 | 0.561 | 0.388 | 0.302 | 0.250 | 0.216 | 0.192 | 0.174 | 0.160 | 0.149 | 0.140 | 0.133 | 0.127 | 0.121 | 0.113 | 0.107 | 0.102 | 0.098 | 0.095 | 0.093 | 0.090 | 0.089 |
| 9% | 1.09 | 0.568 | 0.395 | 0.309 | 0.257 | 0.223 | 0.199 | 0.181 | 0.167 | 0.156 | 0.147 | 0.140 | 0.134 | 0.128 | 0.120 | 0.114 | 0.110 | 0.106 | 0.103 | 0.101 | 0.099 | 0.097 |
| 10% | 1.10 | 0.576 | 0.402 | 0.315 | 0.263 | 0.227 | 0.205 | 0.187 | 0.173 | 0.162 | 0.153 | 0.146 | 0.140 | 0.135 | 0.128 | 0.121 | 0.117 | 0.114 | 0.110 | 0.109 | 0.106 | 0.105 |

Based on the formula, $A = P \frac{(1+r)^n r}{(1+r)^n - 1}$ in which $A$ = annual charges.
$P$ = amount of initial investment.
$n$ = number of years in the recurring period (the average life of the timber).
$r$ = the rate of interest expressed decimally.

decaying timber rapidly loses its strength. Preservation, by lengthening the life of timber and by permitting the use of low-grade material, also helps conserve a timber user's resources and the nation's timber supply.—*Technical Notes, Forest Products Laboratory.*

### Amount of Water in Concrete

WELL mixed concrete containing the proper amount of water will be pasty in composition with no free water standing on the surface. In other words it contains just the amount of water necessary to cause it to settle properly around reinforcement and fill the forms. To guard against formation of air pockets it should be spaded or be worked with rods. No tamping is required. This condition is styled "workable."

Water present in the fine and coarse aggregates combines with the water added to the mixture and for this reason the exact amount to add varies with each pile of material. An accurate water measuring box should be used under the control of a trained workman. The experiments made under the direction of Prof. Abrams at the Structural Materials Testing Laboratory, Lewis Institute, Chicago, form the best guide for proportioning water in concrete. Remarkably small variations in the amount of water were shown to cause surprising differences in strength.

Use the least amount of water required to make a workable mixture. Anything less necessitates tamping which is expensive and may disturb forms and reinforcements. An excess makes poor concrete that does not have proper strength and will deteriorate with age. A properly made concrete increases slightly in strength for several years after which it remains unaffected by exposure to the elements.

The Portland Cement Association says in a recent publication that the exact amount of water required for any particular mixture of aggregates to obtain the greatest strength in the concrete, can be determined only by actual test. Workability of the mixture is important and must not be sacrificed. As a basis for trial with well-graded aggregates up to 1½ inches in size, and a 1:2:4 mix, use 6 to 6½ gallons of water per sack of cement. For a 1:2:3 mix begin with 5¾ to 6 gallons, and for a 1:1½:3 mix, 5½ to 6 gallons.

### Progress in Sanitation

YEARS ago the Bidet was introduced and at once became popular in Europe. It is found in practically every hotel bath room on continental Europe and in many large residences. In the United States, where false modesty has prevented the Sitz Bath coming into vogue except in hospitals, the Bidet was unknown until the medical men of the A. E. F. upon returning from France advocated its general introduction. Recently some American manufacturers, who have been supplying the European market for years, plucked up enough courage to advertise the Bidet which it now appears the public is ready to adopt.

Common sense having been vindicated in the matter of the Bidet manufacturers of plumbing equipment might now essay the introduction of the type of water closet known in France as *"Cabinet à la turque."* For public places, factories and large establishments it is ideal from a sanitary standpoint for nothing can possibly be devised which more adequately can guard against transmission of annoyances and diseases caused by contact. The apparatus serves as a urinal also and is conveniently kept in a clean and sanitary condition.

### Fire Losses in the United States

DURING the period 1914-20, fire losses in the United States were 28.1 per cent of the value of new building construction. In 1920 the fire losses were 23.5 per cent of the value of new buildings. The losses mentioned represent only the actual insurance adjustments made and few buildings are insured for more than 80 per cent of their value. Losses not covered by insurance are not covered in the above figures, which may conservatively be considered as representing about 70 per cent of actual fire losses.

### Government Paint Standards

THE following specifications, adopted by the Federal Specifications Board, are sold at five cents per copy by the superintendent of Documents, Washington, D. C. They are all circulars of the Bureau of Standards and should be ordered by number.

No. 82 Specification for Linseed Oil, raw, refined and boiled. 2d. ed.

No. 84 Specification for Basic Carbonate White Lead, dry and paste. 2d. ed.

No. 97 Specification for Green Paint, semi-paste and ready mixed. 3d. ed.

No. 111 Specification for Flat Interior Lithopone paint, white and light tints. 2d. ed.

No. 117 Specification for Interior Varnish. 2d. ed.

No. 93 Specification for Iron-Oxide and Iron-Hydroxide Paints. 2d. ed.

The following specifications have been prepared and recommended by the U. S. Interdepartmental Committee on Paint Specification Standardization.

No. 85 Specification for Basic Sulphate White Lead, dry and paste.

No. 88 Specifications for Leaded Zinc Oxide, dry and paste.

| Material | | Temperature Difference 1° | 50° | 60° | 70° | 80° | 85° | 90° |
|---|---|---|---|---|---|---|---|---|
| **Windows,** Single Glass, Full Sash Area | a | 1.09 | 54.5 | 65.4 | 76.3 | 87.2 | 92.7 | 98.1 |
| Double Glass, Full Sash Area | a | 0.46 | 23.0 | 27.6 | 32.2 | 36.8 | 39.1 | 41.4 |
| Plate Glass, Full Sash Area | b | 1.00 | 50.0 | 60.0 | 70.0 | 80.0 | 85.0 | 90.0 |
| **Skylight,** Single Glass, Full Sash Area | a | 1.16 | 58.0 | 69.6 | 81.2 | 92.8 | 98.6 | 104.4 |
| Double Glass, Full Sash Area | a | 0.48 | 24.0 | 28.8 | 33.6 | 38.4 | 40.8 | 43.2 |
| **Doors or Partitions** Pine 1" Thick | a | 0.41 | 20.5 | 24.6 | 28.7 | 32.8 | 34.9 | 36.9 |
| Pine 1½" " | a | 0.32 | 16.0 | 19.2 | 22.4 | 25.6 | 27.2 | 28.8 |
| Pine 2" " | a | 0.27 | 13.5 | 16.2 | 18.9 | 21.6 | 23.0 | 24.3 |
| **Brick Wall,** Plain, 8½" Thick | a | 0.37 | 18.5 | 22.2 | 25.9 | 29.6 | 31.5 | 33.3 |
| 13" " | a | 0.29 | 14.5 | 17.4 | 20.3 | 23.2 | 24.7 | 26.1 |
| 17½" " | a | 0.25 | 12.5 | 15.0 | 17.5 | 20.0 | 21.3 | 22.5 |
| 22" " | a | 0.22 | 11.0 | 13.2 | 15.4 | 17.6 | 18.7 | 19.8 |
| 26½" " | a | 0.19 | 9.5 | 11.4 | 13.3 | 15.2 | 16.1 | 17.1 |
| ¾" Plaster on one side, 8½" Thick | a | 0.36 | 18.0 | 21.6 | 25.2 | 28.8 | 30.6 | 32.6 |
| 13" " | a | 0.28 | 14.0 | 16.8 | 19.6 | 22.4 | 23.8 | 25.2 |
| 17½" " | a | 0.24 | 12.0 | 14.4 | 16.8 | 19.2 | 20.4 | 22.6 |
| 22" " | a | 0.21 | 10.5 | 13.6 | 15.7 | 17.8 | 18.9 | 19.9 |
| 26½" " | a | 0.18 | 9.0 | 10.8 | 12.6 | 14.4 | 15.3 | 16.2 |
| 2.4" Air Space, ¾" Plaster on one side, 8½" Thick | a | 0.25 | 12.5 | 15.0 | 17.5 | 20.0 | 21.3 | 22.5 |
| 12½" " | a | 0.21 | 10.5 | 12.6 | 15.7 | 17.8 | 18.9 | 19.9 |
| 17" " | a | 0.19 | 9.5 | 11.4 | 13.3 | 15.2 | 16.1 | 17.1 |
| 21½" " | a | 0.16 | 8.0 | 9.6 | 11.2 | 12.8 | 13.6 | 14.4 |
| 26" " | a | 0.14 | 7.0 | 8.4 | 9.8 | 11.2 | 11.9 | 12.6 |
| Furred and ¾" Plaster 4" Thick | a | 0.28 | 14.0 | 16.8 | 19.6 | 22.4 | 23.8 | 25.2 |
| 8½" " | a | 0.23 | 11.5 | 13.8 | 16.1 | 18.4 | 19.6 | 20.7 |
| 13" " | a | 0.20 | 10.0 | 12.0 | 14.0 | 16.0 | 17.0 | 18.0 |
| 17½" " | a | 0.18 | 9.0 | 10.8 | 12.6 | 14.4 | 15.3 | 16.2 |
| 22" " | a | 0.16 | 8.0 | 9.6 | 11.2 | 12.8 | 13.6 | 14.4 |
| **Frame Wall,** Clapboard, Stud and Plaster 5" Thick | a | 0.44 | 22.0 | 26.4 | 30.8 | 35.2 | 37.4 | 39.6 |
| Clapboard, Paper, Stud and Plaster " | a | 0.31 | 15.5 | 18.6 | 21.7 | 24.8 | 26.4 | 27.9 |
| Clapboard, Sheathing, Stud and Plaster | a | 0.28 | 14.0 | 16.8 | 19.6 | 22.4 | 23.8 | 25.2 |
| Clapboard, Paper, Sheathing, Stud and Plaster | a | 0.23 | 11.5 | 13.8 | 16.1 | 18.4 | 19.6 | 20.7 |
| **Concrete,** Solid, 2" Thick | b | 0.78 | 39.0 | 46.8 | 54.6 | 62.4 | 66.3 | 70.2 |
| 3" " | b | 0.71 | 35.5 | 42.6 | 49.7 | 56.8 | 60.4 | 63.9 |
| 4" " | b | 0.66 | 33.0 | 39.6 | 46.2 | 52.8 | 56.1 | 59.4 |
| 6" " | b | 0.56 | 28.0 | 33.6 | 39.2 | 44.8 | 47.6 | 50.4 |
| **Partition,** Hollow Tile ½" Plaster both sides 2" Thick | b | 0.41 | 20.5 | 24.6 | 28.7 | 32.8 | 34.9 | 36.9 |
| 4" " | b | 0.33 | 16.5 | 19.8 | 23.1 | 26.4 | 28.1 | 29.7 |
| 6" " | b | 0.28 | 14.0 | 16.8 | 19.6 | 22.4 | 23.8 | 25.2 |
| Stud, Lath and Plaster on one side | a | 0.60 | 30.0 | 36.0 | 42.0 | 48.0 | 51.0 | 54.0 |
| Lath and Plaster on both sides | a | 0.34 | 17.0 | 20.4 | 23.8 | 27.2 | 28.9 | 30.6 |
| Solid Plaster 2" Thick | b | 0.60 | 30.0 | 36.0 | 42.0 | 48.0 | 51.0 | 54.0 |
| 3" " | b | 0.50 | 25.0 | 30.0 | 35.0 | 40.0 | 42.5 | 45.0 |
| **Floor,** Single ¾" no Plaster beneath Joists | a | 0.45 | 22.5 | 27.0 | 31.5 | 36.0 | 38.3 | 40.5 |
| Lath and Plaster beneath Joists | a | 0.26 | 13.0 | 15.6 | 18.2 | 20.8 | 22.1 | 23.4 |
| Double 1½" no Plaster beneath Joists | a | 0.31 | 15.5 | 18.6 | 21.7 | 24.8 | 26.4 | 27.9 |
| Lath and Plaster beneath Joists | a | 0.18 | 9.0 | 10.8 | 12.6 | 14.4 | 15.3 | 16.2 |
| Single on Brick Arch | b | 0.15 | 7.5 | 9.0 | 10.5 | 12.0 | 12.8 | 13.5 |
| Fireproof construction | b | 0.10 | 5.0 | 6.0 | 7.0 | 8.0 | 8.5 | 9.0 |
| Concrete on Brick Arch | b | 0.20 | 10.0 | 12.0 | 14.0 | 16.0 | 17.0 | 18.0 |
| **Laid on Ground** | | | | | | | | |
| Cement or Tile laid on ground no Wood above | a | 0.31 | 15.5 | 18.6 | 21.7 | 24.8 | 26.4 | 27.9 |
| " " " " " " Wood Floor above | a | 0.10 | 5.0 | 6.0 | 7.0 | 8.0 | 8.5 | 9.0 |
| Dirt, no Floor whatever | a | 0.20 | 10.0 | 12.0 | 14.0 | 16.0 | 17.0 | 18.0 |
| **Roof.** Tile 1" Thick | a | 0.80 | 40.0 | 48.0 | 56.0 | 64.0 | 68.0 | 72.0 |
| Hollow Tile, 6" thick, Concrete 8" thick, tar and gravel | a | 0.35 | 17.5 | 21.0 | 24.5 | 28.0 | 29.8 | 31.5 |
| Slate, on 1" Planks | a | 0.43 | 21.5 | 25.8 | 30.1 | 34.4 | 36.6 | 38.7 |
| " on Wooden Framing | a | 0.85 | 42.5 | 51.0 | 59.5 | 68.0 | 72.3 | 76.5 |
| Tar, Paper and Gravel on 2" Planks | a | 0.26 | 13.0 | 15.6 | 18.2 | 20.8 | 22.1 | 23.4 |
| Sheet Iron | a | 1.20 | 60.0 | 72.0 | 84.0 | 96.0 | 102.0 | 108.0 |
| Corrugated Iron | a | 1.50 | 75.0 | 90.0 | 105.0 | 120.0 | 127.5 | 135.0 |
| Concrete with Cinder Fill. 2" Thick | a | 0.80 | 40.0 | 48.0 | 56.0 | 64.0 | 68.0 | 72.0 |
| 4" " | a | 0.60 | 30.0 | 36.0 | 42.0 | 48.0 | 51.0 | 54.0 |
| 6" " | a | 0.54 | 27.0 | 32.4 | 37.8 | 43.2 | 45.9 | 48.6 |
| Asbestos Shingles on 1" Tongue and Groove Boards | c | 0.30 | 15.0 | 18.0 | 21.0 | 24.0 | 25.5 | 27.0 |
| Ajax Built up Roofing, 3 ply, on 4" Concrete with two layers | c | 0.508 | 25.4 | 30.5 | 35.6 | 40.6 | 43.2 | 45.7 |
| " " " " of Double Neptune Felt | c | 0.303 | 15.2 | 18.2 | 21.2 | 24.2 | 25.8 | 27.3 |
| Phoenix Built up Roofing, 4 ply, on 2" Boards, with two layers | c | 0.30 | 15.0 | 18.0 | 21.0 | 24.0 | 25.5 | 27.0 |
| " " " " of Double Neptune Felt | c | 0.21 | 10.5 | 12.6 | 14.7 | 16.8 | 17.9 | 18.9 |

Authority:—*a*, Buffalo Forge Company. *b*, American Society of Heating and Ventilating Engineers. *c*, Johns-Manville Company.

**B. T. U. Transmitted per Hour per Square Foot of Surface For Various Differences in Temperature Between Inside and Outside Air**—(*Courtesy of Buffalo Forge Company*)

### Types of English Cook Stoves

CONSUL GENERAL Robert P. Skinner, reports from London that open-front fires are popular for cooking in Great Britain. The Yorkshire range, for example, which is found in most working-class cottages in the north, is designed to throw out a considerable amount of radiant heat for heating and roasting purposes; provide an open fire for general cooking, boiling, etc.; dry clothes; bake bread and serve for other oven-heating operations; and heat water for baths. There are deep-rooted prejudices among the British against any alteration of the old fashioned types of kitchen stoves.

Fig. 1. Typical English Cook Stove showing open fire

The small illustration gives a good general idea of an English cooking stove in action. In front of the open door a flat iron is placed to be warmed by the radiant heat. It must be hot in front of such a stove. Fig. 2 showing an oven placed in a parlor fireplace proves there are men who believe that something may be had for nothing. There may possibly be some convenience in having an oven in a parlor but the coal employed in heating it is of no value in heating the room. Fig. 3 illustrates an economical type for homes of working men. The illustrations were obtained from the advertising pages of *The Architect*, London.

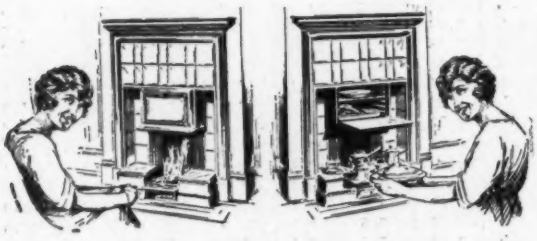

Fig. 2. The Parlor-Grate Stove

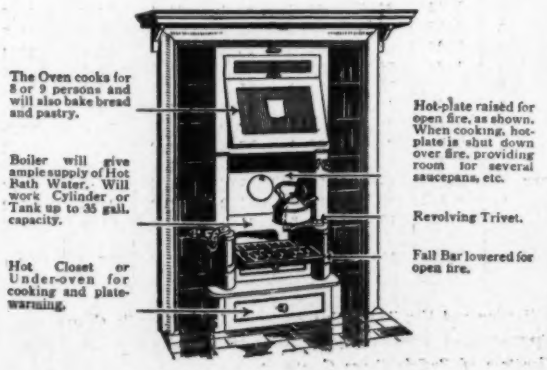


Fig. 3. The Scuttle-A-Day Stove

### The Removal of Paint From Iron and Steel Surfaces

SCRAPING or burning paint from the surface of iron and steel structures previous to the application of a new coat is a slow and laborious process, says William Arthur in the *New Building Estimators' Handbook*. An easier and more rapid way of doing this work, continues the author, is the method used by the United States Coast Artillery, for cleaning the exterior portions of the big guns and gun carriages in their care.

In practice, a one pound can of concentrated lye is dissolved in three quarts of boiling water. and to this mixture sufficient lime is added to emulsify the solution. This solution is freshly mixed each time it is to be used and is applied with a brush and allowed to remain until it is almost dry. It is then removed and unless the paint is very old and thick it will come off with it. If one application of the mixture does not remove all of the paint, the surfaces are washed off and a second coating is applied. Before a new coat of paint is put on, the surface of the metal should be thoroughly cleansed with a solution of washing soda (in the proportion of one-half pound to two gallons of hot water), and well dried.

### Illuminating Engineering Society

THE Sixteenth Annual Convention of the Illuminating Engineering Society will be held at the New Ocean House, Swampscott, Mass., on September 25th to 28th inclusive.

The first day will be devoted to presentation of committee reports. The morning of the second day will be devoted to Residence Lighting and the afternoon to problems connected with the lighting of show windows, cafes and restaurants. The morning of the third day will be given over to the lighting of schools, offices and studios. The remainder of the time will be taken up by the discussion of subjects of more scientific and technical interest.

A paper which the society believes will be of especial interest to architects, engineers and building managers is entitled "The Cost of Daylight." The authors of this paper, M. Luckeish and L. L. Holliday claim that daylight costs more than artificial light.

Mr. Charles L. Edgar, President of the Edison Electric Illuminating Company of Boston, is Chairman of the General Convention Committee.

# THE AMERICAN SPECIFICATION INSTITUTE

*Member of The American Society for Testing Materials*

19 South LaSalle Street, Chicago, Illinois



*THE Board of Governors represent memberships in the following national societies: American Institute of Architects; American Society of Civil Engineers; American Society of Mechanical Engineers; American Institute of Electrical Engineers; American Society for Testing Materials; American Concrete Institute; American Iron and Steel Electrical Engineers; which indicates the scope of activities of The American Specification Institute.*

*THE American Architect and the Architectural Review has gratuitously set apart this section for use by The American Specification Institute. The Editors and Publishers assume no responsibility for any statements made, or opinions expressed.*

*The purpose, simply stated, is to afford an organization which, it is believed, will become a most important element in architectural practice and building operations, a medium through which it may, without expense to itself, reach a class of readers that are most intimately identified with the field of the activities of The American Specification Institute.*

*Publishers,* The American Architect and The Architectural Review.

EVERY specification comprises certain elements that are necessary in order to convey to the mind of the reader all fundamental desiderati that govern the execution of the work. The proper preparation of specifications can be done only on the basis that the economic use of materials and methods consistent with the use to which the final result, whether it be a building, a piece of machinery, or a pavement, will be studied and presented in the specifications in a clear, concise, and coherent manner. Economic values must be considered for every operation if there is in the mind of the writer of that specification a correct sense of justice and right dealing toward the client.

Certain standards of excellence in materials and workmanship must be specified so accurately that there will be no question as to the aims of the author of the specifications. There are times when several standards of excellence or alternative methods or materials may be presented in order that the specification writer may know through tenders submitted in competition exactly what basis he may have before him on which to render his judgment as to economic values. In order that both of these elements may be provided for with scientific provision it is necessary that the architect or engineer become acquainted with the standards and alternatives that are available for use and that are most desirable, economically, for any particular operation. The specifications for materials, methods and their use, cannot be made in a brief, concise, and coherent manner and in an accurate manner unless the writer has at his finger tips all facts that would be of assistance to him in formulating his decision.

Another element of specifications, and an element that is very often lost sight of, is the use made of them as the instrument of instruction to all concerned as to how each step in the work is to be accomplished. It is to be expected that a specification wholly devoid of instructions relating to fabrication and erection work is not written as accurately as is that specification which has been written in a manner conveying to the fabricator and erector all essential requirements that must be followed in order that the demands of the architect or engineer may be entirely satisfied. It is true that a specification for materials with a separate specification for the fabrication of materials, and another one for the erection and installation of materials may be written by a person thoroughly versed in the science and technique of specification writing.

However, truth compels the belief that the ma-

jority of specification writers do not separate an individual specification, that is to say, a specification for one particular trade, in the manner outlined above. The consensus of specification writers, as expressed in their written work, seems to be that these three factors must be covered by one specification running from the Alpha to the Omega of architectural or engineering practice. One must conclude on further analysis that many Betas, Gammas and Deltas are omitted in the haste to finish the document and have it published.

If one will attempt to analyze a specification from the composite basis of the owner, the material man, the contractor, the building superintendent, and the architect or engineer, such analysis will show that the clearness, conciseness, and coherence of the specification may not be quite so accurate as the author thought when the words were flowing from his pencil. An analysis of a specification must cover at least six factors which govern every act normally followed in the production, fabrication and erection of materials used in any sort of work the architect or engineer encounters. It is doubtful whether the correlation of the factors has been given much thought by many specification writers.

Unlike all other branches of scientific endeavor, no person or organization to this day seems to have realized that the science and technique of specification writing should be supported by text books and should be discussed and studied in a unified manner by those on whom there rests the responsibility for the preparation of specifications that will produce a happy accomplishment of the work with a minimum of grief.

Each class of persons engaged in building and engineering construction is vitally interested in having at his disposal good specifications, the intent and purpose of which cannot be questioned. To each of them a good specification brings the assurance that there will be smooth operation and cordial relations for all concerned, whereas mediocre specifications mean everything but cordiality and happiness.

Owing to a present lack of means for collecting and distributing information concerning specifications there is a needless duplication of study, research and labor on the part of specification writers. This condition tends to make the work seem arduous, as it is quite often, if there has been no effort expended toward meeting the conditions present in the individual office. Those specification writers who have had sufficient vision to analyze the problems that they must meet and who have attempted to organize their work in some more or less methodical fashion have been gratified to find that the time so spent has been well spent.

Practically all other professions are so organized that the interchange of knowledge peculiar to their profession, such as the deliberations of committees which formulate proposed standards for basic operations, and the results of researches undertaken by scientific laboratories, is effected in such a way as to result in the improvement of the quality of specifications produced, and as a direct consequence, has resulted in an improvement in the professional and the business standing of their authors.

The American Specification Institute has been organized to improve all those conditions surrounding the writing of specifications and to bring to specification writers the benefits that are to be obtained from organized efforts of men accustomed to study and write these essential documents.

Membership in The American Specification Institute is divided into four classes, as follows:

1 — Active Members are persons who devote their entire time, or a part thereof, to the writing of specifications.

2 — Associate Members are testing and laboratory engineers and instructors in architectural and engineering schools.

3 — Honorary Members will be persons who have rendered distinguished service to the art or science of specification writing.

4 — Patrons will be persons who are eligible to any one of the first three grades but who have, in addition to the payment of annual dues, contributed to the financial support of the Institute.

The restrictions placed on membership, namely, that each candidate must be engaged, to some degree, in specification work for building and engineering structures, assure a membership with a single purpose—the study and improvement of specifications—and preclude the giving of attention to extraneous matters that might occur if the interests of the members were of a diverse character.

The membership fee is ten dollars and the annual dues twenty dollars, payable semi-annually, the fiscal year being from May first to April thirtieth.

The American Specification Institute is incorporated under the laws of the State of Illinois—not for profit—and is governed by a constitution and by-laws in the customary manner.

As indicated at the head of these columns the control of the Institute is vested in a Board of Governors consisting of five members. An Advisory Committee has been created to assist the Board of Governors in the discharge of its duties. This Advisory Committee will be composed of members representing each technical endeavor and an effort will be made to have each section of the United States represented.

Inquiries respecting the advantages of membership are cordially invited.

# THE NEW ZONING ORDINANCE ADOPTED BY ST. PAUL, MINN.

A ZONING ordinance under the police power authorized by Legislative Act, Chapter 217, Session Laws of 1921, and prepared by the City Planning Board—George H. Herrold, City Planning Engineer and Ed. H. Bennett and Wm. E. Parsons, Chicago, Illinois, acting as Consultants, was passed by the City Council of St. Paul, Minn., Friday, July 7, and became a law August 22, 1922.

| | Present Area in Square Miles | As Zoned. Area in Square Miles | |
|---|---|---|---|
| Residential ..... | 17.20 | 31.05 | |
| Business ..... | .8 | 1.78 | |
| Industrial & R. R. Land ..... | 3.8 | 12.10 | |
| Miscellaneous, Parks, Cemeteries, Rivers, Lakes, etc. | 6.52 | 6.62 | |
| Vacant ..... | 27.08 | 3.85 | Unassigned |
| | 55.4sq.mi. | 55.4sq.mi. | |

The ordinance provides for six Use Districts and four Height Districts; areas must conform to the uses all shown on one zoning map. There are three residential districts or zones—A, B and C. Apartments or tenements are permitted in the C district only. The A and B districts differ as to the area of the lot which must be left unbuilt upon. There are special provisions in the ordinance relating to: 1. the grouping of institutional buildings to preserve the residential character of A and B; 2. the establishment of set back lines in the residental districts; 3. requiring stores to take the same set back as the residence where they are permitted at certain corners in the residential areas and 4. the construction of public garages which are not permitted in the A, B and C districts. Other Use Districts are Commercial, Light Industry and Heavy Industry or general purposes.

There are four Height Districts—40, 75, 100 and 150 ft., with provisions for increasing the height by terracing back above the height limit given.

A Board of Zoning was established, consisting of five members of the Planning Board and the City Architect.

The ordinance was presented to the Council on April 26, and under the law required four readings, being finally passed on the date above mentioned, July 7.

The field work on the zoning ordinance began in May, 1921. A complete field survey was made to determine the use of every piece of property, set backs, height of buildings, etc. Publicity work was carried on at the same time by presenting the general principles of zoning to all clubs and civic organizations and through the newspaper.

It will be of interest to note that no public hearings were held, excepting that citizens could appear on the stated dates for reading the ordinance before the Council. Two postponements were made to clarify differences between the Real Estate Exchange of St. Paul and the City Planning Board.

The ordinance was first presented to the Council on April 26. On the date of the third reading, May 23, at which time the ordinance was to have been approved as to form or postponed, the St. Paul Real Estate Board appeared before the Council and asked for six months' time to review the ordinance. This was refused. They then asked for thirty days which was granted. The report of the St. Paul Real Estate Board submitted to the Council June 30 recommmended that all car lines be zoned for business, other changes asked for were minor, representing small changes in boundary lines, increasing the area in which apartments might be built and business go in.

There were considerable argument and evidence presented over the question of zoning all car lines for business. The Planning Board's arguments were that it was better to build up a high-class retail business in the central business district instead of encouraging the small store by zoning large areas for business in the residence districts. The U. S. Census was cited which shows that there is one store for every twenty-two families of the United States and the tremendous overhead burden which the people were required to pay to maintain this costly system of distribution—the census statistics tallying very closely with the conditions in St. Paul, where we have one store for every one hundred and ten people. It was pointed out that 32% of the grocery stores in outlying districts had changed hands in 1921 because they could not make a living. It was pointed out that to place 11 car lines, regardless of the character of the development along them, in a business district was simply for the purpose of creating more speculative property; that the zoning ordinance already provided for sufficient business area to take care of one and one-half million people, this including 100 ft. at four corners every one-half mile along car lines, and to throw all of the intermediate area into business was simply placing homes in a business district where there was no need for business and opening the opportunity for the building of stores in every block, thus destroying valuable home values. The Real Estate Board's

arguments were based largely on the development of two or three of St. Paul's streets along car lines which were largely business and their claim was, that that was the ultimate destiny of any car line street and that it might as well be recognized now as to wait ten years and then change the ordinance. The Council accepted the views of the Real Estate Board on a little over one-half of the car line streets in the city.

### New York Architects Must Re-register

ALL architects practicing in New York State will be subject to fine if they have not made application for re-registration before September first. Application blanks can be secured by writing to the State Board of Examiners and Registration of Architects, Education Building, Albany, N. Y.

### A Competition for Designs for Clock Cases

BELIEVING that the art of clock designing has failed to keep pace with the general advance in decorative and commercial art, awards amounting to $1200 are being offered by the Cloister Clock Corporation of Buffalo, N. Y., for the best designs of clock cases in three general classes. A distinguished jury has been selected to make the awards in the competition. It consists of Charles Dana Gibson; Richard F. Bach, Metropolitan Museum of Art; Albert M. Kohn, jeweler; C. Matlack Price, editor and art critic; and Russell F. Whitehead, secretary of The Architectural League.

The fact that the clock designs of the Willards and Eli Terry, who completed their work over a century ago, are still recognized as supreme in the field of clock design in America makes it apparent that clock designers have not developed their art on a plane worthy of the inspiration and impetus so early given. The donors of the prizes in the present competition believe that this has been due to lack of incentive rather than the exhaustion of the field or a lack of ability on the part of designers to produce new and finer conceptions. Their purpose, in the competition, is to supply this incentive.

The awards include three first prizes of $250 each, three second prizes of $100 each, three third prizes of $50 each, and nine honorable mentions. The prize winning designs become the property of the Cloister Clock Corporation, which also reserves the right to purchase at a fair price any designs which do not win prizes. The competition closes October 23.

One set of prizes is offered for an upright mantel clock case of wood, greater in height than breadth, and another for a case of the same general proportions, in metal. The third set is offered for a mantel clock case of wood greater in breadth, at the base, than in height. The cases must have a minimum inside height of seven and a half inches, an inside breadth of four inches, and an inside depth of four inches.

While open to every one, the competition is expected to be of particular interest to artists, architects, designers and draftsmen.

### Atlanta Adopts Zoning

ATLANTA has adopted a zoning ordinance by a nearly unanimous vote of the council. The ordinance divides the city into dwelling-house, apartment-house, business, and industrial districts. Three classes of height districts are established with limits of 50 feet, 100 feet, and 150 feet, respectively. Building line, side yard, and rear yard requirements are established for all buildings in the residence districts. Lot area requirements are based on the number of housekeeping units for which the residence building is arranged; 5,000 square feet of lot area per family is required for much of the dwelling-house area, and 2,500 square feet of lot area per family for the areas suited to double or two-family house development. In most of the apartment-house areas only 625 square feet per family is required, while in the limited hotel and elevator-apartment sections there is no minimum lot area requirement, though side, rear, and front yards are required.

### Chicago Architectural Club Elects Officers

AT the recent annual meeting of the Chicago Architectural Club, the following officers were elected for the ensuing year: President, Clarence W. Farrier; vice-president, Gerald Barry; treasurer, Alwin Wiersha; and secretary, Chas. H. Markel.

### A National Exposition of Power and Mechanical Engineering

IF present plans mature, there will be held in New York City, at the Grand Central Palace, December 7th to 13th, an exposition of apparatus employed in the generation, distribution and utilization of Power.

An exhibition of this nature, properly assembled and conducted, will have large educational value. The Committee in charge desire to communicate with all interested parties.

Address all communications to the National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York.

Residence at
Glenwolde, *L. I.*

*W*alter *M*cQuade,
*A*rchitect.

# Tudor Stone Roofs

This illustration shows the harmonizing influence of a hand wrought Tudor Stone Roof. Rough in texture and mellow in color, it forms a pleasing picture with the English half timbered home and the surrounding foliage. ❦ Tudor Stone has been used on the finest types of houses throughout the country.

*Write for architectural illustrations and data.*

## Rising-and-Nelson-Slate-Company

Quarries & Main Office, West Pawlet, Vermont

Office of Architects' Service Department, 101 Park Avenue, New York

CHICAGO PHILADELPHIA BOSTON

# PERSONALS

Ellsworth Storey, architect, has removed his office to 308 Pantages Building, Seattle, Wash. Manufacturers are requested to send samples and catalogs.

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Lingle Douglas Lance announces the removal and re-opening of his office for the practice of architecture from Wyomissing, Pa., to 108 North Fifth Street, Reading, Pa.

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Announcement is made that Robert L. Kane and Monroe R. Sandel have formed a co-partnership for the practice of architecture under the firm name of Kane & Sandel, with offices at Room 1320, 64 West Randolph Street, Chicago, Ill.

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Harold C. Ferree, architect, 57 East Jackson Boulevard, Chicago, Ill., would be pleased to receive manufacturers' catalogs and samples, with particular reference to store design and equipment.

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Frederic Hutchinson Porter announces his retirement from the firm of Baerresen & Porter, architects, of Cheyenne, Wyo., and that he has opened an office, under his own name, at 224 Hynds Building, that city.

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Nairne W. Fisher, registered architect, Bemidji, Minn., has formed a partnership with Clarence W. Jackson for the practice of architecture and engineering, with offices in that city. Manufacturers' samples and catalogs are requested.

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Smith, Hinchman and Grylls, architects and engineers, announce the removal of their offices from the Washington Arcade Building to the eighth floor of the Marquette Building, 243 Congress Street, corner Wayne Street, Detroit, Mich.

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Sotaro Y. Ohta has recently won the Perkins Travelling Fellowship in Architecture in Columbia University. Mr. Ohta was born in Japan and received his preliminary education in his native country, but for the past several years has been engaged in architectural work in New York City, now being connected with the office of McKim, Mead & White.

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S. Braverman and K. Van Havermaet announce the establishment of a partnership for the general practice of architecture under the firm name of Braverman & Havermaet, at 801 Ulmer Building, Cleveland, Ohio, where they will be pleased to receive manufacturers' samples and catalogs.

J. Platt Roberts, architect, has opened an office at 813 City Bank Building, Mobile, Ala., for the practice of architecture. Manufacturers are requested to send literature and samples.

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W. R. B. Wilcox, Architect, Seattle, Washington, has accepted a call to organize and administer the Department of Architecture of the University of Oregon, with full professorship, commencing with the next succeeding term.

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J. Mandor Matson, architect, who has purchased the library, plans, office equipment, etc., of the late A. Arthur Guilbert, has vacated the old quarters in the Janes Building and is now established in Rooms 533-539, Baker Block, Racine, Wis.

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Norman Hatton wishes to announce that the partnership formerly known as Hatton, Holmes & Anthony has been dissolved by mutual agreement. Mr. Hatton will continue the practice of engineering and architecture in the same location, 321-2 O. R. C. Building, Cedar Rapids, Iowa.

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Wellington J. H. Wallace announces that he has closed his architectural office in Bartlesville, Okla., and is now the architect for the Baptist Sunday School Board, Nashville, Tenn. Manufacturers' catalogs and information relating to church and Sunday school buildings and their equipment are desired.

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S. E. Holmes and C. B. Anthony wish to announce the dissolution of the former partnership, Hatton, Holmes & Anthony, and that they have formed a new partnership under the name of Holmes & Anthony, architects and engineers, Rooms 307-308, O. R. C. Building, Cedar Rapids, Iowa.

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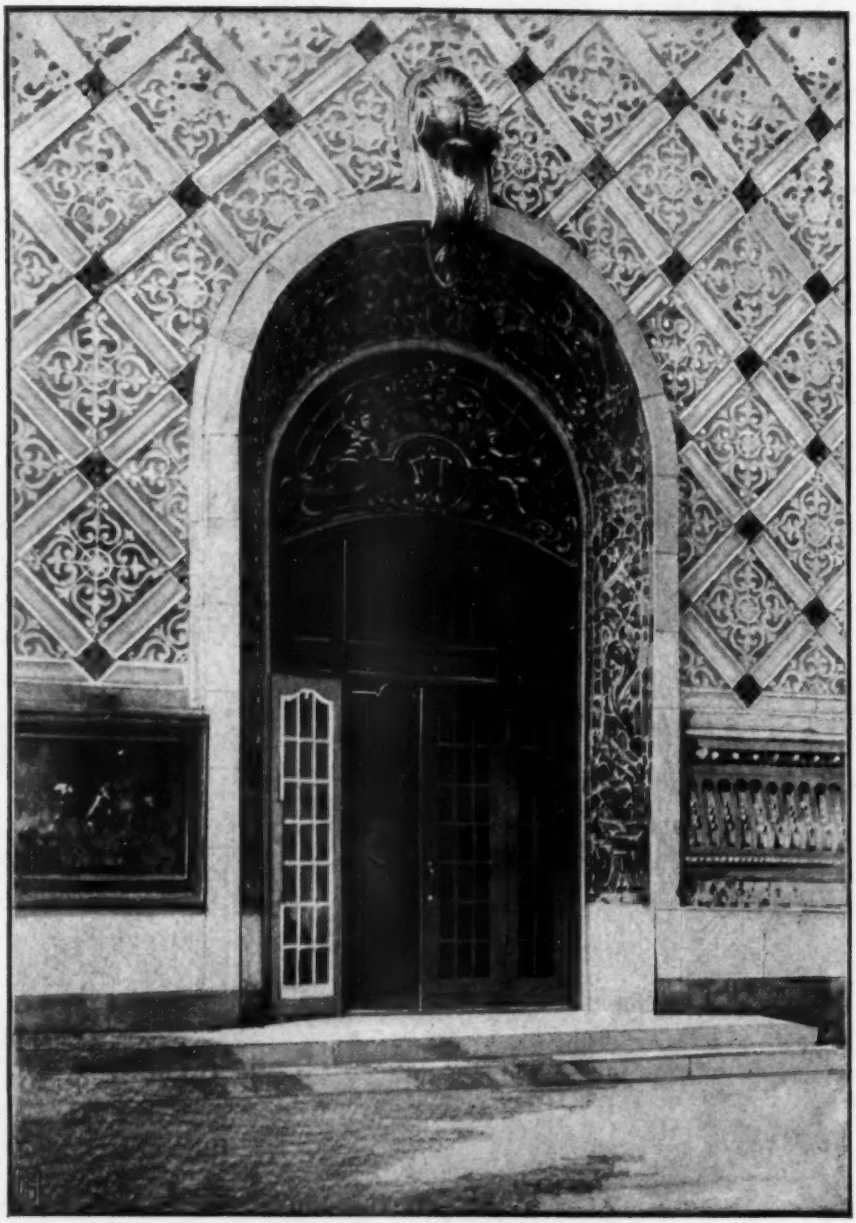
Otto G. Simonson, Inc., architects, Baltimore, Md., announce with regret the death on June 24 last, of Otto G. Simonson. Mr. Simonson was born in Germany and came to the United States in his youth. He was employed in the Supervising Architect's office at Washington, D. C., and supervised the construction of the Custom House at Baltimore. Mr. Simonson designed a number of important buildings in Baltimore, the most recent of which was the group for the Maryland Casualty Company. The architectural practice of this office will in the future be under the direction of Mr. Simonson's son, Louis W. Simonson.



POLYCHROME TREATMENT OF TERRA COTTA, FULTON THEATRE, NEW YORK CITY

HENRY B. HERTS AND HUGH TALLANT, ARCHITECTS

For Illustration of this Building see issue of September 13