# THE AMERICAN ARCHITECT
## The ARCHITECTURAL REVIEW

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# THE RELATION OF PIPE ORGANS TO ARCHITECTURE

BY CALEB W. CAMERON*

## Part III – Residence Organs

THERE are many people who through lack of training or musical talent, are unable to play an organ, and yet who are lovers of the instrument, and keenly appreciative of good music, especially that of the operatic and orchestral type.

To these, the modern organ, with its wealth of tone-color, vibrant strings, and wonderfully voiced orchestral tones simulating the various sections of the orchestra, appeals with tremendous force, especially as since, within recent years, there has been under way a marvelous development in the mechanical operation of the instrument.

No longer need the organ stand idle for lack of an organist, for the self-player has been developed to a point where it not only plays the notes, but it also changes the tone-colors as pre-determined by the composer of the music, and manipulates the expression in a manner which is really human in its delicacy. In other words, the self-player has reached the stage where it is *fully automatic,* and yet *absolutely unmechanical,* in the truest musical sense.

This opens up a vast field of music to the music lover who is not a performer, but he may, should he so desire, still have the notes mechanically played, controlling the quality of tone and expression as he desires, thus giving his own interpretation and conception of the composition full scope; in other words, express *himself* musically.

Residence Organ in a House at Wenham, Mass.

Increased interest in chamber music of this type has been aroused, and is more and more in evidence. Architects are finding that they are called on more frequently to provide space and accommodation for such installations in residences.

Too often the *necessities* which are attendant on such installations are not considered until the plans are so far advanced that *adequate provision* for the organ becomes either one of two things:—an impossibility, or an unsatisfactory compromise.

It is an old saying that a place for the organ can always be found somewhere; but a *good place*—or space—cannot always be found, notwithstanding.

We are told and it *is* possible, to put a part of the organ in a closet under the stairs—another part in the basement—another division in a laundry, and the rest in the attic. It is possible to distribute an organ in this way, but it is *only a mechanical* achievement, not a *musical* one. The residence organ must be thought of, and treated,

*Of Skinner Organ Company

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in the matter of placement, as an orchestra, and no one would for a moment consider so splitting up an orchestra.

On the other hand, it may be stated most emphatically, that *careful planning and proper arrangement of the organ chambers* and console location with respect to each other, and to the music room are as important to the musical results, as is the quality of the organ itself.

The writer is familiar with installations in which small organs—well arranged—are far more effective and satisfying in performance than others which are twice as large, double in cost, and badly placed.

When the chamber is considered as an integral part of the plans, as it should be, and adequate space and proper location are given it, there is no difficulty whatsoever in insuring brilliant results.

Certain factors are of fundamental importance in assuring *distinguished,* rather than *mediocre* results, in return for the money so invested, and these are:—

1—Sufficient space must be allotted to the organ chambers.

2—They must be adjacent to the music room.

3—Openings between the two must be of adequate area.

4—The console must be properly located.

Let us consider in detail the demands of these four fundamental requirements.

## Space

NO house is built without any thought being given to its domestic accommodations—that is a fundamental matter—and, by the same token, the size of the installation which is to be made must be approximately pre-determined in order that the architect may arrive at an economical, but nevertheless, an adequate area for the chamber. There is, however, an irreducible minimum in any event of 12′-0″ in width, 8′-2″ in depth, and 12′-0″ in height. This last dimension may be reduced, at the rear wall, to 10′-6″, but it must be full 12′-0″ at the front. This space will be sub-divided into two sections.

Such a chamber will house the *smallest* installation which will be, tonally, satisfying, *but it will not permit of any further additions or improvements.*

Hence, it is extremely desirable to exceed these dimensions wherever possible, up to an area of five hundred and fifty square feet, (550 sq. ft.)—with a minimum height of twelve feet (12′-0″).

The walls and ceiling should have a finish coat of Keene's Cement, the corners rounded with a 2″ radius, and the floor, if possible, of concrete, covered with two coats of deck paint. There should be no windows in the chamber, and it must be thoroughly watertight. No steam or plumbing lines are to be run through it, either vertically or even above the ceiling. Water is the organ's worst foe.

## Location

IT is, of course, understood that the *raison d'etre* of a house is a domiciliary purpose, but if its prospective owner includes in his aims enter-

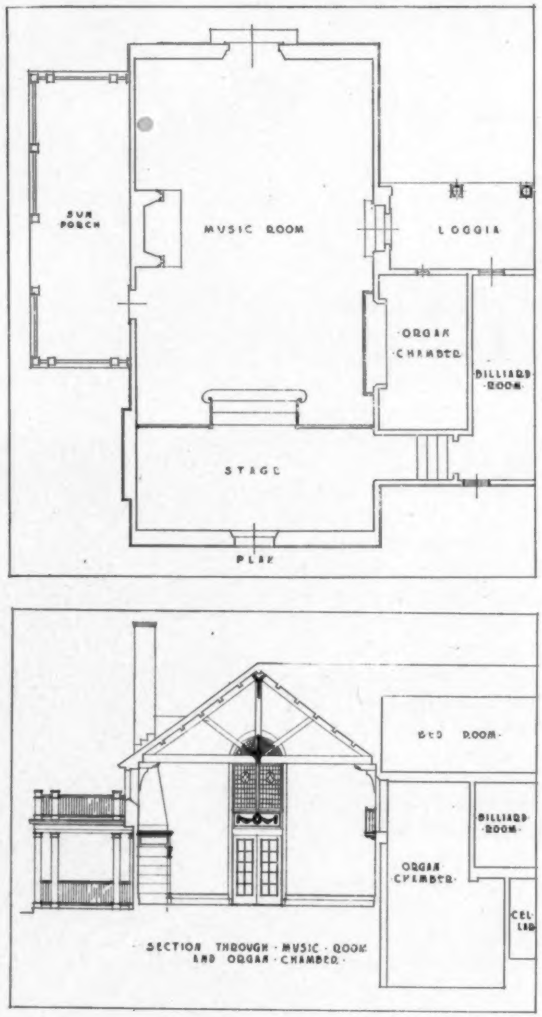


**Fig. 2. "Locke Ledge," Yorktown Heights, New York, House of Arthur Hudson Marks, Esq.**
**Andrews, Rantoul & Jones, Architects**
*(For interior view see Fig. 1, opposite page)*

tainment of a musical character, then that portion so devoted must be *planned* with that end in view, hence a music room of generous proportions, restful and fitting, becomes a necessity, and consequently, (and adjacent to it), the chamber for the organ.

The best location for the latter is at one end of the music room, or else at one side toward the end; the console half-way or more down the room,

Fig. 1. "Locke Ledge," Yorktown Heights, New York, House of Arthur Hudson Marks, Esq.

Andrews, Rantoul & Jones, Architects



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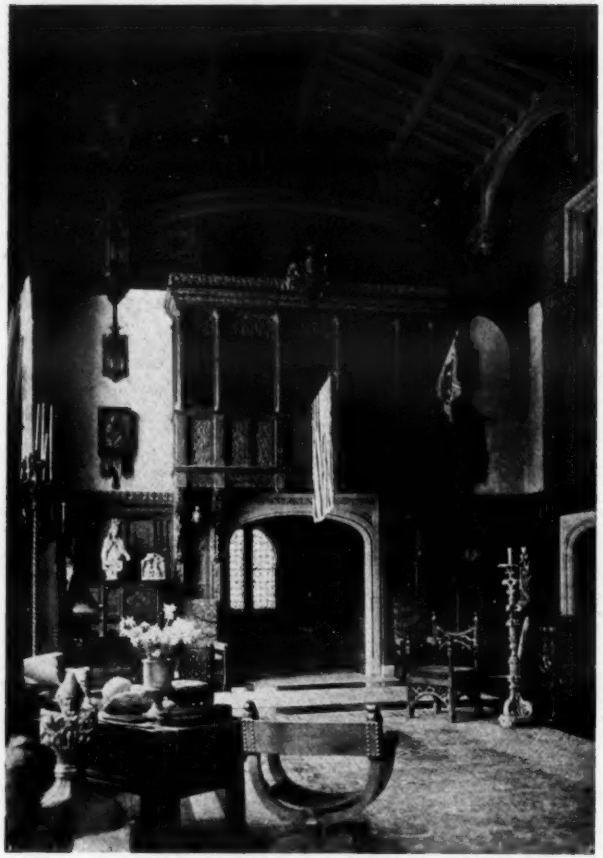

Fig. 3. Organ in upper level speaking through grille

Organ in
Music Room of House of
Arthur Curtiss James, Esq.,
69th Street and Park Avenue,
New York

Allen & Collens,
Architects

Fig. 4. The console opposite the organ

Fig. 5. Basement installation
Tone comes up through floor grilles

and opposite to the chamber opening, which, of course, will be well up from the floor.

This last is well shown in the illustration of the room in the residence of Mr. Arthur Hudson Marks, at Yorktown Heights, New York, (Fig. 1), and in the plans of the space (Fig. 2), which show the opening 8′-6″ above the floor level, with an area of forty square feet (40 sq. ft.).

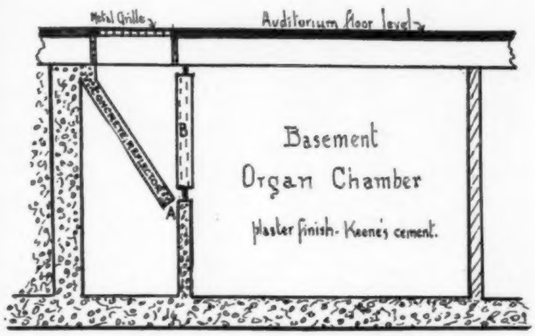


Fig. 6. Section of basement floor showing organ chamber and method of deflecting sound to the floor grille

The chamber may be behind one end of the music room on the story above, (Fig. 3), the opening masked by an ornamental grille, with the console at the opposite end of the room. (Fig. 4.) Hot air inlets should not be located so that they feed into the chamber.

It may be that neither of these locations is feasible, and that the chamber must go in the floor below the music room. Well and good, for the tone can come up through a grille set in the floor, or in the risers of stairs, being deflected.

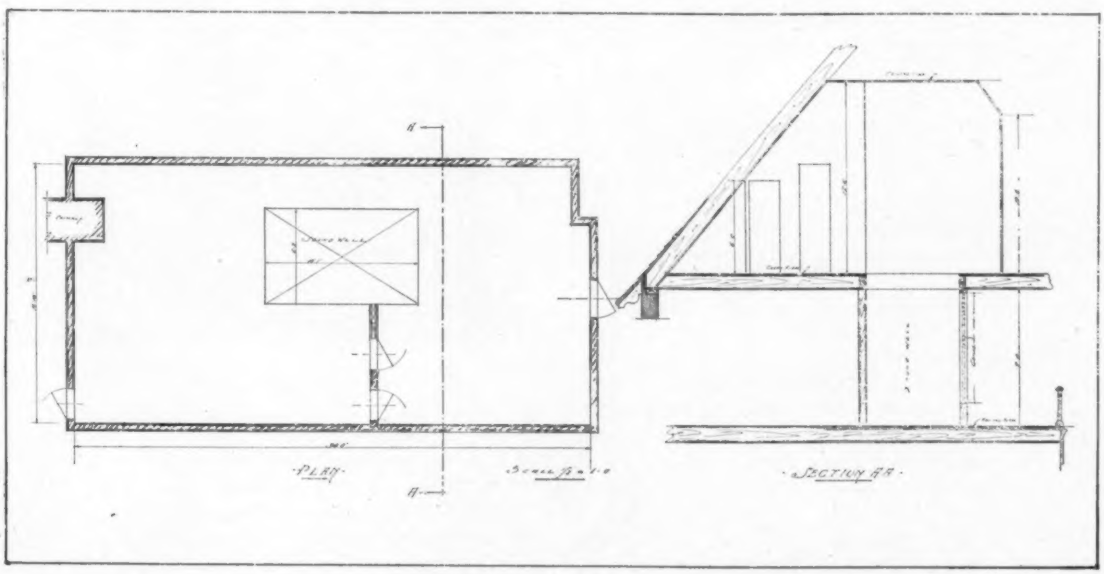

Fig. 7. A sound chamber located in top story with tone deflected down through shaft to grille

(Fig. 5.) This is least desirable, on account of dampness, but that can be successfully coped with.

If the chamber is to be in the basement, a suitable treatment of the space is shown in Fig. 6, but infinite caution must be taken as to thorough

Fig. 8. A Hall installation

waterproofing, and for a supply of clean, dry, tempered air thereto.

The dust and dirt which will inevitably fall through the floor grilles above lands on the reflector, and falls through the trap A to the space below. The tone passes through the swell-shades B, is directed upward by the reflector, and enters the main floor through the grille above.

If hangings are used to mask the openings, they must be of very sheer material, for velours or tapestries will muffle and ruin the tone.

Lastly, a chamber may be located in the top story, and the tone deflected down through the stairwell, but this must be carefully planned, otherwise the music will permeate throughout the rooms on the intervening floors, and will be weakest on the main floor level. This is shown in Fig. 7, and a stairway and hall location in Figs. 8 and 9.

As many of these installations occur in country houses, it is possible to plan, with a little forethought, so as to get, in the great majority of cases, a perfectly satisfactory layout, if the architect knows in advance that the installation is contemplated, for he is not hampered by lack of space, or by rigid building lines as under urban conditions. *That should be one of the items to be ascertained at the start.*

Care should be taken to provide a watertight way for electric cables from the console location to the chamber and motor room. Action cables are waterproofed, it is true, but nevertheless, they are not improved by running them through damp cellars, or in places where a sudden and, of course, wholly unexpected flood caused by a choked leader, or some like unbelievable occurrence, will submerge them. But it *is* done, and the result is useless trouble.

The blower should be housed in a clean, dry enclosure, and its temperature should be the same as that which is in the chamber. A 12″ dia. g.i. duct, leading to it from the main part of the house will insure this, and there must be a like duct from the blower location to the organ chamber for wind supply for the organ.

Fig. 9. Console in Hall

## Openings

It is really astounding how many organs, good in themselves, have been absolutely ruined, tonally, because of the lack of ability, on the part of the tone, to get out. No architect would think of 2′-6″ doors for a room seating a thousand people, and yet he will put a 4′ opening for tone where one three times the size is needed. There *must be ample space* for the tone to come out, else the money is wasted, and the opening should extend to the ceiling of the chamber.

A very satisfactory result can be obtained by having a skeleton construction of the partitions between the chamber and the music room, starting seven feet above the room floor level, thus permitting the tone to flood the room through the wall hangings. In this case the chamber must be adjacent, and practically on the same level.

The matter of openings is *very important,* and we know that "to err is human," but to err in giving what may seem to be a large opening "is divine."

### Location of Console

A CONSOLE takes about five and a half feet square of floor space, and, of course, as to its exterior, can be made to harmonize with the style and general color scheme of the room in which it stands. It must stand *in* the music room, and as far from the chamber opening as possible, (Fig. 10), yet so located that nothing intervenes between the chamber and the player.

He must be able to hear the tones as nearly as possible as do the majority of the auditors, in order that he may properly balance his instrument, and obtain effective expression. (Fig. 1.)

In the case of residence organs, there are no traditions to be followed, and the better hidden the source of the tone, the more delightful is the result. The architect has entire freedom as to method and style of treatment of the screening of the opening, save that the grilles should be light, and the openings between the solids as large as possible.

A word as to *cost* and *upkeep* may, in closing, not be amiss. The idea that a residence organ is to be classed with a steam yacht is a fallacy. The *initial investment* may be as low as Seven Thousand Dollars, ($7,000), and thence upwards; and the *cost of upkeep* may be one, or one and a half per cent per annum. As for deterioration, that is practically *nil,* providing the instrument is kept free from water and rats.

In these articles we have endeavored to look at the matter *from the standpoint of the organ,* and to bring its needs to the attention of those, who give it a place to stand and work, feeling that they are quite as desirous of serving it, and their clients to the uttermost, and always having in mind that, in the busy rush of their detail, they have not realized, as we have said heretofore, that the *fundamental responsibility* for the successful installation of an organ *rests on the architect.* It is *he* who says where it shall go, and how much

**Fig. 10. Console in one end of music room, organ chamber opening in the other, with nothing intervening between the chamber and the player**

room it shall have, *but the unfortunate thing often is* that he says it, without having any adequate idea as to what space the installation will require.

There is no great secret about organs, or organ building, and the information which is necessary can be had for the asking, for the builder is more than anxious to have adequate space, and will welcome any chance which may be given him to help toward that end.

(*The End*)

**Interior view, Fidelity Trust and Savings Bank, Chicago, Ill.**
**A. H. Andrews Company, Architects**

This photograph suggests well the glowing richness of color which may characterize monochromatic use of ceramic material under conditions of interior lighting. Wall, columns, entablature and banking screen are in matt glazed ivory Terra Cotta richly developed in relief yielding shadow notes of a deeper quality



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# COLOR IN ARCHITECTURE—PART III

BY F. S. LAURENCE

Executive Secretary, National Terra Cotta Society

Precedent and Initiative

THE della Robbia family and their immediate successors did not know how to produce a matt surface glaze, much less one having any textural interest. This circumstance suggests another aspect in the resources of modern ceramics for appropriate finish which are open to the architect today. All the examples of the della Robbian school are in smooth bright enamels having a glassy sheen which tends to obscure form by its reflecting action, particularly in its susceptibility to glittering high lights. The original enamels of Luca della Robbia were somewhat softer in this respect than those of his successors but still embodied this drawback to the most satisfying expression. Had Luca known how to saturate his glaze compounds with elements producing a minute crystallization of the surface which eliminates the glitter he would certainly have turned to this resource with the most unbounded enthusiasm. It is in this development that modern ceramics present a medium surpassing that employed by della Robbia. In modern terra cotta and tile matt as well as bright glazes are freely obtainable and in surface textures of the greatest charm. Added to this are

Altar in Holy Trinity Roman Catholic Church, Newark, executed in polychrome Terra Cotta, Mosaic and painted decoration



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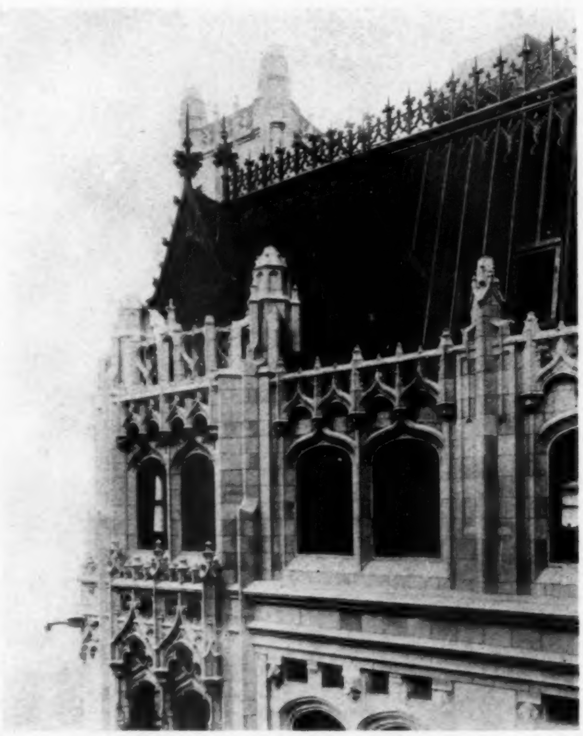
the very much greater range and variety of colors which the modern ceramic chemist has developed. With this increased facility for harmonious expression the matter of equal or superior results reduces itself to the quality of the architect's design and sculptor's modeling and is not a matter of rediscovering the secret of "a lost art" or of a medium of comparable excellence.

The very much greater range of possibility in ceramics now offered the designer suggests another point very vital to the appropriate and significant use of color in modern applications and one that applies whether the material be ceramics or any medium that may be employed for polychrome design.

Allusion has been made to the ample precedent which exists in the practice not only of the early Italians but of the ancient Greeks. It is natural that in any use of the classical orders, particularly the pure Greek, we should turn to the bright colors and shades of colors employed by the Greeks and apply them in the same way. Any use of the corresponding black, dull and bright reds, blues, brilliant yellow, gold and pure white should hold with certainty to the method of distribution which modern research has established as characteristic of polychrome expression in Greek architecture. In fact, it is reasonably certain that the use of coloring was so studied and brought to such a state of final perfection in its technique that no departure in the use of corresponding colors could safely be made. But there is this very significant and vital factor to be remembered. Such perfection of color technique must have rested inevitably upon the precise shades in coloring which the chemical knowledge of the ancient Greeks admitted producing. A virile strong race naturally found satisfaction in the use of positive strong colors and if not indisposed was at any rate unable to develop in the necessary mediums the wide gamut of subtle intermediate variations of color obtainable under the resources of more advanced chemical knowledge. Greek vase painting, for instance, exhibits none of the chromatic variety of ancient Chinese porcelains or Persian tile work nor do we find that the art of glazing their terra cotta extended beyond a process and result that may be more properly described as burnishing. It is an interesting question what the Greeks would have done had they possessed facilities for the production of ceramic glazes in the wide range of various colors and intermediate shades of colors that exist today. Is it not probable that a race of such wonderful æsthetic sensibility would have quickly seized upon such resources and if their use of colors in relation to form was influenced, as it must have been, by the characteristics of those colors, would they not necessarily have employed the differing colors and shades of a very much wider palette in a different way? One can scarcely conceive that they would not have used them at all and that the only shades they would have employed were precisely and identically the ones they did. They would have used electric light and changed their fixtures quickly enough if they had known how; and in the use of color who shall say that the road is not open to the modern architect to associate successfully the differing colors admitted by a modern palette with Greek or other classical ornament in a manner which the ancient Greeks would have accepted as perfectly satisfying? The possibility, of course, rests in an imagination gifted enough to do it successfully within the immutable principles which govern form in Greek art.



**Detail of upper stories, Woolworth Building, New York City**
**Cass Gilbert, Architect**
Color interest focuses mainly in the relation of cream colored Terra Cotta seen against the green and gold copper of main roofs and termination of spire, polychrome accent touches being carried through the Terra Cotta tracery to interlace these masses in the upper stories

Correspondingly a slavish adherence to Persian,

Temple B'nai Jeshurun, Newark, N. J.

Albert S. Gottlieb, Architect

An interesting example of the intermingling of burnt clay products of varying textures and color to produce an artistic ensemble
Materials, unglazed tile and Terra Cotta in varying shades of brown, with altar of marble



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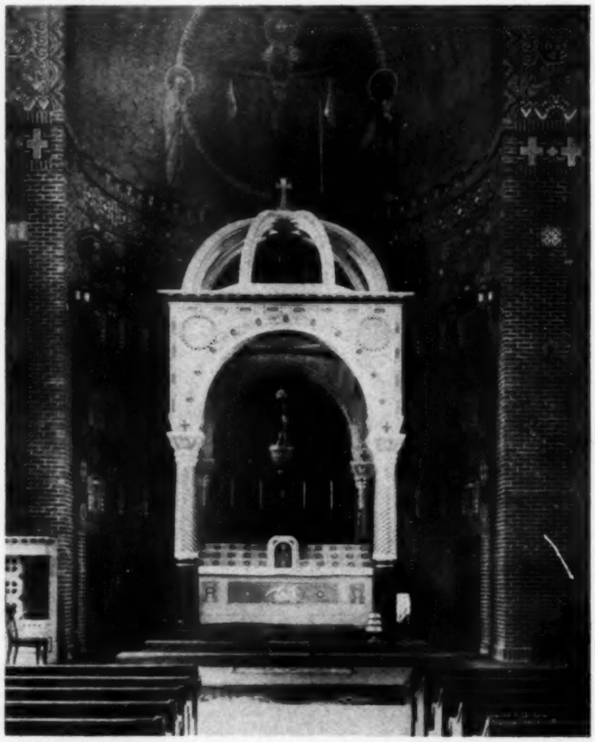
Arabic, or early Italian precedent in the use of color is nowhere enjoined by the facts of history or dictates of sound taste, admitting that in a repetition of any of these motives in design the law of association in mental process calls for a substantial adherence to the familiar chromatic aspects of such design for satisfaction of the mind in its sense of consistency. Beyond that there is no necessary bar to initiative.

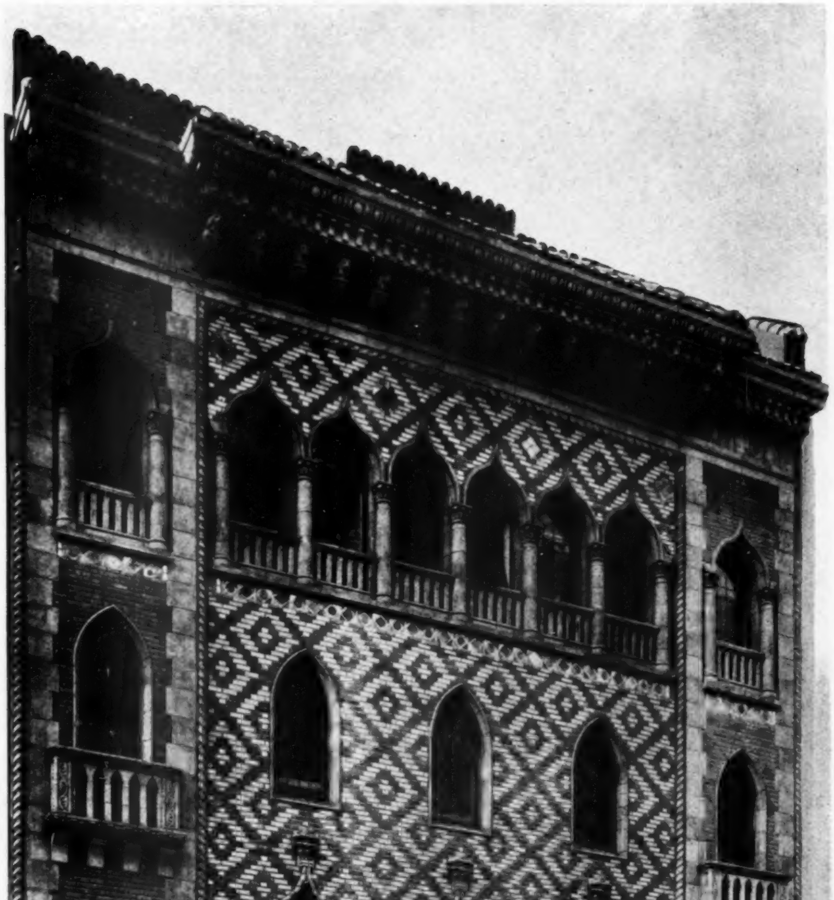
A suitable palette of colors for application to architectural form is therefore not limited to any chromatic scale dictated by precedent. It preferably should include those tints and shades which have been employed in the best architecture of the past, but may confidently include varieties and interests of texture not among those known or available in former periods. Modern ceramics already offer these in an astonishing range of very beautiful effects. In fact, the interest of technique occasionally suffers through a control which eliminates much of the charm arising from the more primitive processes employed in early European and Oriental ceramics. On the other hand, the compensating advantage of much broader chromatic scope and extent of application together with the facilities for obtaining material with the requisite speed for modern building operations could hardly be foregone for the satisfactions of more primitive charm. It is only in certain rare effects of luster in Hispano-Moresque and early Italian maiolicas and the superb porcelain glazes of ancient China that the modern ceramist has yet failed to excel technically in his production of material suitable for architectural application. The range of colors obtainable, for instance, in architectural terra cotta is given in the appendix and need not be elaborated here beyond saying that the laboratory formulas of the modern American manufacturer contain an infinite variety of each one of the colors enumerated in the appendix, in consistent gradations of those which can be supplied commercially and that the range is constantly expanding under further experiment. There is no need for the designer to depart from the obtainable varieties for any effect consistent with the nature of a ceramic medium, the problem in its practical commercial aspect consisting rather in the designer's appreciation of the fact that sumptuous richness can be achieved with a comparatively simple range of colors and a consistent employment of the warm and cool varieties of each color. But the attempt should not be made to express these in a working design without reference to ceramic samples illustrating the qualities of coloring resulting from the nature of ceramic process. These, it should also be remembered, occur from the action of chemical compounds subjected to a terrific heat for their development and this precludes microscopic uniformity of shade among the units produced in any one prescribed color. Certain composite colors should also not be expected from the compounding of other colors which would yield these in the mixture of ordinary pigments. Distributive applications of one color over another or blending into another with this view, should therefore not be attempted in design without prior consultation with the manufacturer.



Altar in polychrome Terra Cotta for Holy Trinity Roman Catholic Church, Newark, N. J.

Hughes & Horton, Architects

Both in tile and terra cotta as well as in the special developments in the latter which are properly known as faience, the color palette offered the architect today is ample for all purposes whose attainment can be reasonably desired. No difficulty exists in this direction where the desire is not to torture out effects of coloring that belong properly to other mediums. It is not reasonable to hand a manufacturer of ceramics a piece of silk and say "match this" or to expect the same duplication from a piece of wall paper, wood,



Wetzel Building, New York City

Hill & Stout, Architects

This well known example embodies detail treatment well repaying study. Polychrome interest has been closely associated with that of very rich textural charm in the brick and plastic hand made freedom of unglazed Terra Cotta ornament. Varying shades of soft golden brown in these materials are further set off by richly colored polychrome accents in glazed tile. This tile also exhibits the free, hand made quality of early ceramics



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**Upper portion of tower, Pantages Theatre Building, Kansas City, Missouri**

B. Marcus Priteca, Architect

Positive polychrome treatment of towers has been comparatively rare in this country. From the Central West we have this example in cream enamel and polychrome Terra Cotta indicating a direction in which color can be lavishly and appropriately employed

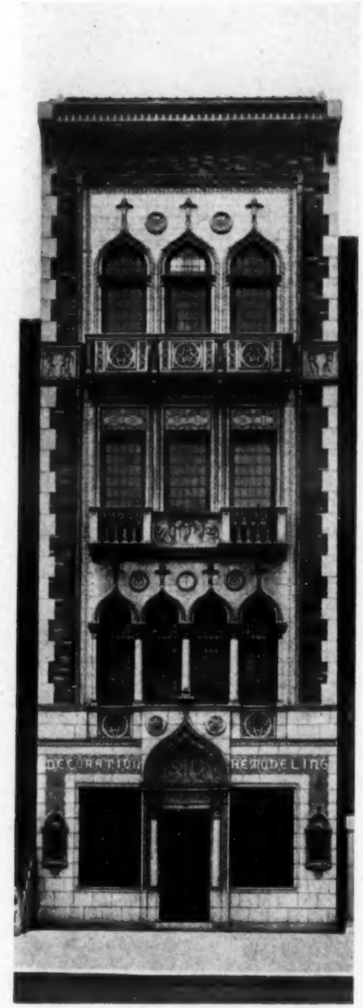
**Interior, National Farmers Bank, Owatonna, Minn.**

Louis H. Sullivan, Architect

Another striking instance of Mr. Sullivan's work in which ceramics have been employed in a unique manner for interior finish. Capping of screen and enclosure with clock frame in green glazed Terra Cotta above brownish brick against painted polychrome decoration of arch

## COLOR IN ARCHITECTURE

## PART III




**Building for Joseph F. Sturdy & Company, Chicago, Ill.**

Joseph F. Sturdy, Architect

Progress from the brownstone era in color interest and otherwise is well exemplified in this instance of polychrome architecture in brick and Terra Cotta

**United States Post Office, St. Petersburg, Florida**

James A. Wetmore, Architect

Buildings of this character present unusual opportunity for effective color treatment. This example illustrates the successful adaptation of Italian precedent in a thoroughly modern treatment. Material is ivory Terra Cotta in low relief, enriched with light blue, yellow and green. Ceiling of the loggia is consistently treated in polychrome, blue predominating

stone, marble or other substance when the material to be used is clay and when almost no color presented by any other substance finds a corresponding equivalent as color in the ceramic medium associated with a distinctive quality peculiar to the ceramic medium and constituting its essential dignity. The fact that the producers of ceramics have succeeded in many instances in successfully matching the characteristics of other materials under an enforced demand for this result in nowise changes the fact that the sincere designer will always prefer to use a material frankly for what it is and has ample resources for satisfaction in the profuse variety of effects which modern ceramic production now affords.

A word may be added in this connection respecting the exceedingly interesting possibilities offered by ceramics for pictorial mural decoration. Aside from the beautiful results in Mosaic which are commonly familiar the possibilities of this in tile treatment are not as well understood as they might be. Demand in this direction has exhibited on the whole a somewhat curious lack of appreciation of the immense dignity of effect obtainable with certain rare exceptions having inclined toward commonplace concepts, and a whole chapter might well be written on this subject which pertains rather to that of interior decoration than the architectural use of color in a broad sense. Faience in the natural medium where particular subtleties in color relationships and technique generally are beyond the customary process in both terra cotta and commercial tile production, involving the use of lower fired glazes and a greater expenditure of hand labor, time and cost than is possible in the bulk production of material for customary building work. The expense is also necessarily greater and the extent of application therefore limited to opportunities relatively unfrequent,


**Terra Cotta Filling Station for Atlantic Refining Company, Philadelphia, Pa.**

W. J. Wilkins, Architect

While treatment in this instance is monochrome it is easy to visualize buildings of this character in color. Not only does Classic precedent warrant the brilliant enrichment of detail in this style but the purposes of such a structure and the essentially modern activity it is designed to serve admit the widest latitude in the choice of architectural style and play of fancy in chromatic enrichment. With landscape accessories the filling station could be made an attractive beauty spot and an important element in municipal planning but in the wider use of color which will give our architecture at large a more pronounced and appealing chromatic interest the materials available for use are generally well within the bounds of cost admitted by our prevailing conditions.

Finally it may be said that notwithstanding the rapid strides which our architecture has made away from the lifeless uniformity of the "brownstone age" the resources for color treatment as they exist in all our native materials have hardly been scratched and that an opportunity of the utmost promise awaits a talent that will make the most of it.

Interior of court, Pan-American Building, Washington, D. C.

Albert Kelsey and Paul Cret, Architects

One of the loveliest schemes of color for intimate interior use existing in American Architecture, polychrome treatment focusing in the Terra Cotta cornice. Brilliant sienna and orange touches enrich the soft ivory gray of relief and lighter shade of the walls picking up the polychrome interest of the base and the floor which is in ceramic tile of unique design embodying symbolic motives from the prehistoric American civilizations. The tropical plants are an important feature in a color ensemble of the rarest charm

### Appendix

THE following shades of color and characteristics of texture are now obtainable in terra cotta as produced in the United States.

In colored glazes the palette includes reds, ranging from a pale pink to deep madder; blues from a light sky blue to cerulean and deep indigo; greens from light emerald and malachite to grass greens and olive shades; yellows from pale shades suggesting Naples to deep ochres; browns from cafe-au-lait to dark russet; light and deep purples of both red and blue cast, mauve and, of course, black and white, the latter including several shades from pure white to a deep cream or buff white. Also toned whites of a grayish cast extending into positive grays of a French and putty quality. These are the shades producible at the regular high firing temperatures followed in the manufacture of terra cotta. For certain special effects there are obtainable at an additional cost several other varieties of the colors named which are produced at lower firing temperatures or obtained by additional firings, such as vermilion and gold.

In unglazed terra cotta the ceramic finish is usually in shades of buff, gray, salmon, red and brown. Most of these colors are vitreous. In glazed or enameled terra cotta the finish may be either matt or a bright glassy surface.

Previous to the application of ceramic finish in either glazed or unglazed terra cotta the body of the ware may be given a surface treatment to combine with the color in a desired textural effect. This body surface may be smooth or tooled, in from six to eight lines to the inch, or may take the form of a light or heavy irregular drag or combing. Special surface treatments of a pitted or wavy character realizing the quality of hand finish are also obtainable although usually at an extra expense.

Main Entrance, Theology Building, Emory University, Atlanta, Ga.

H. Hornbostel, Architect

(*Continued on Page* 321)



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ENTRANCE FRONT

HOUSE OF ELDRIDGE GERRY SNOW, JR., RYE, NEW YORK

DONN BARBER, ARCHITECT

*(For floor plans see Pages 327 and 328)*

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DETAIL, GARDEN FRONT

GARDEN FRONT

HOUSE AND GARDEN OF ELDRIDGE GERRY SNOW, JR., RYE, NEW YORK

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HOUSE AND GARDEN OF ELDRIDGE GERRY SNOW, JR., RYE, NEW YORK

DONN BARBER, ARCHITECT

HOUSE AT OGONTZ, PA.

OSWALD C. HERING AND DOUGLASS FITCH, ARCHITECTS

(*See Page 389 for floor plans*)

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ENTRANCE DETAIL, HOUSE AT OGONTZ, PA.

OSWALD C. HERING AND DOUGLASS FITCH, ARCHITECTS

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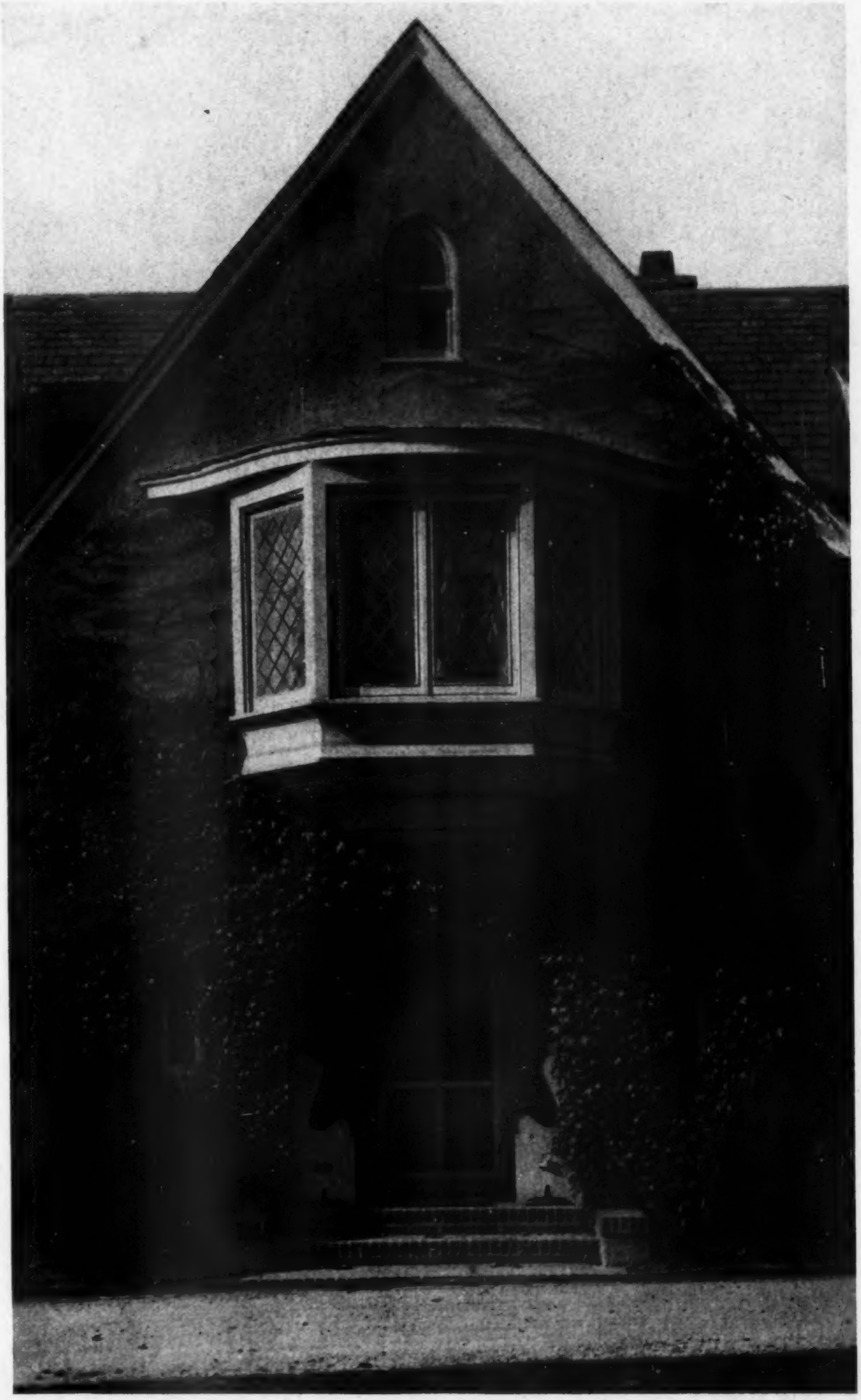

DETAIL, HOUSE AT OGONTZ, PA.

OSWALD C. HERING AND DOUGLASS FITCH, ARCHITECTS

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HOUSE AT RYDAL, PA.

OSWALD C. HERING AND DOUGLASS FITCH, ARCHITECTS

(See Page 330 for floor plans)

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ENTRANCE DETAIL, HOUSE AT RYDAL, PA.
OSWALD C. HERING AND DOUGLASS FITCH, ARCHITECTS

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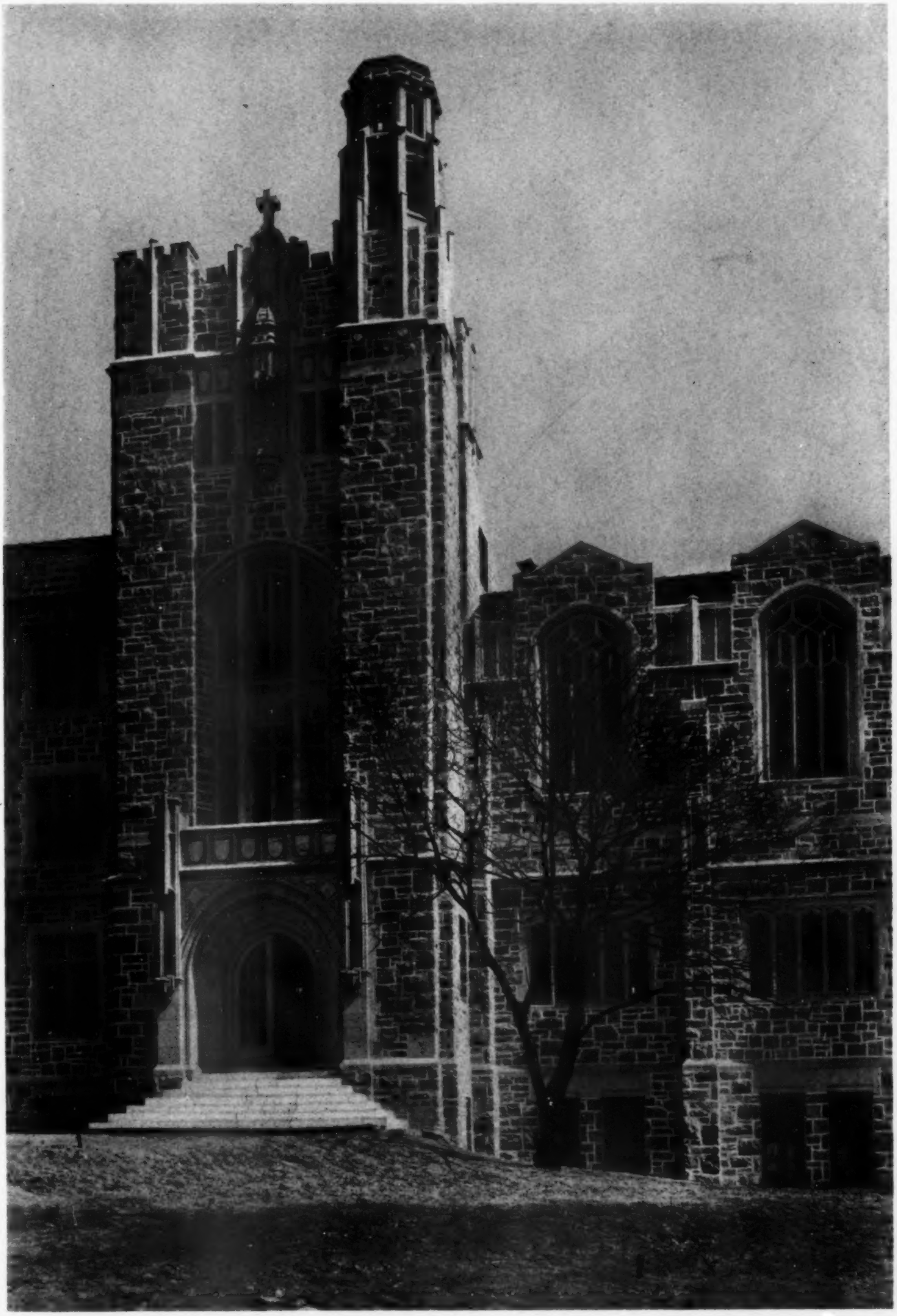

ST. THOMAS NOVITIATE, WASHINGTON, D. C.
MURPHY & OLMSTED, ARCHITECTS

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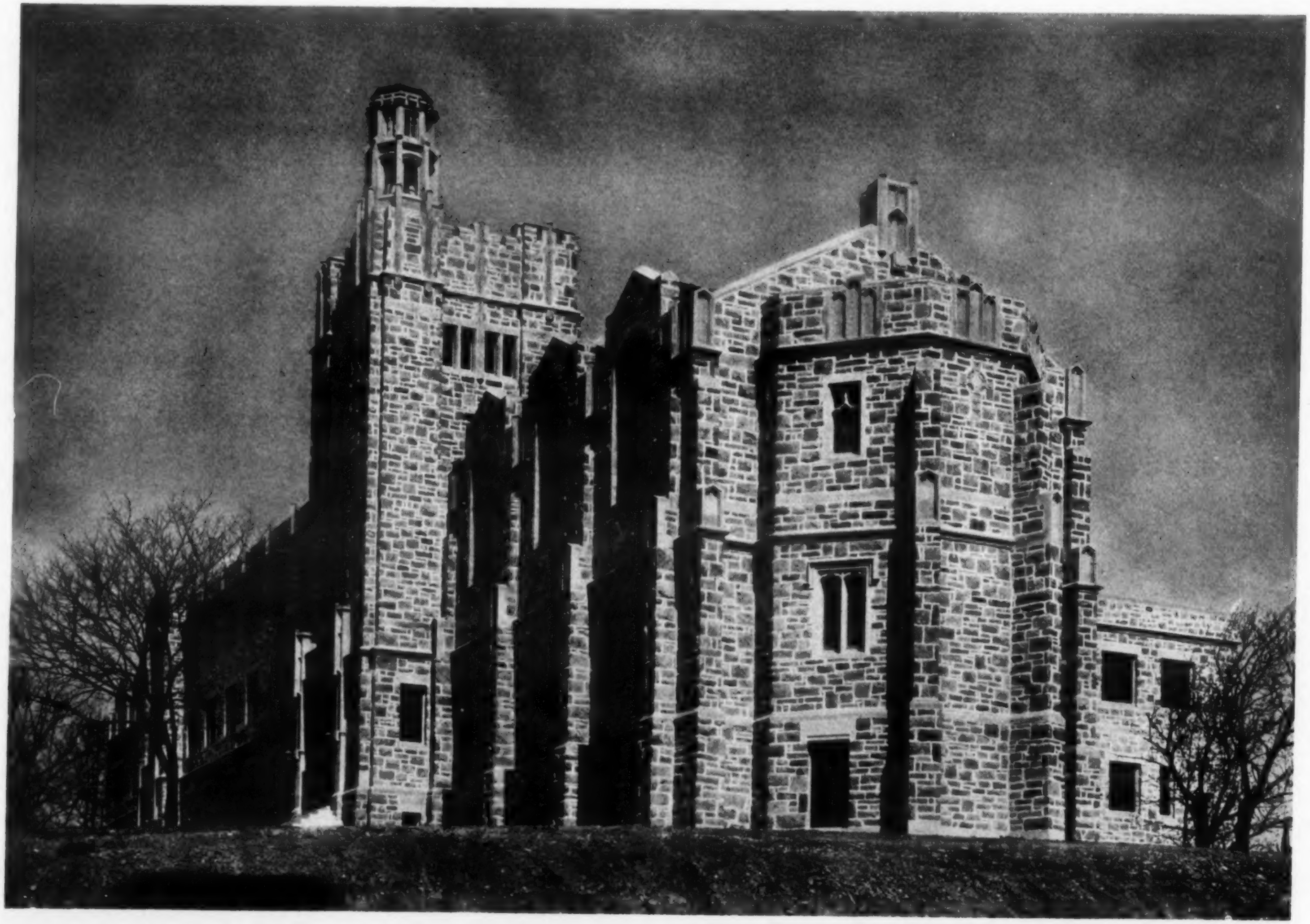

ST. THOMAS NOVITIATE, WASHINGTON, D. C.

MURPHY & OLMSTED, ARCHITECTS

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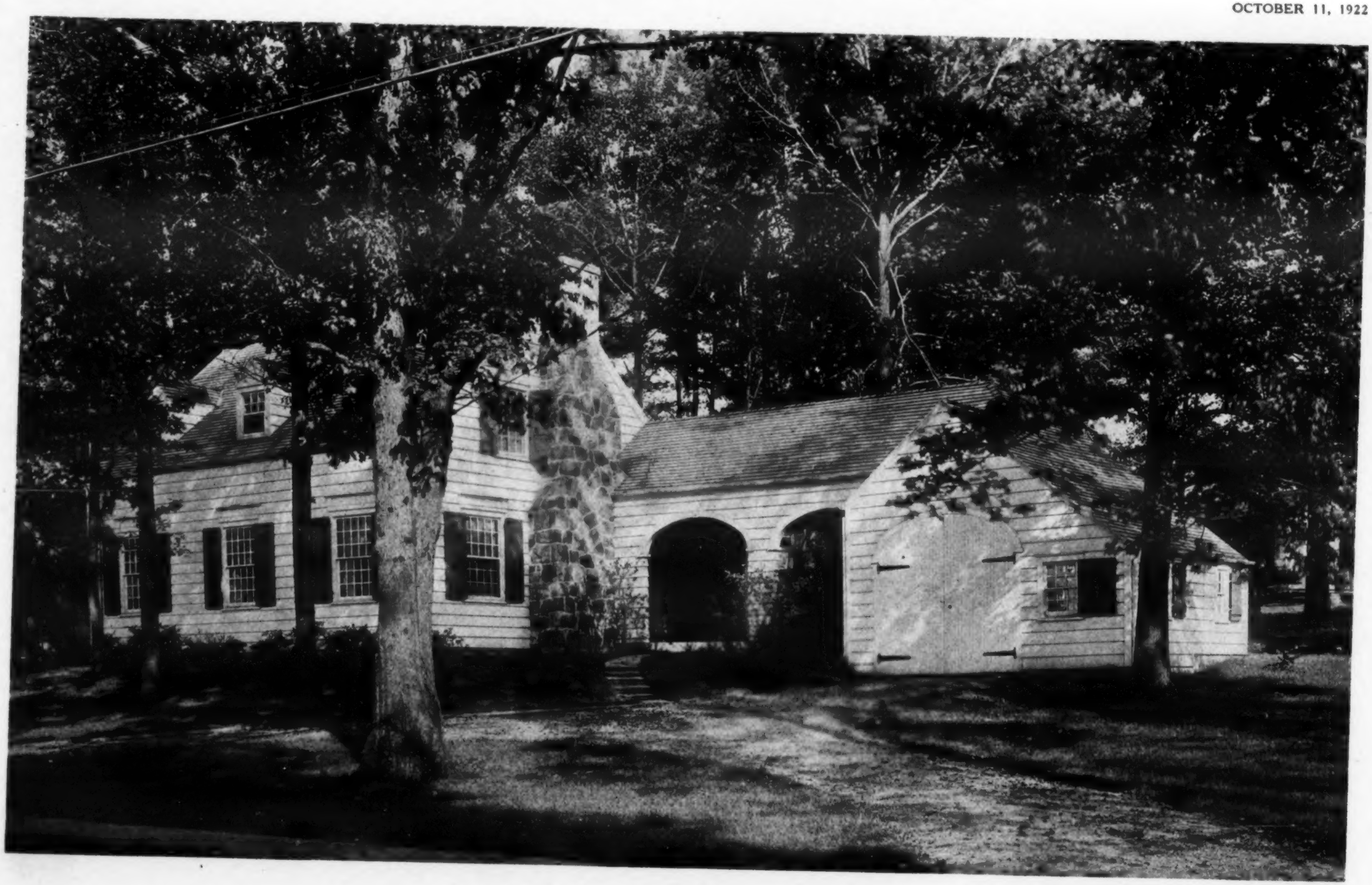

HOUSE OF ROBERT MEARS, ESQ., TENAFLY, N. J.

R. C. HUNTER & BRO., ARCHITECTS

(*See Page 331 for floor plans*)

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COMMERCIAL HIGH SCHOOL, NEW HAVEN, CONN.

BROWN & VON BEREN, ARCHITECTS

*(See Page 332 for floor plans)*

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# ·EDITORIAL·COMMENT·

UNDOUBTEDLY THERE IS better appreciation of good art in this country now than there was twenty-five years ago. The development of our architecture has been steady and consistent. The small houses being erected today are artistically better than were the pretentious houses in the 70's and 80's. People are learning to "live up" to their environment and are making their homes as artistic as their purses will permit. They buy the best they can afford, but unfortunately that best, while often sold for good prices, is not to be compared with the cheaper and more artistic articles that one may purchase abroad. The reason lies solely in the fact that Europe is developing her craftsmen, while in this country we are practically not doing so. We need to encourage the artisan and, first of all, we must provide proper schools under competent teachers for the development of craftsmen.

Now, the man of moderate means must depend on the atrocities of art that are to be found in department stores. This junk mostly takes the form of parodies of some accepted original, designed and made by manufacturers who absolutely know nothing of good craftsmanship. Homes in this country are full of it.

Original work by competent craftsmen is, in this country, expensive and may only be had by those with large purses. Good replicas can be had at fair prices, but, unfortunately, those who make those things first set out to reduce cost of production by simplifying as far as possible such features that are costly to produce, or ignorantly adding such, to them alone, decorative features that create a burlesque of the original.

If we developed the highest craftsmanship, such development will have to proceed by endowment from rich patrons. The cost of the slowly produced articles, made by hand, laboriously and patiently manufactured, is too high for any except the rich. What the average person may have are good replicas, and not so-called copies.

In educating the public taste in good craftsmanship, we shall first have to get to work on the department stores and the many so-called "art shops." It is often quoted that those in charge of our theatres and other amusements succeed by "giving the people what they want." The result of catering to a want that has not even the semblance of refinement or mental uplift is apparent. Stores everywhere sell or "stock" the things the public will most readily buy. Obviously, it will be difficult to get the retailer to experiment in new things of better craftsmanship. It is there that those who are directing their energies toward the development of artistic taste in the masses must work.

Modern furniture design is not always artistically good and much of it is vulgar and commonplace. Museums throughout the country are engaged in developing good craftsmanship. This effort proves the practical value of museums, and may point with satisfaction to the interest taken by manufacturers in this museum work. But, it does not help the cause of good craftsmanship any to find that in copying a good "museum piece" the copyist has so little knowledge of good art that the very elements that gave this piece its artistic value, have all been lost in reproduction.

The craftsman who sells his work to rich amateurs can look out for himself. He knows he must live up to the highest ideals of his craft. It is the ignorant manufacturer and the equally ignorant distributor that should engage the attention of those who are so earnestly striving to forward good craftsmanship in this country.

Fortunately, craftsmanship as allied to architecture has a brighter future. It will be perfectly safe to give architects what they want and it will be difficult to foist upon them something they do not want. There has been a large advance in the last two decades in architectural craftsmanship. Structural details are constantly improving for the good reason that the more important details are designed by architects or developed under their supervision.

Of course, the general public has not the artistic appreciation that is part of the training of architects. As the public has no voice in the design and manufacture of the work of the craftsmen that is offered to them, obviously some influence must be brought to bear on the manufacturer who is making money by giving people what they want and at the same time sadly retarding the development of artistic perception.

* * *

THE ADMIRABLE PLAN for furthering the professional education of those employed in the architectural offices of Boston, perfected by the Education Committee of the Boston Society of Architects, was outlined in a circular setting forth the details and printed on page 299 of our issue of September 27. Nothing could be finer. The successful results from such valuable and efficient combination of effort are practically assured at the outset.

That Harvard and Technology Schools of Architecture have reached a point where they receive the unqualified approval of Boston archi-



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tects, proves that the educational methods at these distinguished schools are progressive and practical. If further proof were needed, the fact of the fine co-operation with the Atelier of the Boston Architectural Club is presented. This trio of educational units when co-operating with the entire profession in Boston, presents an opportunity to the student of architecture such as has never before been possible in this country. It carries forward the architectural education of every student for a period of at least five years after graduation. At the end of that time, he will have become so thoroughly grounded as to enable him to take his place among the "elder brothers" absolutely qualified for such advanced association.

Such a scheme can be applied and successfully carried forward in all our large cities, and the excellent example of the men of Boston will, it is hoped, be an inspiration in every large architectural educational center.

Whether consciously or unconsciously, we do not know, but the Boston Society of Architects has sent out this information to the press in a manner that secures its prompt presentation. The circular needs no editing and it is printed on one side of each sheet. Editors have only to mark and send to their printers, and are pleased to have such excellent matter for their readers.

The Committee on Public Information of the Institute will find in this circular and its method of preparation a model that can be advantageously followed.

* * *

**DURING RECENT YEARS** architectural exhibitions have clearly shown the value of the artistically made photograph as a means of exhibiting works of architecture. Here and there, throughout the country are to be found men of considerable artistic ability who have taken up photography and dignified it to a point of art. These men, born with correct ideas of good composition, and with a correctly developed appreciation for good art, lack only the power to coordinate the hand with the eye to become artists. They find in the camera a means of expressing the artistic yearnings which beset them. Their work is entitled to the respect of every one who desires to encourage good craftsmanship. It is essential that the craftsmanship of architectural photography should become more highly developed, and it is the architect who can, to a great extent, promote that development.

In a recent trip covering many large cities of the middle West, the writer many times heard the complaint that while there was a wealth of material, ready and ripe for illustration, unfortunately there were no local photographers who were sufficiently artistically trained to photograph it. This lack of photographer craftsmen deterred many architectural clubs from holding exhibitions, or contributing as group exhibitors to the larger architectural exhibitions East and West.

Many a man today unsuccessfully practicing architecture, and from one cause or another unable to gain a livelihood, would, by reason of his architectural training plus a knowledge of modern methods of photography, find a very dignified and lucrative calling as an architectural photographer. The field is large, for we know by actual experience that the competent architectural photographers in this country can be counted on the fingers of two hands.

We have in mind a certain city in the middle West, where architects have been doing important work in building up the city. It is several years since any record of this growth has been made in architectural journals. We spent considerable time going about and were amazed that no pictorial record had been made. Without exception we were told that the reason for this omission was due to the fact that there was not available a photographer with sufficient artistic knowledge properly to photograph the buildings.

Architects are passively indifferent to this condition. Like every artist the great interest is in the work then on the easel. But, if we are to hold successful architectural exhibitions, shows that will thoroughly record the architectural development of every section, we must be able to command a wider selection of subjects than is now possible.

Why might not the Institute or the chapters take up this matter, do what they can to encourage excellence in photographic work? Why not issue "letters patent" to photographers, stating that their work has passed the critical scrutiny of the Institute? And why not at each major exhibition give a medal to that photographer or firm of photographers whose work justifies such an award?

### Color in Architecture—Part III

(*Continued from Page* 318)

The term polychrome when prefixed to terra cotta usually denotes the application of two or more colors to the single piece. It is important that the parts to be treated in this manner be clearly indicated on drawings as the expense is higher than execution in a single shade of color for each unit.

#### Bibliography

THE following does not aim to give all of the works which have been written upon the phenomena of color and the principles of its application in the various arts. Practical value for purposes of study requires that selection should be confined to a few comprehensive works of more immediate assistance to the architect and which are readily obtainable by purchase or can be found in American public libraries. Casual articles which have appeared from time to time in periodicals have been excluded under the probable difficulty of obtaining back numbers.

Adams, Edward: The Polychromatic Ornament of Italy. Published by G. W. McKisson, London, Wiley & Putnam, New York. Containing colored plates from the author's drawings with explanatory text.

Chevreul, Michel Eugene: The Principles of Harmony and Contrast of Colors and Their Application to the Arts. Translated from the French by Charles Martel. Published by Longmans, Brown, Green & Longmans, London. Illustrated with many cuts and colored plates. An exhaustive and complete study of the nature and phenomena of colors and their relation.

Chevreul, Michel Eugene: Expose d'un Moyen de Definer et DeNommer Les Couleurs. Published by Didot Freres et Fils, Paris. An atlas of colored plates with brief explanatory text in French.

Crace, J. D.: The Art of Color Decoration. Published by B. T. Batsford, London. Contains colored plates and explanatory text.

Cruttwell, Maud: Luca and Andrea Della Robbia and Their Successors. Published by E. P. Dutton, New York. Three hundred and sixty-three pages with many illustrations.

Gruner, Lewis: The Terra Cotta Architecture of Northern Italy. Published by John Murray, Albemarle Street, London, 1867. Text in English by V. Ottolini and F. Lose with forty-eight colored plates from drawings and restorations by Federigo Lose.

Racinet, M. A.: L'Ornament Polychrome. Published by Didot Freres, Paris. Text in French with two thousand illustrations including many colored plates.

Solon, Leon V.: Architectural Polychromy. Published serially in The Architectural Record, January to June issues 1922 inclusive. Treats of Greek precedent mainly with many colored illustrations and discussion of application in detail. (To be published shortly in book form by Lippincott's.)

Speltz, Alexander: The Colored Ornament of All Historical Styles. Published by Baumgartner, Leipzig. Four parts, text in English with two hundred and forty colored plates.

(*To be continued*)

Dancing—Terra Cotta Frieze Panel, Boston Opera House
Bela Pratt, Sculptor—Wheelwright & Haven, Architects



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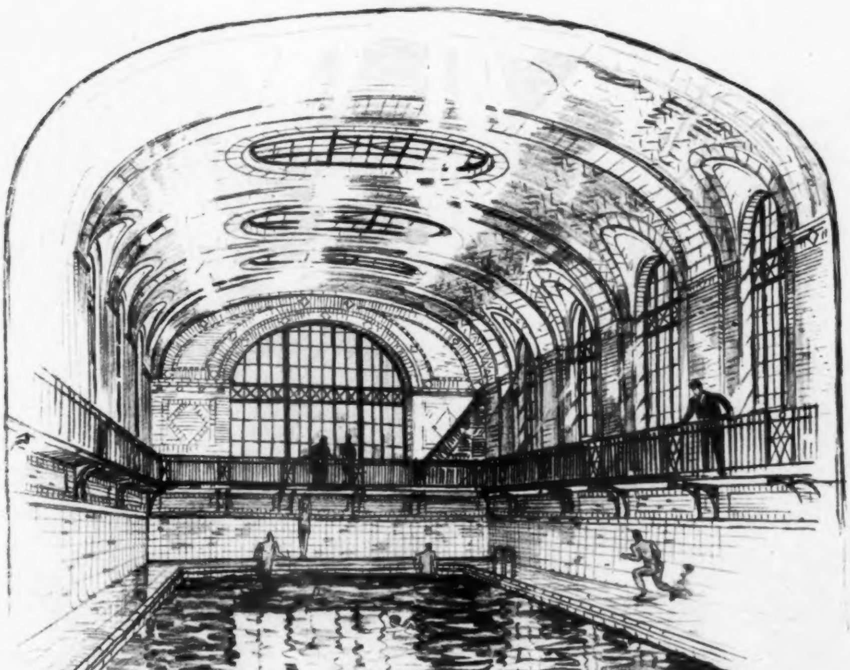
PROPOSED · BUILDING · FOR · THE · YOUNG · MENS · CHRISTIAN · ASSOCIATION · JERSEY · CITY · NEW · JERSEY ·
· JOHN · F. JACKSON · ARCHITECT · NEW · YORK ·

# OFFICE SKETCHES IN PENCIL BY JOHN F. JACKSON, ARCHITECT, OF ROOMS AND DETAILS OF Y. M. C. A. BUILDING, JERSEY CITY, N. J.

THE sketches reproduced on this and following pages are presented by permission of Mr. John F. Jackson, the architect who made them.

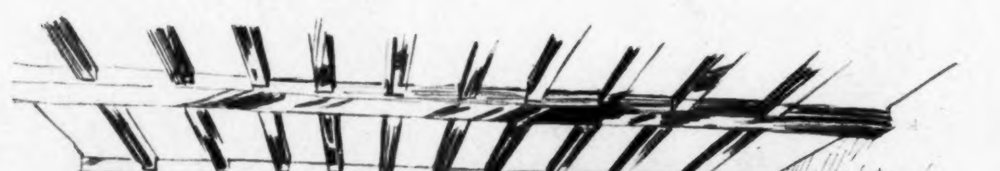
They show a finely developed artistic ability, a perfect knowledge of the medium employed. and emphasize the large value attached to sketching by architects. They were not made for exhibition purposes, but merely to convey to the building committee, and incidentally to those whose generous contributions made the building possible, exactly how the structure and its various rooms would look on completion. The superiority of these sketches over the usual architectural elevations and plans, in accomplishing this purpose, is easily apparent.

It is unfortunate that during recent years the encouragement of the development of sketching has been neglected. Possibly the extended use of the hand camera is responsible, but it should be borne in mind that the camera can only reproduce existing objects. It is not possible to photograph an idea. The student or draftsman who fails to develop a facility for free hand sketching, will find a serious handicap in his professional career, and deprive himself of an artistic and attractive method of interesting clients in the work he is undertaking for them.

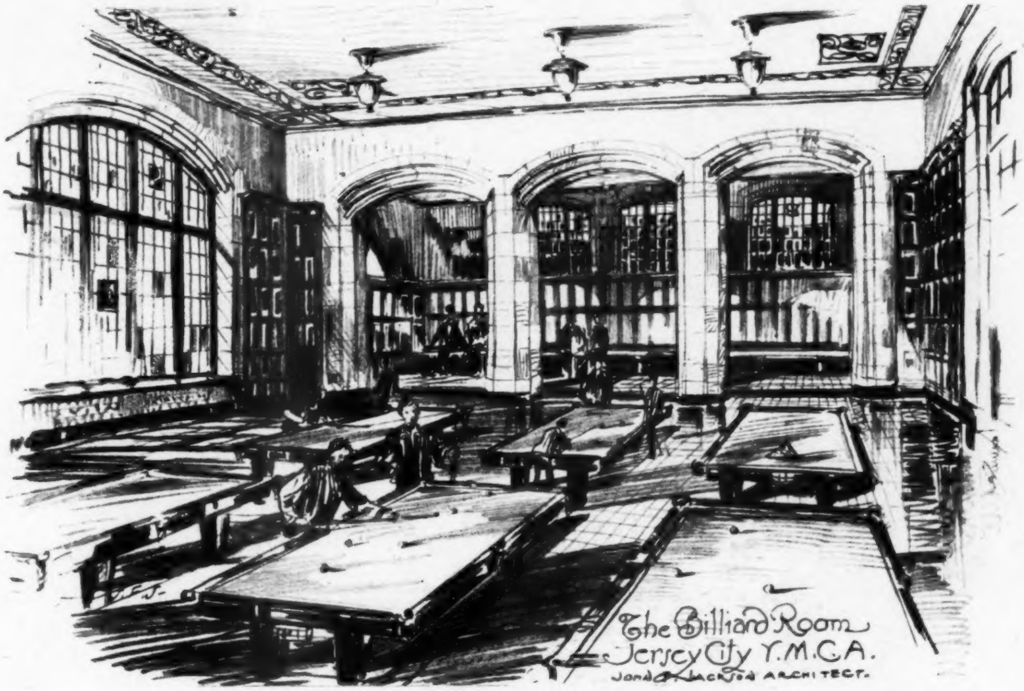



Office sketches in pencil of various rooms and details of Y. M. C. A. Building, Jersey City, N. J.

By John F. Jackson,
Architect


Office sketches in pencil of various rooms and details of Y. M. C. A. Building, Jersey City, N. J.
By John F. Jackson, Architect





Office sketches in pencil of various rooms and details of Y. M. C. A. Building, Jersey City, N.J.

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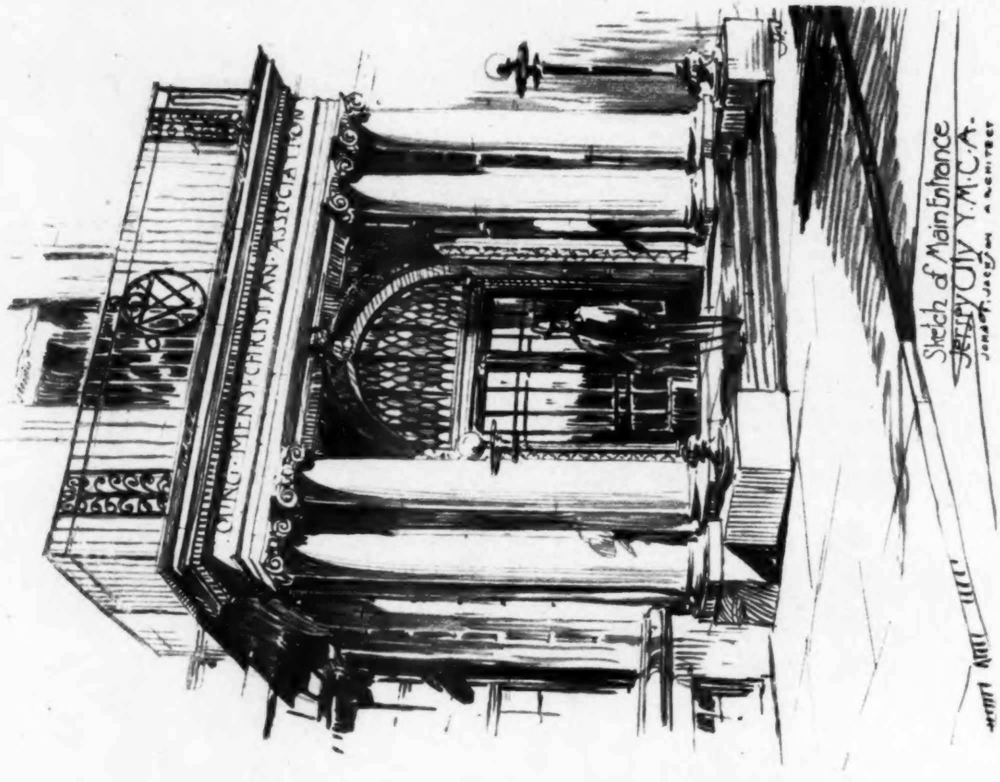
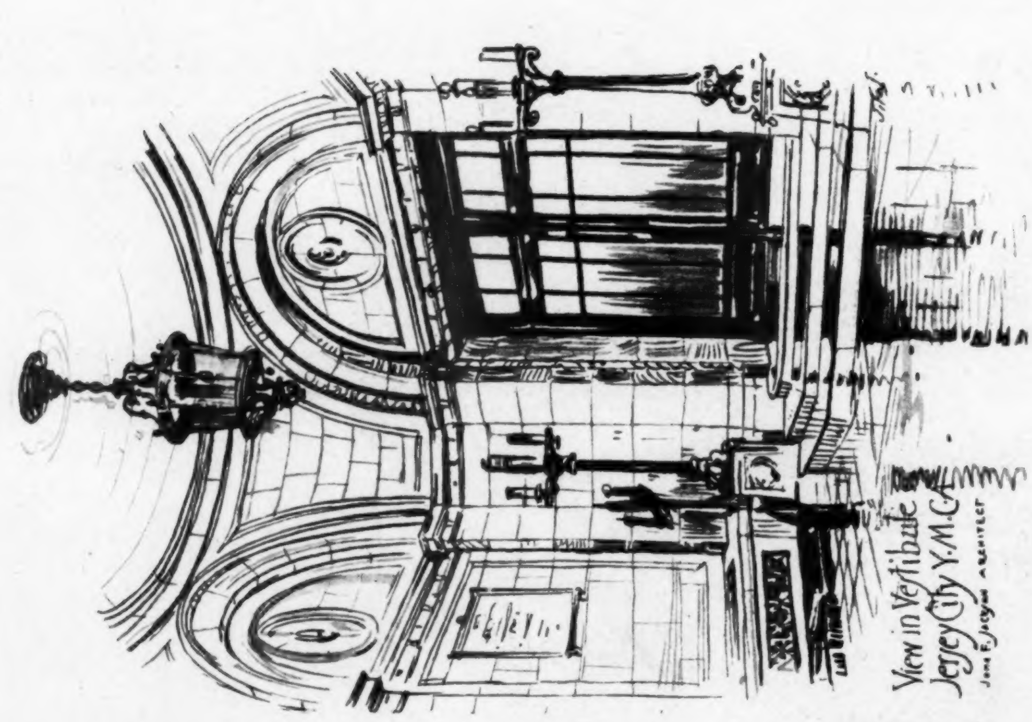
By John F. Jackson, Architect

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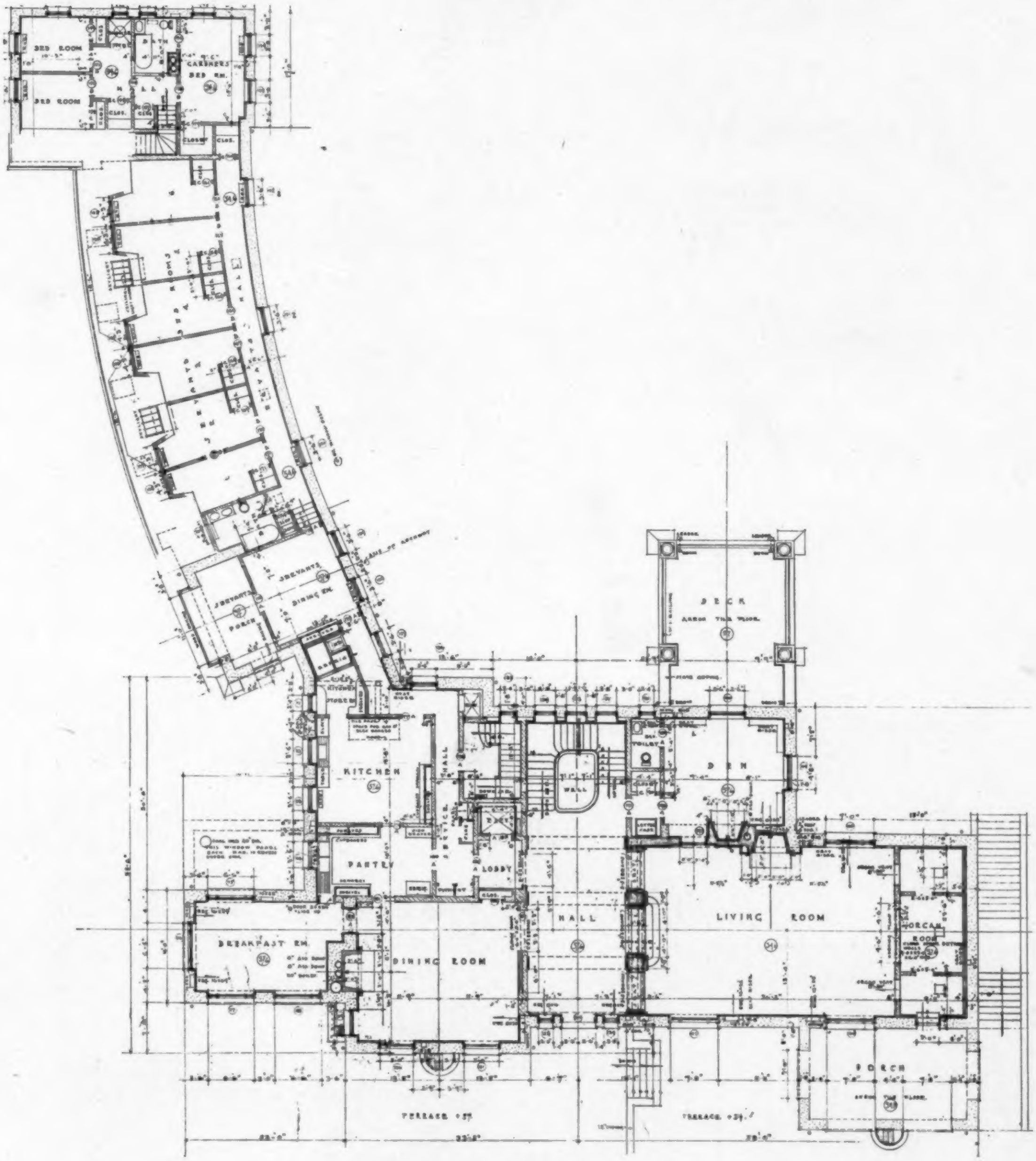

FIRST FLOOR PLAN

## HOUSE OF ELDRIDGE GERRY SNOW, JR., RYE, NEW YORK

DONN BARBER, ARCHITECT

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



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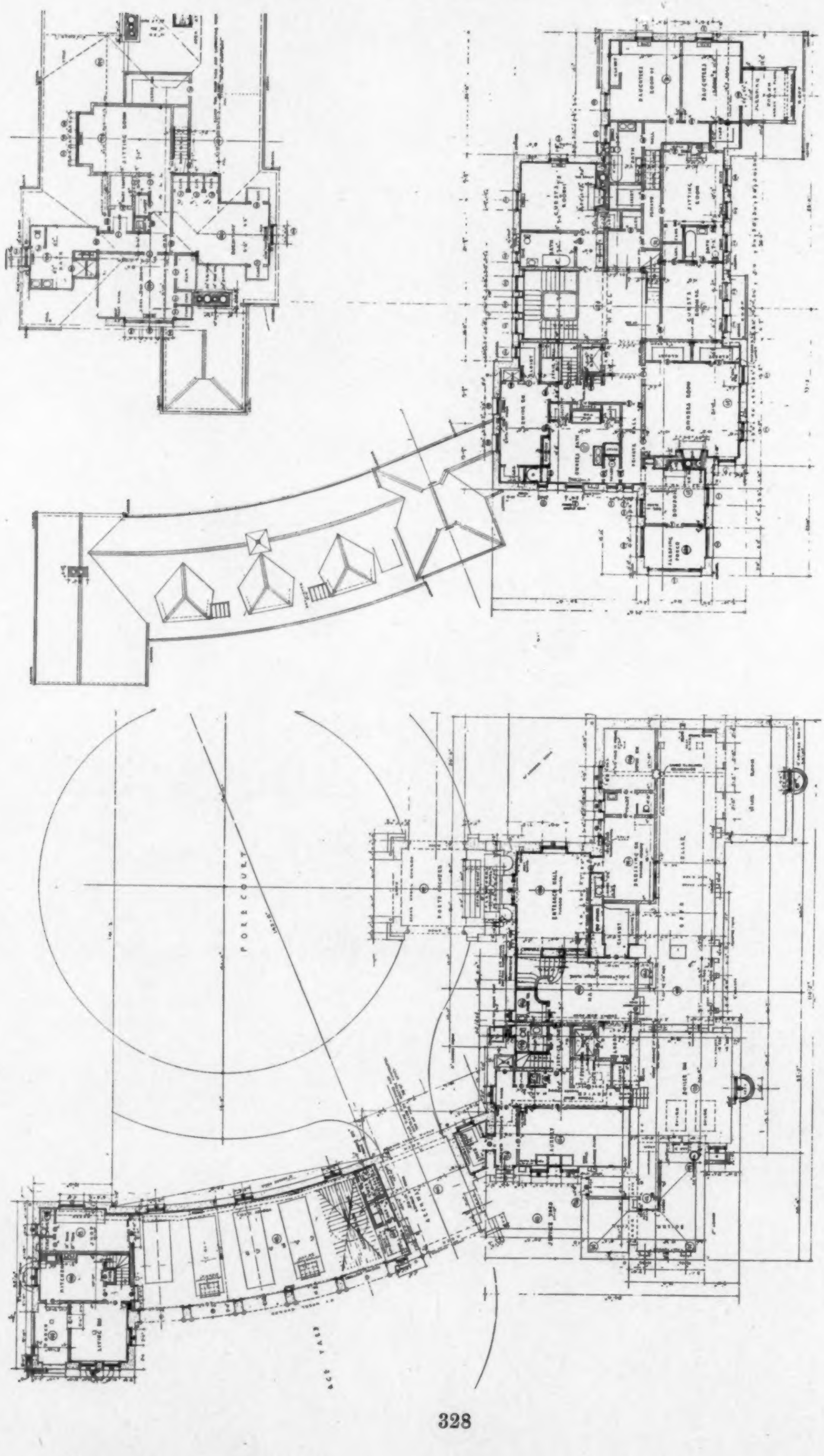
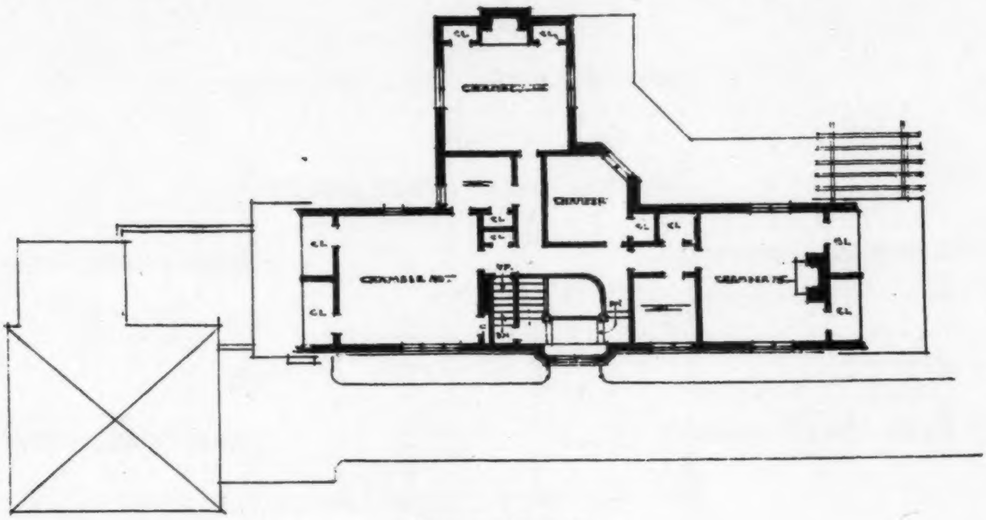


SECOND FLOOR PLAN

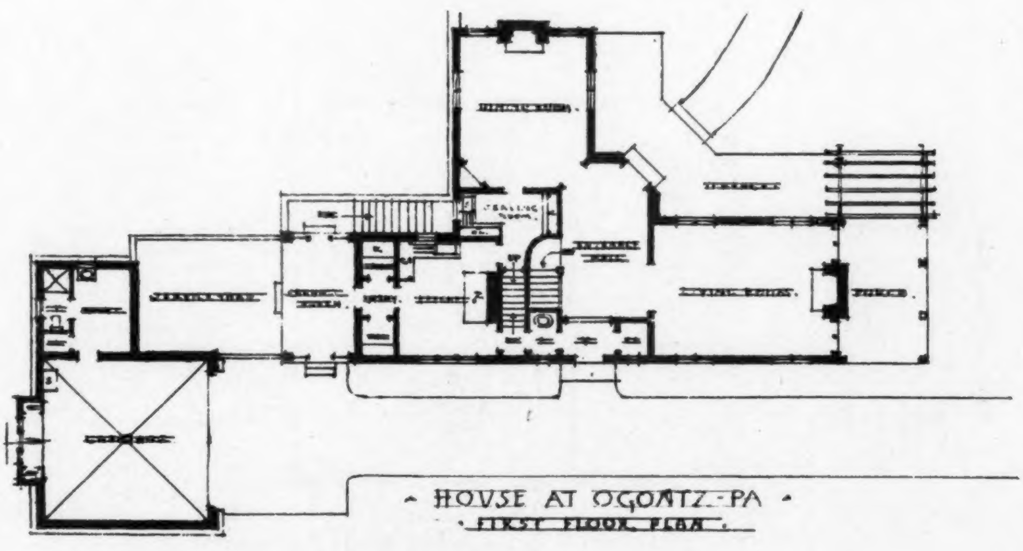
BASEMENT PLAN

HOUSE OF ELDRIDGE GERRY SNOW, JR., RYE, NEW YORK

DONN BARBER, ARCHITECT

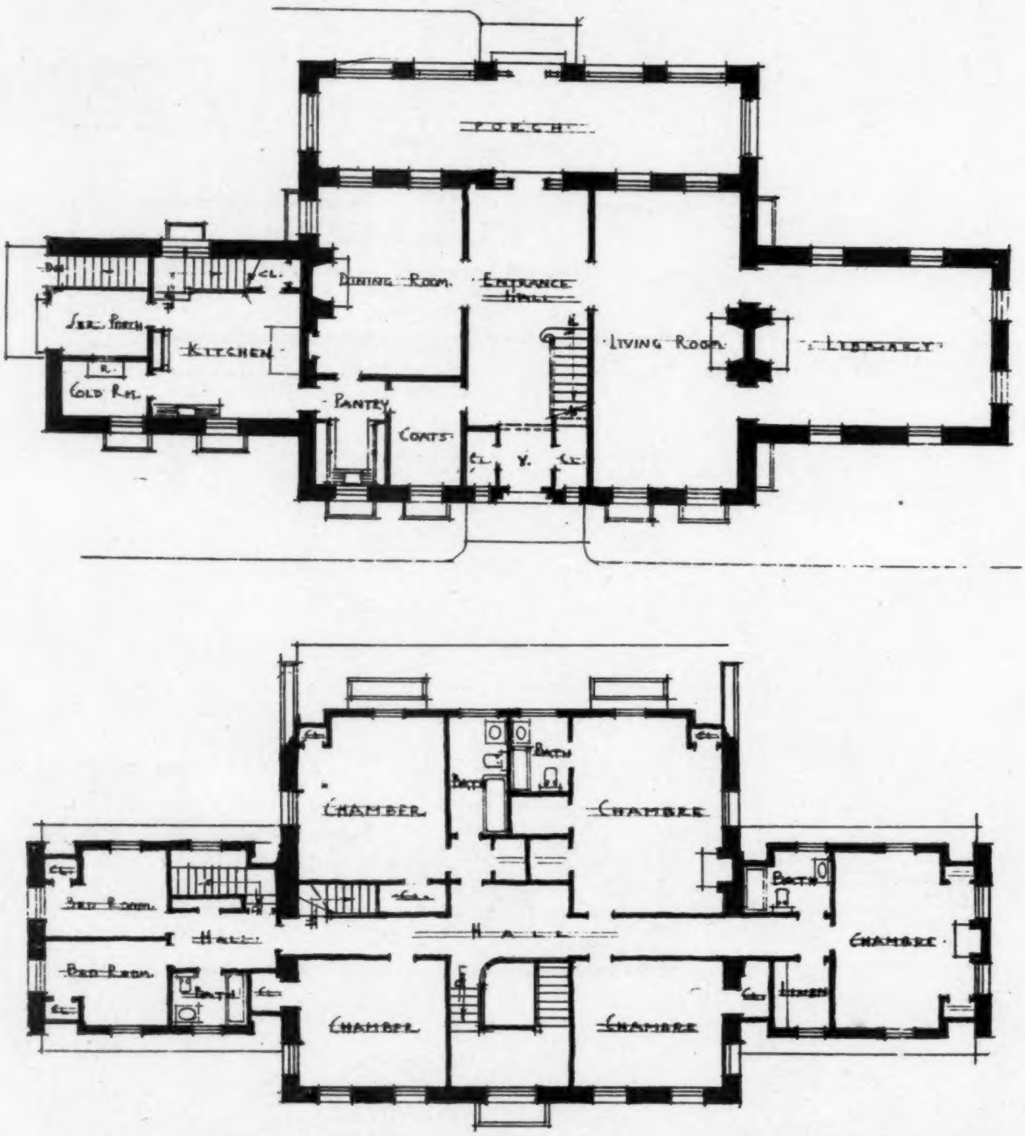


SECOND FLOOR PLAN




OSWALD C. HERING AND DOUGLASS FITCH, ARCHITECTS

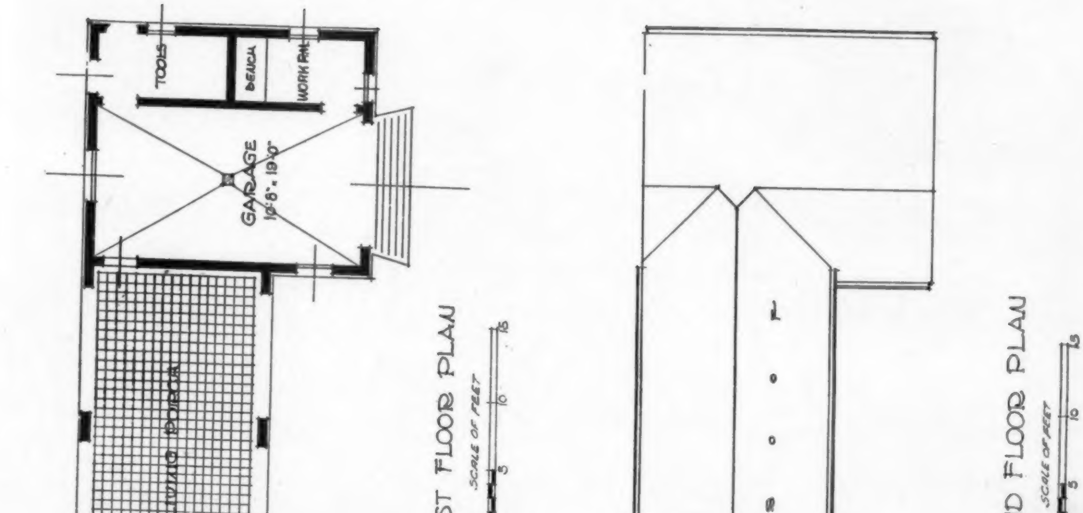
*(For illustrations of this house see Plate Section)*




FIRST AND SECOND FLOOR PLANS, HOUSE AT RYDAL, PA.

OSWALD C. HERING AND DOUGLASS FITCH, ARCHITECTS

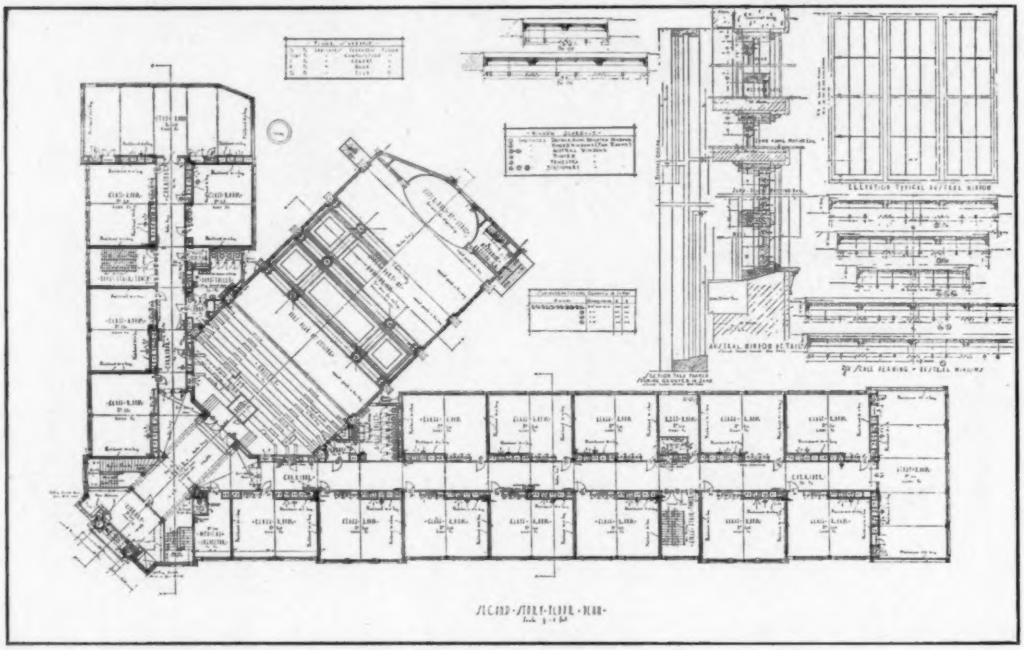
*(For illustrations of this house see Plate Section)*

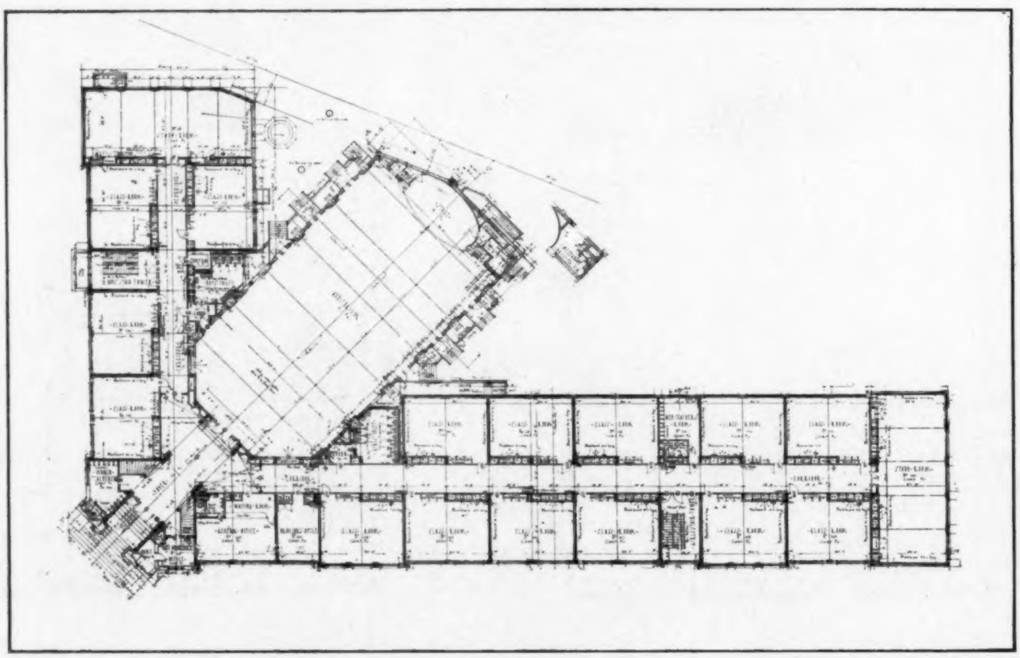



HOUSE OF ROBERT MEARS, ESQ., TENAFLY, N. J.

R. C. HUNTER & BRO., ARCHITECTS

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





FIRST AND SECOND FLOOR PLANS

COMMERCIAL HIGH SCHOOL, NEW HAVEN, CONN.

BROWN & VON BEREN, ARCHITECTS

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



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# DEPARTMENT OF ARCHITECTURAL ENGINEERING

## RECENT DEVELOPMENTS IN WARM AIR FURNACE HEATING*

BY F. R. STILL, Mem. Am. Soc. H. & V. E.

SOME years ago the furnace manufacturers formed an organization known as the *National Warm Air Heating & Ventilating Association.* In 1918 this association entered into an agreement with the University of Illinois to have the latter conduct experiments on warm air furnaces. The University has rendered three reports in bulletin form known as Nos. 112, 117 and 120. The last report, which was presented to the meeting of the association at Cleveland, April 19-20, 1922, has not yet been published. The work so far completed at the University has made available a wealth of valuable data which never before was obtainable. With this data in hand it is now possible to calculate the size and performance of a furnace with about the same degree of accuracy as the size and performance of a steam or hot water boiler can be determined. The unfortunate part, however, is that very few of those who have access to the reports know how to make practical use of the data given in them and these reports have been confined almost entirely to the members of the furnace manufacturers' association, who have made no effort to see that they are distributed among their agents and dealers so that they should take advantage of their practical value should they be so inclined.

Like our own Society, this association has a Warm Air Furnace Code Committee which has been struggling long and arduously in an endeavor to reconcile all the elements so as to get them to agree on a standard code. This committee submitted a report at the last meeting and a code was adopted. It is not perfect any more than was the first report on the boiler code, which was submitted to our Society, but it is a step in the right direction, is founded on the right principles and can be modified and amended at subsequent meetings. Beyond a doubt it will eventually be perfected when all the members of the association become more familiar with it and understand the benefits to be derived from having a standard which is followed by everybody.

The formula adopted in the code for determining the size of the leaders, or pipes from the furnace to the various flues and registers was devised by P. J. Dougherty, engineer of the International Heater Co., a member of our Society and also on the Research Committee of the association referred to previously. It is very simple and is based on experimental engineering data taken from the report issued by the University of Illinois. It has been checked by application to certain test problems covering quite a wide range of capacities and it has been found accurate, conservative and reliable.

The rule proposed by Mr. Dougherty is based on the following:

Outside temperature zero deg. fahr.
Inside temperature 70 deg. fahr.
Heat loss per hour per sq. ft. of exposed wall surface of ordinary frame construction.. 25 B.t.u. (0.36 x 70 = 25.2 B.t.u.)

Heat loss per sq. ft. of glass per hour ...... 83 B.t.u. (1.18 x 70 = 82.6 B.t.u.)

Heat loss per cu. ft. air space in a room, allowing one air change per hour 1.25 B.t.u. (0.075x0.238x70=1.25 B.t.u.)

If 1000 is divided by each of the factors, the result will give the square feet of wall surface, the

* *Paper presented at the Semi-Annual Meeting of American Society of Heating and Ventilating Engineers, Buffalo and Detroit, June, 1922.*

square feet of glass surface, and the cubic feet of space, respectively, to equal 1000 B.t.u. loss per hour.

For example,

$$\frac{1000}{25} = 40 \text{ sq. ft. of wall surface per M.B.t.u.}$$

$$\frac{1000}{83} = 12 \text{ sq. ft. of glass surface per M.B.t.u.}$$

$$\frac{1000}{1.25} = 800 \text{ cu. ft. of space in a room per M.B.t.u.}$$

Suppose a room 10 x 12 ft. and 9 ft. high, has 2 windows, each about 16 sq. ft. area. If two of the 10 ft. walls have outside exposure and only one of the 12 ft. walls is so exposed, then the wall exposure will be 10 x 9 x 2 ft., or 180 sq. ft., plus 12 x 9 ft., or 108 sq. ft. which equals 288 sq. ft. Deducting 32 sq. ft. for the 2 windows, leaves a net wall area of 256 sq. ft. A room 10 x 12 x 9 ft. contains 1080 cu. ft. of space.

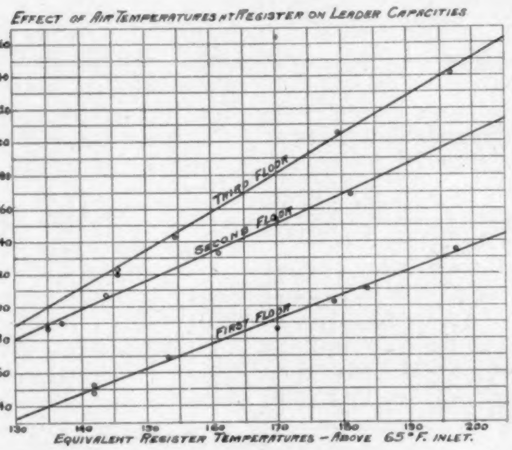



Fig. 1. Chart for determining leader pipe sizes

By dividing each of these quantities by their corresponding factors, as shown above, the result will be the heat units required in thousands; all three should be added together to get the total heat required for the room. This can be stated more clearly as follows:

$$\frac{256}{40} + \frac{32}{12} + \frac{1080}{800} = 10.41 \text{ or } 10{,}410 \text{ B.t.u.}$$

In order to determine what size the leader or pipe should be from the furnace to this room, consult Fig. 1, which is a duplication of the chart given on page 24 of Bulletin No. 120, published by the University of Illinois, and it is found that at a temperature of about 195 deg. there were obtained 125 heat units per sq. in. of leader per hour to the first story. Hence dividing 1,000 by 125 will give us 8 sq. in. per 1,000 heat units.

Therefore 10.4 x 8 = 83.28 sq. in. area of pipes or leaders to the room if it is on the first floor. This is about the area of a pipe 10 in. in diameter.

If the same temperature of 195 deg. is assumed for determining the second and third story pipes or leaders, the area of them should be respectively 5 sq. in. to the second story and 4 sq. in. to the third story, per thousand heat units exposure. Thus, for a similar room on the second floor, the area of the pipes would be 52 sq. in. or an 8 in. diameter pipe to the second story, and 41.64 sq. in. or a 7 in. diameter pipe to the third story.

It was decided by the Committee to allow 6 sq. in. to the second story, and 5 sq. in. to the third story, which is equivalent to a temperature of about 176 deg. Thus, the pipe to the second story would be 9 in. diameter, and to the third story 8 in. diameter. Undoubtedly, the code will be amended so as to provide for a lower temperature to the first story, the same as has been provided for the second and third. This will mean allowing 9 sq. in. per thousand heat units, or 93.6 sq. in. in the leader pipe, or 11 in. diameter instead of 10 in. as the present code provides in the foregoing example.

Reducing the allowable temperature from 195 deg. to 176 deg. evidently increases the area of the leaders to the first story more than 20 per cent above what is now the average practice, but it will avoid the necessity for maintaining such high temperatures to get sufficient heat, will be conducive to economy, and will avoid so many unsatisfactory plants.

In everyday practice when calculating the size of the leaders to the various rooms in the building, one would proceed about as follows:

Wall 10 ft. + 10 ft. + 12 ft. x 9 ft.
= 288 sq. ft.
Glass 16 sq. ft. x 2 = 32 sq. ft. = $G$.

Net wall surface = 256 sq. ft. = $W$.
10 ft. x 12 ft. x 9 ft. = 1080 cu. ft. space = $C$.
$C = 1080 \div 800 =$ 1.35 M.B.t.u.
$W = 256 \div 40 =$ 6.40 M.B.t.u.
$G = 32 \div 12 =$ 2.66 M.B.t.u.

(Heat units in thousands)
10.41 x 8 = 83.28 sq. in. = 10 in. dia. 1st floor
10.41 x 6 = 62.46 sq. in. = 9 in. dia. 2nd floor
10.41 x 5 = 52.05 sq. in. = 8 in. dia. 3rd floor

Should it be the reader's opinion that an air change 1½ times per hr. should be provided for, instead of 1 air change per hour, then substitute

600 in place of the factor 800; or if it is thought that 2 air changes per hour should be allowed because of unusual exposure to high winds, or the frequent opening of doors, or because of poor construction, then use 400 in place of 800.

It is seldom that a contractor will undertake to connect a leader from a furnace to a sun-room and agree to heat it to the same comfortable temperature as any other room in the house. This is probably due to two reasons, one being that the sun-room usually is at a very considerable distance from the furnace and the other reason is due to the unsatisfactory results he has obtained in his efforts to heat such a room. This latter has likely been caused by the fact that he has never realized that fully one-third more capacity would be required in the leader pipes than would be required for a similar room of usual construction.

As an example; consider a room of the same size as in the previous case, but one that has 160 sq. ft. of glass instead of 32 sq. ft. as before, and owing to this large glass exposure 2 air changes per hour will have to be provided for; the size of the leaders would then be as follows:

| | |
|---|---|
| Total wall surface = | 288 sq. ft. |
| Total glass surface = | 160 sq. ft. |
| Net wall surface = | 128 sq. ft. |
| Cu. ft. space = | 1080 |

$1080 \div 400 = 2.70$
$128 \div 40 = 3.20$
$160 \div 12 = 13.33$

$19.23 \times 8 = 153.84$ sq. in. = 14 in. dia. pipe
$19.23 \times 6 = 115.38$ sq. in. = 12 in. dia. pipe
$19.23 \times 5 = 96.15$ sq. in. = 11 in. dia. pipe

It will be noted that the area of the leaders is almost double the size required in the previous instance.

### Need for Increased Wall Stack Sizes

One phase of the furnace business, which has not yet been reported on by the University, but which has a very important bearing on the satisfactory operation of furnaces, is the size of the flues in the walls for conveying the heat to the upper stories. The Code Committee made practically no recommendations on this point at all.

The average wall in houses heated by furnaces is framed with studs known commercially as 2 x 4's; they are more often 1⅞ in. x 3¾ in. and are usually spaced 16 in. centers. Thus the maximum space for a sheet metal flue is 3¾ in. x 14½ in.; therefore, it is hardly practical to figure on a flue being more than 3½ in. deep x 13¾ in. wide and experience shows the standard maximum width to be about 13 in.

A round pipe offering the same friction for the same capacity as a rectangular duct of the above dimensions, would be 7⅛ in. in diameter or it would have an equivalent area of 40 sq. in., whereas it has an actual area of 48.25 sq. in. Many are the instances where an 8 in. or a 9 in. leader is carried from the furnace to a riser of no greater dimensions than above mentioned, which only has the carrying capacity of a 7 in. round pipe. It is no wonder that it is so often difficult to heat rooms in the upper stories of buildings under these circumstances.

The way to overcome this, is to insist that all walls carrying warm air flues are to be built of studs not less than 2 in. x 6 in. spaced 20 in. centers. If 6 in. studs are used in such partitions or walls, even though the studs are set 16 in. centers, which is unnecessary, then a flue measuring 5½ x 13 in. could be built which is equivalent to 8¼ in. diameter pipe. When the studs are spaced 20 in. centers then a flue 5½ x 17 in. can be built in, which is equivalent to a round pipe 10 in. diameter in carrying capacity.

In Bulletin No. 120, issued by the University of Illinois, is a chart on page 21 which is herein reproduced in Fig. 2. By means of this chart the size of the furnace can be readily determined, also the amount of the fuel to be burned, the draft necessary to burn that amount of fuel, the maximum temperature attainable, the heating capacity and the overall efficiency.

As previously stated, the code as adopted, makes it necessary to carry a temperature of 195 deg. in order that the required amount of heat is supplied to first story rooms, when the leaders are determined by allowing only 8 sq. in. of area to each 1,000 heat units of exposure in the building.

Comparing the effect this high temperature has, as compared with what would be the result if only 176 deg. had to be attained, it is found that the rate of combustion must be 6.75 lb. of coal per sq. ft. of grate surface per hour. This will necessitate a draft of 0.085 in. The heating capacity of the furnace is 140,000 B.t.u. per hour, and the overall efficiency will be 56 per cent.

At 176 deg., the rate of combustion will be only 5.5 lb. per sq. ft. of grate surface per hour. The draft need only be 0.07 in.; the heating capacity is 120,000 B.t.u. per hour and the overall efficiency will be increased to 60 per cent.

Assume a house has a total exposure of 120,000 B.t.u. and compare the operating results at the two temperatures, first determining the requirements for 195 deg.

$$\frac{120{,}000}{0.56 \times 12{,}000 \times 6.75} = 2.66 \text{ sq. ft. of grate surface, or } 22.10 \text{ in. diameter.}$$

Heating 1 lb. of air from 65 deg. to 195 deg., or through 130 deg. will require 31 heat units; therefore, 120,000 heat units exposure will require 3,870 lb. of air per hour or about

860 cu. ft. per minute at 70 deg. temperature.

For 176 deg. temperature the following results are obtained:

$$\frac{120{,}000}{0.60 \times 12{,}000 \times 5.5} = 3.03 \text{ sq. ft. of grate surface, or } 23.6 \text{ in. diameter.}$$

Heating one pound of air from 65 deg. to 176 deg., or through 111 deg., will require 26.4 heat units; thus, 4,550 lb. of air per hour must be heated, or about 1,000 cu. ft. of air per minute.

In the first case the coal burned will amount to 17.86 lb. per hour; in the second, 16 2/3 lb. per hour. From this it will be noted that the rate of combustion is about 23 per cent higher to get the high temperature, and the coal consumed to give off the same amount of heat is 7 per cent more.

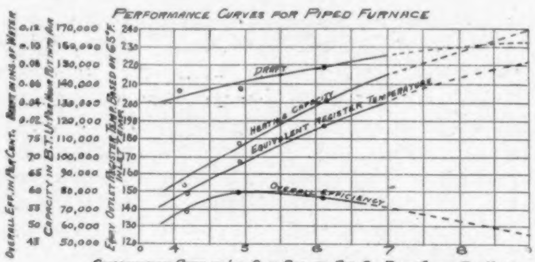
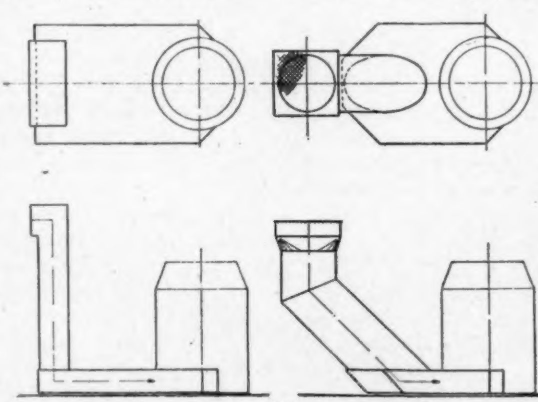



Fig. 2. This chart will give furnace size, fuel and draft needed, temperature attainable, heating capacity and overall efficiency

The volume of air at high temperature is less by about 14 per cent, hence smaller pipes are required. The grate area is about 7 per cent more for the lower temperature; in other words, the furnace having a larger grate surface would proportionately have more heating surface; thus, the same transmission could be effected at lower temperatures, by the circulation of more air, requiring less coal and still have a reserve capacity for quick heating by running the temperature up higher, which would not be possible with the smaller outfit, which is already working at about its maximum capacity.

At Urbana it was found that by making the return air duct to the furnace the same size, or even larger than the combined area of all the leaders, and at the same time avoiding abrupt or right angle turns in this duct, that the capacity of the furnace can be increased as much as 50 per cent. It was further demonstrated that the furnace is affected much more by any restriction to the flow of air in the recirculating duct, than by a similar restriction in the leaders from the furnace to the registers.



Duct A Duct B

Fig. 3. Two types of recirculating ducts

One frequently finds installations where there are two or more recirculating ducts leading back to one furnace. This generally fails to give as good results as one duct. It is perfectly obvious why this should be so. For example, one duct 32 in. dia., has about 8 per cent less area than would two 23 in. ducts, yet the total circumference of the two 23 in. pipes is 44 per cent more than the one 32 in. pipe; hence, for a similar length the two pipes present 44 per cent more frictional surface.

One frequently settles on the area to have and because it may be easier to install, uses a rectangular duct instead of a round one. At Urbana there was an opening 17 x 47½ in. behind a register face, with a right angle elbow to a vertical riser of the same dimensions, the lower end of which connected to a horizontal duct 12 x 67 in., the opposite end of which was attached to the base of the furnace. This is indicated in Fig. 3 as shown by *A* at the left. The modified recirculating duct is indicated by *B* on the right.

Both of the above ducts are exactly the area of a 32 in. round pipe, but the drop leg is only equal to a pipe 30.6 in. in diameter as a conductor of air, owing to the shape of it, and the horizontal leg is only equal to a pipe 29.2 in. diameter for the same reason. In other words, the latter can only convey 83 per cent of the air that a 32 in. round pipe will convey because of the additional friction, when both have the same pressure head. Besides this, the right angle elbow alone presents an amount of resistance equal to 12 ft. of straight pipe 17 x 47½ in. in size, and the right angle at the base will add as much more. In view of all this, is it surprising that the capacity of a furnace can be increased 50 per cent by a few changes in the recirculating duct? Hardly anyone would knowingly set out to install a recirculating duct measuring 17 x 47½ in. that would be nearly 50 ft. in length with a standard register face on the opposite end of it. He would at least feel very uncertain of the results he would get, yet that is exactly what the resistance amounts to in the installation as it was first put in Urbana and it was in no way unusual, as it is being unconsciously done every day. The restrictions in the recirculating duct and the limited area of the flues in the walls are accountable for many of the poor results obtained from furnace installations. That a furnace fails to perform satisfactorily is by no means an accident. When one knows what its limitations are and then sees what is sometimes attempted, it seems like an accident if a furnace works at all.

(*To be continued*)

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# PAINT PROTECTION FOR WOOD

BY CORNELIUS T. MYERS, M. Am. Soc. M. E.

*THE literature on paint as a protective coating for iron and steel is extensive. Paint for wood has been such a commonplace affair for centuries that a mild shock is experienced when a consulting engineer in the year 1922 calmly states that there is a crying need for information on the proper composition of paint as a protective coating for wood. The following paper is reprinted by permission from the August 1922 issue of Mechanical Engineering, the Journal of the American Society of Mechanical Engineers.—Editors.*

ABOUT two years ago the writer, in carrying on some research work on wood wheels had occasion to make inquiry among paint manufacturers as to the value of various kinds of paints and primers for the protection of wood against moisture. This inquiry brought out so many differences and variations in opinion as to paint materials and mixture proportions that a more extensive inquiry among paint men was started. This inquiry revealed that:

(1) There was comparatively little technical information to be gained from the paint industry on the relative protective values of different coatings for wood
(2) The paint industry did not generally recognize the moisture-proofing of wood as a problem, but was concentrating so far as the more reputable manufacturers were concerned on producing paints that would last as long as possible on the surface to which they were applied. In other words, such improvements as have been made have contributed to the life of the coating rather than the life and usefulness of the article which received the coat.

As the demand upon our forests depends to a very considerable extent upon the life of forest products, and as the life of these products in many cases depends to a very considerable extent upon the protection against moisture they receive, the intimate knowledge of protective coatings is a factor of great importance in our lumber conservation program; to say nothing of the possible saving in our $300,000,000 annual paint bill. Wood in its natural green condition has a very limited use as a structural material. Its tiny fibres are cellular in form and contain a large amount of moisture, commonly known as sap, the sap being water containing very small percentages of tannins, sugars, gums and coloring matters. To give wood the physical qualities which make it fit for use in buildings, furniture, truck bodies, wheels, etc., it is necessary to remove most of the moisture.

### Moisture in Wood

Wood is said to be oven-dry when continued oven drying causes no further loss of weight. In their green state the woods used structurally have a moisture content of 60 to 120 per cent of their oven-dry weight, and weigh roughly from 60 to 120 per cent more than when they are in an oven-dry state. In other words, 35 to 55 per cent of the weight of a green log is water. In the green log this water exists in two conditions:

(1) Minute particles of water in each tiny wood cell cavity, known as "free water"
(2) The moisture absorbed by the fibrous material which forms the walls of the cells, known as "hygroscopic moisture."

Felled wood exposed to average atmospheric conditions gradually dries, the air taking up its moisture. First the cell cavities slowly give up their moisture. This evaporation goes on until the cell cavities are emptied of the minute particles of "free water" they contain. All that remains is the moisture actually absorbed by the fibres of the cell walls, which are still saturated with the "hygroscopic moisture." Wood in this state is said to be at its "fibre-saturation point." Up to this time the wood does not appreciably change in size or in physical characteristics except as to weight, which of course decreases considerably as it will now contain but 25 to 30 per cent of moisture instead of 60 to 120 per cent.

Further drying of the wood is necessary in order to increase its strength and hardness, increase its durability, enable it to take and hold paint, and in general to improve its condition for the purpose intended. As this drying progresses beyond the fibre-saturation point, the cell walls give up the moisture they have absorbed, and in so doing they shrink and harden. Under natural conditions this drying process will continue until the amount of moisture in the wood bears a quite definite relation to the average humidity condition in the particular locality. (See Fig. 1.) In the eastern and north central states, for instance, the moisture content of wood will become stabilized somewhere in the neighborhood of 14 per cent for what is known as thoroughly air-dried stock. In the arid, southwestern states it will contain a still lower percentage, while in the former war zone of France the wood will normally contain considerably more than 14 per cent of moisture. Of course unpainted wood that is exposed to rain and snow will absorb considerably more than 14 per cent, depending upon the dimensions of the piece and the extent of the exposure.

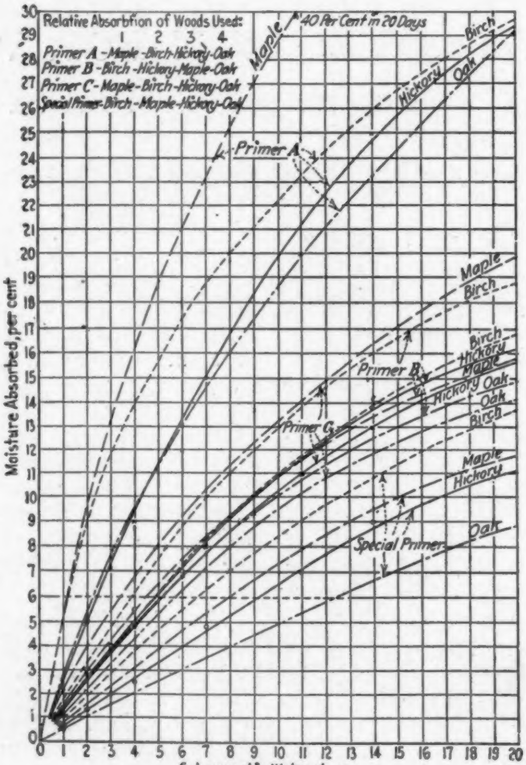


Fig. 1. Relation Between the Amount of Moisture Absorbed by Wood and the Average Relative Humidity

Data secured from the Forest Products Laboratory of the United States Department of Agriculture show that

(1) Many woods should be dried to about 8 per cent moisture content to give the best results as to strength, durability, hardness and finish (See Table 1.)

(2) It is also true that if after being dried, and shrinking in the process, wood reabsorbs moisture, it will swell again according to the amount absorbed

(3) The shrinking and swelling along the grain, perpendicular to the grain and tangential to the grain all differ, and very materially, for a given change in moisture content. (See Table 2.)

From the two following tables it will be seen that it is quite desirable to have wood thoroughly dried, and that steps should be taken to keep it so. But although it is easy to reduce the moisture to 8 per cent in dry kilns, it is difficult to maintain the wood at this point; because of unsuitable protective coatings, or processes, and because of the lack of knowledge as to relative ability of various coatings for really stabilizing the moisture content within a small range.

### Protectiveness of Paint

While we know that several coats of good paint may give adequate protection for floors, truck bodies, furniture, wheels or other wooden articles, we by no means know what paints give the best protection or what paints will give fairly satisfactory protection for the least money. The test fences, where many different paints were exposed to the same atmospheric conditions, have given some data on the durability of paints, but very little data on the durability of the painted article or its dimensional stability. *In durability and dimensional stabilization we are greatly interested;* in the first for very obvious reasons, in the second because wooden structures, furniture, etc., are more durable, serviceable, and can be made more simply if their various component parts do not expand and contract with changing weather conditions. The cost of drying could be reduced in many cases, if when dried to a certain point the moisture content could be stabilized. Wood, on account of its very valuable characteristics, could be used in places where metal now seems necessary. A dozen or more prominent concerns in the paint industry have been co-operating very commendably in this research work, realizing that the dimensional stabilization of wood by moisture-



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proofing was a proper function of paint and of world wide importance. There is, however, quite a difference of opinion among these manufacturers as to what materials should be used, and how they should be mixed and applied. During the war the Forest Products Laboratory investigated the moisture-proofing effects of linseed oil and various paints, varnishes and leaf-metal coatings as applied to airplane-propellers and other airplane parts made of wood, but this work has not been broadened because of lack of funds.

TABLE 1. APPROXIMATE PERCENTAGE OF INCREASE IN STRENGTH OVER GREEN[1]

| | Dried to 14 Per Cent Moisture | Dried to 8 Per Cent Moisture |
|---|---|---|
| Bending strength, modulus of rupture | 40 to 60 | 80 to 100 |
| Compression parallel to grain | 80 to 90 | 100 to 150 |
| Compression perpendicular to grain | 65 to 75 | |
| Stiffness, modulus of elasticity | 20 to 30 | 25 to 35[2] |
| Hardness | 30 to 35 | 40 to 50[2] |
| Shearing strength, parallel to grain | 40 to 50 | 60 to 70[2] |

[1] Compiled from Data given in Timber, Its Strength, Seasoning and Grading by H. S. Betts.
[2] Estimated.

TABLE 2. SHRINKAGE AND MOISTURE CONTENT OF HARDWOOD[1]

| | Specific Gravity of Dry Wood | Shrinkage[2] in Per Cent of Green from Green to Oven-Dry Radial | Tangential | Green Moist in Per Cent of Dry Wood Wt. |
|---|---|---|---|---|
| Ash, white[3] | 0.57 | 4.8 | 7.0 | 39 |
| Birch, yellow[3] | 0.55 | 7.4 | 8.9 | 68 |
| Elm, cork | 0.57 | 4.8 | 8.1 | 53 |
| Hickory[4] | 0.64 | 7.2 | 10.9 | 60 |
| Maple[5] | 0.51 | 4.2 | 8.5 | 63 |
| Oak, red[3] | 0.56 | 3.9 | 8.3 | 83 |
| Oak, White[5] | 0.60 | 5.3 | 8.8 | 66 |
| Average | 0.57 | 5.4 | 8.6 | 62 |

[1] Compiled from data given in Kiln Drying of Lumber by H. D. Tiemann
[2] Average shrinkage along the grain, up and down as the tree grows, is only about ½ per cent
[3] Average of 2 species
[4] Average of 9 species
[5] Average of 3 species

In order to get some comparative data on the paints and primers now on the market, the following schedule was drawn up by the writer, and tests were made on small pieces, measuring 1 × 1 × 1 in., of hickory, oak, birch and maple by several well known paint concerns:

(1) Dry slowly and completely until pieces cea-e to lose weight
(2) Determine "oven-dry" weight
(3) Allow reabsorption to 8 per cent
(4) First coating to be applied at 8 per cent moisture content
(5) Second coating to be applied at 8 per cent moisture content
(6) Third coating to be applied at 8 per cent moisture content
Note: 24 hours to elapse between 4 and 5, and 5 and 6.
(7) Allow the three coatings to dry for a week under conditions of 70 to 80 deg. fahr. temperature, 40 per cent relative humidity, under which condition the moisture content of the wood should remain at 8 per cent even if the wood had no protective coating
(8) Label and weigh for base weight at 8 per cent moisture content with protective coating
(9) Submerge in water at 70 deg. fahr.

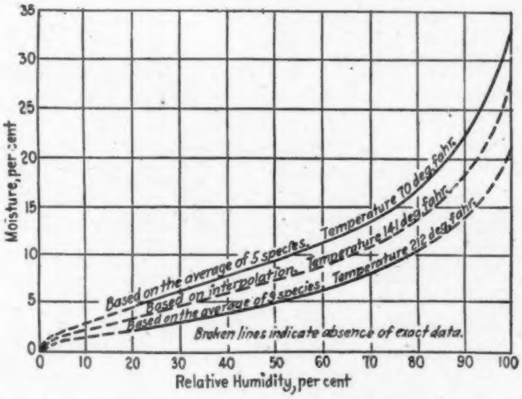



Fig. 2. Curves Showing How the Effectiveness of Different Primers as Moisture-Proofing Agents Varied for Different Woods

(10) Weigh every 24 hr. for first week, every 48 hr. thereafter and determine percentage of increase in moisture
Note: *Please bear in mind, of course,* that whatever is used in the way of coatings, it must serve as a suitable foundation for subsequent coats of paint and varnish.

In general, the results of the tests showed that paints of the ordinary brands and formulas were not very effective as moisture-proofing agents, even when three coats were applied. One paint concern after testing its standard brands, did a little experimenting, and without much difficulty was able to produce a special primer that was several times as effective. The curves in Fig. 2 show quite emphatically the variation in effectiveness of the paints used. Averaging the results for hickory, oak, maple and birch, it took about six times as long for these test pieces to absorb an extra 6 per cent of moisture when coated with the "special" as when coated with the standard "A." There is every reason to believe that much better results can be secured and with less than three coats. Preliminary tests with a casein solution indicate that it has waterproofing qualities, which, for some classes of protection, may be very valuable. The same is true of some of the pyroxalin compounds. Varnishes are in general more effective than paints, but in the protection of wheels its application was not suitable for primary coats.

*(To be continued)*

## Electric Heating of Residences

THE electric heating of houses is an accomplished fact in Tacoma, Washington, and an interesting report upon it forms the subject of Bulletin No. 15, Engineering Experiment Station, State University, Seattle, Washington. The bulletin contains 40 pages and is illustrated. It was written by Edgar Allen Loew, Associate Professor of Electrical Engineering.

The municipally owned Tacoma lighting plant was completed and put into operation in 1912. It consists of a hydroelectric development of 20,000 kw., at La Grande, Washington. Power is transmitted over two 55,000 volt transmission lines to the Tacoma sub-stations, from whence it is distributed throughout the city at 4,000 volts.

In 1914 the city decided to stimulate the use of electric heating in order to market as much as possible of the output of electrical energy it possessed. A low energy charge of ½ c. per kw. was adopted and a campaign inaugurated to induce people to install electrical furnaces and water heaters. The report goes into detail on costs of installation and operation and is decidedly interesting.

The total cost of the transmission and generating system is $243.00 per kw. During 1919 the average selling price of all energy sold was 1.32 cents per kilowatt hour and the net reported surplus was $408,309. During the year 1920 a greater number of kilowatt hours was sold and the average selling price was 1.19 cents per kw. hr. approximately, returning a net surplus of nearly $575,000. The heating business, with its low charge, is looked upon as in the nature of an excess or surplus power load.

The author shows that at the low rate given, the annual cost of heating a house with an electric furnace is practically equal to the cost of heating with a coal fired furnace with coal at $9.20 per ton. The efficiency of heating by electric heaters located in the space to be heated is 100 per cent. The average efficiency of the coal fired furnace was assumed to be 45 per cent. The best planned, best installed and most efficiently operated warm air furnace yields a maximum efficiency of about 60 per cent. Improvements are gradually being made in coal-burning, house-heating furnaces and 60 per cent efficiency may be obtained with care. If an average efficiency of 60 per cent were attained, electrical energy at a half cent per kw. hr. would be on a par with coal at $18.00 per ton; or, with coal at $9.00 per ton electrical energy would be on a par with it if sold to the consumer at 0.25 cent per kw. hr.

The conclusions reached are that when Tacoma has no surplus power to sell the electric heating of houses will cease, except possibly the use of small radiant heaters for special occasions. The cost of water power development is too great to admit of such development for heating purposes. It is out of the question to develop electrical energy for this purpose from steam. The maximum thermal efficiency which would be possible by heating electrically from energy generated in a steam plant is under 20 per cent, while by consuming fuel in furnaces in the home 40 per cent energy efficiency is ordinarily obtained, and 60 or 65 per cent efficiency may be obtained as a maximum. Thus the energy efficiency secured by the latter method is from 2 to 3 times as good as that of the former. Electrical heating need not therefore be regarded as a competitor of wood, coal, or oil, although it is at present remunerative in Seattle in that the energy sold for this purpose helps pay fixed charges on the municipally owned plant.

## The Strength of Concrete

THE Division of Engineering Research of the State University, Austin, Texas, announces that Bulletin No. 2215 is ready for distribution.

The bulletin describes tests made to determine the values of certain local materials and two somewhat surprising statements are made. One is that the strength of concrete is practically independent of the strength of the aggregate, a conclusion differing so greatly from all previous results obtained by other experimenters as to call for careful study of the tests on which the claim is based. The other statement relates to a series of tests which show that the tensile strength of mortar made with natural limestone sand is stronger than mortar made from silica sand having the same grading.

The subject matter is of enough importance to make the bulletin a valuable record of concrete tests for all who attempt to keep in touch with developments in the materials of construction. Copies will be mailed free on receipt of request addressed to the University of Texas, Austin, Texas.

# SOME NEW BUILDINGS IN LONDON AND SOME OLD ONES

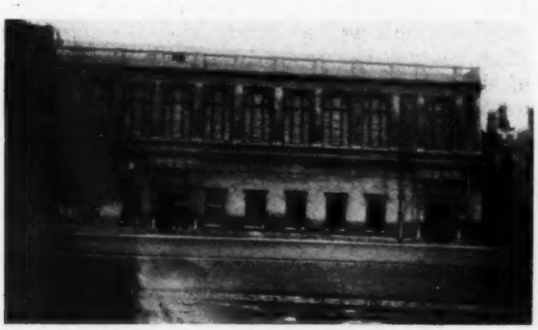
BY EGERTON SWARTWOUT, F. A. I. A.

AT the Southwark end, of Westminster Bridge, diagonally across the Thames from the Houses of Parliament, squats a long yellowish-drab building with a high red tile roof; a recently completed building, and intended, I believe, to contain the offices and chambers of the London County Council. The site is fine, the building is large and undoubtedly expensive, and I'm sure the intentions of the London County Council and of the architect were good, but the general effect is deplorable. As I recall it, there was a competition held for this building some fifteen years or so ago, and this competition, like many of the English competitions, was an open one, and was won by a very young architect of little practical experience; and the execution of this important and expensive structure, costing, I think, over ten million dollars, was entrusted to the successful architect without association with an older or more experienced firm. If this statement is correct, I regret I have no means of verifying it as I write; if conditions were as I stated, then the whole proceeding is a distinct example, not of the evils of competitions in general, but of the evils of open and unrestricted competitions in particular. It is conceivable, of course, that a young and inexperienced architect might design and execute a highly successful monumental building; Elmes did it on the exterior of St. George's Hall in Liverpool and there may be other examples, but the chances are that he won't. There is a great deal of difference between a projet and a working drawing. I have no way of knowing whether the building as built is similar to the original sketch, but I assume it is. I can see no other reason for the steep, bare, tile roof than that it was a competition stunt, nor for the curious circular recess in plan in the center of the facade. A circular recessed front, where it leads up to a central dominating feature, can be most successful, as is shown in the Palais de l'Institut in Paris, but the London County Council Building has no dome as the Paris example has, and consequently the steep roof in silhouette looks as if some modern Gog or Magog had taken a huge bite out of it. The fenestration is restless and unmeaning; large windows which are not large windows at all, but groups of small ones, alternate with stretches of blank wall pierced with rectangular holes. In fact, I never appreciated how good the Houses of Parliament were until I contrasted them with their new neighbor across the river. And the interior is no better—there is a good deal of marble and a vast extent of corridors, but the marble is ordinary and ill selected, particularly the Cippolino wainscot in the Council Chamber, the detail is poor and unstudied, and some of the finish seems cheap, particularly in the subsidiary stairs. The whole thing is, as I have said, deplorable; a wonderful

From "The Architects' Journal," London

The River Front
London County Hall

Trinity House

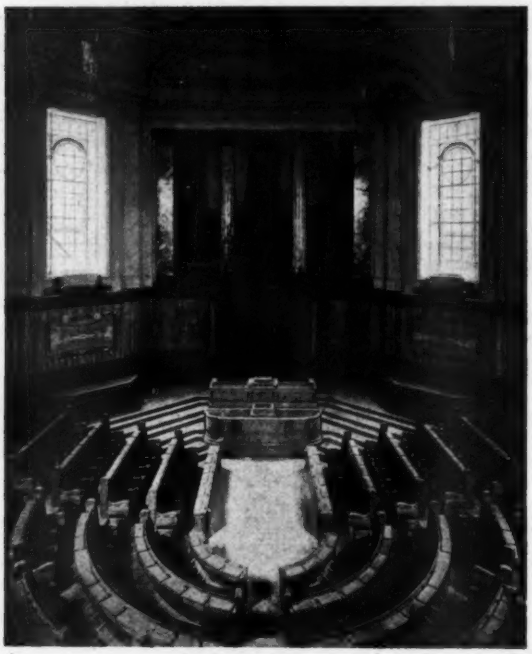


The Back—Trinity College Library

monumental chance has been thrown away.

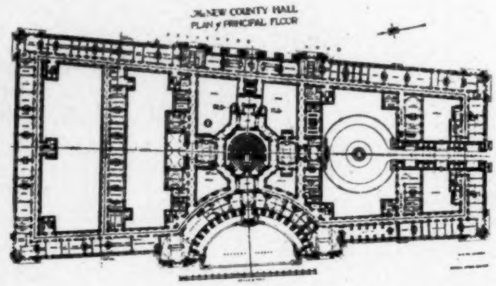
Westminster Cathedral can hardly be called a new building because it has been under construction for a number of years, nor can it be called an old one because it is not yet entirely completed, but there can be no doubt it is an interesting one. The exterior, which is substantially complete, is not very successful. There is a lack of simplicity about it, a fussiness of composition and detail which is quite at variance with the grandeur of conception of the interior. It was probably necessary for reasons of economy to use brick instead of stone for the facade, but if the brick had been used in great simple masses, as at Albi, for example, and if the exterior had been more expressive of the plan and of the interior vaulting, a much more monumental effect could have been obtained. This simplicity of design would have been of particular value, too, because of the restriction of the site. There is no direct approach to the Cathedral, and the surrounding streets are narrow and unimportant, and the scale therefore of the building should have been great so as to dominate the surroundings. But leaving aside the exterior, there are two features of great distinction at Westminster —the general conception of the interior and the honest, legitimate construction. For here is a modern building in which the vaults are real vaults, of brick and of concrete, not sham structures of wire lath and plaster; and these great, simple vaults, unfinished as most of them are, are wonderfully impressive. Some of the chapels are finished; marble, mosaic and gold are freely used and the effect is rich and generally successful, though there is a little too much stiffness and symmetry in the handling of the detail. This, of course, is only what is to be expected in modern work. It is practically impossible for an architect to make enough drawings to vary the detail everywhere, and even if he did, the work would not have that spontaneity and freedom which is one of the charms of the Byzantine style. It is unfair to judge the nave in its uncompleted state, but I cannot help a feeling of regret that those great, simple vaults will eventually be covered with decoration; and yet, decorated or not, the interior is, and will be, most impressive.

From "The Architectural Review," London



Council Chamber
London County Hall

Down near the Tower of London and fronting



Floor Plan, London County Hall

a little park is a new building with a rather curious tower and which contains offices of the Port of London or something of the sort. Here again the architect was unable to let the design alone; the general scheme is good enough, but there are too many parts; there are too many columns, too many windows, too many statues and too many little breaks and vases and dewdads on the tower. And it's all the more surprising that that should be so because right next door is the charming little facade of Trinity House. I suppose I must have seen Trinity House before; I've certainly been to the Tower a number of times, but for the life of me I can't remember that I ever did see it, or what is more, that I ever saw a photograph of it, and it's well worth seeing. I thought when I saw it the other day that it was the most charming thing in London, and I went back several times later to see it again. It's only a facade; the architect seemed to have had a childish faith that no one would see it except from the Park and therefore did not waste either time or money on the sides, but the front is really beautiful, the detail excellent and the scale good, and what is surprising in London, the stone work



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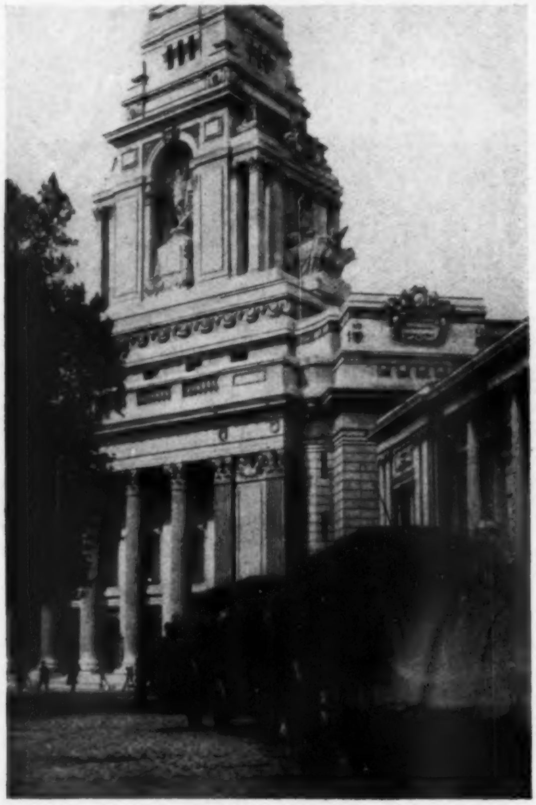
has not been painted. There is one little point in design that is worth noticing; the break at the interior corner of the pavilion is not carried up in what we would call a logical manner; there is a small pier, or rather a piece of the wall about a foot wide inside of the pilaster, and the break in the rusticated basement occurs on this line, and there is no break over the pilaster although the pilaster has at least a three inch projection. In other words, the entablature continues unbroken over the pilaster, leaving a soffit of three inches supported by nothing. A modern architect would, of course, be logical and put in a break over the pilaster and would thereby ruin the simplicity of the whole facade. The overhang of the architrave is really not noticeable and is certainly unobjectionable, and the point is interesting as being a very complete illustration of the rule in architecture, that if a thing looks right, it is right.

There is another new building in London which is of particular interest because it is designed by an American, but which I regret to say is not sufficiently completed to give a very definite idea of just how it will look. I refer to the Bush Building by Helmle and Corbett. It is a large office building, some seven or eight stories in height and is very centrally located, just to one side of St. Mary le Strand, on the axis of Kingsway. Although covered by scaffolding, enough of the general proportions are evident to show that Harvey Corbett will obtain as successful a silhouette here as he did in the Bush Building on 42nd Street. Little can be seen of the detail, but there is a great arched opening facing Kingsway which will be impressive provided it can be pulled into scale with the fenestration on the side. There has been lately in London a good deal of agitation as to the height of buildings. Some of the members of the Royal Institute of British Architects who insist that they are progressive, backed, I presume, by what certain newspapers in New York call "the interests," have been clamorous in their advocacy of an increased height, while a larger number of the more conservative members have just as strenuously opposed it. The Bush Building is one of the highest in London, I should imagine the very highest, but it is so large and the silhouette of the upper stories is so skillfully handled that its height is not objectionable, although it does naturally dwarf the fine old church alongside of it. I feel sure, however, that this height should not be exceeded; in fact, I think it would be better if it was never reached. All buildings cannot have the mass nor the location of the Bush Building and a thin slab of a building with a narrow front and dreary blank sides would be something horrible in London. Then, too, think of what the advocates of "A Brighter London" could do, and probably would do, with a great flat, windowless expanse. The genius who painted bright blue the clock dials of St. Clement Daves would go far with an opportunity like that. Really, if some philanthropist would only corner the paint market in London his name would become immortal. Apparently when the average Londoner has nothing else to do he rushes out and paints his house, especially if it is a stone house. There is a beautiful old house on Dover Street, St. James. I don't remember for whom it was built or what

Detail, Trinity House

was the name of the architect, but it is one of the finest Georgian houses in London and every architect knows it and loves it. Now, some decorator or tailor has it and they are painting the jambs of the windows and even the stone door trims a glaring white. Next year they will probably paint the whole business. And even the venerable Abbey is undergoing some repairs and they have scrubbed with acid or sandblasted several bays on the Northeast front, with the result that that portion of the Cathedral looks as if it had been modelled in plastoline of a loathsome whitish-yellow color; and this same unfortunate condition is not confined to London. In Oxford the sandstone has so badly deteriorated that some restoration was, I suppose, imperative. The surface is badly scaled and a great deal of the detail has dropped off, but I should imagine the safety of the thick walls was not impaired, and that a very



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little careful work would render everything safe. But, instead, the universal custom seems to be to replace whole slabs or parts of cornices or whole balustrades and parapets, not with some stone that would match the old work but with the same stone originally used which, when new, is a particularly obnoxious light yellow. The result is worse than a repaired brownstone front in New York, and the symmetry of design of the whole building is ruined, and the charm of age to a large extent dissipated. And in Oxford as in London the paint pot is always in evidence. Cambridge has suffered less. The stone there is generally of a better quality and the exteriors are in much better condition, though there is some of the same nasty yellow sandstone. Particularly is this evident in Wren's Library of Trinity College. This stone does certainly take a wonderful color when it's very old, but the Trinity Library is not old enough. The stone is dirty and blackened only in spots, often around the joints, and at first glance the building seems to be made of a cheap quality of terra cotta. And in connection with the Library, I never realized before this last visit that the back of it was much finer than the front. I never did think the front one of Wren's best works. It's too much like the Library of St. Mark's to be original and it certainly lacks its charm and distinction, and then the whole scheme is a fake. I suppose there was some reason for the bare flat ceilinged loggia on the ground floor and its height was probably dictated by the height of the adjoining cloisters, but if this condition was laid down at the start, Wren's solution of filling in the spandrels was certainly poor. On the back however, he does not repeat the false arches of the front; there is only a great blank wall pierced with well proportioned windows, and on account of the location of the floor line there is a fine plain wall surface above the windows. Then, too, the facade is longer on the back by the width of the two flanking sides of the court in front, and two pavilions are thus formed, which are a distinct addition. In fact, the back of the Library is extremely monumental and in its beautiful setting with the great trees and smooth lawns and the quiet little Cam flowing peacefully in the foreground, the effect is wonderful.

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On my return to my office I find that there is a small and rather poor photograph of Trinity House in Richardson's Monumental Architecture in Great Britain and Ireland, but neither this photograph nor the snapshots accompanying this article give an idea of the real beauty of the building. Trinity House is one of those buildings which look much better in actual execution than in the photograph or in drawings, and the same condition applies to the back of Trinity College Library.

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

### The Fall Conference

THE Fall Conference will be held in Chicago on the evening of November seventeenth. The subject for discussion will be uses, available qualities, and standard grading rules of lumber.

Since the subject of lumber is too comprehensive to permit even a most condensed survey in one evening, the program will be devoted to discussions regarding the various uses to which lumber may economically be put in building construction and the available qualities for specific uses, with a discussion on the present condition concerning simplification of standard grading rules.

The Institute will have prepared for discussion a tentative outline for specifications for carpentry work, this outline to be considered from the standpoint of practical use pending the solution of the problem of grades and qualities by all the national bodies and agencies of government that are constantly at work on the simplifications for the lumber industry.

### Monthly Meeting of Chicago Section

The members of the Institute resident in Chicago and vicinity will meet in monthly session on November third under the direction of the Chairman of the Advisory Committee, Mr. R. J. Gaudy. This meeting is expected to cover some of the ground work of the program for the Fall Conference and discussions also will be held on the tentative list of specifications to be released in the immediate future. This tentative list is given below:

- Steel Stack
- Concrete Stack (Structural design)
- Sewage Disposal Plant
- Vacuum Cleaning System
- Reinforcing Steel
- Testing
- Automatic Sprinkler System
- Air Conditioning (Ventilating)
- Foundations
- Excavations
- H.P. Water tube boilers (various types)
- Underfeed Stokers
- Overfeed Stokers
- Economizer
- Pulverized coal equipment
- Turbines
- Traveling crane
- Power piping and equipments
- Illumination
- Generators
- Converters
- Switchboards
- H. P. Return tubular boilers (Horiz. & Vert.)
- Traveling grate stokers
- Mechanical draft equipment
- Incinerators
- Steam engines
- Pumps and F.W. Heaters
- Refrigerating and Ice-making equipment & piping



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Internal combustion engines
Heating piping
Insulation (for pipes and ducts)
Kitchen equipment
Laundry equipment
Electric wiring
Private telephone systems
Fire Alarm Systems
Clock systems
Fire brick
Steel tanks
Brick Chimneys
Oil burning equipment
Elevators
Dumb waiters
Pavements
Wire rope
Cut stone (granite, limestone, marble)
Terra Cotta
Acoustics
Sound Insulation
Wells
Plumbing
Ornamental Bronze and Iron
Miscellaneous Iron
Sheet metal
Composition roofing
Furring and lathing
Plastering (plain and ornamental)
Interior wood trim
Cabinet work
Interior marble
Painting and decorating
Waterproofing and dampproofing
Plastic floor materials
Lumber
Steel sash
Exterior stucco
Hollow metal fire windows
Hollow Metal trim

### THE ADVISORY COMMITTEE

THE Chairman of the Advisory Committee informs the office of the Executive Secretary that he is scheduling the season's work and from the response that he has had in the past from various members of the Advisory Committee, he feels confident that the Committee work will be extremely valuable during the coming year. As the specifications noted in the above tentative list are prepared for release, they will be submitted to members of the Advisory Committee for their criticism and suggestions, and it is hoped that each one will find it possible to devote sufficient time to this work to assure a reflection of his specific knowledge on particular points.

The Chairman of the Advisory Committee will ascertain the particular predilection of the Committee members so that specifications on which they feel it impossible to submit beneficial criticisms will not be sent them and to insure that specifications covering work with which each member is perfectly familiar and for which he has made special studies, may receive his undivided attention without the distraction of having to investigate specific points on matters somewhat foreign to his training.

**War Scenes in Wooden Shipyards**

*(From the original aquatint by Frederick K. Detwiller)*

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LAON CATHEDRAL

*(From the original water color by Cass Gilbert, F. A. I. A.)*



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