Principles of Architectural Composition.
JOHN BEVERLEY ROBINSON.
. VIII. No. 1. *For Quarter ending September 30, 1898.* Whole No. 29.

THE ARCHITECTURAL RECORD.

CONTENTS

100 ILLUSTRATIONS.

THE RESIDENCE OF ELBRIDGE T. GERRY, ESQ.
5th Avenue and 61st Street, New York City. Richard Morris Hunt, Architect.

Please notice what Commodore ELBRIDGE T. GERRY says regarding the heating of his large new residence, No. 2 East 61st St., City. House is 100x110.

NEW YORK, March 14, 1895.

Richardson & Boynton Co.,

Gentlemen :—I write to express my great satisfaction with your admirable system of Perfect warm air furnaces recently placed in my house, No. 2 East 61st Street, in this city. They possess the advantage, as to the character of the warm air, that it is neither the disgusting steam heat which dries up the skin and affects the head, nor, on the other hand, is it the almost equally dry hot water heat, as it is called; but during the entire cold weather of the late winter, even during the blizzard, my house has been thoroughly heated. The heat is uniform and the ventilation perfect.

Very truly yours,

ELBRIDGE T. GERRY.

The Philadelphia & Reading Terminal Railroad Station, Philadelphia.
Painted with Dixon's Silica Graphite Paint.

DIXON'S SILICA GRAPHITE PAINT

Nearest to an ideal paint for protective purposes that has ever been made.

Roofs and iron-work well painted with Dixon's Silica-Graphite Paint have not required repainting for ten or fifteen years.

Should be used in the construction work of all Iron or Steel Buildings, Bridges, etc.

JOSEPH DIXON CRUCIBLE COMPANY,

JERSEY CITY, N. J.

N. B. — Architects and Draftsmen who are not familiar with DIXON'S 219½ PENCIL should send for a sample. For fine line work it is without an equal. Sent free when business card is sent us.

ASTORIA HOTEL.

B. A. WILLIAMS. G. N. WILLIAMS. JR.

B. A. & G. N. WILLIAMS, JR.

Cut Stone Contractors,

Avenue A and 68th Street, New York.

REFER TO THE FOLLOWING:

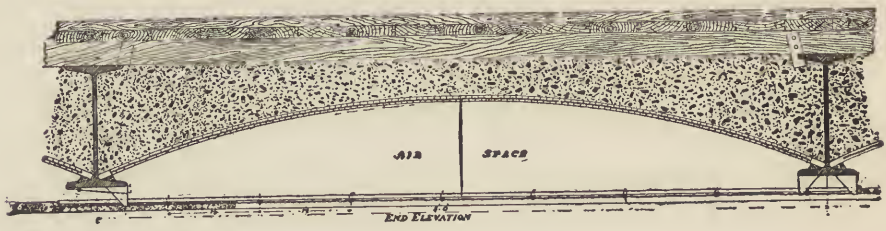
Buildings.	Architects.
ASTORIA HOTEL	Henry J. Hardenbergh
WASHINGTON LIFE INSURANCE BUILDING	Cyrus L. W. Eidlitz
LIBRARY, NEW YORK UNIVERSITY	McKim, Mead & White
PARK ROW BUILDING	R. H. Robertson
CONSTABLE BUILDING	Schickel & Ditmars
PRESBYTERIAN BUILDING	Rowe & Baker
NEW YORK SAVINGS BANK	R. H. Robertson
CABLE BUILDING	McKim, Mead & White
NEW BAR ASSOCIATION BUILDING	Cyrus L. W. Eidlitz
FREE CHURCH OF ST. MARY THE VIRGIN	N. Le Brun & Son
MANHATTAN HOTEL	Henry J. Hardenbergh
HOTEL SAVOY	Ralph S. Townsend
HOLLAND HOUSE	Harding & Gooch
TOWER BUILDING	J. B. Baker
GILLENDER BUILDING	Berg & Clark
CORN EXCHANGE BANK	R. H. Robertson
RESIDENCE OF T. WYMAN PORTER, ESQ.	Clinton & Russell
RESIDENCE OF CHAS. T. YERKES, ESQ.	R. H. Robertson
RESIDENCE OF HON. LEVI P. MORTON	McKim, Mead & White
RESIDENCE OF ISAAC STERN, ESQ.	Schickel & Ditmars
RESIDENCE OF R. M. HOE, ESQ.	Carrere & Hastings
UNITED CHARITIES BUILDING	Robertson, Rowe & Baker
STORE OF B. ALTMAN & CO.	Kimball & Thompson
MILLS BUILDING NO. 2	Ernest Flagg
SHOE AND LEATHER BANK	Cady, Berg & See
NEW KNICKERBOCKER THEATRE	J. B. McElfatrick & Son

Every Observant Architect and Builder

has noted the unsightly cracks that develop after a few years in the mosaic, tile, and granolithic floors of many of our public buildings. Upon examination it is found that the cracks occur at regular intervals over the iron beams.

What is the cause?

The arches have settled. Floor arches consisting of a number of assembled parts with more or less imperfect joints, whether flat or segmental in form, **invariably settle.** This causes cracks, not only in the expensive floor finish, but also in the plastered ceilings.



A segmental concrete arch as here shown **never settles.**

Why?

Because the concrete when set becomes a monolith or single piece. The concrete arch as erected by this Company has, besides, considerable elasticity.

JOHN A. ROEBLING'S SONS CO.,

TRENTON, N. J.

NEW YORK. PHILADELPHIA. CHICAGO. ST. LOUIS.
CLEVELAND. SAN FRANCISCO.

THE PRUDENTIAL LIFE INSURANCE BUILDING, NEWARK, N. J.
GEORGE B. POST, Architect.

V. J. HEDDEN.
C. R. HEDDEN.

S. S. HEDDEN.
L. O HEDDEN.

V. J. HEDDEN & SONS,

BUILDERS AND MANUFACTURERS OF FINE CABINET WORK

Factory at Newark, N. J.

143 Liberty Street, New York.

REFERENCES.

OFFICE BUILDINGS.—N. Y. Produce Exchange; N. Y. Mercantile Exchange; N. Y. "Tribune" Building; N. Y. "Times" Building; "Mail and Express" Building; N. Y. "Herald" Building; Pierce Building; London, Liverpool and Globe Ins. Building; Mortimer Building; Havemeyer Building; Prudential Ins. Co., Newark, N. J.; Delmonico, N. Y.; "Life" Publishing Co.; American Surety Co.; American Society Civil Engineers, Broadway and 57th street; Gillender Building, Wall and Nassau streets; Arbuckle Building, Water street and Old Slip; Bank of Commerce, Nassau and Cedar streets; Newark, City Hospital; St. Paul Building, Ann street and Broadway; Weld Building, 12th street and Broadway; Singer Building, Broadway and Liberty street; Empire Building, Rector street and Broadway.

STEAMSHIP AND R. R. BUILDINGS, FACTORIES, ETC.— N. Y. Central R. R. Co.; N. Y., N. H. & H. R. R. Co.; Central R. R. of N. J., Terminus, etc.; Long Island R. R. Co.; Penn. R. R. Co.; N. Y. City & Northern R. R. Co.; Manhattan R. R. Co.; Baltimore & Ohio Co.; White Star Steamship Co.; Inman Steamship Co.; National Steamship Co.; Atlas Steamship Co.; Old Colony Steamship Co.; Union Ferry Co.; South Brooklyn Ferry Co.; Pier A, North River; Mass. Cotton Mills, Rome, Ga.; Clark's Mile-End Thread Works; Nairn Linoleum Works, Newark, N. J.; U. S. Electric Light Works, Newark, N.J.; Union Edison Electric Light Works, Newark, N. J.; Fourth Avenue Horse Car Stables, N. Y.; Prescott Mills, Passaic, N. J.; Richardson & Boynton Co.'s Works, Dover, N. J.; Knappmann-Whiting Co., Carteret, N. J.

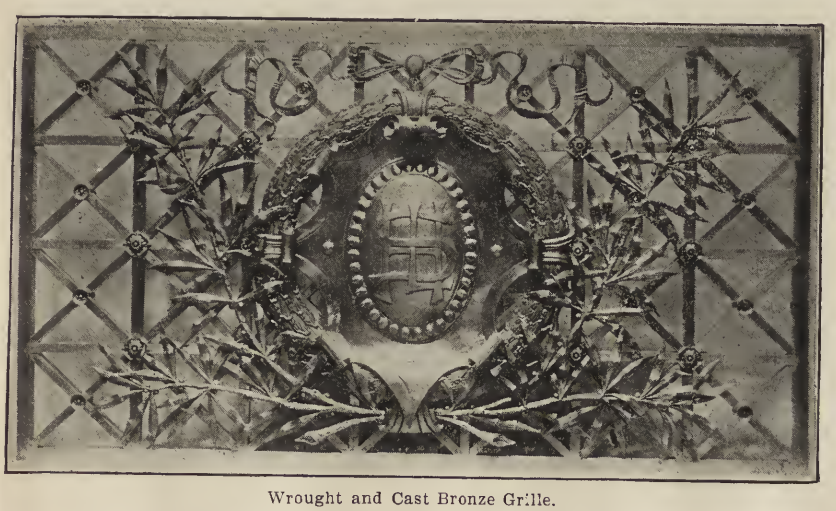
CLUB HOUSES, HOTELS, ETC.—Century Club; Metropolitan Club; Duetscher Verin Club; Hamilton Club, Brooklyn; Plaza Hotel; N. Y. Hospital; Hotel Martinique, W. 33d street, N. Y.; Judson Memorial Church; N. J. State Insane Asylum; Essex County Insane Asylum.

RESIDENCES.—W. K. Vanderbilt's, 5th avenue, N. Y., and Oakdale, L. I.; E. D. Morgan, Esq., Wheatley, L. I.; Fred'k Bronson, Greenfield Hills, Conn.; Wm. H. McCord, Greenwich, Conn.; W. J. Hutchinson, 59th street and 5th avenue; H. G. Marquand, N. Y.; D. Willis James, Madison, N. J.; E. C. Benedict, Greenwich, Conn.; Giraud Foster, Lenox, Mass.; Fred'k Cromwell, Mendham, N. J.

ARCHITECTS.—Geo. B. Post, Carrère & Hastings, August Namur, Peabody & Stearns, McKim, Mead & White, Le Brun & Sons, Thorp & Knowles, Babb, Cook & Willard, Clinton & Russell, Robt. Maynicke, Lockwood, Greene & Co., Thomas R. Jackson, Lamb & Rich, James Brown Lord, Bruce Price, Albert Wagner, Berg & Clark, H. Edward Ficken, John R. & Wilson C. Ely.

ST. PAUL BUILDING,	GEORGE B. POST, Architect
HAVEMEYER STORES,	GEORGE B. POST, Architect
EQUITABLE BUILDING,	GEORGE B. POST, Architect
WELD ESTATE BUILDING,	GEORGE B. POST, Architect
COE ESTATE BUILDING,	GEORGE B. POST, Architect
THE PARK BUILDING,	GEORGE B. POST, Architect
EMPIRE BUILDING,	KIMBALL & THOMPSON, Architects
STANDARD OIL BUILDING,	KIMBALL & THOMPSON, Architects
SHERRY BUILDING,	McKIM, MEAD & WHITE, Architects
NEW YORK LIFE INS. BUILDING,	McKIM, MEAD & WHITE, Architects
UNIVERSITY CLUB,	McKIM, MEAD & WHITE, Architects
EXCHANGE COURT BUILDING,	CLINTON & RUSSELL, Architects

Wrought Iron Grille designed by McKim, Mead & White, Architects.



Wrought and Cast Bronze Grille.

ARCHITECTS:
KIMBALL & THOMPSON,
NEW YORK CITY.

RESIDENCE OF MRS. WALDO.

SEVENTY-SECOND ST.
AND MADISON AVENUE,
NEW YORK CITY.

Below is a list of a few of the many RESIDENCES in New York City equipped with Yale Locks and Fine Hardware. In many cases the Hardware used in these Residences was prepared by us from special designs furnished by the Architects.

Residence of	Architect.
GEN. HORACE PORTER,	M. W. MORRIS.
HON. LEVI. P. MORTON,	MCKIM, MEADB & WHITE.
E. C. BENEDICT,	CARRERE & HASTINGS.
GEO. J. GOULD,	BRUCE PRICE.
CHAS. T. YERKES,	R. H. ROBERTSON.
MAJ. F. BARTLETT,	BORING & TILTON.
HON. WM. C. WHITNEY,	GEO. A. FREEMAN, JR.
L. M. DOMERICK,	C. P. H. GILBERT.
W. BAYARD CUTTING,	C. C. HAIGHT.
A. DURYEA,	M. C. MELLEN.
DR. QUIMBY,	CLINTON & RUSSELL.
ELDRIDGE T. GERRY,	R. M. HUNT.

Residence of	Architect.
MRS. OGDEN,	PEABODY & STEARNS.
ROBERT GARRETT,	RENWICK, ASPINALL & OWEN.
F. L. STETSON,	ALGERNON S. BELL.
JOS. PULITZER,	C. A. GIFFORD.
COL. McALPIN,	E. S. HAPGOOD.
MORRIS K. JESSUP,	JARDINE, KENT & JARDINE.
ISAAC V. BROKAW,	H. P. KILBURN.
* MRS. G. P. WALDO,	KIMBALL & THOMPSON.
U. S. GRANT, JR.,	CHAS. S. NORTH.
C. H. DICKERMAN,	F. C. MERRY.
COLLIS P. HUNTINGTON,	GEO. B. POST.
ISAAC STEARNS,	SHIKEL & DITMARS.

* Residence shown above.

A handsome Exhibit Room is provided in each of the Company's offices. It contains samples of its products and is intended for the use of architects and their clients in the selection of locks and metal work. Ladies are especially invited to make use of these facilities.

The Yale & Towne Mfg. Company.

GENERAL OFFICES: Nos. 9-11-13 Murray Street, NEW YORK CITY.

9204-98-
250-6000

LOCAL OFFICES: Chicago, Philadelphia, Boston, San Francisco.

(WHOLE No. 29.)

Vol. VIII ONE DOLLAR A YEAR. No 1.

The Architectural Record

July-September, 1898.

25¢

CONTENTS

100 Illustrations.

25¢

Illustrated Published Quarterly

ADVERTISERS' DIRECTORY.

ADVERTISERS' DIRECTORY.—*Continued.*

The
Architectural Record.

VOL. VIII. JULY-SEPTEMBER, 1898. NO. 1.

PRINCIPLES OF ARCHITECTURAL COMPOSITION.

I.

The Involved Nature of Architectural Design.

DESIGN, in general, as applied to the fine arts, means the disposition of objects so as to please the senses, in contradistinction to the mechanic arts, where design means disposition toward some useful end. To the work of either fine or mechanic art intellectual pleasure may attach.

In all art, design has various aspects. The painter must take into account the intrinsic interest of his scene, its fidelity to nature, and its importance in history or thought, in addition to the work of pure design—the arrangement of forms and choice of colors—regardless of what they represent or suggest.

Perhaps in music alone is pure design possible—the juxtaposition of sounds to give pleasure to the ear alone; but even here, sentiments of dignity, gaiety, and others, are so closely connected with the mere sounds, that not even in music do we find design pure and simple.

Especially in architecture is design complicated with considerations of such magnitude and importance, that they are usually set forth as constituting the whole of architectural design, almost to the exclusion of the essential part of æsthetic design—the determination and correlation of forms and colors in combinations that are intrinsically pleasant.

The most important of these considerations is that of utility. Nowadays an architectural form rarely seeks expression, except as including some useful purpose. Formerly, when architecture was chiefly employed in building houses for the gods, utility counted for less; next to the satisfaction of the eye, the sentiment of reverence chiefly needed to be gratified. But now we must build

It is not intended in the following pages to set forth anything like a complete theory of composition, but only to put together in a coherent form some practical generalizations, to aid the student by formulating in words what he must otherwise acquire by a slow process of unguided observation.

houses, and town-halls, and office buildings, and put forty windows where we would rather have but four, and make our design out of such mundane needs. Sentiment, too, must be taken into account, if not religious, perhaps domestic, or that of public pride, or private ostentation. A hundred utilities and a score of sentiments arise for us to satisfy.

Next to this comes the constructive sense, which, even in the unprofessional mind, shrinks from a post that seems too slim; and in the professional mind, objects to an arch with too slight abutments.

Then, again, there is a sentiment with regard to material, which prefers stone to brick, bronze to iron, marble to plaster.

There are all of these, and perhaps still other considerations, in deference to some of which we may, at times, find it necessary to do what pure design would forbid. Thus, to take a familiar building as an instance—the Doge's Palace, at Venice—to satisfy the constructive sense, sadly needs abutments at the angles, for both the first and second story arcades, while, pictorially, it is quite right just as it is.

Most designers, in fact, dwell chiefly upon utility and construction. Admirers of both the Gothic and the Classic modes will urge that the design must spring from the plan—that is, from the arrangement that utility or construction requires.

They are both quite right: the design should spring from the plan; but it must spring from it, and not remain nothing but plan. Designs must be suggested by the plan; but if no design attaches itself to one way of satisfying the utilities, some other way of satisfying them must be devised, which will suggest a scheme that pleases the eye.

Nor would any one ever have exalted the value of the mere utilities, were it not that each starts with a certain type of artistic results, to which, it is assumed, all utilities must be made to conform. Thus, when the Gothic man talks of plan, he has in mind as a type an unsymmetrical group of parts, apparently thrown together as nature throws the rocks of a mountain, yet really carefully arranged, according to the skill of the designer. In the mind of the classical man, on the other hand, there is an assumption of a different type, to which all of his utilities must adapt themselves. He wants something symmetrical, with horizontal lines predominating.

Just as the mediævalist cannot think of a house as a square mass, the classicist cannot think of one all peaks and steeples.

The truth is that men have not thought of design as a general method, applicable to all styles. They fall in love with some special beauty of the past; justly, no doubt, but without anything like a fair appreciation of the possibilities of the case.

Beyond the utility—beyond even the construction of a building, there is the question of design purely from an artistic standpoint—

the erection of forms that are pleasing to the eye, regardless, for the moment, of whether they are granite or sugar-candy; of whether they are to be lived in, or worshipped in, or worked in.

It will, perhaps, never be possible to reduce the art of delineating and arranging pleasing forms to an exact science; but it is possible to analyze and classify these operations, in such a way as to help one to make a simple and pleasing design, or an intelligible criticism, just as a knowledge of counterpoint may help one to construct a simple melody or harmony, and aid him in appreciating and estimating the masters. But we cannot make a master by teaching rules, and design, in its more delicate discriminations, must always remain a matter of talent and temperament.

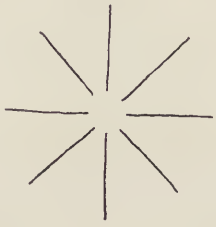
II.

Unity.

In all fine art—that is, art which has as an end the pleasure of the senses—there are two qualities which must be obtained: unity and grace. Unity is the manifest connection of all the parts in a whole; grace is the pleasing form of the parts thus connected.

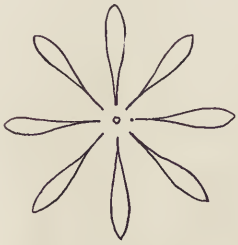
Draw eight lines at random, thus (1); there is no evident connection among them—there is no unity; but if they are drawn thus (2), unity appears; they constitute a whole by virtue of their arrangement.

1. Random lines without unity.



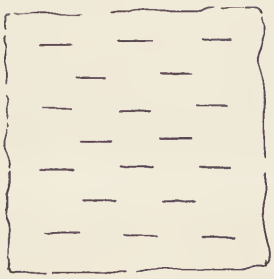
2. Lines united by their arrangement.

If now, instead of straight marks, we give the parts shapes that are pleasing, we add grace, thus (3):

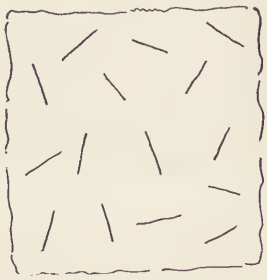


3. Grace added to unity by the shapes given to the parts.

There is another method of arrangement by which separate things may be united; not, indeed, into a whole, but into an unfinished part of a whole that must be otherwise completed. If we arrange our former units, either regularly, like this (4), or irreg-



4. Objects evenly disposed, giving continuity to another object upon which they occur, but only when a boundary is marked; otherwise giving a sense of incompleteness.



5. Objects, unevenly disposed, also giving continuity, but less so than when evenly disposed.

ularly, like this (5), with more or less evenness and absence of accentuation, we give a certain sense of continuity to the surface thus covered.

So, again, if we apply our lines to a long line (6), we unite them; yet,

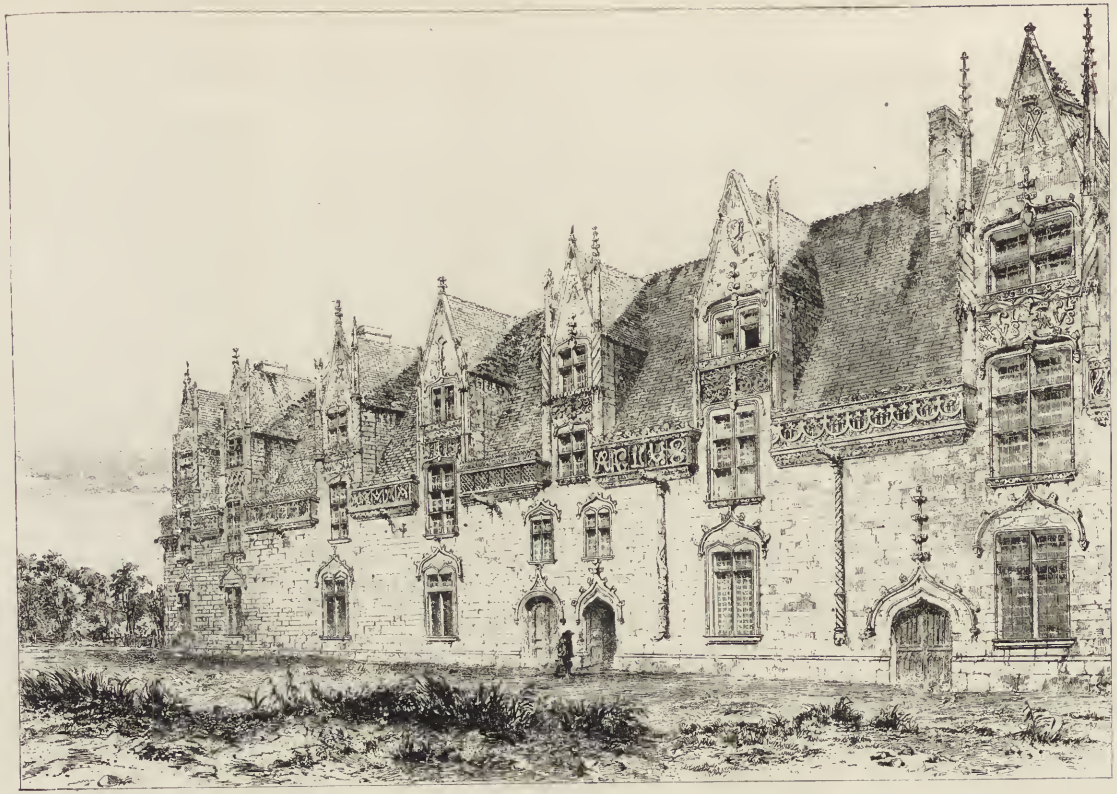
6. Objects, occurring at even intervals, giving a sense of incomplete continuity until the terminations are marked.

without some termination, it appeals to the eye not as a completed group, but as a part of something of which the whole is not yet supplied; this is what we feel in a row of columns, in a wall with dormers at regular intervals, (7), and in almost every ornamental border.

The quality of unity is essential to all objects of art, and to all parts of each; and it constitutes the greater part of architectural design.

In architectural composition there are two principal processes, in which considerations of unity are paramount—the assemblage of parts that are side by side into a whole, which we may call grouping; and the separation of the building as a whole, when it is a single mass, or of each of the component parts, when it is a group of masses, into parts disposed one above another, which we may call subdivision—limiting the word arbitrarily to horizontal subdivision, and keeping the word "grouping" to describe vertical separation, even when it seems to be rather the division of a whole into parts than the assemblage of parts into a whole.

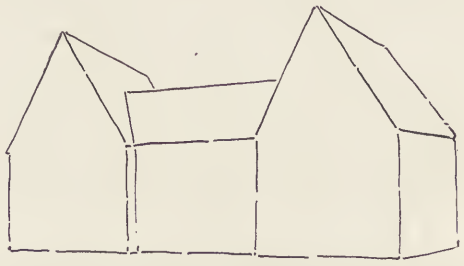
After the arrangement of the main masses of the design, comes a



7. CHATEAU DE JOSSELIN.

Dormers evenly distributed, giving a sense of continuity, almost of infinity.

similar process with each part of which it is composed, whether vertically or horizontally; and the grouping of details—windows, columns, turrets, and the like—for each part, upon the same general principles that applied to the whole.



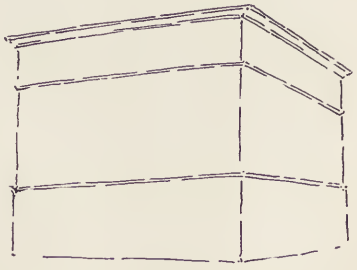
8. Group of two masses, joined by a connecting part.

Thus, in figure 8 two masses—joined by a lower connecting link—

9. The same group, sub-divided in height, and elaborated with minor parts.

have been grouped; in 9, the combination has been subdivided horizontally into three parts, by the sill-line and the eaves line carried through; and upon the gables and the connecting link, windows, dormers, and columns have been placed by ones, twos and threes.

So, again, in 10, the single mass of the building has been sub-



10. A single mass, sub-divided horizontally by mouldings.

divided by means of mouldings; while in 11, in each subdivi-

11. The same as 10, with minor parts grouped upon the different sub-divisions.

sion, windows of different sizes and shapes, and in different numbers, have been grouped.

We are to consider, first, the number of principal parts that may compose a group, and their sizes in relation to each other; next, the number of subordinate parts which should be grouped, as details, upon the main mass or masses: then subdivision horizontally must be investigated, in the same way, as to both the number and size of parts.

Afterwards we shall try to find some method of determining the relative proportion of length to height, both for masses and for details; and, finally, make some attempt to apply our conclusions to practical cases.

Taken together, these different processes of determining the number of parts, and the size and shape of the parts, primarily for the main masses; secondarily, for the subordinate masses; and, finally, for the details, constitute what is called composition.

III.

Grouping.

In all designs of form, whether it be the design of a finger ring or of a cathedral, there are but three groupings that give satisfaction to the eye by a sense of unity.

Other collocations may please by superadded qualities, by richness of encrusted decoration, by association, historical or sentimental, or by pleasant color; and even the best groups will fail in satisfying the eye, if the parts composing them lack the quality of grace—individual and separate beauty. But, as far as mere number is concerned, the experience of designers seems to show that the available groups are only three.

Rule 1.—One thing looks well.

Clear and conspicuous oneness—characteristic of most of the great buildings of ancient times, when it comes to us, is fundamentally satisfying to the eye, and is not to be lightly cast away. By oneness; we do not mean what has before been called unity, which is the perception that many parts constitute a whole; but it is rather the perception that the whole consists of but one part.

To talk of one, under the head of grouping, may seem anomalous; it is so; yet we must lay all possible stress upon the value of this singleness. Such we see in a Colosseum and in a Parthenon, in a Pisan Baptistery and in a Cheops Pyramid; each is one, as distinguished from a Pantheon that is two, or a Karnak temple, that is three or four, or a modern country house, that may have eight or ten parts. In the illustrations 12, 13, 14 and 15 are shown other instances of single masses.

Rule 2.—Two things look well together.

This is true always, whether the objects be equal or unequal, large or small, twin Notre Dame towers, or coupled columns, or doubled windows. 16, 17, 18 are examples of groups of two masses.

Rule 3.—Three things look well together.

This is also true, but here we reach a qualification. A group of three equal parts is not always pleasing. In certain things, in a triplet window, in a triple arcade, it will do very well; but three equal domes, as the main bulk of the building, or three equal spires, or three equal pavilions, would be impossible.

We may illustrate our rules by a diagram, so: 19.

First, one thing; second, two equal or two unequal things—all always good; third, three equal things, sometimes good; and of three unequal things there are two cases.

In both, it is essential that one of the three should be the largest; it is also essential that it should be in the middle.

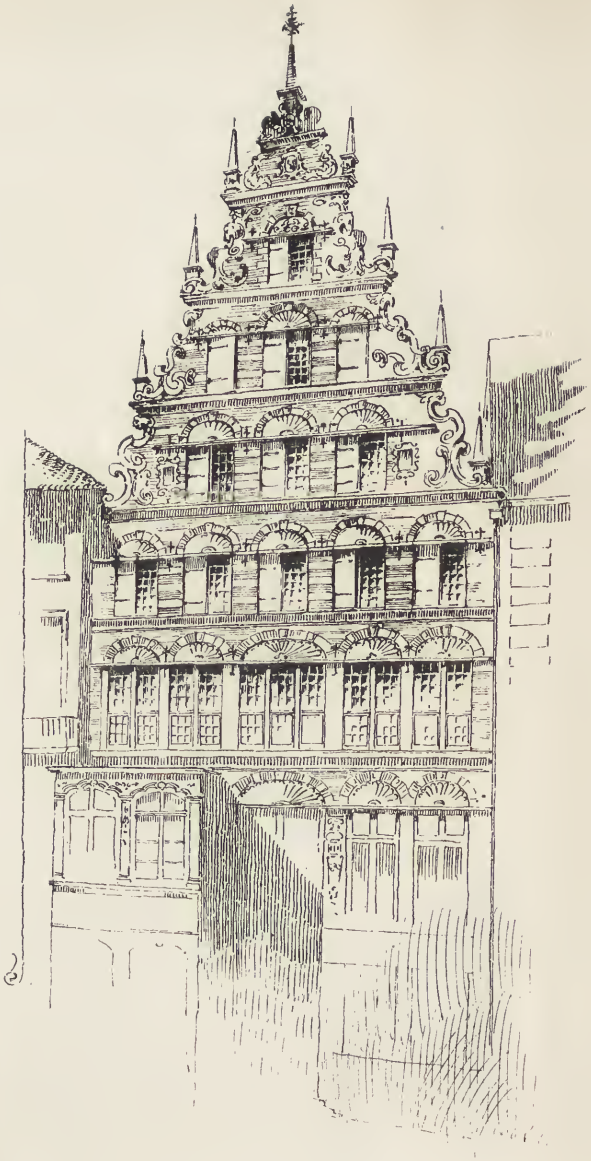
Although the eye may tolerate certain other groupings of three objects, when they are softened by distance, or accounted for by reason, yet when we pronounce a pure æsthetic judgment, we find that the largest of a group of three must be in the middle. 20, 21.

These three rules are the foundation of the art of grouping. All the rest is but to learn ways of doing what these require, when other considerations interfere; of reconciling them with situation and use, and other modifications and adaptations.

12. A Single Mass. Although sub-divided into horizontal parts by the line of the cornice, it is single in vertical division; that is, it has no other mass standing beside it. The oneness is accentuated, too, by the one big dormer on the roof.

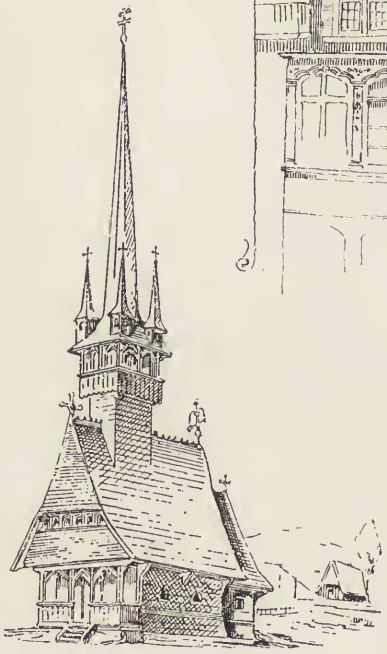
13. THE HOOPATOREN, AT HOORN.

A single mass, standing alone with none beside it, although composed of two parts, walls and roof horizontally.



14. THE MARKET, BREMEN.

A single mass, that is a single large gable, there being no other gables on either side. It is subdivided, however, into many horizontal parts. The pyramidal termination in any composition conduces much to its unity.



15. CHURCH AT VORÖSMAT.

A single mass, the slight chancel projection may be neglected at present, as insignificant.

16. MISSION CHURCH OF S. AUGUSTINE.

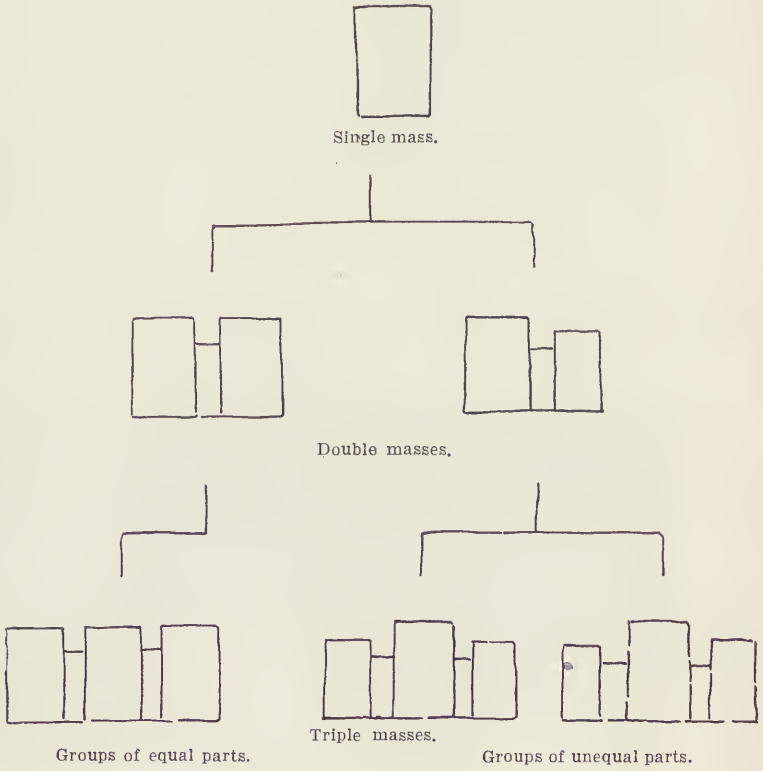
A group of two objects, connected by a link.

17. THE FALCON COCOA HOUSE, CHESTER.

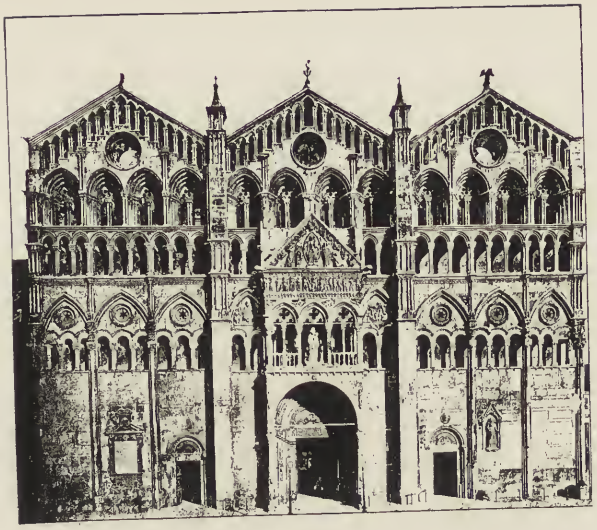
An interesting group of two unequal objects, each being composed of two equal ones. In this case the connection is by juxtaposition only. There is no linking part.

18. GATEWAY TO LINCOLN'S INN.

Two masses, joined by a link of a different character from that in 16.



19. DIAGRAM OF GROUPING.



20. FACADE OF FERRARA CATHEDRAL.

A group of three equal masses, illustrating the unsatisfactory effect of equality in the members.

21. THE ESCURIAL.

A group of three, one larger than the others.

Yet, it will be said, there are many groups of more than three objects. There is St. Mark's with its five domes, and with its four towers; and there are innumerable groups of four, five, and more windows, pinnacles, arches, gables, pavilions. How can it be said that three is the largest possible number for a group?

It is strictly true. Just as soon as we pass three, we begin to lose the sense of a definite number, bound together into a group, and to feel only the vague sense of an indefinite number of things, placed upon another object. Four dormers, or four windows, or as many more as we please, we may have, but as soon as we pass three, we begin to lose sight of the dormers, as objects themselves, and to think

22. CHURCH OF THE NATIVITY OF THE VIRGIN, MOSCOW.
Group of five, of substantially equal size, showing the confused and unpleasing effect.

of the building as a whole, decorated by a row of an indefinite number of dormers.

And so used, multiplicity of subordinate parts is of value in giving continuity to a larger object, and is used in certain situations. 7.

But for plain masses that stand up asserting themselves as inde-

pendent objects, four is a combination that cannot be made to look well.

It is almost impossible to find an actual instance of four grouped masses that affords a fair illustration. In most cases either the body of the building so much predominates that the four towers, or whatever they may be, fall into subordination, as mere sub-masses, or a simultaneous view of all four is impossible, one or more being cut off by perspective.

Here, however, 22, is a group of five, substantially equal spires, which displays, even to a greater extent, the defects of a group oi four.

In the grouping of details, four is a number that often occurs, and must always be avoided, or glossed over in some fashion.

Recall Ruskin's denunciation of the familiar four-pinnacled type of tower, 23, and realize that you know—what he didn't know—namely, why he disliked it. If you think that he was not justified in his dislike, recall the many cases where tower-builders themselves made one of the four much the largest, 24, quite a little turret often; and in the many other cases where they interpolated intermediate pinnacles, making eight in fact, but in practice, innumerable, for you can never count them, owning to their coming one behind another, 25.

23. Four-pinnacled tower, a type to be avoided.

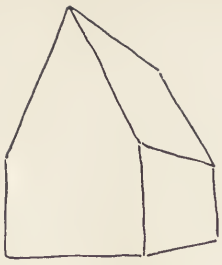
24. Four-pinnacled tower, one much larger than the rest to disguise the equality.

25. Four pinnacles and and four smaller pinnacles, giving the effect of a multitude.

Therefore, in shaping our first thoughts of what our plan is to be, we must remember that the outside, whatever be its character, must consist of not more than three leading parts. If we are going to have high roofs and gables, we may have a single gable, or we may have two unequal gables, or two equal.

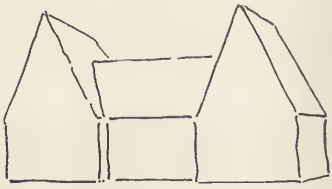
Or if we find that three will suit our purpose better, we must make the flanking gables either equal or unequal, and the middle larger than either, 26.

It is just the same if we are dealing with flat roofs and square masses. The single mass of this kind is the usual thing, but the group of two equal is as good; so is that of two unequal or those of three, whether symmetrical or unsymmetrical, and whether the square-topped masses are broad and low, or high and narrow, as in these groups, 27.



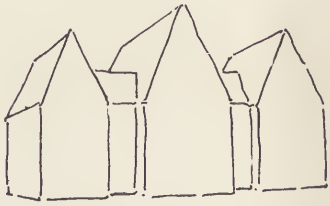
Single.

Double unequal.



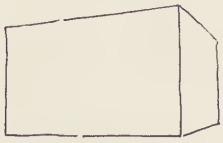
Double equal.

Triple unsymmetrical.



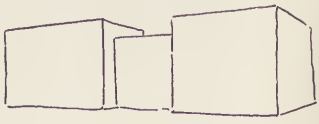
Triple symmetrical.

26. GROUPING OF GABLES.

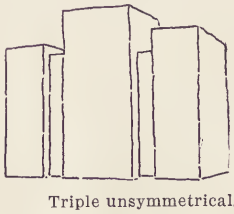


Single.

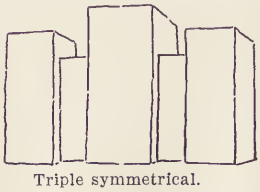
Double unequal.



Double equal.



Triple unsymmetrical.



Triple symmetrical.

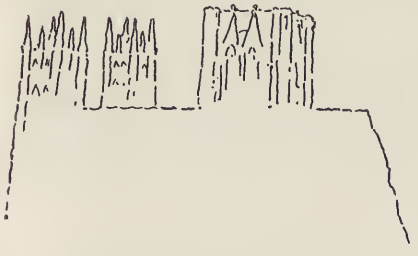
27. GROUPING OF SQUARE-HEADED MASSES.

In order to constitute a group, the members composing it must be of similar general appearance; not by any means absolutely alike, but sufficiently alike for the first impression to be that they are exactly alike. These groups of towers, for instance one of two, 28,

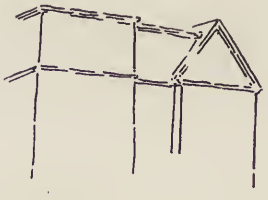
28. NOTRE DAME, PARIS.

A very fine instance of a double group. The differences between the towers require close observation and a larger drawing than this to discern.

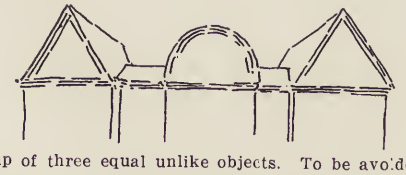
one of three, 29—the former indistinguishable, the latter so much alike that it is long before it occurs to us that the biggest has no pinnacles, while the other two have them.



29. An example of a group of three, all of like appearance.



30. Group of two equal unlike objects. Never to be used.



31. Group of three equal unlike objects. To be avoided.

Nothing can be more unsatisfactory than trying to link together two equal unlike objects, or three equal unlike objects. It is impos-

sible to join a gable and a square-top, or two gables and a dome, when they are of equal sizes, without giving pain, 30, 31, 32.

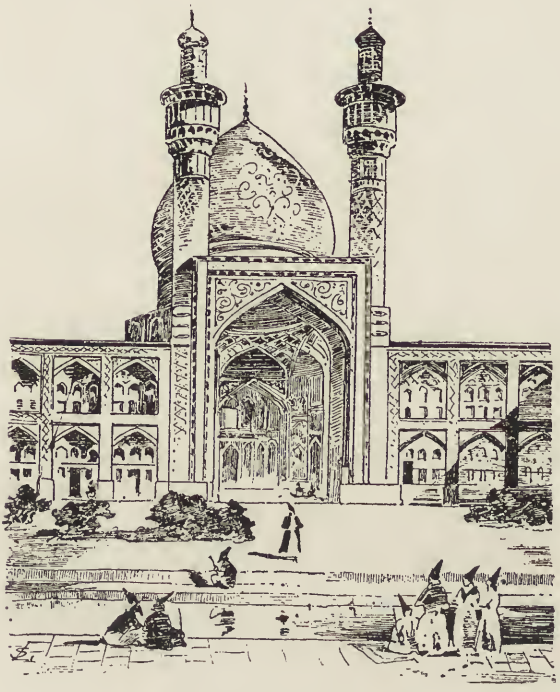
32. LICHFIELD CATHEDRAL.

An example of three like masses grouped. It would look better if the central tower were larger.

But, some will say, there are many buildings wherein are grouped together successfully different kinds of masses. Not to look at smaller buildings, of which the excellence might be questioned, what are we to say of St. Paul's, with its central dome and subordinate western towers, or of other domed buildings with minor masses, towers or pavilions; quite different from the dome with which they are placed?

Simply this—that the best of these are verifications of the assertion that the objects grouped must be of the same general appearance.

In every case where the dissimilar objects are successfully grouped it will be found that one of them is much the largest, 33; so large, in



33. TOMBS OF THE CALIPHS, CAIRO.

An example of three unlike objects successfully grouped by the predominence of one of them.

fact, as to make us lose sight, at first glance, of the others, when contemplating the building as a whole. Thus, in St. Paul's the dome appeals to the eye as the single feature of the building, in any comprehensive view; the towers are so much less that they fall in with the mass of the building as a base for the dome. How different is the silhouette of York minister, 29, in which the three towers all stand together, the chief only primus inter pares.

But in groups of two, whether equal or unequal, the members must be alike.

One of the best examples of studied inequality and similarity combined is found in the façade of Notre Dame at Chalons. The ill appearance of dissimilarity in groups of two is shown in this front of Lisiéux Cathedral, 34, and again in 35, where neither dome nor minaret looks well.

A word may be said as to what is known as "double composition." This term is applied to some combinations of two objects that are not

pleasing. A double arch with a single column between and plain imposts on each side comes very near the condemnation of double composition. A square-headed opening in which a column is used as a mullion quite deserves such reprehension. So two entirely separate twin masses standing side by side, without a connecting part never looks well.

34. FACADE OF LISIEUX CATHEDRAL.
Illustrating the bad effect of unlikeness in two objects grouped together.

But the reason that such double groupings do not look well is not because they are double; the great number of double groupings that do look well quite forbid such a conclusion.

In some cases it is the lack of an adequate connection, and consequently the absence of groupings at all; in others the presence of a linking part that asserts itself as an individual and causes hesitation as to whether we are to regard it as an arrangement of one or of two things, as the mullion column in the square-headed opening, 8.

In groups of three members, as we have said, the central one must be made much the largest if it is different in shape. There are, however many buildings in which a small central feature is flanked by double principal masses, quite different in character (44). Such arrangements, to be successful, must have the flanking masses so large that it is at once evident that a group of two, not of three, is intended. The small central feature becomes a mere subordinate mass upon the linking part, or upon the whole group, considered as a unit, 36.

In a complex building, all sorts of groupings may be used, as we descend in treatment from whole to part, from part to detail; yet at each step we must be clear in our delineation of our conception.

If we mean the main motive to be a single mass, we must abstain

35. MOSQUE OF KAIT BEY, CAIRO.

Two unlike objects. Such a group cannot look well. In order to make it look well either the minaret must be magnified, until it dominates the dome, as the Campanile does St. Mark's at Venice, or the dome must far exceed the minaret.

36. CHATEAU MARTAINVILLE.

A double group in which the appearance is much injured by the central turret. It is so large that the eye takes the group at first glance for a group of three.

37. ST. PAUL'S SCHOOL, CONCORD, N. H.

A group of two unequal gables. The third is so small that it becomes merely a subordinate object upon the linking part.

from groups of parts entirely, or we must make our central thing—dome, or pavilion, or spire, or gable—so big that nothing else at first is seen.

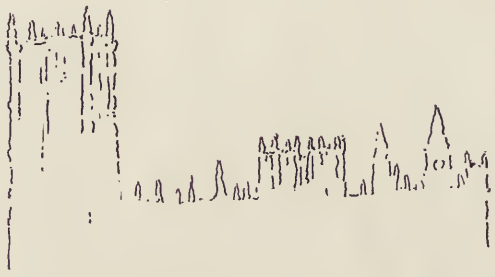
If, on the other hand, we want to make it two, 37, or three, 38,

38. A group of three similar objects, one of them predominating. Here again the small turret, between the two of the façade, detracts from the effect.

whatever the things are, they must be of the same shape and stand side by side, brothers in blood, if not in stature.

Observe once more, that the bigger the one thing, the more and more various things may cluster around it, unnoticed, except as part of the mass upon which the big thing rests.

That is the function of the great tower at Westminster, 39, the ap-



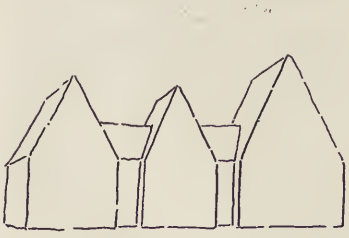
39. One very large mass, harmonizing many smaller heterogeneous objects.

parently heterogeneous mass of towers and pinnacles and various things is, when taken at a glance, but an appendage of the large tower. Only when we come closer, and begin to lose sight of the dominant mass from very nearness, the smaller must begin to group themselves, by ones, twos and threes, clearly and coherently, as do the westerly towers of St. Paul's as we approach.

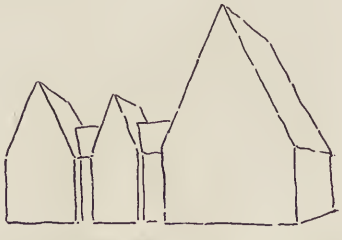
There is another convenience in making one mass predominate. By so doing, we can reconcile groups, even of like objects, that would otherwise be impossible.

Such a triplet as that of 40 is not agreeable; but it is at once harmonized and brought into relation by making one member comparatively very large, 41. By this means, too, we may construct a harmonious quadruplet, otherwise out of the question.

The reason for all this is that the difference in size effects a classification. In the first group there are plainly three objects, ill arranged; in the next, the group reserves itself into two parts, a large one and a small one, which is itself compounded of two, yet counts as one in relation to the large one. It is in effect a



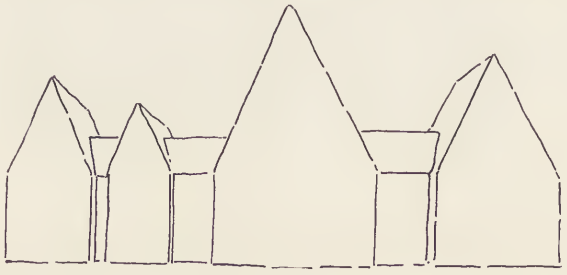
40. Ill effect of triplet of nearly equal size, the largest not in the middle.



41. Good effect, when the largest of 40 is made very much larger than before.

group of two unequals, of which the smaller member is itself a group of two unequals.

So with the third, 42, the predominance of one mass causes the



42. A group of four parts in which the two on the dexter side coalesce, and appear to the eye as one compound object.

others to classify themselves as two things rather than three, one of the two being compounded of two unequals.

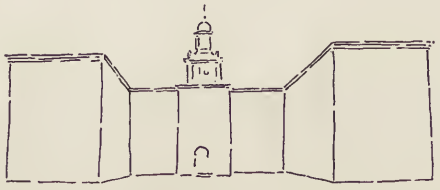
In this way almost any collection of objects may be harmonized; and it is a comparatively easy task, when we are able to set clearly before ourselves in words what we are aiming at. We may then lay down two more rules for our guidance.

Rule 4.—In double grouping, whether of equal or unequal objects, the members must be alike.

43. CHATEAU DE MAISONS LAFITTE, NEAR PARIS.
Triple group. It would be improved if the central pavilion were larger.

Rule 5.—*In triple grouping, either the members must be alike, or the central must be much the largest,* 43.

Counting, you will observe, cases where the central object is much the smallest, as double and not triple grouping, 44.



44. A double group. The central turret becomes a feature of the central link, and does not rank with the twin masses of the wings.

We might similarly reckon those where one of three predominates, as single grouping, and hereafter at times we shall do so; but there are so many cases where this might seem confusing, that we will let it stand as we have written it.

Rule 6.—*A group of any number of members may be harmoniously constructed, by making one object very much the largest, and letting the other fall into subordinate groups, but always by twos and threes, as if they were single,* 45.

With which general conclusion we may pause.

John Beverley Robinson.

45. CHURCH OF BASIL THE HAPPY.

A group of a large number of heterogeneous parts, harmonized by a single very large one.

RESIDENCE OF W. E. HALE, ESQ.

46th St. and Drexel Boulevard, Chicago, Ill. D. H. Burnham, Architect.

A STUDY OF EVOLUTION, PERSISTENCE AND REVERSION IN ORNAMENT MOTIVES.

Trefoil and Palmette.

I.

A COMMONPLACE pattern on an old silver-plated sugar bowl does not at first appear to furnish an inspiring or instructive theme. Yet it may prove, like so many other every-day commonplaces, worthy of careful study. Placing the pattern of Fig. 1, engraved, perhaps, fifty years ago, by some half-trained Connecticut artist, on the bowl of a plated tea-service; by the side of Fig. 2, from a bit of pottery of the fifth century, B. C., we come face to face with the whole question of the persistence and survival of ornament forms in the art of different ages. It is easy to imagine the inexperienced engraver of fifty or sixty years ago, with his slender resources and undeveloped imagination, picking from books of assorted designs the incongruous elements with which he decorated his plated ware, altering and combining them with but moderate skill and little originality. Or we may imagine him to have been simply applying in various permutations and combinations a limited stock of motives, learned in the course of an apprenticeship to some English, French, or German master. But in either case, the motive came originally from antiquity by way of the Renaissance; it is a part of the vast stock of art-forms borrowed by the Renaissance from Roman antiquity, imitated, modified, and bequeathed to modern times; much as Roman art had borrowed them in its turn, from conquered Hellas, two thousand years ago, and, moulding them to its own purposes, had left them to succeeding ages. All this is elementary art history, of course; the peculiar interest of the study lies in its details. How, why, and by what means have such ornament motives been transmitted to us from a remote antiquity? When and where did this particular motive—a group of branching lines, enclosed in a frame—originate, and why should it possess such a potent vitality as to survive all the changes of a score of centuries? To answer this question leads us into some of the most fascinating inquiries in the archæology of art. Whether we follow back the ancestral history of this ornament to the immemorial antiquity of the Nile Valley, or retrace its course thence through the islands of the Mediterranean, through Assyria and Asia Minor to Attica, and thence again

throughout the Roman and Byzantine empires and the Middle Ages to the Renaissance and modern times, the omnipresence and persistent vitality of this motive and its cognate forms surprises and finally astonishes the investigator. We meet with it everywhere, in Protean shapes and variations, but still unmistakable. One receives in time a deep impression of a certain unity underlying all the styles of historic ornament, as though, indeed, the letters of its alphabet were few and simple; or as though in a rich and varied language a limited vocabulary had, after all, sufficed for the expression of a marvelously wide range of thought.

II.

I have spoken of the *persistence* of certain ornament forms. By this I mean their continued use, through long periods and in successive styles, in shapes which never quite lose their original identity in spite of wide variations. Thus the motive of Figs. 1 and 2

Fig. 1. Pattern on sugar bowl.

Fig. 2. From a Greek vase, 5th Century B. C.

belongs to the anthemion class, and I propose to show how the anthemion, with its related forms like the palmette, grew out of a combination in Egyptian art, of the lotus flower and rosette; was used by the Assyrians, by the Greeks, both of Asia and Europe, and by the Romans; that it was by the Byzantines merged into the Roman acanthus, and in this composite form was constantly employed by the carvers of Romanesque times; that it is a common motive in Gothic carving, in which it is often merged into naturalistic foliage forms, and that in the Renaissance it reappears in its Roman dress to run through a new gamut of variations, many of which are in common use to-day. In like manner we shall find the lotus of Egyptian ornament persisting through successive ages in an endless variety of three-leaved motives, of which the fleur-de-lis of Florence and of France is one. But there is also another phenomenon in ornament history less common but more curious and interesting than that of the persistence, which requires to be taken into account, and which may property be called *reversion*. By this I mean the occasional and sporadic returns towards an extinct type or form, which the student encounters at intervals in tracing the development of ornament forms. They are often puzzling, and almost always surprising; while to the inexperienced observer they are apt to suggest the most erroneous and confusing conclusions.

Their frequent occurrence makes necessary the utmost caution in the investigation of historical sequences in the development of ornament. A complete chain of apparently successive developments by no means establishes continuous descent. Not only must all reversions be carefully eliminated, but allowance must be made for wholly fortuitous resemblances, and for the vagaries and idiosyncrasies of individual designers. Nothing is easier than to draw plausible conclusions of the most sweeping kind from apparent relations which in reality have never existed.

It is not worth while here to attempt a detailed explanation of persistence and reversion in ornament motives. That is a subject by itself; but it is proper to point out that in decorative designs identical conditions and requirements are constantly recurring, so that there is nothing inherently strange in the recurrence of the same motives as solutions of similar problems. But not only is it true that like reasoning under given conditions is apt to lead to like conclusions, in design as well as in philosophy; it is equally true that often widely diverging paths of development may lead around to the same or to closely similar results. This is illustrated by such cases as that of Figs. 3 and 4—the first a Romanesque capital from

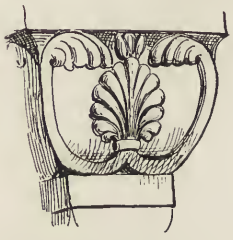


Fig. 3. Romanesque capital from Hersfeld, (Germany).

Fig. 4. Pattern from an Assyrian bronze platter.—Nimroud.

Hersfeld, Germany; the second a bit of Assyrian bronze, from Minroud. There is a singular family resemblance between them, but it is purely accidental. The mediæval carver had no knowledge of Assyrian ornament, but in applying a more or less familiar motive to the bulbous capital of a square pier he was led, as we see, quite naturally into this singularly Assyrian-looking combination of forms.

III.

For the origin of our sugar-bowl motives we must go back to the lotus forms and rosettes of Egyptian ornament. That the anthemion is descended from this ancestry has been very clearly and conclusively proved by Mr. W. H. Goodyear in his "Grammar of the Lotus," and in an article published in the "Architectural

Record" for the last quarter of 1893.* Whether or not we accept every one of his assertions and conclusions, the main theory may be regarded as proved beyond cavil—that the Greek anthemion (Fig. 5) is ultimately derived from an Egyptian ornament common in jewelry, in amulets and in pattern ornament, which is composed of

Fig. 5. Anthemion motive: Greek antefix.

a rudimentary lotus combined with a half-rosette (Fig. 6). That the diverging scrolls at the base represent a lotus is proved by a long line of transitional forms, of which the trefoil-lotus (Fig. 7), from a pier in the sanctuary at Karnak is the most important link. Thus we are brought back to the lotus of the Nile as the first ancestor of our sugar-bowl pattern.

The lotus is, indeed, the parent of a greater number and variety of ornament-forms than any other motive known. It was the most conspicuous and beautiful flower known to the Egyptians, and its intrinsic decorative value, as well as its importance in their mytho-

Fig. 6. "Lotus-palmette": Egyptian amulet. (After Goodyear.)

Fig. 7. Three-leaved lotus motive from Stele at Karnak.

logical symbolism, gave it an extraordinary vogue as an ornament. Associated as it was with Horus and Osiris, with the idea of Nature's reproductive power, with the life-giving Nile, and with all the solar

*I have in my possession a series of sketches dating from about 1884, in which I had myself outlined a very similar line of derivation from Egyptian lotus-types, for use in my classes at Columbia. Unfortunately, there is no date inscribed upon the drawings, and the precise sources of the various illustrations are not given, so that the definite proof of priority is lacking. In any case, it was Mr. Goodyear who first published the theory and supported it by adequate illustration and evidence; so that I can only claim to have independently noted some of the facts on which this theory and its demonstration rest, and to have personally anticipated in part his conclusions, without realizing their importance or following out in detail the evidence required to support them.

elements of Egyptian mythology, it was in constant and universal use as a symbol and amulet, both in its natural or concrete form, and in decorative representations of the flower. Whether or not its symbolic use as an amulet preceded or accompanied from the outset its decorative use as an ornament, it underwent the operation of that universal law by which ornament forms lose in time their original significance and receive new and diverse applications. In historic Egyptian ornament the lotus appears simply as a flexible and useful decorative device; just as to-day we use the shield, ox skull and garlands without reference to their original Roman symbolism, purely for their decorative value; or as we take the symbolism of the dolphin, or even of the cross, as an excuse for a desired decorative combination. Four-fifths, perhaps nine-tenths, of the ornamental patterns of Egyptian art are based on the lotus. Its symbolism does not sufficiently account for this. The real reason for this extraordinary vogue of a single motive is found in the decorative possibilities of the type itself.

The blue lotus (*nymphæa cærulea*) of the Nile is a species of water-lily having four green calyx leaves at the base of the flower and a mass of delicate blue petals of a slightly pointed outline (Fig. 8). Looked at in side elevation, two or three of the green calyx sepals are visible, partially enclosing the spreading mass of bluish petals. The Egyptian designers interpreted this aspect, as was their wont, by a conventional presentation, in which two lateral and one central sepal, generally but not always colored green, formed the most striking feature; the petals—blue or white—ap-

Fig. 8. Egyptian blue lotus.—From nature.

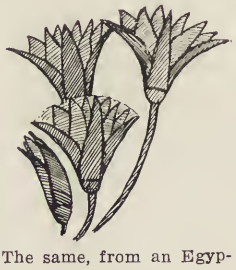


Fig. 9. The same, from an Egyptian painting.

pearing in two groups each of three, or rarely seven, in the spaces between these sepals. The bud was always ovate, pointed at one end, and rarely if ever showing any separation between the closed sepals. Fig. 8 shows the lotus as it appears in nature; Fig. 9, a semi-conventional picture of the same from a temple-painting; and Figs. 10, 11, 12, 14, 26 and 45*a*, various examples of the conventional lotus in borders and all-over patterns.

Now, the flower thus presented contains two decorative elements

of pregnant importance. The first is represented by the three sepals, and may be called the trident or trefoil motive; it consists of three strokes, either straight or curved, diverging from a common nucleus at the end of a stem (Fig. 13*a*). The second is represented by the sepals and petals together; it consists of a bunch or bouquet of

Fig. 10. Egyptian lotus-pattern; unusually naturalistic form.

Fig. 11.* Egyptian lotus-pattern; from a tomb.

Fig. 12. Egyptian lotus-pattern; from a tomb.

Fig. 13. Ornament motives from the lotus.

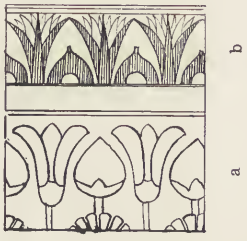


Fig. 14. Egyptian lotus-patterns: a, three-leaved form; b, ordinary form. Showing genesis of "egg-and-dart" motive.

diverging lines—straight or curved—radiating from a common point, or springing from a common nucleus (Fig. 13*b*, *c*). These two motives differ apparently in nothing but the number of diverging strokes; yet they are the types of two entirely distinct, though constantly associated, categories of ornament forms, persisting, with frequent reversions, through all the ages to our own. It took many centuries to develop their respective possibilities into clearly distinct types, and all the centuries since have failed to produce anything that could wholly supersede them.

*A number of the lotus patterns shown have been inverted from their actual position for better comparison.

IV.

Let us trace in a summary way a few of the episodes in the history of the trident or trefoil motive. Its origin is plainly to be found in the accentuation of the radiating green sepals of conventional lotuses, as in Fig. 11, Fig. 14*b*. In process of time, as the lotus came to be treated less and less pictorially, more and more as a mere decorative form, the petals were subordinated and finally suppressed (Fig. 14*a*, Fig. 15). A new decorative form had come into being, and the original lotus-origin was easily forgotten or ignored. The simplified form was still occasionally used, however, to represent the lotus as an amulet or symbol, rather than as a mere ornament; the most famous example is that on a stele in the sanctuary at Karnak, already mentioned (Fig. 7).

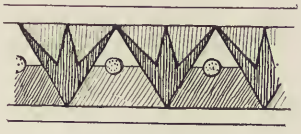


Fig. 15. Geometric pattern derived from the three-leaved lotus.

Fig. 16. Anthemion pattern, from Greek pottery. The same pattern was used as painted ornament on the Parthenon, 5th century B. C.

But it was in other lands that this trefoil motive received its widest applications. In Greek pottery, for instance, a large proportion of the painted anthemion bands show three-leaf motives separating the anthemions, in which we clearly recognize the trident lotus motive (Fig. 16). Moreover, the Greek egg-and-dart ornament, with its derivatives, the heart-leaf and water-leaf, is made up of juxtaposed trefoils or tridents, separated by oval masses called *oves*. The original motive is shown in Fig. 17, and its relation to the lotus tridents is clearly shown by comparison with Fig. 18, and with the earlier Figs. 11, 12 and 14. In these we find the lotus-bud, originally used, both in jewelry and in ornament, to alternate with the full blossom, at last superseded by wholly heterogeneous and irrelevant forms—bunches of grapes in Figs. 11 and 18, nondescript forms in Figs. 12 and 14. This species of inchoate egg-and-dart

Fig. 17. Type of egg-and-dart decoration.

Fig. 18. Egyptian lotus-border, showing egg-and-dart motive with frame or "shell" of egg treated as an independent feature.

ornament occurs not infrequently in Egyptian art. The Greeks seized upon the idea, rejected or ignored its original meanings, joined together the adjacent lateral strokes, painted in the ove—the lotus bud—with a single sweep of the brush, leaving the core blank, and made the units consist of the ove and the two adjacent lateral strokes forming the "shell," thus suppressing for a time the individual trefoil or trident motive (Figs. 19, 20).

Nearly all the other Greek moulding ornaments are derivatives of the egg-and-dart motive, modified in accordance with the great principle discovered or first systematically applied by the Greeks, by which the elements of decoration on a moulding reproduce approximately its profile. Thus for the cyma-reversa the ove was

Fig. 19. Painted egg-and-dart motive from Greek pottery.

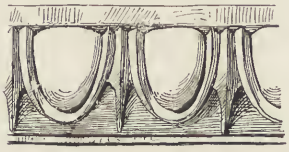


Fig. 20. Carved egg-and-dart moulding, from Erechtheum, 5th century B. C.

Fig. 22. Rhodian vase-ornament: lotuses and buds, 6th or early 5th century B. C.

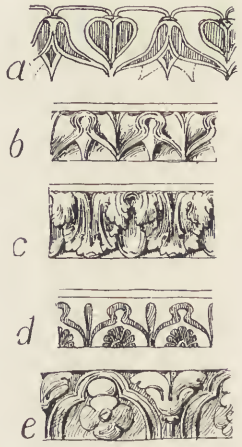


Fig. 21. Moulding ornaments based on egg-and-dart motive:

a, Rhodian lotus-border, from vase, inverted; to compare with b.
b. Carved Greek heart-leaf or water-leaf moulding. From Erechtheum.
c. Typical Roman carved water-leaf moulding, treated with acanthus-leaves.
d. Greek moulding ornament; painted terra-cotta; to compare with e.
e. Late Roman moulding: Arch of the Silversmiths.

given a leaf-like form (Fig. 21*b*), and the leaf provided with a midrib, probably a survival of the cleft between the sepals of the bud which originally alternated with the lotus. This is suggested by the inverted ornament, Fig. 21*a*, a simplified drawing of an actual Rhodian pottery lotus border (Fig. 22) of the sixth or fifth century, B. C., where the lotus-bud has been converted by the Rhodian painter into a heart-shaped leaf. Strong as is the resemblance between *a* and *b* in Fig. 21, it is due to a fortuitous reversion only. The pottery border *d* in the same figure is possibly derived from old patterns like *a*, but it is more likely an application to pottery of mould-

ing patterns, or at least a derivative from them. It illustrates a curious transformation. The "dart" or down-stroke, instead of starting from the loop between the two heart-leaves to form with the adjacent edges of two leaves the trefoil or trident motive in which the whole pattern had its origin, has been here, for decorative reasons, set in the middle of the leaf—perhaps as a survival of the midrib; and the vacant spaces between the leaves are occupied by half-rosettes. This really inverts the pattern, which, taken upside down, is a fairly good egg-and-dart pattern. No less singular than the accidental resemblance between *a* and *b* is that between *d* and *c*. This last is a very late Roman carved moulding from the Arch of the Silversmiths. In this every feature of the original heart-leaf decoration has been forgotten or ignored. The broken curve of the cusped frames no longer reproduces the profile of the moulding. The original ove, and its next of kin the water-leaf, are replaced by a meaningless stalk and blossom, curiously reverting towards the trefoil or fleur-de-lis type of the lotus in Fig. 7, while the interleaf spaces have, instead of the "dart" of *b*, or the tongue-like intermediate leaf in *c*, a rosette of clumsy design recalling the half-rosettes in *d*, and evidently inserted with a like motive. Seven centuries separate *d* from *c*. The pattern *c* is an example of the enrichments applied by the Romans to the water-leaf motive as a carved moulding ornament; it was

Fig. 23. Roman water-leaf moulding, from Pantheon: (probably from earlier Pantheon, 27 B. C., re-use in present structure.)

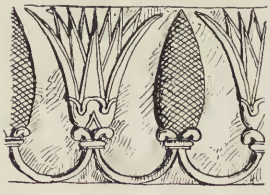


Fig. 24. Assyrian lotus-and-pine-cone motive, from Koyanjik.

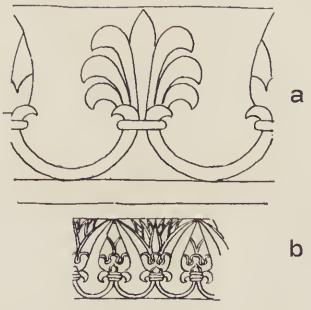


Fig. 25. Assyrian borders: a, palmette ornament with lotus-buds, from Khorsabad; b, lotus-and-bud ornament.

converted, like nearly everything else, into an acanthus-leaf, whose midrib and diverging carved pipes and veins reproduce the movement, though not the forms, of the elementary lotus-and-bud motive of Fig. 17. Fig. 23 is a Roman water-leaf moulding from the Pantheon, of very Greek character.

The egg-and-dart or lotus-and-bud motive was a favorite pattern in Assyrian art, in which it is found both painted on tiles and plas-

ter, and carved in low relief (Figs. 24, 25b). The lotus bud was often replaced by or assimilated to a pine cone (Fig. 24), illustrating a very common phenomenon in ornament history: it frequently happens that a motive, derived from a foreign art, is by the artists who adopt it in their own art remodelled into resemblance to local, familiar, or already-existing national types, completely alien to its original significance. The egg-and-dart may be traced through early Christian and Byzantine art, and in Italy it is met with in works dating from every century through the Middle Ages down to our own time, principally in mouldings. In Germany, along the Rhine, and in the south of France it is recognized as late as the latter part of the twelfth century. Elsewhere in Europe it vanished before the naturalistic foliage-work of the lay-builders and later Gothic carvers. But the Renaissance once more restored it to the arts, and it seems destined to persist for centuries yet. The simple trefoil, by reason of its very simplicity, must find application in all ages. A few examples will be recognized in the early mediæval carvings, Figs. 48 and 50.

V.

The second type of ornament-forms furnished by the Egyptian lotus was that of the bouquet of diverging lines springing from a common nucleus (See Fig. 13*b*, *c*). Although, at first sight, this seems like a mere elaboration of the trefoil motive, it is in fact radically different and capable of vastly wider decorative applications by the very fact that its component parts are not limited to three. Moreover, the tendency with the three-stroke motive seems always to have been to subordinate the lotus itself to the buds or other intervening forms, and to make of these the axial units of the decoration, as in Figs. 18 and 20. The second and more complex motive, on the other hand, could not be thus subordinated and divided up between its alternating or accompanying forms, and we find it throughout maintaining its identity far more completely than the trefoil motive. It is most commonly associated with spirals or volutes; it springs in most cases from a nucleus wedged between two spirals more or less developed (Figs. 5, 16, 24, 25*a*, 26, 27, 40 and others). The decorations from Egyptian tomb ceilings, of which Fig. 26 is one, are, perhaps, the oldest examples of this association of the spiral with the multiple diverging lines of the lotus. But the spiral was not a favorite or typical motive in Egyptian art, nor did the Egyptian decorators ever shake off their conservatism to the point of developing the endless possibilities of this combination. This was reserved for the Greeks, although the Assyrians had taken the first steps in this development, and produced in such border designs as Figs. 24, 25

and 27, very important decorative modifications of the multifoil lotus motive.

The two chief Assyrian improvements on Egyptian practice were: first, the elaboration of the lotus into a more complex and more purely decorative ornament; secondly, the application to its petals of the principle of approximately tangential diverging curves (the type in Fig. 13*b*); and, lastly, the connection of all the units of the pattern into a continuous design by curved bands linked together and ending in spirals meeting under each unit. Comparing Figs. 24 and 25 with 11 and 12, the superiority of the Assyrian examples in organic connection and completeness is very marked.

Fig. 26. All-over lotus-pattern, from Egyptian tomb-ceiling.

Fig. 27. Assyrian palmette ornament.

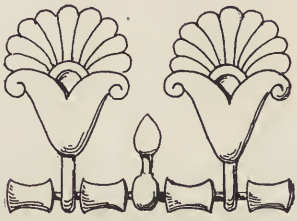


Fig. 28. Egyptian "lotus-palmette." (Fig. 6 repeated.

This motive, however, remained comparatively sterile so long as it was confined to the lotus type. It required the invention of the *palmette* to give it permanent vitality. The true theory of the origin of the palmette has been pretty conclusively established by Mr. Goodyear, as already observed on page 30. There appears to be no evidence of the direct evolution of the palmette from the lotus, simple as is the transformation which this would require. The "lotus palmette," as Mr. Goodyear calls it, was a combination of the simplified three-leaf lotus with a half-rosette (Fig. 28). For decorative reasons the central sepal or leaf was nearly suppressed, and the two lateral sepals curled into volutes. The germ of this transformation is shown in Fig. 7 (page 30). The lotus had in this shape wholly lost its symbolism as a *lotus*, and become a conventional amulet and ornament. In this new combination it was much used in jewelry and in decoration, and passed into the ornament of all the Mediterranean populations. We find it contemporaneously in Cypriote, Phœnician and Assyrian art. Fig. 29 is a Cypriote lotus from a vase, showing the tendency towards emphasis of spiral or volute forms

in the lateral sepals; and the same appears in the inverted *branched* lotus engraved on the bronze stele from Cyprus in Fig. 30, showing manifest Assyrian influence. Fig. 31 is an Assyrian, 32 a Phœnician, example of the same; Fig. 33 is from a Greek vase, presumably archaistic, reproducing the motive with an affectation of Asiatic character; and Fig. 34 shows another variation—at *a* a Cypriote prototype with the volutes curled upwards (compare with the Assyrian palmette, Fig. 27); at *b* an early Greek modification of it from a vase. Figs. 25 and 27 present the two finished types into which it was developed in Assyria, one retaining its resemblance to the Assyrian rosette with chevrons of black and yellow, the "recurved

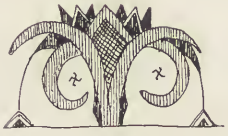


Fig. 29. Cypriote lotus, with voluted sepals. (After Goodyear.)

Fig. 31. Assyrian lotus-palmette ornament.

Fig. 32. Phœnician lotus palmette ornament.

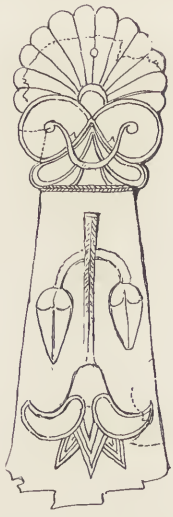


Fig. 30. Cypriote bronze stele, with inverted branching lotus and lotus-palmette capital.

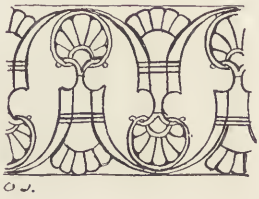


Fig. 33. Archaistic Greek vase ornament, reviving Oriental lotus-palmette type.

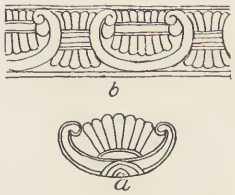


Fig. 34. a. Cypriote lotus-palmette with up-turned volutes. b. Early Greek vase-ornament.

sepals" at the base converted into horns having no significance whatever; the other, suggesting more closely the Greek "honeysuckle," has no nucleus at the base, and the "recurved sepals" or volutes are replaced by the curled-over linked bands that tie the whole together (Fig. 25*a*).

Precisely by what chain of developments the palmette motive reached Greece is not capable of exact demonstration, because of its widespread use throughout the Mediterranean countries. Cypriote, Phoenician and Assyrian art and commerce, direct influences from Egypt, the early pottery of Melos and Rhodes, all had probably a share in acquainting the early Greek artists with this motive. Once apprehended, its marvelous possibilities were developed by the Hel-

lenes with a constant and unswerving eye to decorative effects. The process of development is chiefly to be traced on pottery, and the influence of the *technique* of execution appears very plainly in the process, though we have not here the space to follow out this influence. Its main result was to strongly differentiate the two types of the motive which we have already observed in Assyrian ornament, and then combine them into running patterns or borders in which the contrasted types alternated with admirable effect (See Fig. 13*b*, *c*, Fig. 25*a*, Fig. 27 and Fig. 16; also Figs. 35 and 37). The type of

Fig. 35. Greek anthemion band, with "frame," volutes and "lotus-trefoil" motive: from a vase.

Fig. 36. Greek vase-decoration: anthemions and S-scrolls.

Fig. 25*a* retained always a certain resemblance to the lotus, sometimes with three, sometimes with five or even seven leaves. This ornament in Greek pottery and architecture generally has sharply-pointed slender blade-like leaves, and these in many cases are drawn as though the lower ones partly swathed the next pair, and these, the next, like many stiff-bladed palm-like and grass-like plants; the suggestion being probably drawn from the familiar plant life of Greece. The palmette, on the other hand, was painted with blunter and more closely crowded leaves, very often in later examples treated with double curvature and framed by the adjacent lotus-like forms, as in Fig. 16. The suggestion of a frame produced by these adjacent lateral leaves enclosing the anthemion, was adopted frankly and led to the frequent surrounding of the anthemion or palmette by a wholly independent frame, as in Figs. 2 and 35.

Meanwhile the Assyrian idea of organic connection of the repeated units of design by linked curves ending in spiral volutes—a feature strongly if not exclusively Assyrian—also received in Greek hands a new and remarkable development. With their quick perception of intrinsic beauty of forms the Greek artists realized the value of the spiral, and added to it a new element, the so-called "line of beauty" or S-line. This combination was not unknown to the Egyptians, as proved by patterns like that of Fig. 26. But it remained unproductive and sterile with them; its endless possibilities and its almost measureless decorative value seem to have passed almost unnoticed or ignored. It was a peculiar attribute of Greek artistic genius that it seized upon elements of beauty previously neglected in familiar motives, and pursued their development to the

highest attainable perfection. So it was with this simple combination of the line of double curvature terminating in contrary spirals, with the palmette-and-lotus motive. The substitution of this line for the uniform upturned curves of the Assyrian lotus bands effected a revolution in ornament. The volute became a favorite terminal ornament, and was used to finish the ends of anthemion frames (Fig. 35). Thus were developed all the elements of Greek anthemion decoration; the alternating lotus and palmette forms, the spirals from between which they spring, the S-scrolls which connect them, and the frame around the anthemion; Egyptian, Cypriote, Assyrian, Phœnician, Ægean elements persisting and amalgamating into the perfect Greek product. Reversions are common, not only in decorative returns toward the lotus and lotus-bud, but in other combinations. Fig. 36, for instance, by its alternate inver-

Fig. 37. Carved anthemion-band from Erechtheum.

sions of the same anthemion approximates to the motive of Fig. 26. A similar reversion occurs in mediæval carving, derived from Byzantine imitations or unconscious reminiscences of Greek motives, as in Figs. 48 and 49.

Another great contribution of the Greeks to decorative art was the systematic adoption and development of architectural carving. The painted moulding-ornaments of the Doric order were in the Ionic replaced by carved versions of the same general forms. The antefixae of painted terra cotta, the painted earthenware eaves-gutters, crestings and acroteria were similarly replaced by carved counterparts in marble. Richness in the play of light and shade was substituted for brilliancy of color, and the result was a progressive elaboration of the forms derived from painted decoration. This fundamental change in decorative methods seems to have been first effected in Asia Minor; it was carried to Greece in the Ionic order and profoundly modified the traditional Doric order in matters of detail during the fifth century, and may be said to have revolutionized architectural art. Form, light and shade, rather than color become the theme of decoration applied to architecture. The anthemion motive was not abandoned but enriched by fluting the S-scrolls, modelling the anthemion-leaves in relief in the most delicate and subtle manner, and adding as a subordinate feature

leaves of acanthus at the branchings of the minor scrolls (Fig. 37). But its most effective application was to the heads of steles or memorial columns. The prototypes of these are found in Cypriote art (See Fig. 30), and in the antefixae and acroteria of temples (as, for instance, Fig. 5); in the stele-caps the type was greatly elaborated and enriched with branching scrolls and acanthus leaves, as shown in Fig. 38.

In Roman art, which adopted bodily all the elements of Greek ornament and subjected them to further elaboration, the anthemion

Fig. 38. Carved stele-cap from Athens.

Fig. 40. Roman carved anthemion frieze. Forum of Nerva(?).

Fig. 39. Late Etruscan terra-cotta border.

Fig. 41. Roman carved frieze, with framed anthemion.

plays a less important part than in the Greek. Late Etruscan terra cotta friezes like those of the Campana collection in the Louvre, show apparently a survival of very primitive versions of the motive, of a quite Asiatic aspect. This is illustrated in Fig. 39, which at once recalls the Assyrian example in Fig. 27, belonging to a period at least five and perhaps seven centuries earlier. The enclosing frame of the Etruscan example, however, seems to prove its Greek derivation, and to stamp it as an unconscious reversion to the ancient type, or a case of traditional persistence. This persistence of the Oriental and primitive type is also illustrated by the "lotus-palmette" motive in Fig. 62 (which compare with Figs. 31 and 32). True Roman art, however, exhibits none of this archaic or archaistic crudity. Figs. 40 and 41, representing fragments from the Forum of Nerva, show the manner and spirit in which the Romans elaborated and complicated the simple Greek anthemion. The acanthus leaf reigns supreme, and the aspect of the trefoil lotus motive, as well as of the anthemion itself, is completely changed.

VI.

The Middle Ages introduce us to a new era in art. Christian symbolism, the gradual extinction of Roman civilization and the decay of its monuments, the direct recourse to nature for suggestions and models of decorative form and the coming up of wholly novel aims and requirements in architecture, all tended to suppress if not exterminate classic types in ornament as well as in structural art. Yet even in fully developed Gothic art we encounter from time to time surprising instances of the persistence of these types, Figs. 42, 43 and 44 are clearly recognizable versions of the anthe-

Fig. 42. Late Romanesque frieze: type of framed anthemion.

Fig. 43. Transitional early Gothic carving, from Halberstadt Choir. Early 13th century.

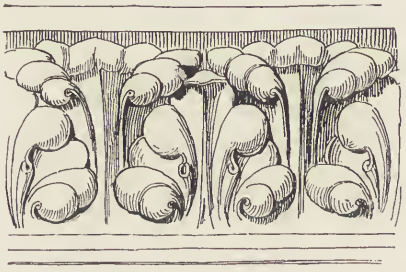


Fig. 44. Carved moulding from triforium of Notre Dame, Paris. Early 13th century.

mion motives of Greek and Roman art. The diverging lines or lobes of the larger leaves, the enclosing frame, the linked spirals or volutes connecting the units, the alternating three-part leaves, tall and spreading like the lotus trefoils of Fig. 16 or their elaborate Roman counterparts in Fig. 40, are all survivals of the various characteristic features of typical classic anthemion compositions. These survivals are traceable, first, through Byzantine carved ornament, then through the various Romanesque styles into Gothic art. In Southern France and in Italy, the abundance of Roman monuments exerted a powerful direct influence over early mediæval art, and in Italy this influence continued all through the Middle Ages, as already observed on page 36.

Byzantine carving is flat, thin, sharp and dry. It is rather a frosting of the surface with intricate patterns than carving in the ordinary sense. The background is reduced to a minimum, and there is no high relief or strong massing. It is essentially surface decoration by incision, and is capable of rich and effective results within its lim-

Fig. 45. Byzantine carved moulding.

45a. Egyptian lotus-band: compare with 45.

Fig. 46. Early Arabian pattern, from Ibu-Touloun, Cairo, 976 A. D.

Fig. 47. Byzantine cross-patterns with anthemion-treatment: a, from St. Sophia, 538 A. D.; b, from St. Mark's, Venice, 10th century.

Fig. 48. Framed anthemion pattern from St. Mark's, Venice.

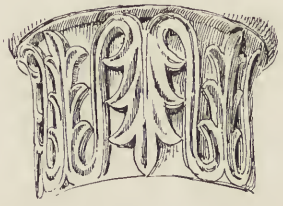


Fig. 49. Byzantine capital: compare with 36.

Fig. 50. Vaulting-boss from Boxgrove Church, Sussex. 13th century.

Fig. 51. Vaulting-boss from Boxgrove.

ited field. Its motives are Roman in origin, Greek in treatment. The acanthus leaf seems to have furnished the basis of most of the designs; it was generally carved as a perfectly flat leaf, without ribs, pipes or curled-over ends; the lobes were all sharply-pointed without subdivisions, and the leaf was fluted with V-section flutings, one

to each lobe (Figs. 45, 47, 48). The points of the lobes of one leaf were made to fit against the stem or side of the next one. This method of carving the acanthus resulted in combinations of line singularly like those of anthemion motives, and it is possible that some surviving tradition of the anthemion lingered to blend with the universal acanthus leaf, so that it is often hard to tell which of the two forms the designer had most in mind. When such leaves were combined with the symbolic cross to fill a circular or square panel the result was a reversion, perhaps conscious, more likely unintended, towards the framed anthemion (Fig. 47 *a*, *b*). The alternation of large and small leaves in Fig. 45 is itself an interesting though wholly accidental reversion towards the Egyptian pattern shown in 45*a*, in which a small three-leaved lotus alternates with a large many-leaved lotus. Fig. 45 shows how the idea was copied from Byzantine art by the presumably Coptic artificers of the Mosque of Ibn-Touloon at Cairo (*cir.*, 976 A. D.). This version of the lotus trefoil with incised diverging veins or flutings is not uncommon in early Arabian art. Other varieties of the anthemion are recalled by Byzantine acanthus-leaf carvings, as, for instance, in the capital, Fig. 49, reproducing the motive of Fig. 36 with a lank and sprawling acanthus instead of the anthemion or lotus. In Fig. 48, from St. Mark's, we have the framed anthemion type with small trefoils separating the units, over a row of trefoil acanthus leaves. In this example, moreover, we note the persistence of the divided anthemion, two half anthemions separated by a space without the central leaf: a type especially common in Attic stele-heads of the fourth century B. C., and illustrated in Fig. 38. This feature is not uncommon in Gothic carving, as is seen in Fig. 50, a boss from Boxgove church, Sussex, dating from the thirteenth century. Another boss from the same church (Fig. 51), is strikingly like the cross-patterns from St. Sophia (Fig. 47*a*), dating from the sixth century, and St. Mark's 47*b*), of the tenth or eleventh century. Fig. 52 shows a

Fig. 52. Carved moulding from Hersfeld, Germany. Late 12th century.

German Romanesque derivative from Byzantine motives like that of Fig. 49. It might almost be taken as a carved copy of certain Greek pottery-bands of the type of Fig. 36, while at the same time it irresistibly recalls the Egyptian pattern of Fig. 26. This last re-

semblance is a case of accidental reversion; the resemblance to Greek pottery patterns is probably due to persistence of a decorative idea, not of the specific type; for the five-foil leaves that fill the heart-shaped spaces are demonstrably derivatives of the acanthus, rather than of the anthemion. Another curious case of accidental reversion towards Egyptian types is furnished by Figs. 53 and 54;

Fig. 53. Modified Egyptian form of lotus-palmette. (After Goodyear.)

Fig. 54. Byzantine cross with cypress-trees. From Baptistery of Cindals; 8th century.

Fig. 55. Rosette and trefoil pattern: canopy of open-air tomb, Bologna.

a

b

Fig. 56. Italian Byzantine framed anthemion motives: a, from Torcello, 1108 A. D.; b, from demolished church of S. Marco dei Partecipazi, Venice, 829 A.D.

the first, an Egyptian motive, derived perhaps from the lotus-palmette; the second, a detail from the ancient Baptistery at Cividale (eighth or ninth century), in which the cypress trees flanking the cross are crude variations of the common Byzantine acanthus, treated like an anthemion.* Figs. 55 and 56 are Italian Byzantine details, illustrating the persistence of the trefoil and anthemion motives; the latter being reduced in Fig. 55 (from Bologna, eighth

Fig. 57. Rhenish-Byzantine anthemion-acanthus motive. Reichenaw, 12th century.

Fig. 58. German-Romanesque frieze, 13th century.

Fig. 59. German-Romanesque pier-capital from Gelnhausen, 13th century.

century) to a half rosette, while the trefoil is almost a lotus once more. In Fig. 56 we have two curious and crude, but decoratively

*The cypress as a symbol of burial is not uncommon in Byzantine baptisteries and churches of the VIIIth-XIth centuries in Venetia. Baptism was regarded as a mystical burial of sin and of the "old man with his works;" hence the funereal symbols.

effective, versions of the framed anthemion (Torcello, early eleventh century, and Venice, ninth century). These should be compared with Figs. 48, 42, 39 and 2. Figs. 57, 58 and 59 are from German (Rhenish) Romanesque buildings, and are strikingly suggestive of Greek motives. Yet they date as late as the thirteenth century! Byzantine traditions were held to with singular tenacity in the Rhine Provinces, where they are sometimes found, almost unchanged, in association with the pointed arch and Gothic vaulting of the thirteenth century.

VII.

The heart-shaped form produced by the juxtaposition of opposed S-scrolls with voluted terminations was never developed into an independent decorative motive. But the S-scroll itself occurs so frequently that we should expect to find, as we do, occasional examples of the heart-form or lyre-form in all periods. We have already encountered it in Egyptian ornament (Fig. 26) and Romanesque ornament (Fig. 52), not as an independent motive, but as an incidental detail of the decoration. It came nearest to an independent development during the later Romanesque and early Gothic periods.

Fig. 60. Ornament from a mediaeval manuscript.

Fig. 61. Detail from stained glass window, Canterbury Cathedral, 13th century.

In combination with the five or seven-lobed leaf (as in Fig. 52) it is not uncommon in mediæval MSS. illuminations, as a border (Fig. 60), and in stained glass decoration of the thirteenth century. In combination with the idea of the framed anthemion it underwent a new development in the exaggeration of two of the lobes or leaves of the anthemion, which were extended behind and beyond the frame and curled over so as to partially enwrap it. This motive, common in late Romanesque carving, especially in the Rhine valley, is also frequent in stained glass, of which we give an example from Canterbury in Fig. 61.

The lyre or heart-motive is not common in classic ornament, except in late Etruscan work. There are many examples of it in the Campana terra cottas. One of these is given in Fig. 62, and furnishes an interesting example for comparison with the next figure,

taken from the stucco-work on one of the piers in the court of the Palazzo Vecchio at Florence and dating from 1565. Seventeen centuries separate these two motives, with no continuous chain of connecting links between them. We have here a case of fortuitous re-

Fig. 62. Detail from terra-cotta frieze: Campana Collection (Louvre.)

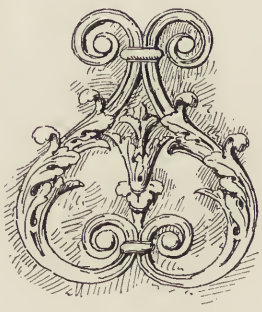


Fig. 63. Stucco decoration from piers in Court of Palazzo Vecchio, Florence, 1565.

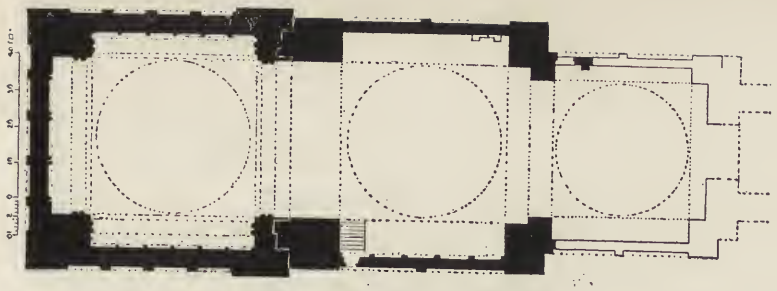
version, due merely to the employment of the same S-scroll by designers of different ages.

I have not otherwise touched upon the Renaissance; first, because it repeats classic motives to so great an extent; and, secondly, because the field is so vast. The changes, modifications, and imitations of and reversions to classic themes are endless, and this paper has already reached or exceeded its proper limits. In another article I propose to trace the history of the branching scroll-motive called by the French the *rinceau*, and for which we have no specific name in English. It involves a study of the vine pattern and the acanthus, extending, like that of the anthemion, from Egyptian art to modern times, and offers to our attention phenomena no less curious and instructive than those we have observed in connection with the lotus and palmette motives.

A. D. F. Hamlin.

Fig. 64. From an early Greek vase.

THE OLD SOUTH BUSHWICK REFORMED CHURCH, BROOKLYN.



Plan of S. Étienne, Périgueux.

FRENCH CATHEDRALS.—PART XV.

THE DOMED CATHEDRALS. II.

THE CHURCHES, S. ÉTIENNE AND S. FRONT, PÉRIGUEUX.

I.

OF the ancient cathedral of S. Étienne de la Cité of Périgueux, only one of the three primitive bays remains. The easterly bay dated originally from the XII. century, but it was so thoroughly ruined by the Protestants that its restoration in the XVII. century amounted practically to a complete rebuilding on the lower fragments. The western bay has wholly disappeared, except for some fragments that are still attached to the present west wall, which at once makes clear the original plan and enables one to understand the construction of the domes with which all the bays were covered. Beyond this ruined bay was once a tower, that an engraving published in 1575 tells us closely resembled the tower of S. Front.

The misfortunes that have attended this church were chiefly due to the Protestants in the XVI. century. This is the more to be regretted since S. Étienne is one of the simplest and earliest of the domed churches in Aquitaine, and in its original form would have been a monument of great interest. It was dedicated on the 21st of March, 1047, by the archbishop of Bourges, who, on the same day, also dedicated the abbey church of S. Front in Périgueux—a church whose relation to the present church of that name will be discussed presently.

The single early bay that has survived to our time is a structure of very primitive form. Externally its north and south walls are divided into two parts by shallow piers and arches, utterly devoid of ornamental detail. This treatment does not appear within, where the lower part of the walls is decorated with a simple round arched arcade, with two round topped windows above and a small circular window between them near the apex of the arch on which the dome

S. ÉTIENNE, PÉRIGUEUX.
(West front.)

S. ÉTIENNE, PÉRIGUEUX.
(From the northeast.)

is carried. The arcade is now covered with elaborately carved wood altarpieces that once formed the high altar of S. Front. The dome is supported by four deep unmoulded pointed arches, that between the two bays being of great thickness. The construction of the pendentives of the dome, as shown by the fragment adhering to the west wall, is rude and irregular, in very striking contrast with the carefully laid courses in the domes of S. Front, and a valuable piece of evidence tending to show that the date of S. Étienne, 1047, is much too early for the careful work of the greater church, and that, therefore, the building we now know as S. Front could not have been the church dedicated in 1047.

Of the eastern bay, which was rebuilt in the XVII. century, there is little to be said save that, for its time, it is a really remarkable at-

TRANSVERSE SECTION OF S. ÉTIENNE, PÉRIGUEUX.

tempt to reproduce a design of the XII. century. Its general style approximates that of the ancient bay; but its proportions are lighter and higher; its piers are decorated with slender applied columns; its three windows in the upper part of the walls are enclosed within architectural frames; the arches of the dome are moulded, and the dome itself considerably higher than the western dome. Externally, also, the walls are treated in a more elaborate manner, with slender piers and moulded arches.

Notwithstanding its small size the exterior of this church is highly characteristic. The western bay is covered with a very flat pointed roof, from which rises a low circular drum, that, in its turn, is surmounted by a flat conical dome, covered with tiles, and carrying a

small colonnaded lantern on the apex. The roof of the eastern bay is similar, but there is no gable. It is a somewhat remarkable fact that while we must believe all the domed churches of France to be more or less closely related to each other; while it cannot be questioned but that each successive church is a derivation from its predecessor, all of the domed cathedrals have an intense individuality of aspect, both within and without. The cathedral of S. Étienne at Périgueux is no exception to this rule. Its plan does, indeed, approximate that of the cathedral of Cahors, but in its appearance it bears no resemblance to that structure. This arises, of course, in large part from its small size, and the very abrupt form of its general outline; but the domed churches in France of the XI. and XII. centuries are much more individual in their appearance than the domed churches of the Renaissance, perhaps even more individual than the Gothic churches. One cannot regret the expansion and development of the Gothic style, but a continued evolution and progression of a domical form of church building could not have been otherwise than attended with many interesting developments.

II.

No one visits Périgueux for the purpose of seeing the little old cathedral of S. Étienne; but its chief building, the vast cathedral of S. Front, dominates the city and concentrates interest in it, as it raises its lordly walls above the River Isle. It is a church not only great in size and noted in history, but the very strangest church in all France, an exotic growth from the east, in some senses of the word, planted in the far west where, of all places, such a structure could scarcely be looked for. Yet it stands in a region dotted with domical churches, itself the culmination, the most remarkable of them all. No other church more strikingly illustrates the individuality of the domed churches; and certainly few have excited wider controversy or been the subject of more heated discussion.

The initial fact in its history is that no one knows when it was built. No one knows, though many have put forward theories and suggestion without end. It is needless to review these theories here, for not a few of the most probable have, by later analysis and research, been found wanting in probability and accuracy; it will be sufficient to summarize the ascertained facts and to draw from them such inferences as may seem both reasonable and capable of historic support.

That there have been at least two great churches dedicated to S. Front on or at the site of the present church admits of no doubt. The latter of these is the one we now know as the cathedral of S. Front; the earlier, generally called the Latin church as expressive of

its early date, still survives in fragments of its west wall, encased in the walls of houses to the west of the cathedral, and parts of which are also known to be contained within the base of the great tower, as well as in two confessionals that still adjoin the walls of the western arm of the present cathedral. It is possible to reconstruct from these portions the plan of a church that preceded the present structure.

The difficulty with this older church is not its form, its plan, its architectural character, all of which we know with considerable definiteness, but with its date. Which of the earlier churches of S. Front is it? Its date once known, the chronology of the existing cathedral becomes a matter of great simplicity. A few dates are essential to the discussion of this point. In 991 S. Froterius, bishop of Périgueux, was buried in S. Front; in 1000 his successor Martin was also buried there; and in 1031 Raoul de Couhé, who succeeded him. A church of S. Front, therefore, existed in Périgueux in 991, and must have been begun some years earlier. We must look to S. Mark's in Venice as the model from which the plan and design of the present cathedral were derived. The plans of the two churches so closely approximate each other, and, moreover, are so striking and individual, that no other conclusion is admissible. Further, a colony of Venetian merchants settled in the neighboring city of Limoges in 988, though the influence of their native city which they brought with them could scarcely have brought about the designing and erection of so large a church as the present S. Front, ready for burials, as early as 991. Recent research has developed the fact that S. Mark's in Venice is not earlier than 1063, when its rebuilding was begun by Doge Orseolo; by 1120 it was practically built and the panelling of the walls with mosaic and marble had made much progress. It had become one of the wonders of the world and was already enjoying the celebrity it has had from the day of its beginning. In 1120 the monastery of S. Front was burned with all its ornaments, the bells of the tower being melted in the fire. "At that time," says an ancient account," the monastery was covered with timber roofs."

It has been argued that this refers to the monastery only, not to the church; but this refinement of identification is one that would have occurred to a modern writer only, and is not of great value. The plan of the older church to the west of S. Front is exactly that of a church roofed with timber, and its date is certainly prior to 1120. The pendentives and domes of the present church are built with the utmost nicety and care; unlike many of the early domes, as those of S. Étienne, their construction was not concealed behind plaster. The domes of S. Front, in fact, mark the culmination of dome building in France, and it is quite impossible, in view of the facts that have been

briefly stated here, to admit that the church dates from the closing years of the tenth century. It is impossible to resist the conclusion that the present cathedral of S. Front was begun after the conflagration of 1120, and that year may, therefore, be taken as the date of its beginning. With this date as a starting point, the present splendid edifice ceases to be an archæological enigma, and assumes a natural place in the chronology of architecture. Its extraordinary form and the grandeur of its dimensions must always create astonishment in the mind of the spectator; but it should no longer be necessary to regard its origin as an unsolved riddle.

The visitor to S. Front sees before him one of the most magnifi-

S. FRONT, PÉRIGUEUX.
(View from the northeast.)

cent and most striking churches in Europe. Its high walls, surmounted by a group of five domes, its singular stepped tower, its general aspect, produce an ensemble not readily forgotten. Within it is almost overwhelming in its effect; with its great piers and arches, its lofty domes of enormous size, at once so great and so audacious in their structural significance and architectural impressiveness. Its dimensions are monumental, 120 metres long and more than 120 metres wide, including all outer parts. Within and without everything is in spick and span order. Every surface is true, clean, smooth and white; every moulding is perfect, every arch solid and

S. FRONT, PÉRIGUEUX.
(South Transept and Domes.)

S. FRONT, PÉRIGUEUX.
(View of the Domes.)

firm. There is no hint of age, no suggestion of a stormy history in this astonishing interior or this singular exterior; everything is as though it had been built no later than yesterday.

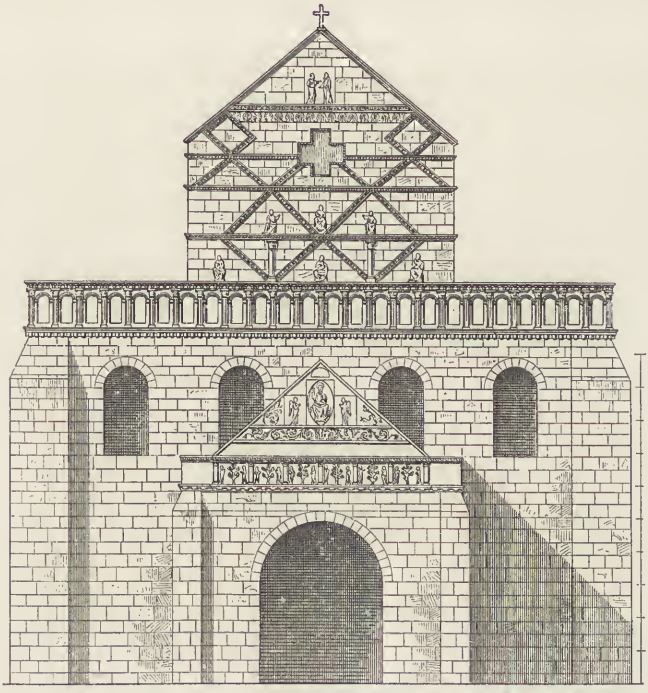
And the truth is not far from this; for the cathedral of S. Front is one of the archæological and architectural scandals of modern France. A church much as we see it to-day was built about 1120 and suffered depredations under the Protestants in 1575, when many precious relics and numberless rich works of art were ruthlessly destroyed. About 1347 the Cardinal de Talleyrand built a chapel dedicated to S. Antoine immediately behind the apse; it was a separate and a considerable church, with clergy of its own; in 1583 it was connected with the cathedral by Bishop François de Bourdeilles, and became the choir of the cathedral, until it was removed in the present century to make way for the present choir which was supposed to be in harmony with the general style of the building. In 1669 the Bishop of Périgueux removed his throne from S. Étienne, and S. Front became the cathedral. All these things are true, and this is the identical church referred to as concerned with these events, but there is no hint of them in the present structure. The fact is that, beginning in 1856, the cathedral of S. Front has been the object of so extended a restoration that it has been practically taken down and rebuilt in our own time. The general plan of the ancient church has been followed. There are the four arms of the Greek cross, with four great central piers supporting the central dome. The dimensions of the plan were not changed nor the relative situation of the parts; only that exceeding care was taken that, in the hands of modern French architects, means the introduction of modern ideals; the substitution of modern detail for decaying ancient ornament; the clearing off of walls; the insertion of new stones; the betterment and improvements which mean simply the doing afresh of everything that, having been done once, might be done again.

All of these things are bad enough; but no architect ever went so far in introducing his own ideas of what should be as M. Abadie did in the restoration of S. Front. There have been many instances of rebuilding, changes, alterations in the restored cathedrals and churches of France; but nothing so flagrantly opposed to actuality as the substitution of round arches for the great pointed arches that formerly supported the domes of S. Front, and which were changed because, to the restoring iconoclast, round arches seemed better in keeping with the domical style of the church than the original pointed arches!

It is needless to comment on the barbarism that instigated and carried out this radical change in construction. The mischief has been done, and the modern church of S. Front, therefore, only recalls the church as it was less than a half century since. Drawings

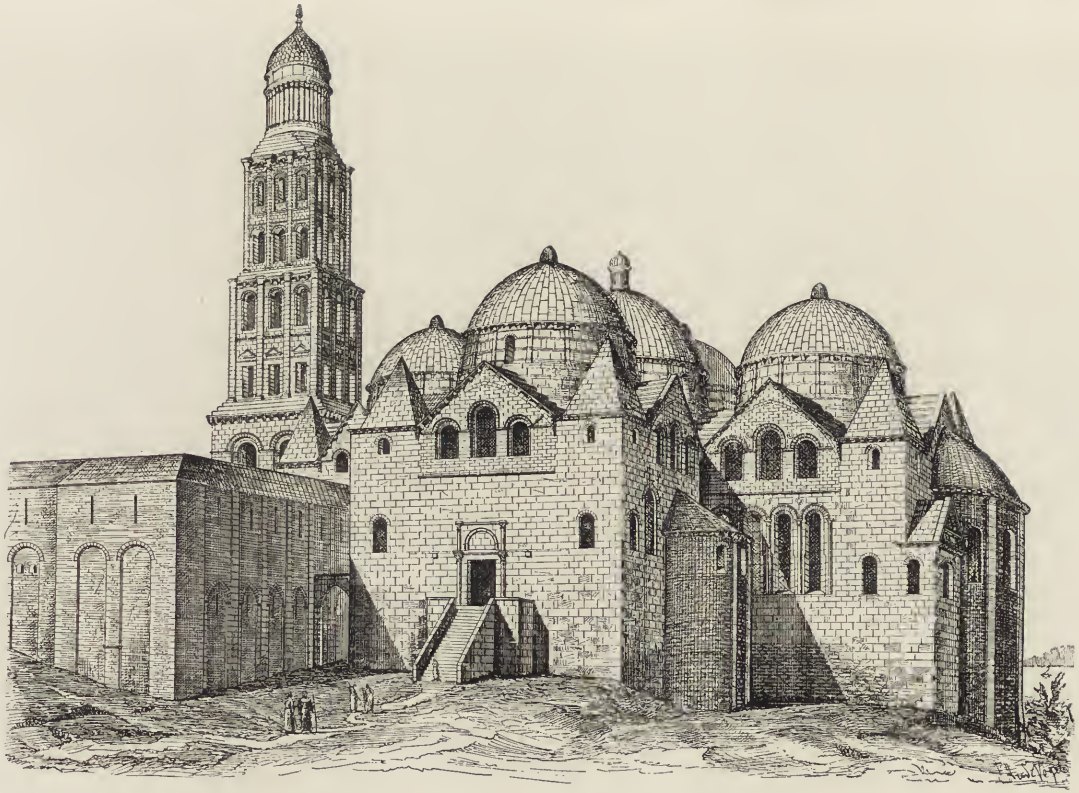
and plans made before the restoration tell us of its original character, and one must, in one's mind, reconstruct many present forms back again to their original aspect before one can conceive of the church as originaly built.

The cathedral of S. Front is planned on a Greek cross with five domes. Each corner of each arm and the four corners of the central bay are marked by gigantic piers, carrying enormous supporting arches, now round, but originally pointed. At the outer corners of the arms of the cross they adjoin the bounding walls; in the centre they stand free; and all of them are lightened by arches cut through

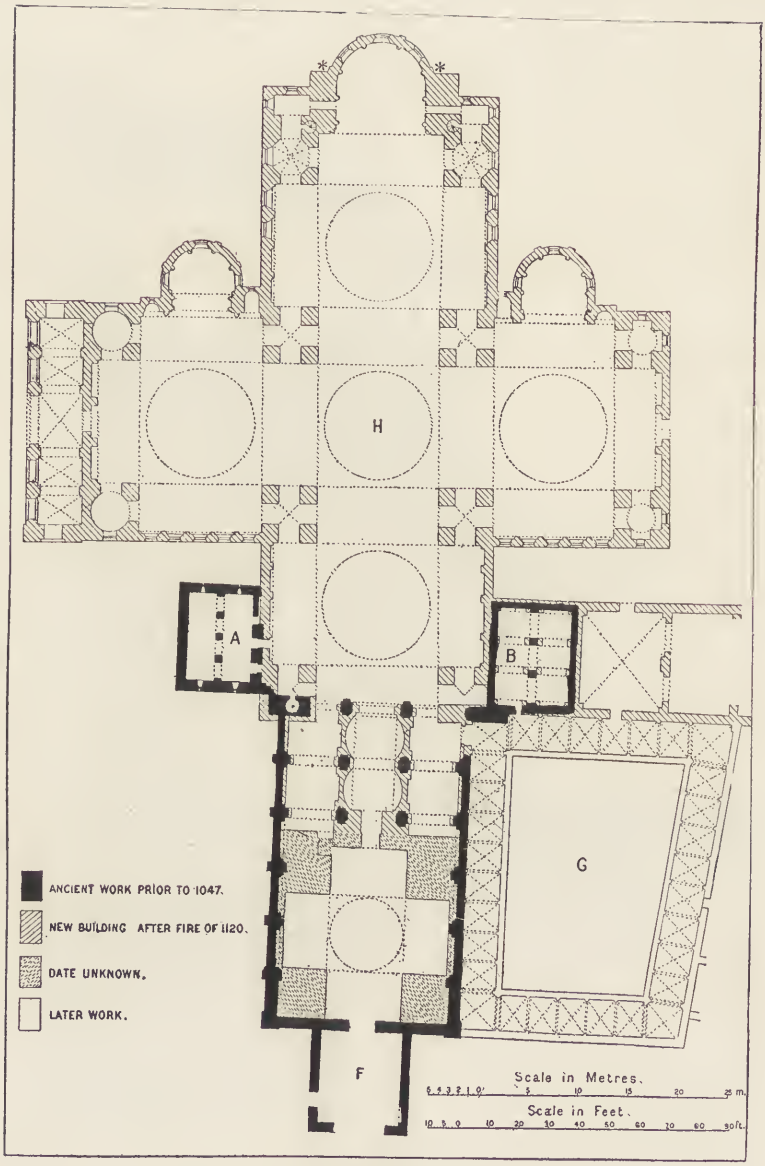


S. FRONT, PÉRIGUEUX—RESTORATION OF THE LATIN CHURCH.

them and so high as to have an effect of extreme narrowness in the openings. In plan, therefore, the interior walls are bounded by aisles, indicated by these supporting piers, but whose covering is simply the main arches of the great vault. The cathedral is entered through a porch, repaired in 1581, built against the northern arm or transept, the west end being closed by the great tower. The north and south arms have each a semi-circular apse on their east walls, of which that in the north transept is entirely modern except the columns at its entrance. And not the least of the ravages committed by M. Abadie has been the building of a deep new central



S. FRONT, PÉRIGUEUX.
(Before Restoration.)



PLAN OF S. FRONT, PÉRIGUEUX.
Drawn by R. Phene Spiers, Esq.

apse and choir, quite unlike any original or previous feature of the church.

Notwithstanding the regrettable manner in which S. Front has been restored its interior is one of the most impressive church interiors in France. Its walls and arches and domes have that unpleasant freshness of newly-cut stone that is positively horrible in a building of its age; but the faults and errors of its restorers have not been

INTERIOR OF S. FRONT, PÉRIGUEUX.
(Before Restoration.)

sufficient to destroy the impressiveness and sublimity that are imperishably a part of a church of this size; an impressiveness that the simplicity of its parts and the vastness of its dimensions do so much to heighten. The plan is that of S. Mark's; the work itself is that of S. Front. There is no gilded mosaic here, no enamelled decoration, no rich finish ; nothing but the bare walls and piers, the simple arches with small, almost insignificant bands of moulding around their tops

S. FRONT, PÉRIGUEUX.
(View of Interior, from the West.)

and the few sculptured columns of the apses. There is nothing else. The interior has sometimes been described as an undecorated S. Mark's; it has nothing, indeed, of the gorgeous decoration of that church; but it has what S. Mark's has not, a distinguishing quality of size and might, an immensity of structure that is almost overpowering in its daring, and which forms the great and distinguishing glory of this magnificent church.

Its exterior is hardly so impressive. It is striking, indeed, as what exterior would not be with five domes carried on low circular drums,

S. FRONT, PÉRIGUEUX.
View from the East.

S. FRONT, PÉRIGUEUX.
(Transept and Chapel.)

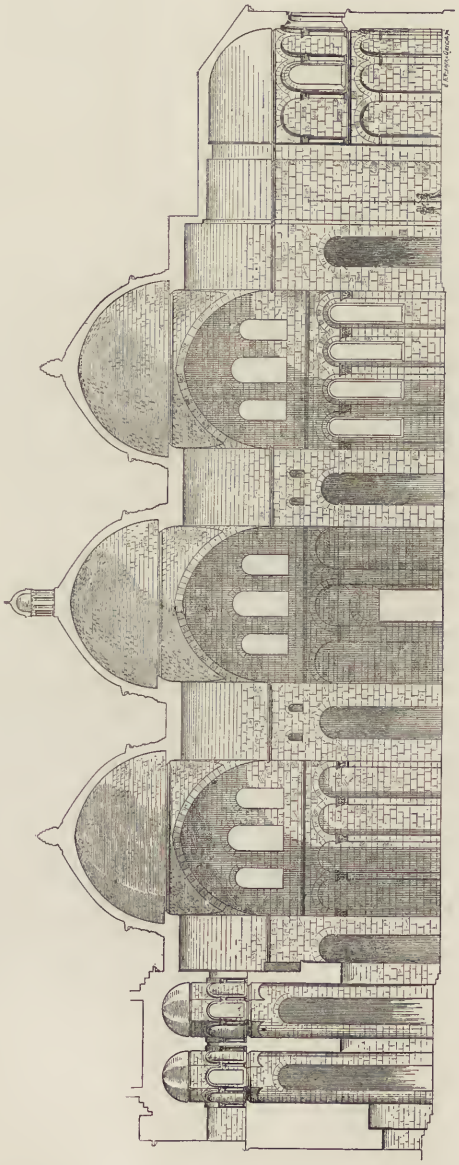
rising above gabled roofs; each dome surmounted with a columned pinnacle with a high conical roof; with pyramids at each outer angle of the gables surmounted with similar turrets, and, in the background, the great tower, in four recessed divisions, marked off with pilasters and applied columns, with many windows, and surmounted with a stepped pyramid bearing a columned circle surmounted, in its turn, with the inevitable conical roof? In the brilliant sun of the southwest the whitened walls of S. Front appear too new and fresh; the roofs are too dazzling, the pinnacles and ornaments too regular and perfect to convey that sense of antiquity that should belong to a church as old as this. Moreover, it is a known fact that only the central dome was originally surmounted by a pinnacle, the others being capped with simple cones; while so far as drawings made before the restoration tell us, the corner turrets were simple pyramids without ornament. The addition of the new apse has, of course, wholly changed the eastern aspect of the cathedral.

A cloister adjoins the older church to the west of the cathedral. It is an irregularly planned structure built partly in the XIII. and partly in the XIV. centuries. It is now greatly ruined and is entered from the market place under an archway, above which are the remains of the facade of the older church, the street leading directly to the cloister roof. It has no architectural interest. The cathedral is built on a steep slope, a little back from the river, and to be seen to best advantage must be viewed from the opposite side, where its walls and domes, turrets and tower form an ensemble that will not readily be forgotten.

One further fact concerning S. Front may be adverted to; its Byzantine character. In cataloguing the Byzantine influences throughout Europe S. Front is almost invariably given a first place. There could be no greater error. The Byzantine influence in this church is discernible in its plan and general form only; it is wholly wanting in its detail, its ornament, its spirit. The carving of its capitals and its string courses is Romanesque, not Byzantine, and might, so far as general appearance go, belong to Elne, to S. Trophime and to other churches unhesitatingly classed as Romanesque. Ornament is the sure indication of style, and the absence of Byzantine character in this feature in S. Front is the best possible ground for maintaining that the cathedral is not Byzantine, but Romanesque. Its form, its plan, were unquestionably borrowed from the East, and quite as unquestionably from S. Mark's. But the men who copied that wonderful plan and re-erected it in the west of France, only borrowed the general idea. They were thoroughly successful in this, it is true, but they were unaware that, to make their copy a real one, they must go further than generalities, and place upon their building the inevitable

earmarks of foreign origin always to be found in the detail. They did not know that, and contented themselves with reproducing the ornamental forms of their own period and country with which they were familiar. S. Front is, indeed, one of the architectural marvels of France, but the mystery of its origin disappears, to a large extent, before the facts brought out by comparison with contemporary monuments.

Barr Ferree.

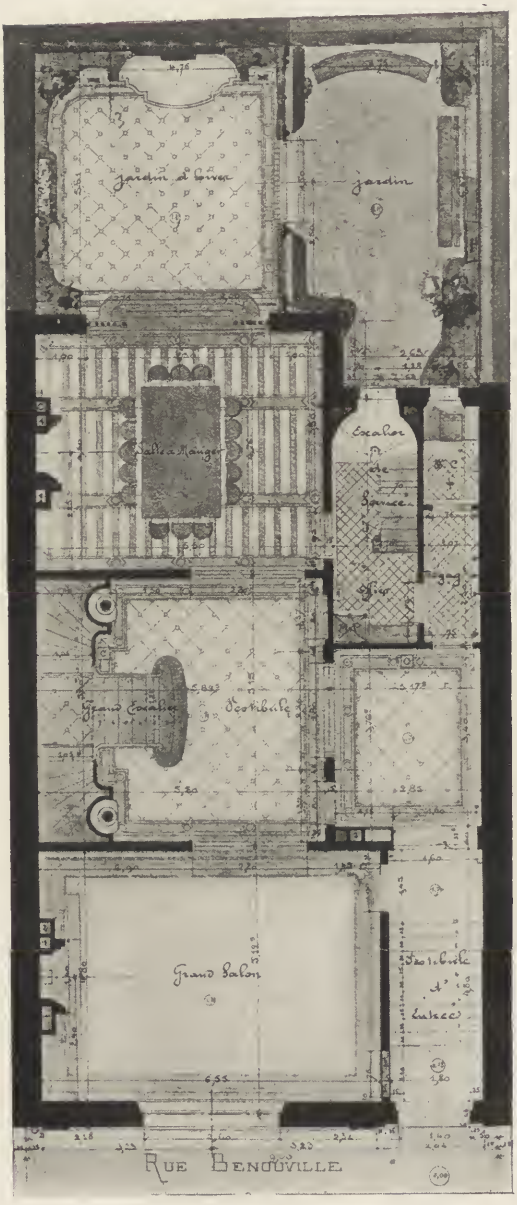


S. FRONT, PÉRIGUEUX.
(Longitudinal Section.)

RESIDENCE.

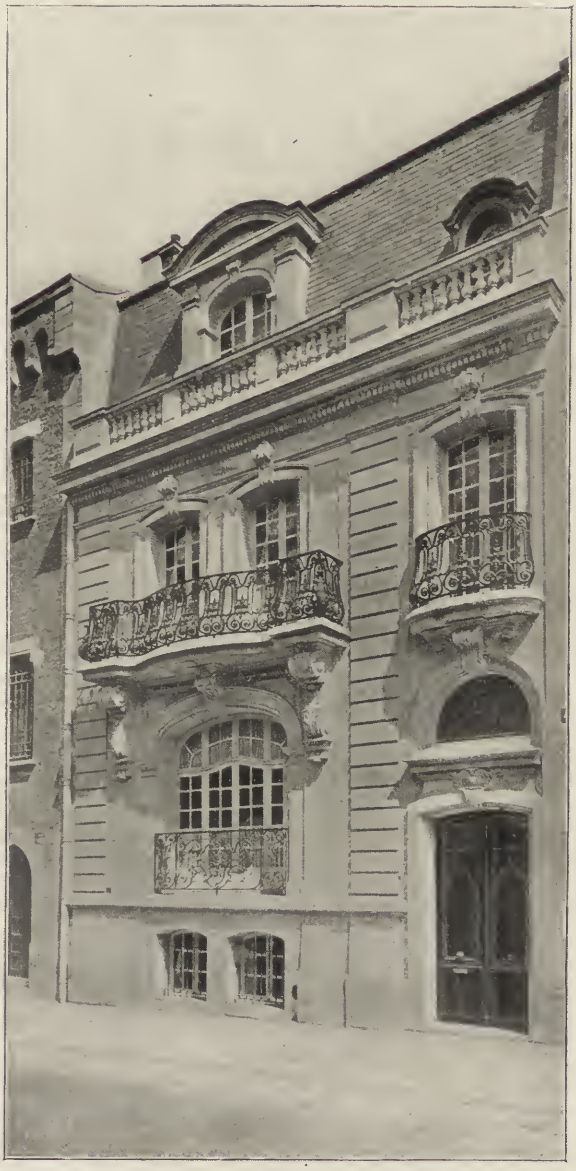
W. W. Berrington, Architect.

Examples of Recent French Architecture



PLAN OF RESIDENCE.

Rue Benouville, Paris. (See page 69.) Henri Grandpierre, Architect.



RESIDENCE.

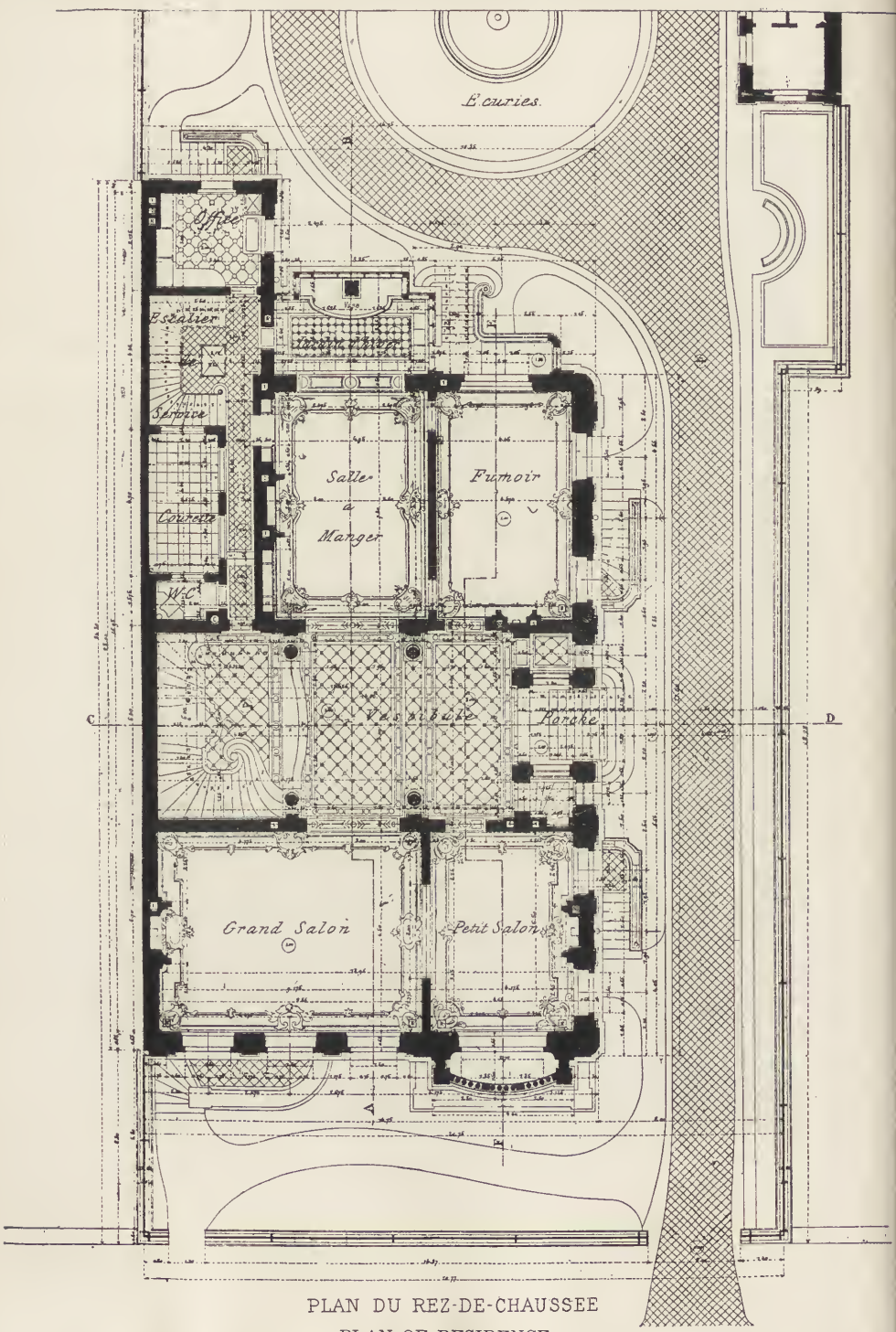
Rue Benouville, Paris. (See page 68.) Henri Grandpierre, Architect.

BUSINESS BUILDING.

Rue Reaumur, Paris. A. Walwein, Architect.

ENTRANCE TO BUSINESS BUILDING.

Rue Reaumur, Paris. (See page 70.) A. Walwein, Architect.



PLAN DU REZ-DE-CHAUSSEE

PLAN OF RESIDENCE.

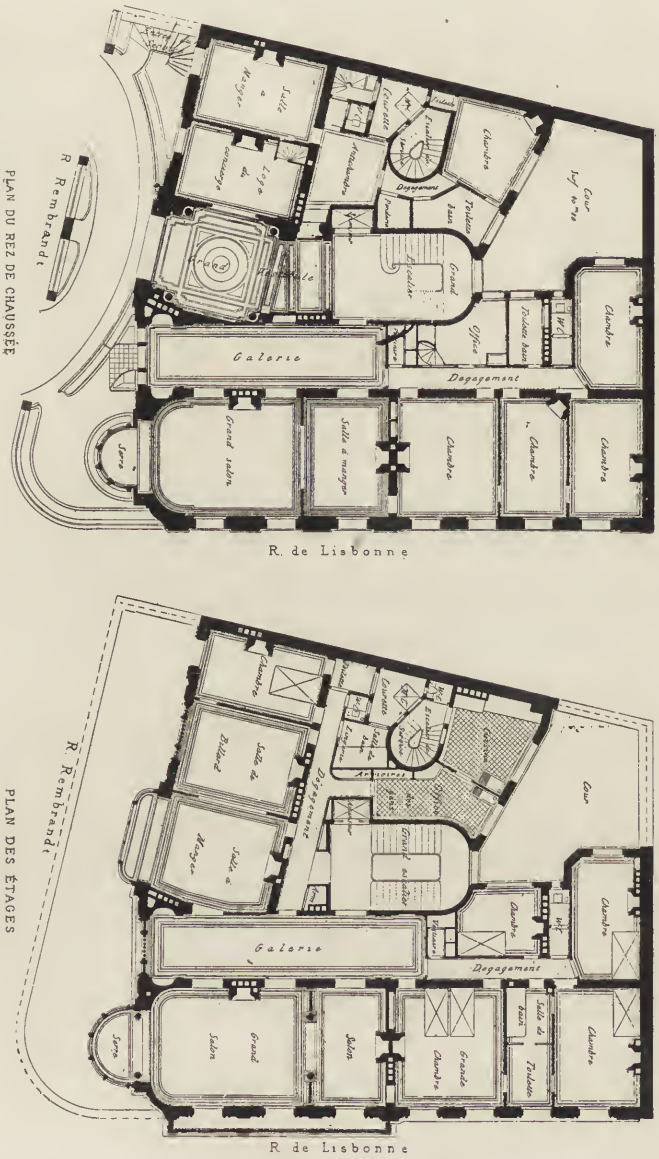
No. 39 Bendler Strasse, Berlin. (See page 73.) Henri Grandpierre, Architect.

RESIDENCE.

No. 39 Bendler Strasse, Berlin. (See page 72.) Henri Grandpierre, Architect.

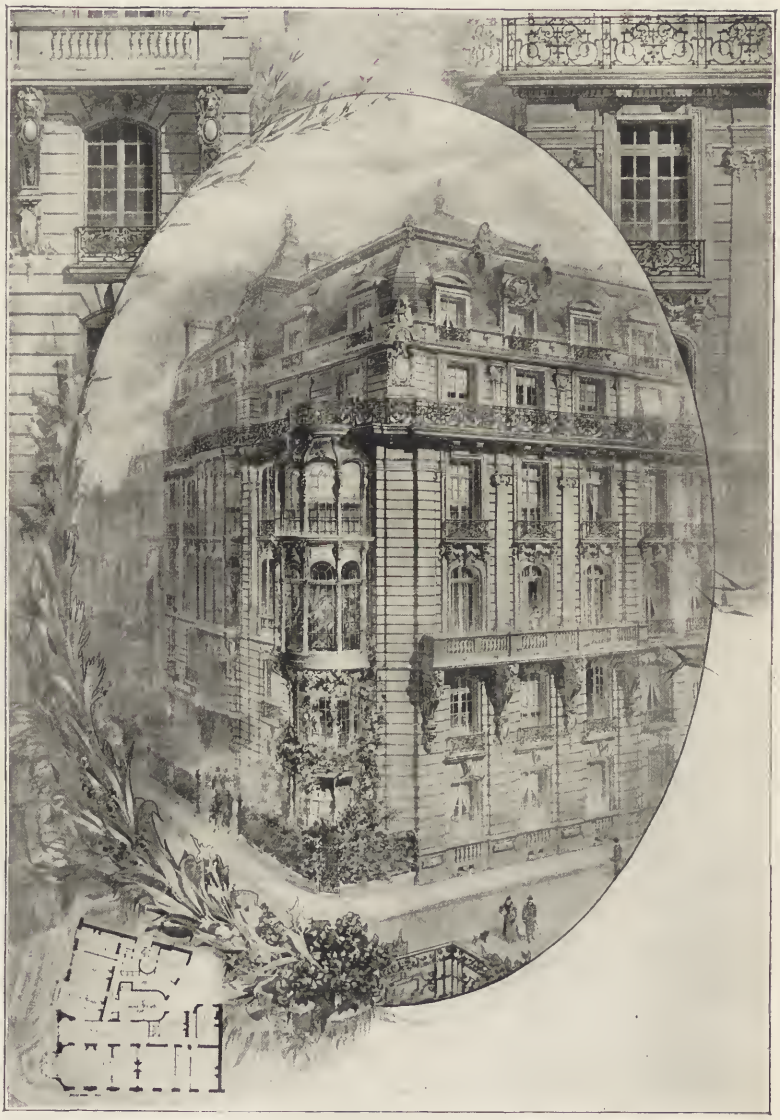
VESTIBULE IN RESIDENCE.
No. 39 Bendler Strasse, Berlin. (See page 73.)

DINING-ROOM IN RESIDENCE.
No. 39 Bendler Strasse, Berlin. (See page 73.)



PLAN OF APARTMENT HOUSE.

Rue Rembrandt, Paris. (See page 76.) G. Rives, Architect.



APARTMENT HOUSE.

Rue Rembrandt, Paris. (See page 75.) G. Rives, Architect.

DETAIL OF APARTMENT HOUSE.

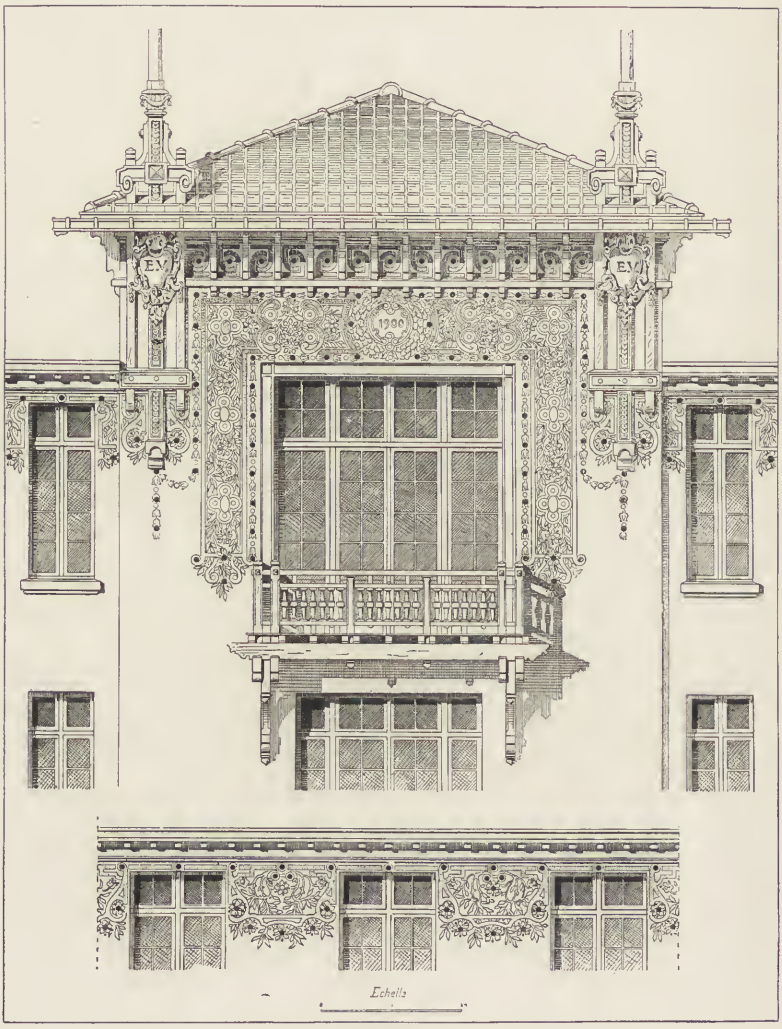
No. 7 Rue Rembrandt, Paris. (See page 76.) G. Rives, Architect.

DETAIL OF APARTMENT HOUSE.

No. 7 Rue Rembrandt, Paris. (See page 76.) G. Rives, Architect.

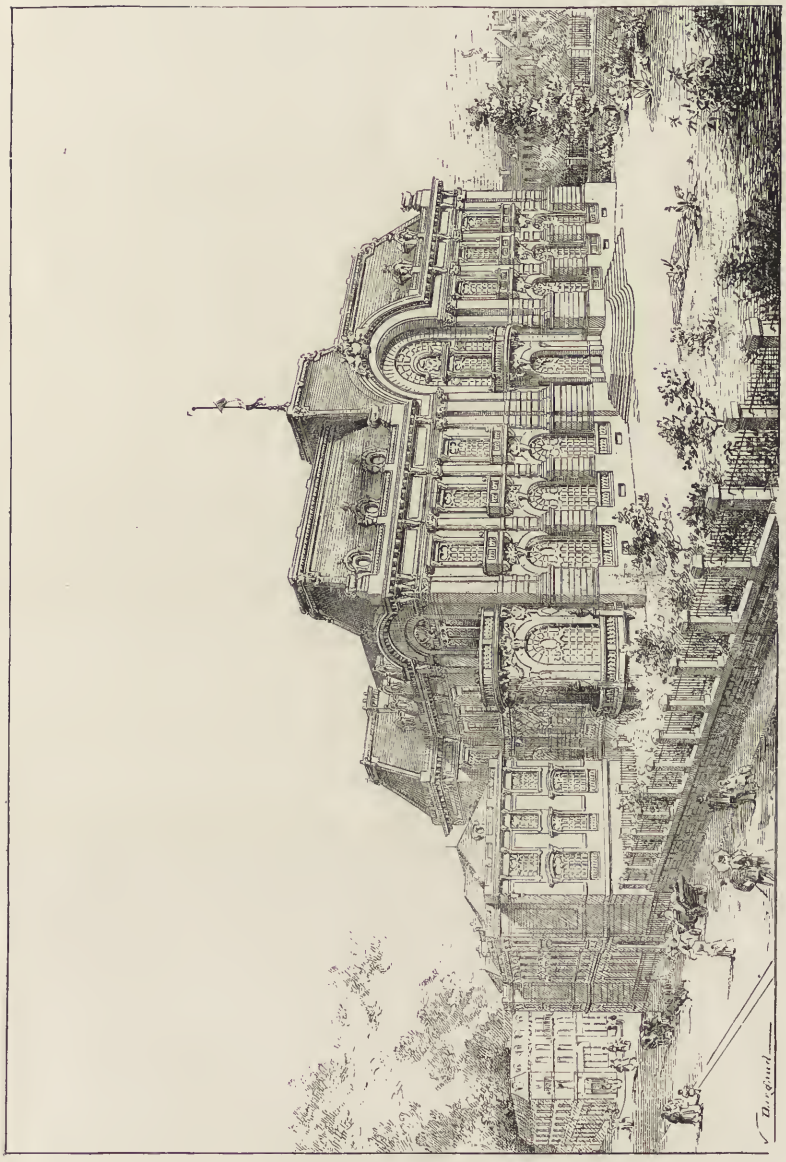
WAR AND MARINE BUILDING.

Paris Exposition, 1900. Auburtin & Umbdenstock, Architects.



DETAIL OF ADMINISTRATION BUILDING.

Paris Exposition, 1900. M. Deglane, Architect.



PREFECTURE.

M. M. Vionnois & Valentin, Architects.

Limoges, France.

AN ARCHITECTURAL EXPERIMENT.

A FEW years ago a curious problem presented itself to the architectural firm of which I am a member. It was this: An Unitarian minister, but lately returned from Japan where he had been living for the purpose of studying the civilization of that wonderful country, required a house in the city of Fall River, Mass., a city that outwardly gives no evidence whatever of the rather unusual amount of artistic appreciation existing there. The Rev. Mr. Knapp was the possessor of a splendid store of Japanese bronzes, lacquers, porceliains, embroideries, kakemono and all the other manifestations of the extreme civilization of "Dai Nippon." Hence arose the question, how shall these be housed?

At first the decision was in favor of the simplest form of construction with slight "Colonial" details, but immediately the ungrammatical nature of this combination of Puritanical architecture and Oriental furnishings asserted itself, and it seemed intolerable. Suddenly the impulse arose to see what could be done with the architecture of Japan. For a time this seemed fantastic in theory and impracticable. The domestic architecture of Japan is exquisitely adapted to local conditions. Widespread poverty, seismic considerations, a gentle climate, habits of out-of-door living, lack of what we of the West consider domestic habits, have resulted in a form of habitation that seems out of touch with western conditions. The Japanese house is practically nothing but one floor with a wide roof supported on many posts, sliding "shoji" or screens of rice paper serving to divide it into an indefinite number of rooms of no fixed size, though always some multiple of three feet on one side, of six feet on the other; this being the unchangeable size of the thick mats of finest straw that cover the floors. There are no fireplaces, few stairways, few windows—in our sense of the term. Moreover, a Japanese house is bare of all decoration except for the kakemono hanging in the tokonoma, with its bronze or porcelain jar in front holding a spray of blossoms, and the two or three bits of cloissonné, ivory or bronze in the adjoining chigi-dana. The vast stores of precious objects owned by the Japanese collectors are always kept in a godown, one or two being brought out every day for the delight of the owner. In the present case this course could not be followed. We cannot get rid of our western and most barbaric desire to surround ourselves with quantities of gorgeous objects, and for this reason, even if climatic conditions were overcome, it was impossible to create absolutely Japanese rooms, if

they were at once to lose their whole effect of gentle delicacy and dignified reserve by being crowded with works of art.

It seemed, however, that there should be some middle course which would result in an interior that might possess the element of unity and yet be practical and without affectation; this working basis was at last found. Whether the result was or was not a justification thereof the accompanying photographs must show, though they cannot be infallible testimony, for they show nothing of the color or of the varied effects which were obtained by the use of many woods in a

FLOOR PLAN.

natural state. At all events, to the owner and to the many Japanese who saw the work the outcome was satisfactory, and to the architects it was something of a surprise, since it made possible a contrast with other modes, that immediately ceased to appear altogether admirable, revealing certain elements of brutality hitherto unrecognized.

The experiment was made on the following lines: In plan and construction the house was to be absolutely western, arranged for convenience and habitability, all the details, both exterior and interior, were to be studied faithfully from Japanese examples, paint, wood stains and varnish, being unknown in the East, as well as particularly

VIEW FROM THE FRONT.

vulgar and hideous, were excluded. Plaster also was largely omitted in the finish of the rooms, and natural woods of twenty different kinds, selected for their color, surface and veining were used instead. The exterior showed beam construction with the intervening spaces filled in with cement in the Japanese fashion. Finally, at one corner of the house was arranged a section absolutely Japanese in design, construction and finishing, and around this lay the little garden designed on the most approved lines, with its miniature mountains, valleys and plains, its lake and cataract, its forest of dwarf trees.

To read of a scheme of this kind gives one an idea of unmitigated affectation; the whole thing seems like a toy house, a thing in which one could not live comfortably or with self-respect unless clothed in kimono, obi and tabii. One would say "this is a silly pose."

In actual fact it was none of these things. People came to wonder, and went away convinced, while to those most interested the experiment has justified itself absolutely. The house was rational and livable. Nor was this due to its western elements. The "tea house" was built more or less as an amusement; no one ever expected it could be used except in summer, and then only as a tea house, or garden shelter. Instead it was by far the most charming part of the whole structure, the coolest in summer, the warmest in winter. In a little while the westernism of the main house became distasteful, and the tea house with its sliding rice paper shoji, its matted floor, its lack of all confusion, its very bareness became irresistible, and instead of serving as a summer house it became the principal living room. Then the owner realized that he (his architects) had been too cautious, and declared that if he were to build again it would be more closely still to the Japanese principles.

All this seems to show that there is something in Japanese domestic architecture which is good apart from its perfect adaptation to oriental conditions, something that could be advantageously adopted in western building. This thing is certainly simplicity. Compare the view of the interior of the tea house with that of the parlor. Does not the effect improve the farther one gets from western suggestions? Contemporary domestic architecture is a riot of complication and overdetail, without reserve, quiet or dignity. Its outward forms are borrowed from stone construction, its bad workmanship is daubed over with coats of paint; wood, in its natural state a material of exquisite beauty, is tortured and hacked into grotesque forms, stained with muddy dyes and smeared with paint and varnish. Windows are filled with single sheets of plate glass until all sense of protection is gone. Walls are covered with gaudy paper hangings, and then loaded with crowded pictures. Our living rooms are turned into junk shops, while the house itself from the exterior looks like nothing ever seen before in the history of art.

FROM THE GARDEN.

DETAIL OF THE FRONT DOOR.

Compare any typical "parlor" of the present day with a corresponding Japanese room—that in the "tea house" for instance, which is simply a copy and for which the architects are to receive neither praise nor condemnation. The posts and frames are of cypress, innocent of stain or varnish, and with a surface like satin. The lattice of the shoji is white pine, the coverings rice paper. The ceiling is of strips of cedar filled in with long thin boards from Japan of a marvelous wood with dark veins; the pierced carvings in the screen between the two rooms are also from Japan, and are of cryptomeria wood. In the chig-i-dana apple, cedar and cypress are used. The floor is covered with straw matting, and the only decoration is in the shape

THE HALL.

of a kakemono, a bronze jar, two pieces of cloissonné and a bit of lacquer. It would be impossible to imagine anything more quiet and delicate than the effect of this room either in winter when the shoji are drawn and it is full of a soft, diffused light, or in summer when they are run back and two sides are open to the fresh air, on one side lying the fantastic little garden, on the other the distant river with the meadows beyond.

That this form of construction and style of decoration is absolutely fitted for certain of our purposes is evident. Nothing could be imagined that would adapt itself so delicately to seaside architecture, and in cost quite as well as in other ways. A house on Japanese lines could be

built for summer use, of the most beautiful woods, and adequately furnished for half what is expended now for a Queen Anne or Colonial horror doomed to most desirable decay. One of the greatest surprises in connection with this house in question, was its cost. It is finished in the most beautiful woods—cedar, sycamore, cypress, apple-tree, white mahogany, curly maple, black cypress, birch, as well as many brought from Japan; inside it is one piece of fine cabinet-work from top to bottom, and yet it cost less than a "Colonial" house of the same size would have done.

For serious purposes, for permanent habitations in the country for instance, the style would hardly be admissible in its entirety, but a

THE PARLOR.

study of its nature, better still, an attempt to work in it, cannot fail to show the absurdity of some of our modern customs. We build constantly in wood, but we show no appreciation whatever of this material; we can't let it alone, but are impelled to try to make it look like something it is not, by the use of paint, stains and varnish. The Japanese understand it perfectly, and their houses are marvels of beauty, just because they make of each post, each beam, a thing to admire by reason of the natural beauty of its grain, color and texture. Here in America we have a great variety of exceedingly beautiful woods, if we can be content to use them in their natural state. American oak is not a fine wood, and there is no very good mahogany in

IN THE TEA HOUSE.

the market, but we use these ad nauseam, quite ignorant of the fact that white pine, sycamore, gum wood, birch, maple, cedar, Canadian elm, and above all, black cypress, are incomparably more beautiful. One of the ceilings of Mr. Knapp's house was of cypress and white mahogany, and the color effect was singularly beautiful. The hall was finished wholly in wide plain boards of black cypress wonderfully veined, and perfect in color—the delight of all the Japanese, who declared it equal to anything their own country could offer.

Another lesson to be learned is that windows are in most cases to admit light, not to afford a view of what is without. In our vainglorious over plate glass we fill every opening with it, whether there is anything to be seen from the window or not. The Japanese are wiser; they furnish sliding paper screens that admit the softest, most delicate light imaginable, and when they wish to enjoy the view without, move them to one side. Between a great shapeless window filled with a sheet of glass, and then half hidden by voluminous draperies, and a Japanese window shoji with its delicate network of dark lines against the pearly rice paper, there is just the difference between barbarism and civilization.

There are many things of this nature that one may learn from Japanese architecture, but if nothing was acquired but a sense of the sanctity of wood and the beauty of fine workmanship, the study would be worth while.

It is possible to write of this experiment now, for in a measure it is a thing of the past; the owner has found it impossible to live in the West after a taste of Eastern civilization, and is now a citizen of Tokyo. The house is dismantled of all its treasures, the rooms are empty, the little garden is running wild, and the bare shell alone remains, a forlorn relic of a delightful attempt to graft an alien civilization on a tree grown rank with too vigorous life, and already showing signs of decay.

R. A. C.

GOOD THINGS IN MODERN ARCHITECTURE.

BUILDINGS designed upon the old lines may be the prettiest buildings, but they are not the most important to us when we are considering the matter artistically. Those designs which are the most nearly the result of old tradition are easier to keep within bounds, easier to invest with propriety, easier to keep within the limits of good taste; but these are not the buildings in which students should take the most interest. If, indeed, any artistic traditions were unbroken, then the student should be encouraged to follow that and should refuse to listen to anyone who might bid him study other styles. There is no such tradition as that. Those buildings which are the most nearly the result of unbroken tradition are probably the large English country houses which still arise in many parts of England, and which the weekly and the monthly illustrated journals publish, and also those American country houses designed by Mr. Robertson, Mr. Haight, Messrs. Peabody and Stearns and others, and in which the same Elizabethan or Jacobean tradition has governed the designer. The American wood-sheathed frame house is another such tradition; and if the good taste and refinement which marks much recent work had been more general and had been continued longer, here would be a style fit to rank with anything which was of necessity so simple and domestic. Let it be admitted once for all that our constant demand for originality has something unreasonable about it. Let it be admitted that the true system of architectural design is not to ask for originality but to build on the lines laid down by one's predecessors and let originality come if it will. Let it come if it will in spite of your best exertions to exclude it! That might be thought the wiser maxim for the architect than the contrary one which would bid him seek originality at all hazards. Again, however, this is not the course likely to interest the student. There are, indeed, three excellent reasons why he can hardly be expected to work as builders worked when tradition was strong and unquestioned. All recognized styles are more or less discredited by the sad misuse which they have undergone at the hands of our own generation and the preceding one. Many modern requirements are absolutely opposed to the pursuit of design according to the old principles. Many modern materials and methods of building, important and not to be disregarded, compel the introduction of new forms and new combinations. These are the three reasons which

are going to compel us to develop one or more new styles which may or may not be valuable as matter of fine art. It follows that in very many designs, for large or for small buildings, for city or for country, for residence and for money-making, to be built at high cost or for a few hundreds or thousands of dollars—the old styles simply do not apply to us, and we are compelled to disregard them.

We cannot build in the Gothic style because we cannot afford to vault our buildings, and because we are absolutely without any power to produce Gothic sculpture; moreover, a Gothic style, in which large single-storied buildings something like churches should not be the prevailing type, would be an absurdity. No man can conceive of a Gothic style based upon many-storied buildings divided into small rooms. No form of strictly classic or neo-classic style is of any use to us, because, as the orders have no relation to our systems of building, it follows that no architect knows how to handle those orders. No one now holds the orders plastic in his hands as the builders of Roman baths and Herculanean villas held them. No one feels free to deal with intercolumniations and with the proportions of entablatures to columns as the men who invented them and those who re-invented them felt free to handle those details. The boldness of our predecessors, the men of the eighteenth century, who in Germany and in France, tossed the orders about and refashioned them in detail and in composition—that boldness is held up to our students as altogether heretical, and the dash and verve of the Rococo men, which was, indeed, mingled with much bad taste, is denounced as if it were nothing but bad taste. Romanesque architecture has been tried by good men, by patient and thoughtful men with much capacity for design, but it has not succeeded. The Romanesque style seems inseparable from its primitive ponderosity. Every attempt which we have yet seen at creating a lightened and less massive Romanesque—a Romanesque in which skilful building should render unnecessary the monstrous thickness of the old walls and the resulting deep reveals of the little windows, has ended in a comparative failure; and a curious look as if the building were a pasteboard model, such as made the delight of idle people a century ago, pervades all these structures.

Things might be better if architects were allowed to build very plainly for awhile. If no one was held bound and committed to perpetuate the usual amount of architectural detail the designer might get on better with his masses. If no sculpture were asked for, something like dignity and a true severity not suggesting raw and bare nudity might be obtained. If the architects were compelled to fall back upon their building, their construction, their handling of material as their sole source of architectural effect, a new and valuable style might take form, unpleasing as some of its earlier examples

Fig. 1.
ÉCOLE DE DROIT, PARIS.
(Detail of New Building.)

might be. Take the example of the new buildings of the Paris Law School. Fig. 1 is an interior view of a part of the library of the École de Droit. Allowed to use excellent masonry, not stinted as to his method of building and not bullied into finishing his wall faces with plaster on iron lath, or any similar patent device, the architect has treated his interior in a dignified and massive way, and little as we may admire the lines produced by the setting of the roof upon the walls, we are bound to recognize the possibility of great things in the future. Note the use of the two niches in which, by a simple device, the surface-staircases are put well out of the way and yet remain most conveniently located. Fig. 2 is the exterior of the same pavilion used as a reading-room. As in the interior, a little architectural ornament and a little sculpture has been applied to features which seem to call for it, especially; so in the exterior the symbolical shield of the City of Paris adorns the two large piers, and the student approves this, only wishing that they were nearer the eye, for they seem to be delicately sculptured. The slightly or-

Fig. 2.
ÉCOLE DE DROIT, PARIS.
(Detail of New Building.)

namented band which passes along at the spring of the arches in the interior and the exterior alike, seems to tie the structure together and to unite the stone facing of the inside, and that of the outside, giving a harmony which our buildings with their plastered interiors cannot possess. The placing of the triple window of the pavilion in a recess between piers is not particularly happy, but it is partly excused by the insertion of the great inscription beneath the windows;

a look being given to it as if the inscription were the main thing in this pavilion and that the sheltering of this panel from the weather was a matter of special pains. The design is not of especial charm; it has no peculiar grace; the resulting lines are not very beautiful, but clearly there are possibilities here and a designer of

Fig. 3.
CHURCH, CASTELLANE.
Basses Alpes, France. M. Paul Lorain, Architect.

great ability might do surprising things with this simple programme. Note that the ugly cowl which seems in the picture to emerge from the top of the pinnacle over the dormer is not there in reality, but rises from the large pavilion beyond. Note also that the dormer is a door leading out upon the terrace roof. No view can be got by means of photography which would rightly explain the general masses of the building; but, indeed, it is with detail only

that we are concerned at this moment. Many similar partial views could be chosen from this interesting structure, each of them exemplifying this frank acceptance of the twofold conditions laid down by requirements and materials.

The above cited building is mainly neo-classical in feeling, as if its design were based upon a century or two of academic schooling, but many of the recent French structures of radical and rational build are mediæval in general character and that from obvious reasons. The system of corbelling which many French constructors have elaborated, each improving upon his predecessor's practices, is obviously more or less mediæval in its origin, nor can one push that system far without imparting a still greater Middle Age look to his work. Thus, the very interesting little church of Castellane, in the department of the Basses Alpes and near the Italian frontier, is not only constructional, it is also almost Provençale Romanesque or Provençale Transition in its design. Fig. 3 is copied from the rough drawing published in some recent periodical whose name has been forgotten. The southern look of it is caused partly by the tunnel vaults set at right angles to the main vault of the nave, these vaults covering a narrow aisle of mere communication—a passage aisle, as the English builders are calling it. These subsidiary vaults spring from those buttress-like piers which take up the thrust of the main vault, and these piers are given a form which allows their material to be used in the most economical way. A similar piece of rational building is shown in the design by a well-known architect of the church at Rambouillet in the department of the Seine et Oise. Here the system of corbelling used to counterpoise the thrust of the main vault, at least in part, is carried very far, and the vertical supports are furnished by the slender shafts of cast-iron occupying as little as possible of the floor of the church and affording a secondary passage or ambulatory between the main piers and the floor of the nave. In this church the vault is of a character never used in the Middle Ages or in antiquity, a vault which it is easier to point to in the illustration, Fig. 4, than to describe. In like manner, Fig. 5 shows how Mr. Baudot has undertaken to carry off the rain water from a church of mediæval design though erected at a time when the public would no

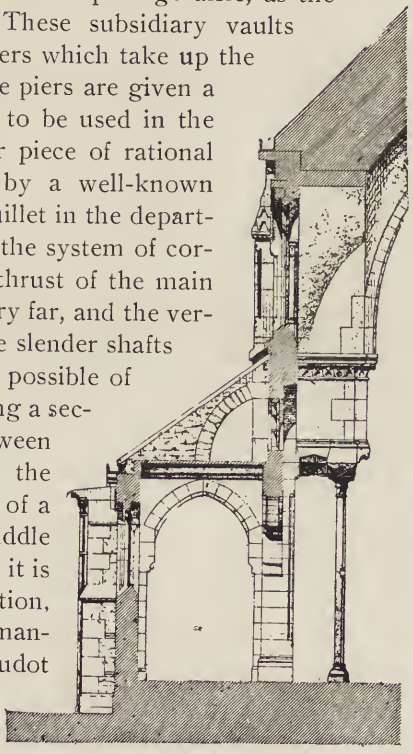


Fig. 4.
CHURCH, RAMBOUILLET.

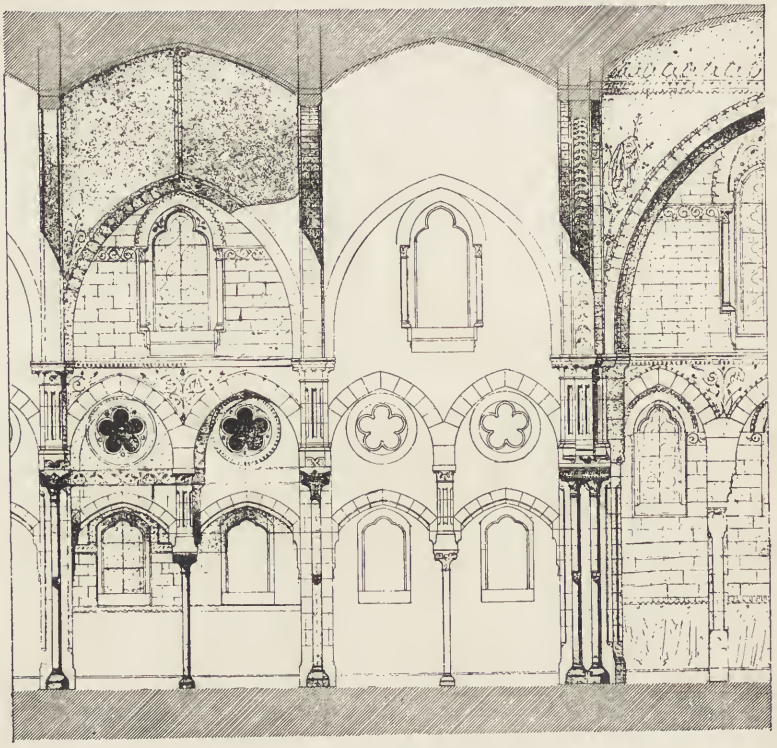


Fig. 4a.

Seine-et-Oise, France. CHURCH, RAMBOUILLET. A. de Baudot, Architect.

longer endure the throwing of the water from the mouths of gargoyles directly into the street. Vertical leaders combine with horizontal gutters cut in the stone cresting of the buttress to carry the water in the most humble and domestic manner to a sewer beneath the street, while at the same time the character of the buttress may be thought to be accentuated by the utilitarian device.

It is noticeable that in all these three buildings masonry is used with a freedom which we hardly understand in the United States, and this is in itself a great advantage for such builders as are not thought extravagant if they use cut-stone, rubble and bricks and mortar freely where the unfortunate builders of the United States, inheriting carpenter traditions, now translated into iron, are disguising their real means of support and resistance by simulacra and shams. Obviously it will be much easier to push a system of design if it is based upon solid mason-work than if it is to be carried out in boxing with slender iron uprights and ties, metal lath and coatings of plaster to conceal the whole. The man who is designing in a rational way in masonry has rational designing in masonry to follow,

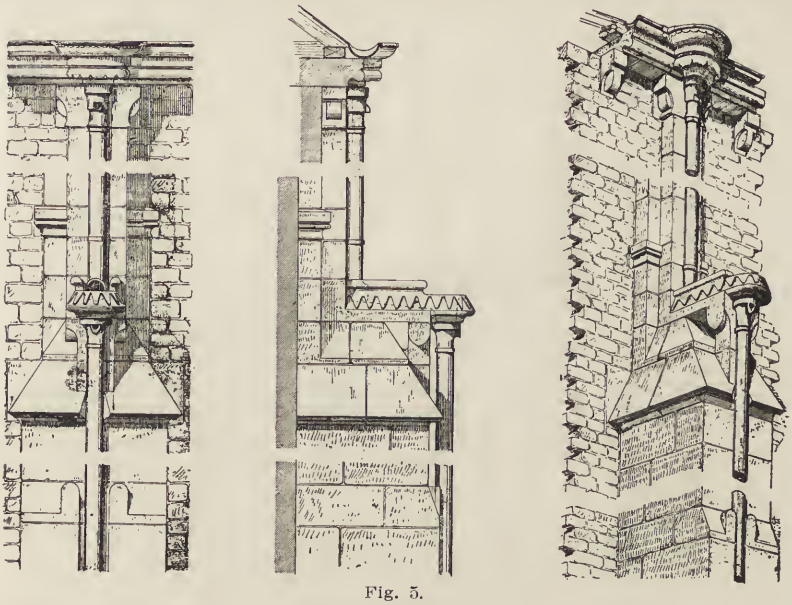


Fig. 5.

Ardeche, France. CHURCH, PRIVAS. A de Baudot, Architect.

in principle if not in detail; twenty centuries of such designing and more if he searches the past. The building man takes to it intuitively, handles it aright without any especial training—no engineering science is needed for sensible and beautiful building in masonry. The metal building which the American has committed himself to has no such artistic past and its right use requires a scientific teaching which tends to destroy his native sense of architectural design.

If we turn to instances of American building in a rational way, in the way suggested by the material, we are very apt to bring up against a structure of wood and iron covered with thin metal. Such are the bay-windows and loggie which project from many of our new house fronts. Such are some of the domes and lanterns which cap our skyscrapers. Such is the recently built ferry house of the Pennsylvania Railroad Company, at the foot of West 24th street, New York City. There the whole exterior is composed of thin copper, which, as it has never been painted, has already taken on a beautiful tone, passing from dull green to dull red, with pleasant modifications of both colors. The fact that the exterior is, although a mere metal shell, punched and stamped into a quasi imitation of a semi-classical order of pilasters, only shows how little way we have gone as yet in our use of these new materials. The capabilities of the method used in this building are equally evident. The interior is partly sheathed with thin metal, probably patent steel panelling, which covers the ceilings and the upper parts of the walls, the lower part being either sheathed with

Fig. 6.

BAYARD BUILDING.
65 Bleecker Street, New York.

Louis H. Sullivan, Lyndon P. Smith, } Architects. Geo. S. Hayes, Consulting Engineer.

wood or opened up into large windows, forming glass partitions between large waiting-rooms. Such a building as this, if carried out in fireproof material, the metal sheathing fixed to metal frame, and even the flooring incombustible, would be an extremely interesting structure, and we put on record the present ferry house merely as a step in the right direction. In like manner the new Bayard Building, Fig. 6, just approaching completion on the north side of Bleecker street, opposite Crosby street, exemplifies the growth of modern American building connected with the steel cage construction. Here the metal construction is covered and completely enclosed in tile and brick and the whole façade consists of a series of slender uprights running from top to bottom and consisting of the actual construction piers where steel columns are jacketed by baked clay laid in mortar and, alternately, slender mullions built in the same way but without constructional value. The mention of this building, the design of Mr. Louis H. Sullivan, of Chicago, with whom is associated Mr. Lyndon P. Smith, of New York, is not to be taken as implying an intention here to criticize it fully. Mr. Sullivan's great power over floral and foliated design must receive notice elsewhere. We are using the building now merely as an example of rational building as Americans most commonly understand it. There is here no pretense that the building is a massive structure of cut-stone, and no pretense that it allows of treatment in the modern classical way with orders and with classical proportion. The whole front is a careful thinking-out of the problem, How to base a design upon the necessary construction in slender metal uprights and ties. Were it not for the most unfortunate treatment of each great opening between the uprights with an arch and a seeming system of tracery in the head, this front might be pointed to as completely realistic in design. Even as it is, if the reader will eliminate by a mental process those five great arches with their subordinate arches and the occuli which fill their heads, he will have the architectural treatment of the future metal building of our cities in the form which it must pass through if it is to reach any serious architectural success. In like manner, Fig. 7 gives an excellent piece of wooden building, a dwelling house at Orange, N. J., the design of Messrs. Babb, Cook & Willard. There is here no pretense at construction anywhere different from the one actually existing. The frame is, indeed, concealed by a sheathing of wood, but as the system of building by means of corner posts, studding, sills, plates and inter-ties is understood by every American; as it has prevailed over the whole continent and as, moreover, the sheathing outside with wood and the sheathing inside with lath and plaster are essential to its peculiar characteristic of being a system of building warm in winter and cool in summer, so it is the reverse of a fault to be

Fig. 7.

Orange, N. J. RESIDENCE. Babb, Cook & Willard, Architects.

criticized that this concealment of the actual framework should be carried out in the familiar way. Buildings much larger and more pretentious could have been chosen, in which the sheathed and concealed frame would be equally the central idea. The present sensible house is chosen because the photograph shows its details clearly, and because the little building is most beautiful and appropriate. Let no one despise the American way of building, whether in the old-fashioned way as the country carpenters worked it out two centuries ago, or in the newer system which the engineers have adapted from what the carpenters had given them. The American system of slender uprights and ties, whether of wood or iron, is one out of which the architects should try to make all that its very peculiar character allows.

At the same time it is to be regretted that masonry is not more familiar to us in America. A year or two of life among the people of southern France or of central Italy would do a world of good to an architectural student in this, that he would learn there how much can be done by masonry alone without the intervention of wood or metal. If you are resident in a city of central or southern France at a time when a street is being cut through the ancient, too compact and too closely crowded masses of dwellings, you will see, where houses are being cut in halves, just how they were built in their main masses and in detail. You will not see as much vaulting as in Italy, probably because space has been more valuable and because the

haunches of the vault which encloses a room and the walls which carry those heavy haunches represent more space, both vertically and horizontally, than the owner could afford to surrender. You will, however, see solid masonry walls, and floors made very largely of blocks of stone laid upon wooden floor beams, which beams are plainly visible from below, and which are out of the reach of fire from the very absence of wood to communicate fire to them. The stairs are of stone; and the balustrading of iron even if the handrail itself be of wood. The cellars of such a house are, of course, vaulted. The floors of the chambers are probably of plank laid upon wooden beams, but these floors are isolated; that is to say, they are never continuous from room to room, but are separated by the very massive stone and mortar walls which divide the rooms. Moreover, and here comes in the essential peculiarity of these houses, there is no wooden door-trim, window-trim, or wainscoting. The doors themselves, the mere swinging valves, are of wood, but the iron hinges which hold them are built into the solid masonry of the door-jamb and not the slightest pretense of a wooden door-frame appears, except as an upright of wood is provided for the door to strike against. In some elaborately finished houses there will be on one side only of the twelve inch or fourteen inch partition of solid masonry a light wooden casing or trim upon which the swinging door is fitted in slight relief on its hinge side and on the side where the lock is and also at the head. That is to say, the edge of the door is rabbeted and projects a little beyond this trim and the trim serves as a means of making the joints more tight and the door-piece less inconvenient and more tasteful in appearance. This wooden trim is, however, applied, as we have said, on one side only of the wall and the jambs are not covered with wood, but are left in the plaster-faced slope or splay which the mason has given them. In short, the wood which enters into the construction of one of these houses in Avignon, in Nimes, in Montpellier, and even in Marseilles would make but a small bonfire even if it were all brought together. It is our misfortune as Americans that when we seek for an example of how the older societies of Europe, the more traditional, the more organized peoples of Europe build, that we should turn first to Great Britain, for in the British Isles building has never been as thorough and never conceived on so great a scale as on the continent. Wood has always been comparatively abundant in England and building has always been undertaken, it is difficult to say why, with less abandon—with less disposition to build massively and for all time. At the same epoch, the parish churches of France were being vaulted in solid masonry while those which Sir Christopher Wren was building in London were covered with a mere simulacra in wood and plaster. Nor is this an unusual device resulting in consequence of the need

of rapid and inexpensive rebuilding after the great fire of 1666. English monuments, national and ecclesiastical, and the homes of the great nobility have always been built on a smaller scale and in a slighter way than those of France, Germany, Spain and Italy.

The future of American building should really be marked off into two great divisions. There should be the buildings of solid masonry

Fig. 8.
LIBRARY, OLD COLUMBIA COLLEGE.
C. C. Haight, Architect.

with wooden roofs where it is not possible to substitute iron construction, or with vaulted roofs beneath the outer shell of wood or of iron, and secondly, the buildings of iron. From the buildings of either class wood should be excluded as far as possible. People must learn to make themselves comfortable on floors of cement, tile or mosaic; and they will not find this as difficult as they suppose. People must learn to dispense with wooden wainscoting of any sort, whether lining a whole room or serving as ornamental and protecting dado; with wood used anywhere except for doors and the mere sash of windows, and frequently to abstain from wood altogether, even in such familiar and such minor appliances as these. Fig. 8 gives

the exterior of the very beautiful library of Columbia College which has just been relinquished by the college for its new buildings, but which still stands on 49th street, near Madison Avenue. The lower stories of the building were occupied by the Law School, but the whole upper part, forming one large room, was the main hall of the library. Here, of course, there is no sham construction at all, nor any concealing of the construction. Here the stone and brick wall surface without and the brick wall surface within are merely the two faces of the massive wall in which, indeed, there is a narrow open space kept for dryness, but which is otherwise a solid piece of masonry. Upon this the roof of wood and iron rests in the most simple and obvious way, as the photograph fully explains. This is a really beautiful design, one of the finest things which New York contains, and it may defy criticism as to the matter of constructional sincerity and of rational design. It may, however, be thought more difficult to carry out such straightforward building in houses of many stories, and used for business and for habitation. It may be more difficult, but it has been proved feasible. The other buildings of Columbia College, such as Hamilton Hall and the basement and ground floor of the Library Building itself are instances of exactly such work applied to low stories and small rooms.

Those admirable buildings of old Columbia College were, however, built without special effort to avoid the use of wood. They would be very hard to burn; but yet there are wooden floors and wooden stairs in them. The problem which Americans should set themselves is rather to eliminate wood as much as possible. Fig. 9 shows one of the work-rooms of the Boston Public Library built from the designs of Messrs. McKim, Mead & White. The whole ceiling of this room, or more correctly the whole floor of the story above, the under side of which forms the ceiling of this room, is built with flat, dome-shaped vaulting resting upon arched ribs which go from pillar to pillar. The pillars are of stone, the arches are of brick or tile, the vaulting is of masonry, and, like the arches, of some light modern variety especially introduced for the purpose. The upper surface of this floor is smoothed with cement masonry and the flooring of tile, mosaic or the liqe is laid directly upon this. There can be no better floor for any purpose, private or public, when the supports beneath can be brought near enough together to allow of flat segmental arches like these of reasonable dimension. Without knowledge of the exact dimensions, and speaking from memory only, these columns may be said to be sixteen to eighteen feet apart. It is obvious that in most private houses supports could be obtained as near together as this by the simple device of springing the arch from wall to wall across any ordinary room. If the thrust of the arch is to be feared, that is to

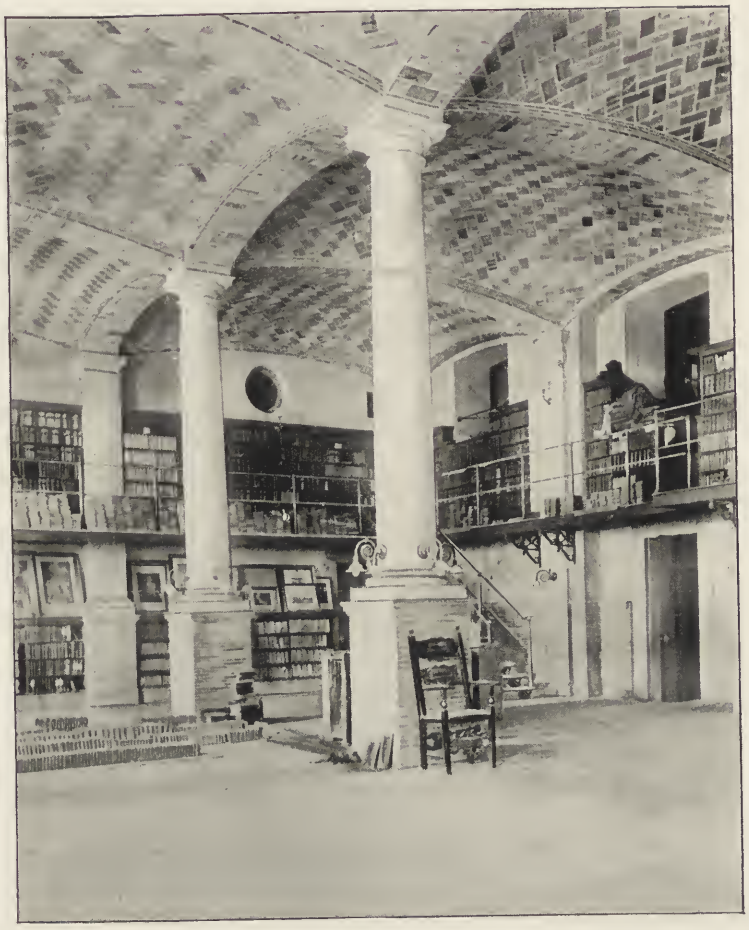


Fig. 9.
ROOM IN BOSTON PUBLIC LIBRARY.
McKim, Mead & White, Architects.

say if the load upon the wall which resists the thrust of the arch is not sufficient to resist that thrust, then a slight pier may be advanced into the room or a corbelled construction may be built inward from the wall at a height above the height of the arch sprung from this. It is not necessary to explain in detail the constructional device here hinted at. The suggestion is merely that almost any building, public or private, may have large parts of its floors built in this way, and that only great halls for the gathering of numbers of people would require a totally different treatment of their roofs.

The building of the Mechanics' and Farmers' Bank, in Albany, erected in 1873, has a banking-room twenty-five feet high, into which opens a cashier's room twelve feet high and a lobby of en-

trance of the same height; and above these small divisions is the directors' room, also twelve feet high, occupying all the horizontal space of the cashier's room and the lobby together. Above this are rooms for storage, for the preservation of the books of the bank and for such other purposes as might be suggested thereafter, and the cellar contains toilet-rooms and compartments for fuel. The bank vault built up from the cellar floor as a pier of solid granite stands in the bank as a mere burglar proof iron box open on all four sides, with passages in constant use separating it everywhere from the walls of the building. In this building there is no wood used whatever. Not one piece of wood as large as the lead pencil which you hold in your hand, enters into the whole fabric in any form more permanent than the movable tables and desks in the cashier's and directors' rooms, and the sloping and also movable desk tops used by some of the clerks behind the bank counter. The counter itself is of stone, marble, bronze and glass. The outer walls are composed of a twenty-inch wall of solid brick, faced within with ornamental brickwork and a little cut-stone, which wall carries the floor beams; while an air-space separates this from the outer face-wall, eight inches or one brick in thickness, the cut-stone which is abundant in this eight-inch wall, being backed off to exactly the same thickness as the brickwork, so as not to encroach upon the air-space. The roof is a steep gable-roof, and is composed of iron beams which run horizontally from gable wall to gable wall and upon which iron beams brick arches rest, as in the floor, while the whole is cemented on top and the cement covered with sheets of copper left free to swell and shrink. The heavier partitions are of brick, faced with marble, where a dado was required; the lighter partitions, such as those which enclose the private rooms for depositors and for those who use the Safe Deposit Company, are made of iron grillage filled in with obscured glass. The windows have hollow iron frames and the sash are also of iron, the ornamental glass being set in copper bars. The doors throughout are made of light iron frames upon which leather is stretched. The building being thus free from combustible material is thought not to require fireproof jacketing for the iron beams of its floors which are the only large and constructional pieces of iron visible. It is not thought that heat from outside alone could injure these beams to the extent of bringing down the floors, while at the same time there is nothing within the building to make a fire, even as hot as that which one makes in a grate on an autumn day. Under these conditions an elaborate decorative treatment has been given to the building within and without. There is no plaster introduced into the building except where the arches of the ceiling are smoothed with a thin coat of plaster to receive painting. It is not, however, implied that any objection exists to plas-

tering which is a perfectly legitimate and respectable building material, and which in some of its modern forms is admirably durable and capable of excellent decorative treatment. With the appliances introduced during the last twenty-five years such a building could now be built somewhat more cheaply and it would be quite fitting, quite proper, quite realistic to treat with Keene's cement or other hard and solid plaster work such parts of the interior as might be thought too retired and domestic in their character to allow of rough brickwork, or of such staterooms as seem to demand high polish and delicate finish. The materials and aspect of this interior, and of the recitation rooms, halls and passages of old Columbia College might certainly be used, unchanged, in the twenty stories of a business building; nor need the requirements of an elegant dwelling house be essentially different.

It is to be observed that safety against fire is not the principal nor the primary good to be sought in masonry building with iron used where masonry is inapplicable. All that is good in solidity is to be had in such building as that; the unyielding, non-shrinking floor which allows of the solid and well-jointed pavement and upon which the workmen in marble tiling will gladly lay their best and most closely-jointed floor, the partitions without hollow flues to carry smells and gases from bottom to top of the house; the compact structure without inaccessible chambers where mice and rats can expatiate and in which corruption and disease may linger, a system of building which is closely allied to all the great building of the past and which allows of immediate application, both indoors and out, of whatever system of design, of whatever details, or appendages the past has given us and which we now desire to use again in altered forms. Moreover, the custom of building in solid masonry allows of liberties to be taken with the decoration without hindrance; without question; it allows of wood-work when wood-work is needed for the ornamental design, nor will any strictness of building laws or requirements of municipal departments be likely to forbid such decoration when all around is permanent and proof against the evils which lie in wait for such houses as are common with us. The writer knows a great Paris house, à loyer, in which the two state parlors of the chief apartment were lined with that elaborate panelling in white and gilded wood which has been fashionable in Paris for more than a century, and in which it became necessary to provide a private corridor. This was done by the simple process of taking up one whole wall of the wainscoting and pushing it four feet outward from the masonry behind it, diminishing the salon by that much and leaving a passage nearly four feet wide. With such houses as we build in New York, the Department of Building ought to find a rule forbidding any such alteration of the interior as that would be, but in

Paris where buildings are not built of quite such combustible stuff and where fires are very rare, objection could hardly be made. The wooden lining of these two large drawing-rooms is in itself as combustible as material can be, and is also, in itself, open to objections as to insects in the joints of the wood-work, "dry rot" in the wood itself and the disagreeables of a small and inaccessible space between the woodwork and the brick. So far as that goes the wood lining is, indeed, inferior to a lining of tile or plaster applied directly to the face of the brick; and greatly inferior to an exposed and decorative facing of the wall itself. The point of the argument is that

Fig. 10.
DWELLING HOUSE—VESTIBULE AND STAIRWAY.
Paris, France.

where the building is, almost as a matter of course, solid and permanent, such liberties as these may be taken with interior design and little harm ensue.

Still, however, that design which is independent of the necessity of such sheathing and facing and lining and disguising is superior and in every way to be preferred. Fig. 10 shows a modern vestibule and staircase hall in Paris, one of no very great pretensions. To build such a vestibule and staircase of Caen-stone is immeasurably cheaper in Paris than it is here. High prices are the result of our American system; there can be no doubt about that in the minds of

the most ardent patriots. The possibility, however, of such a structure as this, the staircase built and the walls faced with soft cream-colored stone of the Paris basin while the wall itself is, according to all Parisian custom, a fairly well laid solid structure of brick, unless, indeed, it is of stone throughout, as is very often the case; such a possibility as that we have now to insist upon. It will be the subject of future articles to consider how nearly some pieces of American and foreign building of the past few years may be found to approximate to such a standard as we are trying to set up.

Russell Sturgis.

BURNT CLAY FIREPROOFING AND ITS SUBSTITUTES.

WITHIN the last seventeen years forty-four tall buildings have been erected in the eleven blocks bounded by Beaver street, Battery place, Trinity place, Pine and William streets—the district which houses the bulk of the city's financial business. The average number of stories in the old buildings that were destroyed to make room for improvements was 4 3-11. The average number of stories in the new buildings is 11. The average in the buildings erected since the introduction of skeleton construction, say since 1890, is very much higher, inasmuch as twenty-story structures are, at the present day, not uncommon. During business hours each of these mammoth steel cages contains a population equal in number to that of a sizable village. In case of fire, if a panic, due to real or fancied danger, were to seize simultaneously upon the inhabitants of several contiguous modern buildings in the heart of the financial district, the street would not afford standing room for the crowds struggling for egress. In a community where such overcrowding is established, and where each successive new building intensifies the existing congestion, the imperativeness of the duty of excluding all but the most approved fireproof construction known to science, for the purpose of reducing to a minimum both the danger of fatality from fire and the danger of fatality from panic, is self-evident.

The forty-four tall buildings in question have added fifty per cent. to the rentable office space comprised in the financial district delimited. In other words, the district contains fifty per cent. more of rentable office space than it did in 1880, and the percentage increases with every sky-scraper that goes up. During the past seventeen years, on the other hand, the city's commerce has increased less than thirty-two per cent. As a consequence, according to the best

information obtainable, rentals have decreased fully one-half. At the same time land has risen in value until it has brought as much as $330.70 per square foot. It is doubtful whether, owing to the introduction of the elevator and skeleton construction, the demand for mercantile housing on Manhattan island will ever again exceed the supply. Real estate is bringing a fair return on capital invested, but the landlord is no longer in a position to exact monopoly rents. The decline in the net income producing power of real estate necessitates the keenest economy in running expenses, precisely as in any other competitive business. The chief item of possible saving is in the matter of insurance. The better the fireproofing, the lower the insurance. When the Siegel-Cooper Building was erected, terra cotta arches were used in the floor construction, but, to save space, the columns were covered with wire lathing and plaster. The effect on the insurance is explained in the following letter from the manager of the New York Tariff Association to the secretary of the Central Fireproofing Co.: "Replying to your inquiry of the 7th inst. (Nov., 1896,) as to the effect of inferior column protection upon the rates of the Siegel-Cooper Co.; if the column protection had been made satisfactory to us, the rates on building and contents would have been about fifteen per cent. lower, which would probably have saved them over $3,000 per year on their insurance."

The tendency of the elevator and steel construction to congest population on the one hand, and to reduce the net income producing power of real estate on the other, is especially striking in the district we have been considering. But, in varying degree, it is noticeable elsewhere throughout the city—in the residential as well as mercantile sections. Self-interest and regard for human life, therefore, combine to make it desirable for the real estate owner, in improving his property, to employ the most approved constructural material for resisting fire which the market affords. There are practically only three fireproof materials: burnt clay, cement and plaster. Each of these has been in use for an indefinite period, and, as the result of years of experience, the weight of expert opinion, both here and abroad, has long since pronounced in favor of burnt clay.

The leading plaster product is a compound of plaster of Paris, carbonate of lime, and cinders or wood chips. The fatal defect of this compound is that it absorbs and retains moisture, qualities which prevent wall decoration, afford a lodgment for disease germs, and cause wood to rot and steel to rust. The unfitness of this compound for constructural use has recently been demonstrated in two conspicuous instances, namely, the Corcoran Art Gallery, at Washington, and the Elliott F. Shepard residence, at Scarboro, on the Hudson.

Cement, whether plain or mixed with some foreign substance, as

cinders, is open to the supreme objection that, when subjected to a thorough fire-test, it loses its cohesive properties, both on account of the loss of its water hydration and the internal strains caused by the expansion of one side under heat. A thoroughly tested cement arch is found to have lost its load sustaining power, and after a period of progressive disintegration falls to the ground of its own weight. Exhaustive tests have shown that a fire of ordinary intensity is sufficient to completely ruin a very large covering of concrete. The risk involved in the use of such material is apparent when it is known that the claim is made for cement floor arches that they give additional strength to the floor beams.

Mr. Francis C. Moore, president of the Continental Fire Insurance Co., in a publication entitled "How to Build Fireproof and Slow Burning," quotes with approval the following passage from a recent writer: "The question of fireproof material is really a very simple one, and anyone who is so disposed can make the most convincing sort of test by taking a small fragment of ordinary porous terra cotta and a small fragment of the cinder concrete, which is usually employed for concrete construction, and holding a piece of each in his hands, expose the other end to the flame of a blowpipe. He will drop the piece of concrete first. Some time afterwards he will have to drop the terra cotta. If, while hot, they are dropped directly into a bucket of water, the most casual inspection will satisfy anyone that what is left of the concrete is hardly the material that is most desired for the protection of a building. Concrete is cheap, terra cotta is not; therein lies the secret of the possibilities of the use of the former material."

Some twenty-five years ago hollow concrete blocks were in common use in the United States as a fireproof material. Since the invention of the hollow tile, shortly after the Chicago fire, concrete blocks have been completely driven from the market. The Chicago fire demonstrated beyond peradventure the inefficiency of concrete as fireproofing and established the superiority of burnt clay to all other known constructural materials. Burnt clay in the form of hollow tile precisely answered the requirements of fireproofing as interpreted in the light of the Chicago fire, and has been employed in perhaps more than ninety per cent. of the notable buildings erected since the introduction of the elevator and skeleton construction. Much money and ingenuity were expended in efforts to rehabilitate cement—to correct its vital defects by the admixture of some foreign substance. The most thorough and scientific experiments, covering a period of many years, were, for example, conducted by the Dalton Chemical Co., organized under the laws of New Jersey, in 1890, for the purpose of inventing and marketing some efficient fireproof substitute for terra cotta. But these experiments merely served to rein-

force the lesson of the Chicago fire. This lesson, it was thought, had been thoroughly learned. But of late years, manufacturers of expanded metal and wire lath have sought to find an increased sale for their product by combining the same with cinder concrete and other compounds in floor arch construction. In every thorough test of such arches the component metal has been found to have been so far burned away as to destroy its effectiveness as a support to the arch. In fact, the use of metal in combination with concrete merely emphasizes the danger from the defects inherent in the concrete.

Invariably, in all the tests that have been made in this country, either by Building Departments or by the manufacturers of the various concrete systems, the suspended ceilings of wire, lath and plaster, used for the purpose of giving a flat ceiling construction, have disintegrated, and have fallen by the action of the fire, or the water used in extinguishing the fire. Where the tests have been at all severe, incrustations have been found, demonstrating that the iron beams had been heated to a red or white heat.

It would perhaps be unnecessary to consider seriously the claim of the cinder concrete arch to equal the hollow tile arch for fireproofing, were it not for the aggressive advertising campaign in favor of the former which has been inaugurated on the strength of a specious fire-test conducted under the auspices of the New York Building Department, November 19, 1897. At this test a floor arch consisting of tiles of an antiquated pattern and not all of the same make was constructed by the manufacturers of the concrete arch, whether accidentally or purposely, in such a manner that the arch was not properly keyed. The result was a foregone conclusion. The terra cotta arch collapsed after less than three hours' firing under a load of 150 pounds per square foot, whereas in a previous test, conducted under the auspices of the Building Department, an arch of similar pattern sustained six hours' firing under a load of 150 pounds per square foot, and, after being quenched with a regulation fire-hose, showed a maximum deflection of only 2-16 inches. This test occurred on September 29, 1896, the arch being composed of end-construction, hollow tiles. This identical arch, far from falling in, was loaded on September 30 with a load of 600 pounds per square foot; October 20, the load was increased to 611 pounds per square foot; and on October 21, to 1,175 pounds per square foot. On the 22d of October, at 2.30 p. m., the load was shifted to cover an area of only 9x4 feet, which made an approximate load of 1,960 pounds per square foot. The deflection was then observed to be 3.41 inches. As the arch was still intact the test was discontinued. The advertisements of the manufacturers of the concrete arch state how their arch acted under the fire and water test of No-

vember 19, 1897, but volunteer no information as to the condition of the arch, say six months after the test.

Long observation of the conduct of porous terra cotta arches in artificial and natural fire-tests has established the fact that this arch gives a more thorough protection to the steel framing in a building than any arch composed of one or other of the several substitutes for burnt clay fireproofing. The numerous small air spaces in the terra cotta arch between the steel floor beams, in conjunction with the highly non-conductive character of the terra cotta itself, tend to retard the progress of the heat in a fire more completely than any competing floor arch, no matter what the non-conducting virtue of its material, as in all other arches the entire space between the beams, the floor, and the ceiling, is given to one large opening. The skewbacks of the tile further protect the soffits of the beam—the most vulnerable point in a fire—both by a thickness of terra cotta and an air space in the tile itself. In the concrete arch, if any protection at all to the soffit is attempted, the concrete is made to adhere directly to the metal in a solid mass. That there is something in the character of the porous terra cotta arch, other than the mere non-conducting qualities of the material itself, to stay the progress of heat, is recognized by the makers of rival fireproofing, and it is doubtless for this reason that they refuse to submit to a comparative test of more than a few hours' duration.

The terra cotta arch possesses a decided constructural advantage in the circumstance that it is of greater thickness than the arches of cement or plaster. The floor system plays a very important part in the transmission of wind pressure and in the matter of lateral stiffness of narrow, high buildings. "It acts as a horizontal truss, and should be considered as a horizontal plate girder, which, if too thin and flexible (liable to spring or buckle), fails in the fulfilment of a most important function."

In constructive work with a simple material, like terra cotta, fraud is impossible, whereas the contrary is the case with cement and plaster compounds. In compounds, implicit trust must be placed in the contractor, and he, in turn, is at the mercy of his men. It is an easy matter for a laborer, for example, to slight his work through want of appreciation of the critical nature of the process of putting a cement arch in place. The cement which the contractor uses may be unreliable, not necessarily because of fraud on the part of the manufacturer, or unskilful manipulation on the part of workmen, but because of injury from exposure in transportation or storage about the building. A properly set terra cotta arch, to keep in place, does not depend entirely on the mortar used, while a concrete arch is necessarily altogether dependent on the quality of the cement. A defective hollow terra cotta block is readily detected. In construc-

tion work of such importance as a concrete floor arch, to secure reliable results, it is necessary to test every barrel of cement. Concrete that has lost its tensile strength in part, can, of course, be used at times as a mortar, or in other ways in a building, without serious danger, but in the construction of an arch, defective cement can never be used without the risk of serious consequences. Those who are familiar with the use of cement in plastic or monolithic work are aware that occasionally mixtures which at the time the work is in progress seem likely to prove good will, later on, go to pieces unexpectedly; frequently after several months have elapsed. Knowing the uncertainty of cement, the makers of terra cotta arches exercise unusual care in lowering the centering of an arch, for fear that, should the arch chance to depend on the cement to any great extent, it might give way.

But the great source of danger in cement arches arises from the tendency to use too little cement in the concrete mixture, because of the cost of the cement; keen competition among the concrete fireproofers forcing contractors constantly to do cheaper work. Cement sidewalks, when first introduced, served their purpose so well that they soon came into extensive use, but now, in the days of keener competition, it is rare to find a good piece of cement work in a sidewalk, and it is only natural to expect that the same results will follow in the case of the cement arch. An expert interested in hollow tile construction states that frequently, when looking at cement work in progress at a building, where he knew, from the price at which the work had been taken, that it could not be done in accordance with the architect's specifications, he has seen barrel after barrel of cinders or sand surreptitiously turned over into a mixture of concrete just passed by the architect's representative as right. This was done as soon as the inspector's back was turned, or after he had left the building. Besides, it is well known that bribery is frequently resorted to in like cases to secure the contractor against loss.

There is no better known fire fighter than Chief Charles W. Kruger, of First Battalion Fire Department, New York, who has just completed his twenty-fifth year in the service, and his recent experience in the large fire that swept clean the west wing of the sixth floor in the Postal Telegraph Building, is a case in point which illustrates the futility of using plaster or concrete in fireproof construction. The columns were covered (as in the Siegel-Cooper Building) with wire lath and plaster in order to economize room and save expense. The wooden studding, placed for its support back of the wire lath, was found to be in flames, and instead of acting as a protection simply added to the difficulties of extinguishing the fire.

WASHINGTON LIFE BUILDING.

Broadway, S. W. Cor. Liberty St., New York City. Cyrus L. W. Eidlitz, Architect.

N. Y. Life Banking Room, Leonard Street and Broadway.
Messrs. McKim, Mead & White, Architects. Executed by R. C. Fisher & Co.

THE J. L. MOTT IRON WORKS,

84-90 BEEKMAN STREET, NEW YORK.

332-334 Boylston Street, Boston. 311-313 Wabash Avenue, Chicago.

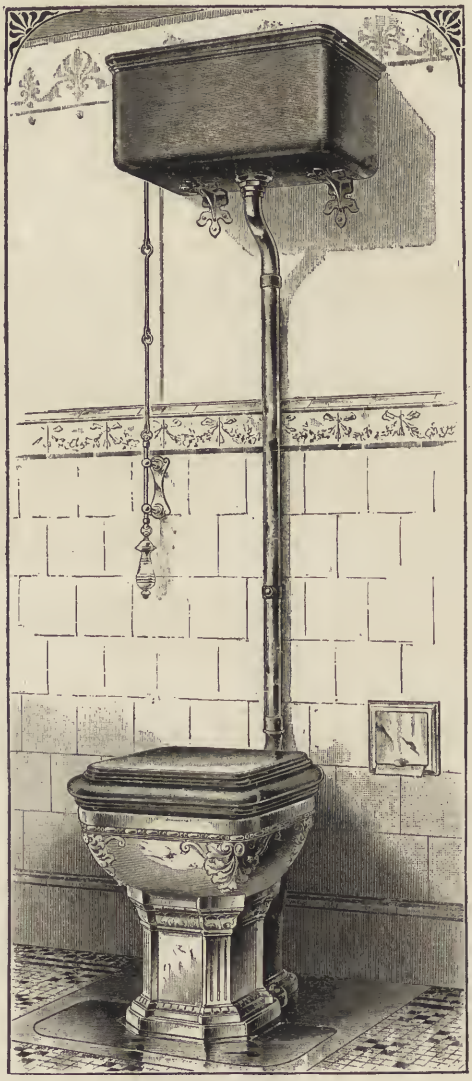
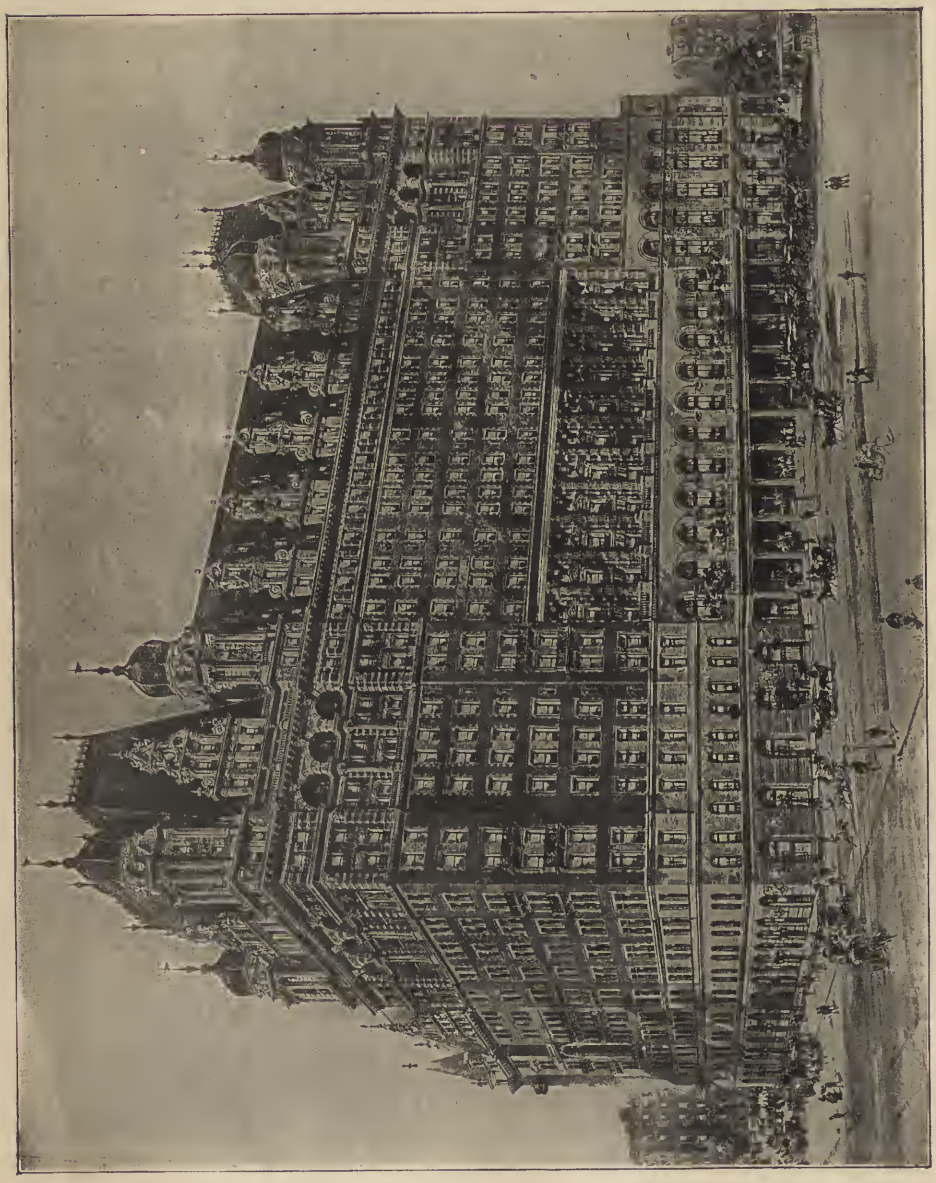


PLATE 5016-R.

The "Renaissance" Improved Syphon Jet Water Closet.

(PATENTED)

FOR FULL DESCRIPTION SEE CIRCULAR, WHICH MAY BE HAD ON APPLICATION.



THE ASTORIA HOTEL.

THE BROOKLYN BRIDGE BRAND OF ROSENDALE HYDRAULIC CEMENT WAS USED IN THE CONSTRUCTION OF THE ABOVE BUILDING.

. VIII. No. 2. *For Quarter ending December 31, 1898.* Whole No. 30

THE ARCHITECTURAL RECORD.

CONTENTS

100 ILLUSTRATIONS.

THE ARCHITECTURAL RECORD CO., 14-16 VESEY STREET, N. Y.
PRICE, TWENTY-FIVE CENTS.

ST. PAUL BUILDING,	Geo. B. Post, Architect
STANDARD OIL BUILDING,	Kimball & Thompson, Architects
HARTFORD FIRE INS. BUILDING,	Cady, Berg & See, Architects
NEW YORK LIFE BUILDING,	McKim, Mead & White, Architects
SEIGEL-COOPER BUILDING,	DeLemos & Cordes, Architects

CENTRAL NATIONAL BANK BUILDING,	J. T. Williams, Architect
SPINGLER BUILDING,	W. H. Hume & Son, Architects
GILLENDER BUILDING,	Berg & Clark, Architects
COLUMBIA COLLEGE BUILDINGS,	McKim, Mead & White, Architects
NEW YORK ATHLETIC CLUB,	W. A. Cable, Architect

The Philadelphia & Reading Terminal Railroad Station, Philadelphia.
Painted with Dixon's Silica Graphite Paint.

DIXON'S SILICA GRAPHITE PAINT

Nearest to an ideal paint for protective purposes that has ever been made.

Roofs and iron work well painted with Dixon's Silica-Graphite Paint have not required repainting for ten or fifteen years.

Should be used in the construction work of all Iron or Steel Buildings, Bridges, etc.

JOSEPH DIXON CRUCIBLE COMPANY,

JERSEY CITY, N. J.

N. B. — Architects and Draftsmen who are not familiar with DIXON'S 213½ PENCIL should send for a sample. For fine line work it is without an equal. Sent free when business card is sent us.

THE RESIDENCE OF ELBRIDGE T. GERRY, ESQ
5th Avenue and 61st Street, New York City. Richard Morris Hunt, Architect.

Please notice what Commodore ELBRIDGE T. GERRY says regarding the heating of his large new residence, No. 2 East 61st St., City. House is 100x110.

NEW YORK, March 14, 1895.

Richardson & Boynton Co.,

Gentlemen :—I write to express my great satisfaction with your admirable system of Perfect warm air furnaces recently placed in my house, No. 2 East 61st Street, in this city. They possess the advantage, as to the character of the warm air, that it is neither the disgusting steam heat which dries up the skin and affects the head, nor, on the other hand, is it the almost equally dry hot water heat, as it is called; but during the entire cold weather of the late winter, even during the blizzard, my house has been thoroughly heated. The heat is uniform and the ventilation perfect.

Very truly yours,

ELBRIDGE T. GERRY.

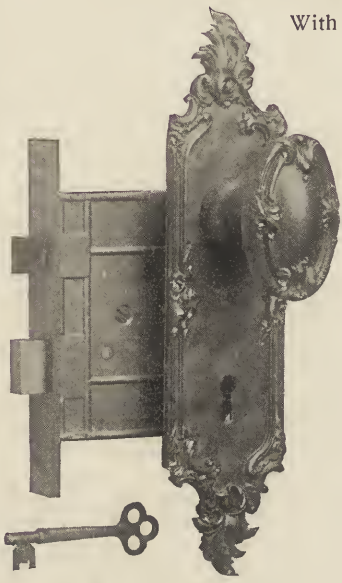
RESIDENCE OF J. S. BACHE, ESQ.
No. 8 East 67th Street, New York City. Charles P. H. Gilbert, Architect.

ST. PAUL BUILDING,	GEORGE B. POST, Architect
HAVEMEYER STORES,	GEORGE B. POST, Architect
EQUITABLE BUILDING,	GEORGE B. POST, Architect
WELD ESTATE BUILDING,	GEORGE B. POST, Architect
COE ESTATE BUILDING,	GEORGE B. POST, Architect
THE PARK BUILDING,	GEORGE B. POST, Architect
EMPIRE BUILDING,	KIMBALL & THOMPSON, Architects
STANDARD OIL BUILDING,	KIMBALL & THOMPSON, Architects
SHERRY BUILDING,	McKIM, MEAD & WHITE, Architects
NEW YORK LIFE INS. BUILDING,	McKIM, MEAD & WHITE, Architects
UNIVERSITY CLUB,	McKIM, MEAD & WHITE, Architects
EXCHANGE COURT BUILDING,	CLINTON & RUSSELL, Architects
METROPOLITAN LIFE INS. BUILDING,	N. LE BRUN & SON, Architects

The "Vulcan" Locks

All Wrought Metal:

With "Compensating" Hubs.



Set No. 241—Fleury Design.
One-third actual size.

We have recently received the following unsolicited letter from a prominent builder and contractor in New York. Believing that the statement of experience it contains will be of interest, we reproduce it here.

An Artistic Brochure on Vulcan Locks, also a Catalogue of 90 pages, will be sent on request.

The
Yale and Towne
Mfg. Company.

General Offices: 9-11-13 Murray St., New York.

Office of A. BEINHAUER,
124 Maiden Lane,

NEW YORK, July 11th, 1898.

The Yale & Towne Mfg. Co., 9-11-13 Murray St.

Gentlemen:—Having lately had occasion to use and apply your "Vulcan Locks" in the Anderson Building, 12-14-16 John Street, I take pleasure in mentioning the fact that in the application of these locks, there is a large saving of labor, as compared to the ordinary cast-case locks. The difference, as I found it, was, that while a man put on six to eight of the latter, he could in the same space of time put on twelve to fourteen "Vulcan Locks," thus decreasing the cost of labor to a considerable extent.

Another feature about these "Vulcan Locks" is that while they give as good service as any cast-case lock of their denomination, they do not require as much cutting away of wood in the lock-rail, thereby strengthening the door to an appreciable extent.

Wishing you all success with your "Vulcan Locks," I remain

Yours truly, (Signed) ALFRED BEINHAUER.

9220-98-200 6000

(WHOLE No. 30.)

Vol. VIII. ONE DOLLAR A YEAR. No. 2.

The Architectural Record

October-December, 1898.

25¢ 25¢

CONTENTS

100 Illustrations.

Illustrated Published Quarterly

ADVERTISERS' DIRECTORY.

ADVERTISERS' DIRECTORY.—*Continued.*

The
Architectural Record.

VOL. VIII OCTOBER-DECEMBER, 1898. NO. 2.

NOTABLE BUILDINGS.—No. 1. The Villa Lante.

THE few miles intervening between Viterbo, that venerable town of many fountains, and the village of Bagnaia, with its mediæval squares and its one main street, is rarely traversed for the sake of the little town itself, although it is attractive as all Italian hill towns must be. At the end of the village lies the old estate of the Bishops of Viterbo, now the home of the Duca di Lante, usually attracting students of art and architecture from the main route, but seldom the more general traveller, who, on visiting Viterbo, has Rome or Florence as an immediate destination.

Yet they who visit the Villa Lante find something unknown at Florence, and unequalled in Rome. Around the latter city, on the hills by rushing torrents or on the border of mountain lakes, are towns filled with the old houses of Popes and Cardinals and Princes, some situated in the midst of their own groves and vineyards, many with their backs to the Alban hills, face Rome with that view over the vast blue campagna; all are set in a grand, natural position, and none in a spot where man has had to form the great characteristics as at the Villa Lante.

It is not alone a perfection of natural site or conventional works that render an Italian villa of this type successful, nor even the admixture of both, unless the unison be so deftly accomplished as to leave in the mind of the beholder no idea of imperfect unity.

A mediæval castle, with its far-reaching view for friends or foes, was perfectly situated on its rugged height, springing from the midst of the wildest forest; and a Roman villa of the first and second centuries was wide set in its small garden, devoid of all natural beauty, where all foliage was forced into forms never prescribed by nature. But the architects of the fifteenth and sixteenth century villas had neither the problem of the former or the latter, but were forced by the very nature of these summer homes and the times into a modification of both.

The architecture of this period exhibits buildings of various forms, but the great ones always indicate their purpose and that they were considered as units, not as a collection of separate parts. As a composition such was the result attained in the gardens of the Lante. And it is far more evident here than in other Italian villas that this was the result sought, and that it was never for a moment forgotten or undervalued. In ornamental gardens, as in buildings, it is evident that if the composition is good the result is a production of some worth, and that detail is of lesser importance, increasing the harmony of the result, however, as the detail becomes more fitting in its application and in its own beauty. In the Villa Lante such parts are not only beautifully designed but wisely used, and from the grand fountain in the lower garden to the source in the upper terrace there is an impression throughout of unity and ideal beauty in which minute study discovers but few faults. The general plan of the villa, except the surrounding park and woodland, is long and narrow, the length stretching away from the entrance, upon passing which the arrangement of the gardens is at once made plain; and it is upon this basis that the scheme of the fountains, terraces and colonnades has been formed. From the lower level of the entrance and main garden rise terraces in four different levels, each connected with the other by flights of steps, flanked by colonnades, each terrace having as a central motive either a fountain or a course of water, all so placed and arranged as to fulfil their own part without interrupting the main scheme.

Although the villa displays established precedents, it has by no means the traditional formality, and although prominence is given to the main features, they have not been unduly developed. There is no superficial display of or attempt at vulgar ornamentation. The lower garden, approximately two hundred and fifty feet square, is surrounded on three sides by a hedge of box of magnificent growth; the centre is occupied by the grand fountain; four lions of bronze are seated between bronze figures of nude youths, standing beautifully poised over a circular stone basin; the water is thrown aloft in the centre, and from the lions' mouths to the water below, whence it finds its way through masks in the pedestals of the stone balustrade to the second surrounding basin, and finally on through lions' masks again to the great pools below, which are surrounded towards the centre by balustrades, but on the garden sides are bounded only by a low coping level with the water. The effect of this great motive, a hundred feet square, is charming beyond description; nothing could be more effective, or yet fill so large a space more simply. The basins, balustrades and stone vases and covers are of a coarse porous stone, now moss-covered and beautifully worn by time and the water, all well designed and in excellent har-

THE GRAND FOUNTAIN AND TERRACE, FROM THE ENTRANCE.

mony, and the bronze figures are far above the average sculpture usually devoted to this purpose. The garden surrounding this fountain is laid out in four great blocks, or rectangles, and four small ones, all consisting of box and laurel, all having in the centre, on a level with the ground, circular basins, with one low, central jet of water. These rectangles are emphasized and defined at the angles by pedestals supporting great terra cotta vases containing lemon or orange trees, the fruit of which is the only bright color. All is subordinate to the main tone, green, just as all minor arrangement in these blocks is kept subordinate to the form and placing of the blocks themselves. The end of the garden opposite the entrance is occupied by the two buildings forming the residence; between them the ground rises in a steep incline, a balustrade at the top and a hedge at the sides and bottom, the higher level being gained by flights of steps against each building. The first terrace thus reached is planted with a dozen noble trees, spaced with a regularity that leaves the view of the upper terrace from the open loggie unimpaired. At the end of this terrace and on the axis is a circular fountain of four simple concentric basins, rising one above the other, with a single central jet in the highest, the water flowing not over the rims, but through bronze bills in the sides. On either side steps lead to the next level. Low pedestals with stone vases con-

CENTRAL GROUP OF THE GRAND FOUNTAIN.

taining laurel continue the lines of the steps below, while the higher level is bounded by a balustrade. The second terrace consists of groves of ilex; in the centre between them is greensward with a long, low, plain stone trough or hollowed table extending along the main axis, containing a shallow body of water, apparently quiet, yet ever changing and playing its own part in continuing the supply to the grounds below. At the end of this terrace, abutting the wall of

FOUNTAIN AT THE UPPER END OF THE FIRST TERRACE.

the next level, is a semi-circular fountain of three concentric basins, two figures of reclining river gods marring an otherwise pleasant spot.

The third terrace is gained as the others, by flights of steps on both sides of the fountain. A low wall with stone vases serves for a balustrade and the retaining wall of the higher level is continued with a series of niches to the limits of the garden. This, perhaps the most charming terrace, is narrowed to about one-third the width of those below, but is longer. Down its length, at the slightest incline, runs for ninety feet a narrow stone trough of wavy form and curved outline, so that the water, meeting in its downward course a hundred little impediments, ripples continuously, and its sweet, low music, borne on air heavy laden with the scent of orange blossoms, must be very soothing as it reaches the open loggie below on those days when the sun of central Italy seems never to lose its fierce, burning power.

Stone seats and high hedges run parallel with this water-course to the farther end, where the fourth and highest terrace is reached, still narrow like the preceding one, and separated from the surrounding park land by a low wall, on which is a colonnade with stone vases set in the intervals, all now covered with ivy, and here and there an old fig tree trained flat and reaching from column to column. In the centre is an octagonal fountain with dolphins; sur-

THE SECOND TERRACE.

rounding it are stone seats, and beyond is greensward. At the upper end, between two small buildings, forming merely open loggie, is the rocky niche from which flows the source of all the fountains. Gnarled fig and ancient ilex have grown so close and so tenderly shield this spot that their branches mingle with the dense growth of ivy and ferns, and as the water falls on these the stream loses its force and turns each point of every leaf into tiny jets, so that the great architectural gardens below are fed after all but from a misty shower. Aside from the wonder and admiration with which one views each successive part one is awed at the knowledge which accepted so small a source and at the skill with which it was utilized, which directed it step by step from source to fountain, from fountain to pool and from level to level, all so perfectly adjusted that each has played its part for centuries. Above all, there is no great display, no wearying dash or roar. The subordinization of all parts of all colors, and even of all sounds is here perfected to attain a simple unity. Protecting these gardens and forming a worthy setting

LOWER GARDEN AND TOWER, FROM THE FIRST TERRACE.

THE THIRD TERRACE.

for them are great groves of ilex and olive orchards and vineyards, stretching away to the rugged hills where the Roman pine and the cypress show clear against the white walls of some monastery, which here, even as in Tuscany, seem part of every eminence. On one side only is seen the little village, its grey stone, grey-tiled, weather-worn, sun-bleached houses grouped close to form one street and one piazza, where rise towers greyer and older, more bleached and even more picturesque than the houses; where the women meet every morning with their great water jugs to draw their daily supply from the old octagonal well, and where all winter the people sit on the sunny side and talk of the two events which most affect their lives, the vintage and the coming of the Duke.

Edward S. Cale.

THE OLD CATHEDRAL, MOLFETTA.

"UNKNOWN ITALY."

IN the spring of 1895, Gen. C. G Loring, Director of the Boston Museum of Fine Arts, was good enough to call my attention to some photographs of Italian architecture from the unfrequented territory of Apulia which he had recently purchased for his museum. Not only were the subjects of these pictures wholly unfamiliar, but even the names of the towns in which they had been taken were for the most part also unknown to me. It was General Loring's idea that these localities might offer something of interest in the direction of the studies which he knew I was about to undertake in Italy, and the result of this kindly interest on his part was a visit to the territory which I am bold enough to denominate "Unknown Italy." The midsummer season, the later part of June and early part of July, was chosen by necessity for this trip, and it may be mentioned for the benefit of others that the heat was by no means intolerable at this time. Here, as in other parts of Italy, the dryness of the air enables one to endure the heat without great difficulty. A sun umbrella is indispensable, but with this protection one can go about even at noon time without serious discomfort.

It is quite likely that the names of the cathedrals of Altamura, Matera and Bitonto are as unfamiliar to the readers of the "Architectural Record" as they have been to me—and quite probable that most of them are personally unfamiliar with Bari, Troja, Barletta and Trani. As for Ruvo, Andria, Molfetta, Acquaviva delle Fonti

Golfo di Manfredonia
Golfo di Salerno
GOLFO DI TARANTO
CAMPANIA
PUGLIE
BASILICATA
NAPOLI
Taranto
Bari
Foggia
Potenza
Salerno
Benevento
Avellino
Caserta
Matera
Barletta
Trani
Andria

S. MARIA DELLE GRAZIE, GRAVINA.

and Bitetto, it is safe to assert that even Italians outside of these places, to say nothing of other nations, know very little about them.

The simple fact is that Italy is such a mine of interest to the archæologist and the art-historian that they may, and do, spend years of residence and of study in the country without exhausting its riches, while the inconveniences and discomforts of these out-of-the way Italian towns of Apulia have so far discouraged even the advance guard of adventurous tourists from "doing" this part of the country.

The churches and cathedrals have, however, notwithstanding their isolation, not escaped the omniscience and omnipresence of German research. The monumental publication of Schulz in five volumes of text and one large folio of plates is a splendid work.* It has, however, shortcomings in the matter of comprehensive illustration, whose special causes have been explained in the preface of the work itself. The publication of Huillard-Bréholles must be judged as a literary history of the Normans and Hohenstaufens in South Italy.† In this sense it is a worthy and competent book, but its illustrative plates represent a mere fraction of the actual monuments, even as compared with the folio of Schulz. Schulz is the only archæologist who has thoroughly examined the country, but his actual sojourns and explorations in it date back of 1842, while the book known under his name was given to the world in 1860, five years after his death. When it is understood that much of the text was compiled after his death, in 1855, by collaborators who had not visited the territory, and that all the illustrative material was collected before 1842, it becomes clear how some gaps can be pointed out in this excellent and indispensable monument of German erudition.

Before saying a word or two about the splendid architectural monuments of this territory we will record some facts of travel experience bearing on its isolation and backwardness, which are only paralleled in the most obscure villages of Egypt, of Syria, or of Asia Minor.

The rarity of photographs from Apulia is, in the first place, significant of this isolation. Naples is the natural centre for photographs from South Italy in general, but none are obtainable at Naples for any site east or southeast of Beneventum. In Rome only one series is accessible. This is the set made under the auspices of the Italian Ministry of Public Instruction by Signor Moscioni and for sale at his shop in the Via Condotti. This set was made about five

*Denkmäler der Kunst des Mittelalters in Unter Italien. Dresden, 1860.

†Recherches sur les Monuments et l'Histoire des Normands et de la Maison de Souabe dans l'Italié Méridionale. Publiées par les soins de M. le Duc de Luynes. Texte par A. Huillard-Bréholles, Traducteur de Matthieu Paris. Dessins, par Victor Baltard. Paris, 1844.

years ago, and before this date there were apparently absolutely no photographs obtainable from this district. That they are not to be had in the towns themselves will appear from what follows. Even at Bari, the most thriving town of Apulia, with a population of 60,000 inhabitants, I saw absolutely no photographs. Photographic plates were likewise unobtainable. They can be had nowhere in South Italy outside of Naples, and this warning may be of service to others.

Some notes as to hotel accommodations and other questions of creature comfort will suggest why there are no tourists in Apulia, and this again will explain why photographs are confined to the series made by Moscioni under Government auspices.

On the railway line which carries one across Italy from Naples in a general eastward direction, Beneventum is the most important town. It is in a sense a very well-known place, though not often taken in by tourists. One obtains here a first hint of what is to follow in the way of hotel accommodation from the fact that one of the two leading hotels has a hen roost directly inside the main entrance. The said main entrance gives the hens access to the outer world. I was drawn to this hotel by Baedeker's praise of its cleanliness, and his praise, be it added, is quite justified, after one has compared the entrance with the interior. The reason that the hotel is so clean is that the hen roost is close to the front door; otherwise it would be insufferable. In fact, if one is to keep hens in town and give them the run of the street this arrangement seems most commendable.

The junction of the Naples line with the railway which runs down on the eastern side of Italy from Ancona to Brindisi, is at Foggia. It will illustrate the amount of through express travel by way of Foggia to say that its railway restaurant has several waiters who speak English. This was not noticed by me in any other railway restaurant of Italy and is due of course to the through express travel down the eastern coast to Brindisi, as one main point of departure of English travel to India, Egypt, Greece, Syria and Constantinople. The railway line from Foggia to Brindisi carries most of the through express travel from Northern Europe to the southern and eastern Mediterranean, but of the thousands who use this line, perhaps not one has any conception of the interest of the neighboring architectural monuments.

Only twelve miles distant from Foggia lies the Cathedral of Troja, whose architectural details offer the most remarkable mediæval survivals of classic art to be seen in all Europe. Neither Venice nor Pisa can offer anything as marvellous in the way of classic survival as the capitals of Troja. The decorative details of its bronze doors are the finest mediæval metal work in Italy or in all Europe, judged from the standpoint of decorative art; although

PALAZZO SIROS, BITONTO.

CATHEDRAL, ALTAMURA.

in figure design they are surpassed by the bronze doors of Trani and Ravello. Its rose window has no parallel in the art of Italy.

Should any one be surprised that these facts hold of a place of so little renown, it will offer a partial explanation to describe the leading hotel. If you go to Troja, as we did, by carriage from Foggia, your carriage and horses will be stabled in the hotel dining room, and your dinner will be cooked in the same apartment, which is thus, at one and the same time, a most excellent stable, an indifferent kitchen, and an indescribable salle-à-manger.

One English-speaking Italian, was, however, found at Troja, a reminder that the territory to be described furnishes the bulk of the Italian emigrants to America. There is said to be in the South Italian province, known as the Basilicata, a town in which three-fourths of the men speak English. These men are, or have been, organ-grinders, and it is said that this town furnishes a large proportion of the organ-grinders of the English-speaking world. In our own experience, however, no English was spoken in this district, outside of Troja (and the Foggia railway restaurant). The population of Apulia is quite guiltless of French.

But Troja is a small place, and its undeniable isolation would account for almost anything, except the forgotten glories of its marvellous cathedral. It is in the larger towns of Apulia that one finds the most peculiar phases of undeveloped culture and primitive society. Take, for instance, Andria, which is only seven-and-a-half miles from Barletta (Barletta is on the main line below Foggia). Andria is credited by a Baedeker of 1890 with a population of 37,000. The population, at the time of my visit, was said to be over 40,000. Under these circumstances it will be considered incredible that there is not one restaurant of even the humblest description in this place. It has no shop with a glass window in its whole compass. In fact nothing was seen that could be called shop by the extremest stretch of courtesy. Having found a hotel over a stable it turned out that its one sleeping apartment was not available for guests who were in search of solitude at night. After diligent search and inquiry for a place where one might obtain supper (naturally not excluding the hotel simply because one could not sleep there) it was manifest as well from information as from a prolonged search through the principal streets that not even one *trattoria* was to be found in Andria. Refuge was taken in a humble private dwelling, which afforded a warm-hearted welcome and primitive accommodations. The good people of this house were somewhat prejudiced against Americans. They had several friends who had relations in America. These friends had written to the American police for information about their relations, and the police of America had sent no manner of reply, all of which was considered most

heartless and indifferent, and a distinct stain on the national character.

The conditions at Andria are surprising, considering that it is on a steam tramway running between Barletta and Bari and that it is accessible four times a day from both places, but these conditions are typical for the best part of Apulia. Barletta itself, it is true, has not much to boast of in the way of comforts for the tourist, but Bari is a thriving place, by no means destitute of creature comforts, among which a multitude of barber shops which are actually decorated with mirrors, affect one with an indescribable atmosphere of reckless extravagance and dissipation, after a vain search for a glass of vermouth and seltzer at some neighboring place like Bitonto, with a population of 26,000.

To continue this catalogue of hotel and restaurant grievances we may quote an experience at Acquaviva delle Fonti, which is on the main line from Bari to Otranto. Here the most expensive supper obtainable cost the sum of seven cents. The host of the *trattoria* offered me the bread which was left on the table, after the repast was finished. Having paid for it, it was mine, and the expectation was consequently that I should take it away with me. No coffee was obtainable at this *trattoria*, but we were referred to a café, so designated by a sign in the neighboring public square. It was somewhat of a disappointment to find that this café, which was the only one in town, had no coffee to offer at half-past-seven in the evening, although a military band was playing in the public square. The relative nearness of Apulia to the Oriental world, and the ease with which coffee can be obtained in out-of-the-way Oriental towns, makes this experience very significant for the poverty and stagnation of the district.

An incident met with at Bitetto will farther illustrate the primitive conditions of this society. Our host in the *trattoria* of Bitetto, after setting a jug of water on the table, raised it to his own lips and partook therefrom with absolute simplicity. The jug from which he drank had the old Greek shape and was decorated with a Greek pattern; both descended in a straight historic line from the old Greek colonies of South Italy. The cathedral at Bitetto has a very fine façade and a phenomenal ground plan. The interior is spoiled by Renaissance overlay. The style is in reality essentially Apulian Romanesque, although dating from the Gothic period.

The character of the accommodations awaiting the student of the marvellous cathedral at Altamura and of the very fine cathedral at Matera may be argued from the above incidents.

What has been said on the subject of accommodations is mainly to explain why we have chosen "Unknown Italy" as the title of this Paper. The recorder of these incidents found himself personally

MAIN PORTAL, ALTAMURA CATHEDRAL.

CATHEDRAL, BITONTO.

absolutely happy in this country. There were no real discomforts and no real privations. The people were genial and polite. The architectural monuments were splendid. The weather was perfect, and the air was pure. The scenery was varied and interesting. The wine was not bad. At Matera it is said to be exquisite. This information was offered by my esteemed friend, the photographer Moscioni, long after Matera had been sampled for cathedrals rather than for wine.

One thing results from the conditions we have described. In view of the inexhaustible wealth of Italy in art treasures which are more accessible, and in view of the absence of such hotel accommodations as the average traveler is accustomed to expect, it is certain that many years will elapse before the monuments of Southeast Italy will be familiar, by personal observation, even to the archæologist.

How such primitive conditions come to exist in any part of a country presumably as well developed as modern Italy the following incident may serve to explain: An English gentleman who was met in a railway carriage between Orvieto and Rome told me of his acquaintance with a high Italian official, who had been born at Altamura. This official related that as a boy he had been used to dance on the bodies of the brigands when they were exposed in the public square. This was one of the amusements of the youth at Altamura as recently as 1870. The railway through Altamura has only been running five years. The tramway to Bitonto, Ruvo and Andria from Bari has only been built about the same length of time. At present the country is absolutely safe, but it is not many years since brigandage has been put down in the territory of the former State of Naples.

As to the character of the population there seems to be no upper class and no middle class outside of Bari. There is not even any distinct class of small trades-people. The country peasantry and farming population live only in the towns, and these are now destitute of any other class of inhabitants. The large landed proprietors appear to be residents of Naples. The only educated people are the ecclesiastics. As to how these people manage to live without shops and restaurants, it would appear that they are very poor and extremely economical, and that their simple wants are supplied by occasional fairs. The towns impress one as wholly populated by the class one meets in the Italian laborers of American cities, which class is by no means typical for other parts of Italy, as all tourists are able to testify. It is, of course, the present poverty of this territory which causes this emigration from it to be so heavy.

That Apulia has had another history and a different past, that its present condition is a retrogression, is sufficiently evident from

PART OF THE FACADE, RUVO CATHEDRAL.

the architectural monuments. The population described is uniformly distributed through all classes of dwellings in towns which frequently boast very fine Renaissance palaces, now utterly abandoned by the class which built them. There is hardly a single town which has not a cathedral of an importance far beyond its present condition. There are fine Renaissance palaces and fine cathedrals in places where one cannot buy a glass of vermouth or a sheet of writing paper, and where a three-cent cigar is a luxury beyond the means or, at least, beyond the aspirations, of every inhabitant.

To judge, however, from the comparative number of surviving buildings, even the Renaissance period was one of relative decay as compared with Northern and Central Italy, and the great time of Southeast Italy evidently ended mainly with the Hohenstaufens and the middle of the thirteenth century. The most flourishing period of this territory since the Greek colonies of early antiquity must have been during the Byzantine rule which closed, generally speaking, during the eleventh century. Under the Normans and under the Hohenstaufens, it continued to enjoy a high degree of prosperity and importance, and most of the surviving churches are of the twelfth and thirteenth centuries. The Saracens sacked and ravaged Apulia, and first impaired its prosperity. The Normans who drove them out and who at first figured as the military force of the Byzantine State, whose rule they soon overthrew, were not able or fit to improve the Byzantine civilization, which scarcely survived the Hohenstaufen successors of the Normans. The country must have been at low ebb during the time of the Anjous (after 1272), to judge from the relative absence of Gothic monuments. The Renaissance does not appear to have done much for its sunken fortunes outside of the coast towns, to which the Renaissance palaces are mainly confined. Gravina, however, which lies east of Altamura, has many fine monuments of the Renaissance period.

Among the cathedrals of the first class, that of Troja must be given an altogether pre-eminent mention. In certain features it outranks any building of the Byzantine-Romanesque architecture of Italy. All things considered, it cannot be ranked below any Byzantine-Romanesque building in Italy, excepting St. Mark's at Venice and the Pisa Cathedral. On account of the importance of the details of Troja we shall reserve them for a separate and following Paper.

The Cathedral of Altamura deserves the next mention in order, for dimensions and decoration, and as offering a unique example of a German Romanesque type of building in Italy, as regards the relation of spires and façade. Begun and mainly finished by the Hohenstaufen emperor, Frederick II., who also founded the town in 1220, it shows the arrangement of the double spires rising from the

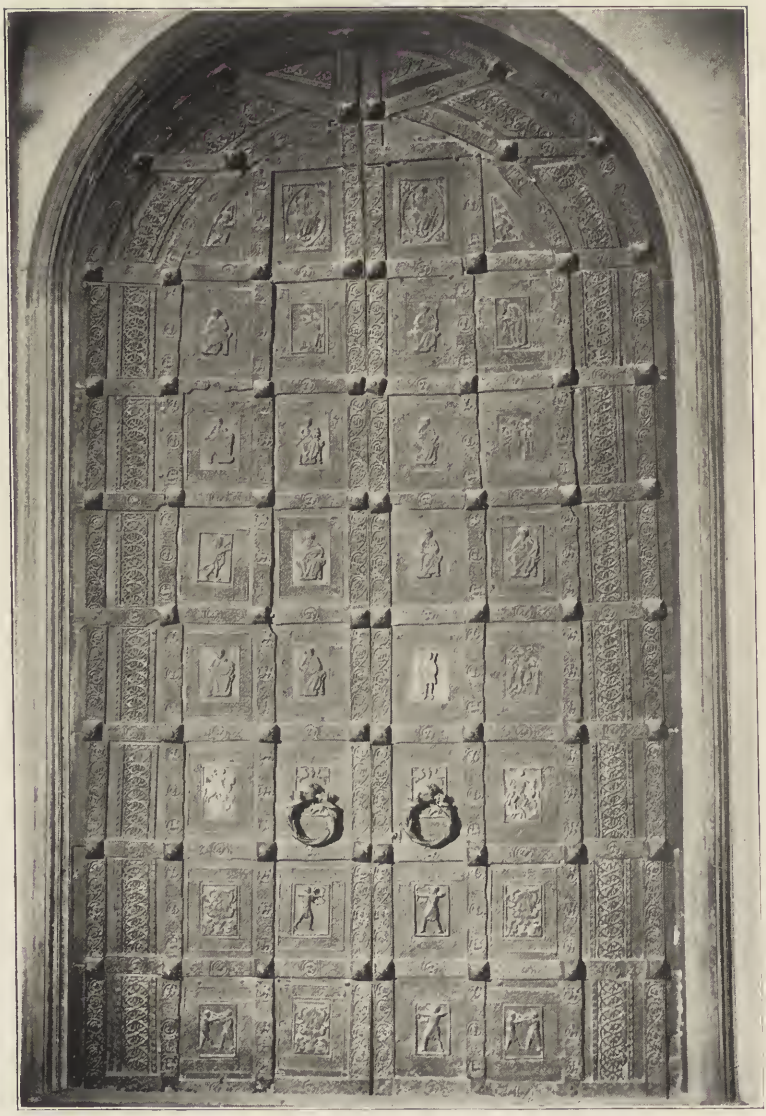
façade and forming a portion of it, which is otherwise absolutely foreign to Italy. In general effect, Altamura suggests a Rhine Cathedral, although its details show the characteristics of the Romanesque of South Italy.

The main portal, considered simply as a doorway, is the most richly and sumptuously decorated bit of the kind in all Italy. This portal dates from the Anjous, and shows Italian Gothic quality in some points, although generally following the style of work peculiar to the Romanesque of Apulia. These hooded portals, with columns, resting on lions, or griffins, are more numerously represented by fine examples in Apulia than in any other part of Italy or of Europe. Several of our illustrations show these portals. They survive in many churches whose interiors, as at Bitetto, have been wholly spoiled by restorations and Renaissance stucco. They have also created a similar type of window which have no counterparts in other parts of Italy or of Europe. (Page 143.)

A most peculiar indication of the conservatism of Apulia and of its backward conditions during the Renaissance is the survival of these mediæval portals resting on lions, through the Gothic and down to the late Renaissance period. This curious mixture of mediæval and Renaissance art is found, for instance, at Acquaviva delle Fonti. It was some time before I could persuade myself that the Renaissance architect had not placed a new portal and columns on older mediæval lions, a suggestion which may occur to some students of the photographs, but which is positively not the case. Similar instances of Renaissance survival of these portals occur at Bari, at Conversano and at Gravina.

To recur to the Altamura Cathedral it may be added that its interior has suffered from a modern marbleized stuccoing, but that the mediæval details and carvings are all intact and free from disguise. Notwithstanding its dimensions, its interesting peculiarities and its splendid portal, Altamura Cathedral is not mentioned by Burckhardt's Cicerone, the best general guide to the art of Italy. It is erroneously mentioned by Baedeker as a "Norman" Cathedral. Baedeker passes it by with the slighting remark that there is "a Norman Cathedral on the road from Potenza to Grumo." Murray mentions the "fine cathedral," but Fergusson only specifies the name of the place.

Neither the town nor the Cathedral of Altamura are mentioned by Huillard-Bréholles, one of the two supposedly special authorities on South Italy. The plate illustrations of Schulz are confined to a section, a plan, and a few details; but the portal has fitting mention in his text to the effect that "there is probably in this district hardly another which could be compared with it for beauty and perfection." The accounts which are given by Schulz of his travels in Italy



BRONZE DOORS, TRANI CATHEDRAL.

DETAILS OF BRONZE DOORS, TRANI CATHEDRAL.

would indicate a very slight acquaintance with North and Central Italy, and we may boldly extend his verdict to the whole country, provided the qualification be made that one is speaking of a portal as distinct from a façade.

Bitonto Cathedral receives full justice from Fergusson, who rightly pronounces its upper exterior gallery the finest thing of the kind in Italy. (Page 135.) Bitonto is easily and quickly reached from

SOUTHERN GALLERY, BITONTO CATHEDRAL.

Bari. It shares with the more inaccessible Matera; best reached by carriage from Altamura; the distinction of having a fairly intact ancient interior. The capitals of Matera are among the most vigorous and beautiful of all mediæval Europe, but are not especially Byzantine in quality. They are probably local Italian work under Norman direction. The fine character of the exterior is to some extent shown by our illustration. This church is "Norman," according to better authorities than Baedeker. Matera is not mentioned by Burckhardt. It is not even indexed by Baedeker. Fergusson, however, gives an excellent illustration. Matera Cathedral has no illustration whatever, either in Schulz or in Huillard-Bréholles. The mention in Schulz dates from the collaboration done after his death, and is very meagre and insufficient. Bitonto Cathedral is not mentioned by Huillard-Bréholles, and the single plate of Schulz is a poor affair. The description and text of the latter are, however, quite competent in this case. There are no records to give the date at Bitonto, which is fixed, on general grounds, for the thirteenth century.

WINDOW IN APSE, BARI CATHEDRAL.

Ruvo Cathedral, in the close vicinity of Bari, is another interesting case of intact Romanesque preservation, both within and without. In 1833 Schulz was "astonished to find here a most stately Cathedral." This experience of astonishment was repeated by me in 1895, as I had then no knowledge either of Schulz or of Moscioni's pictures. It will give an idea of the difficulty of research in Apulia to say that even the existence of this church is unknown to the guide books. Moreover information on such matters is unob-

CAPITAL IN THE RUVO CATHEDRAL.

tainable from the inhabitants, even in well-to-do places like Bari, because they have no comprehension of one's distaste for Renaissance stucco and made-over interiors or of their uselessness for purposes of study. This cannot be explained to them because they have no conception of the periods of architecture, of the peculiarities of Byzantine-Romanesque style, etc. Therefore one cannot tell

BASILICA OF S. NICOLA, BARI.

in advance whether one is being sent fifty miles to see a small architectural fragment like a doorway, or an intact Romanesque interior, or a wholly spoiled and Renaissanced church. Italy, of course, is full of restored interiors, but elsewhere the books give one warning what to avoid. Thus it chanced on my trip from Bari to Barletta, by way of Bitonto and Andria (and return to Bari by Trani and Molfetta), that I passed through Ruvo without having any idea that there was an old cathedral there. This advice was first given by a priest on the train from Bari to Altamura, which is on a different road. The capitals of Ruvo are exceptionally fine, and the

BALCONY OF THE PALAZZO FRAGIANNI, BARLETTA.

façade is highly interesting. Huillard-Bréholles does not mention this church.

Andria, which was once an important seat of the Teutonic Knights, and of the Hohenstaufens has now nothing to offer but fine bits, like church doors and the like, but Castel del Monte, a castle of Frederick II., ten miles away, is the finest mediæval castle of all Italy, a country in which feudal castles, as distinct from castellated town halls and town palaces, are otherwise almost unknown.

DETAIL OF BARI CATHEDRAL.

Castel del Monte has been well published, both by Schulz and by Huillard-Bréholles, Isabella Plantagenet, daughter of King John and spouse of Frederick II., is buried in Andria Cathedral crypt, but the tomb has been destroyed.

Barletta has not much to boast of besides the colossal bronze statue of the Emperor Heraclius. The cathedral is a rather uninteresting building, completed under influence of French Gothic, due, of course, to the Anjou rule over Naples.

At Trani the cathedral has a most interesting exterior, with Byzantine bronze doors of the twelfth century, which resemble very closely those at Ravello, and were done by the same artist, a native of Trani. The interior is defaced by Renaissance marbleized stucco, but is a rare and perhaps unique case of a mediæval use of coupled columns in a church interior, dating from the original construction. The doubling of the columns at Bari, in San Nicola, was an afterthought, due to an earthquake, and not part of the original design, but may possibly have suggested these at Trani.

The Cathedral of Molfetta is a well preserved Romanesque dome church with some interesting detail of partially Saracenic quality.

Bari, which we have already eulogized, appears like a small edition of Paris to a tourist who has been knocking about in Apulia, and who likes meat for dinner and other similar luxuries. Its cathedral has been modernized, but boasts a splendid hooded window, with columns resting on elephants, of a type peculiar to Apulia. These elephant supports, which are frequently met with in this territory, have no parallels in other parts of Europe, outside of the symbol of the Malestesta at Rimini, and must point to a Byzantine introduction from North Africa. One is reminded of the record regarding the elephants and other African animals imported by Frederick II. and by Manfred, but many sculptured representations antedate considerably their period.

The church of San Nicola, at Bari, is a fine old monument of the eleventh century, with a stern exterior, and is essentially intact within. It furnished good material for the surveys which were the main object of our trip, and which have been published in earlier Numbers of the "Architectural Record."

The two hundred photographs of Moscioni, subsequently found in Rome, taught me that I had missed many of the splendid monuments which are scattered through Apulia. The best and only real guide to this territory is to be found in these pictures. From them, for instance, I first learned of the importance of Gravina, only seven miles east of Altamura, with its fine early Renaissance Cathedral and many other interesting Renaissance monuments. Gravina has apparently escaped the researches of Schulz, and has certainly escaped the mention of other authorities. But the most curious case

of an absolute and universal oversight, first corrected by Moscioni's pictures is that of Conversano. Conversano is only ten miles from Bari. On the authority of Moscioni's photographs the cathedral can be quoted as a rare case of intact Romanesque preservation both without and within. The interior shows the only case in Apulia of the use of interior masonry in the variegated style of the Pisa Cathedral, and is altogether a well-preserved and remarkable monument. Although Schulz had repeatedly and persistently studied closely adjacent churches his work contains only a hearsay mention for Conversano of four or five lines, dating from the collaboration after his decease. Conversano undoubtedly ranks in importance among the first four or five cathedrals of Apulia, and yet it is not even indexed by Baedeker, Murray, Burckhardt, Kugler, or Fergusson.

The following additional places, which are represented by important photographs of Moscioni's set have not been mentioned in this Paper: Gioja del Colle, Canosa, Noicattaro, Bisceglie, Corato, Colonna, Rutigliano, Noci, Castellana, Polignano a Mare, Mola di Bari, Monopoli, Terlizzi, Giovinazzo. Of all these places Canosa is the only site previously known to illustrative publication. It was a mere chance which saved me from missing Troja, which was discovered, so to speak, on the way back to Naples. The details of this cathedral are too important to be minimized by the limitations of illustration incumbent on a single article, and they will find their place in the following number of the "Architectural Record."

Wm. H. Goodyear.

MATERA CATHEDRAL.

STUDIES IN ANTIQUE FURNITURE.

English Chairs.

FROM the time of the early savage hut down to the present day, man has impressed upon his dwellings, not of the spirit of the time in which he lived, but direct evidences of his own personal character. Actual personality is, perhaps, more observable in furniture than in houses, and it is in the immediate surroundings of the individual that we find the strongest reflection of his tastes and habits. The reverse of this is equally applicable, for not only do we influence articles in daily use, but they exercise considerable influence over us. The mere association with beauty tends towards refinement; and what is artistic beauty in furniture but true proportion joined to excellence of construction and faithful, intelligent workmanship? The basis of all artistic conception is real love of the work and sympathy with the subject operated upon, and if the evidence of this is continually before us in our daily life we must instinctively shape our thoughts and lives to the same standard. It may seem a small matter to consider why the old method of "riving" oak panelling was adopted in preference to sawing it into planks as at present, but the mere fact that the tree could not be "riven" when the branches began to appear because of the knots, leads us to an appreciation of the honesty and thoroughness of past labour, while an examination of the way in which each portion of an old oak chair was tenoned and pegged into the other till the whole was rendered practically indestructible is apt to raise doubts of the mechanical workmanship of the present day even in the most unthinking mind. Wonder is often expressed at the way in which Chippendale and Sheraton furniture, with all its seeming delicacy, has lasted intact for over a hundred years, but when it is remembered that Chippendale never carved a fret without glueing together three thicknesses of wood, so that each different way of the grain should protect the other, and that Sheraton devoted whole pages of his book to constructive directions for even the most simple table, it is no longer surprising that the work of these men should have stood the test of time in the wonderful way it has.

Such reflections excuse the serious study of furniture, and if the examination of old specimens leads the public to wish to be again more in touch with the designer than the manufacturer, there may be some hope of the re-union of art and the furniture industry. The architectural designers of old led the public taste, they did not fol-

low it; and when designers no longer express their individuality, but simply supply the demand for any well-known style, they pander to the public taste, without attempting to turn it in the right direction. Though some architects are following out an original aim and giving cabinet-making an impetus by introducing better principles of construction, yet what characteristic style is in vogue at the present time as distinctly individual as those we associate with the eighteenth century designers, who were the outcome of the association of architectural and furniture design?

To trace the evolution of the English chair from early times is to follow almost exactly the life of the race. From the time when houses were first built, a seat of some sort was required in the room, though such necessaries must naturally have been rude and simple till civilization transformed them into objects of luxury. As the only representations we possess are of finished specimens, it is impossible to form a chronological series, for the earliest seats were probably constructed of rude blocks or single planks joined together with little knowledge or skill, in an era too illiterate to leave much artistic legacy.

Our knowledge of the earlier forms of English furniture is mainly derived from ancient drawings, carvings, illustrations, and painted glass, but Anglo-Saxon seats are about the first of which we have actual representation. Some of these were made to fold up, like garden chairs, while the supports were carved in imitation of the heads and feet of animals. There are engravings of stools in the shape of an X in manuscripts of the seventh century. While in Strutt's "Dresses and Habits" and "Manners and Customs" cross, solid and pyramidical seats are illustrated, some with square backs and others with triangular seats, all belonging to the eighth century. Judging from these drawings the seats must have been provided with loose cushions, while a canopy was often fastened above the raised platform as a protection from the weather.

The influence of Norman civilization had its effect, for in the reign of Henry III. panelling began to be used, and the seats became completely enclosed, with the woodwork perforated to the circular-headed arches. But the taste for Gothic in the succeeding era changed the seats into high pedimented thrones, whose carving closely followed the prevailing architecture. There are still several specimens extant, such as the Coronation Chair in Westminster Abbey, the Conventional Chair of the Abbot of Gresham, and the well-known ecclesiastical seat in St. Mary's, Coventry, which seems as if it had been originally joined to a series of church stalls.

These richly sculptured thrones were probably only made for royal and sacred buildings, as even in the fourteenth century the

Chair in St. Mary's Hall, Coventry; 15th Century.

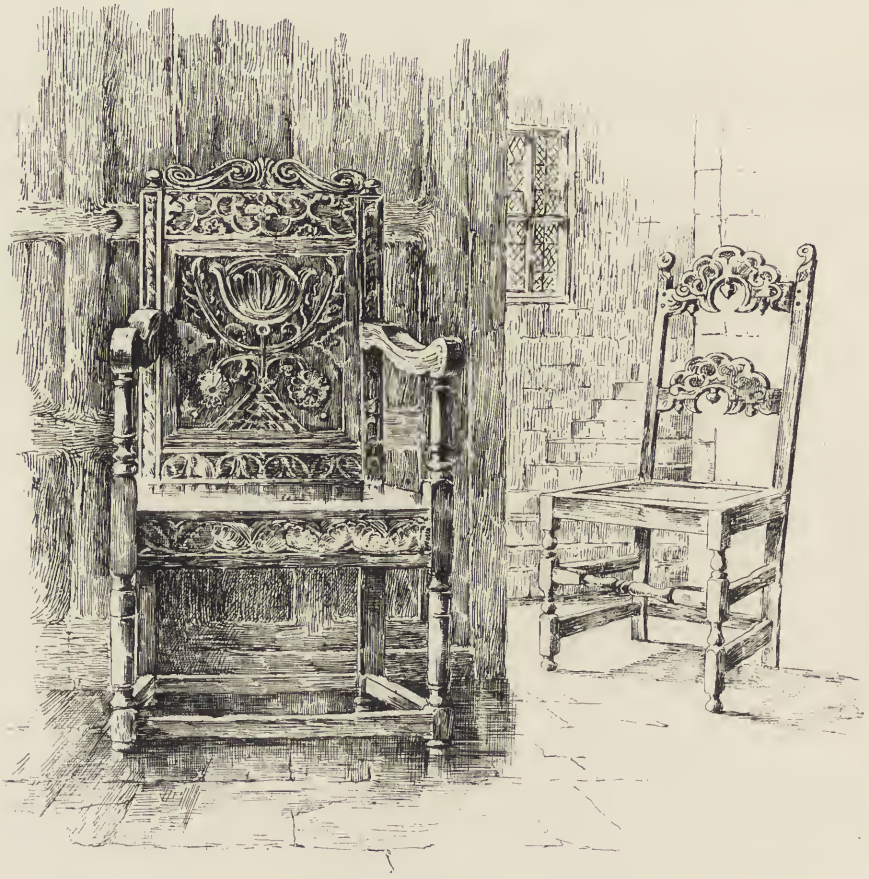
halls of the nobility had little more than fixed benches running down the sides, and our word banquet is believed to be derived from the "bancs" or benches used on such occasions. The portable stools or forms with which the rest of the room was provided could be easily removed for dancing, or when the masquers came round, as the great hall or "house place" was then the common meeting ground for the lord and his retainers before any portions of it had begun to be screened off as a parlor or speaking place, or a "withdrawing room" for conversation, or a dining room for feasting. What chairs there might be were far too heavy to be moved, so were placed on a dais, and covered with a cloth of state and costly cushions, on which the head of the house seated himself on formal occasions. The mistress, though very secondary, was not

altogether ignored, for the raised seats were often made large enough to allow the lady to sit beside her lord. The honor attached to the occupancy of these early chairs is still preserved in our phrases of "taking the chair," and "the dignity of the chairman," for it certainly must have been a distinction to possess such a seat when all the rest of the company were accommodated with movable stools and forms. Indeed, we can hardly realize how scarce chairs were till the Commonwealth leveled all distinctions and gave every man a right to as good a seat as his neighbor.

In the sixteenth century even these scarce chairs were only of rude appearance, depending solely for their outward glory on their embroidered draperies, and these were often so important as to be preserved for successive generations and bequeathed in old wills as of "his own makyng," while "guysns" of velvet and gold embroideries, "Turkie work" and "Tapestree" are constantly mentioned. Chairs with ornamental frames were designated as "forynge work," and the introduction of Italian, or "Romayne" work in England, gave a new character to English furniture. Imported chairs first brought in the fashion of fixed stuffings and coverings, and in the old halls and dining rooms there were generally "two great chayres covered with crimson figured silk and silver" as a compliment to the "high joined stools covered with carpet work and fringed with crewell" like those still to be seen at Knole. When the cushion began to be joined to the framework rich velvet and fringe superseded needlework, and the quality of the chair denoted the position of the occupant. The Spanish ambassador from Philip the Fourth very proudly records that at a banquet, at which he was present, the king and queen sat on brocaded chairs with cushions, and he and Prince Henry were seated in equal honor on a high tabouret of brocade with a cushion, while the rest of the company were only accommodated on forms.

Once decoration was transferred to the actual frames, carving and inlay were employed, the chairs increased in number and variety, and "Thrown," or turned, "Scrowled" or carved, and "Wainscot" of solid box-like frames were a few of the names by which they were known. These chairs had often richly carved backs, and turned or carved legs, while the design was generally adapted from that of the Flemings, who had settled in England to escape the disturbances in the Netherlands. At this period it is difficult to distinguish between English and foreign productions, though the style became modified later, according to the taste of the English workmen, and assumed a national character in the "spacious times" of the Maiden Queen. Walnut, cypress, lime, cherry and oak were the woods employed, but as oak was the most plentiful and best able to withstand the ravages of time, it is most frequently met with.

Though all the houses of the great landowners, from the latter years of Elizabeth down to the death of James, possessed the same general characteristics, a good deal of diversity was caused by the varying skill of the local craftsmen, and some of the chairs and tables and cabinets are much ruder and rougher than others of the same date. The patterns, too, are equally varied, not only in the furniture, but in the woodwork of the houses, and even in rural parts of Scotland shut off from much communication with the



Arm chair with box-seat belonging to Sir Spencer Ponsonby Faul, Brympton Yeovil, and single chair of Yorkshire pattern belonging to Lady Beaumont, Carlton Towers, Selby; both about 1620.

outer world, the oaken shutter-boards which cover the lower parts of the windows are never alike, but exhibit the greatest fertility of design.

Some of these have braved the winters and summers of more than three hundred and fifty years, and are yet in perfect preservation because the joiner work was wrought as the Galashiels' cloth was

said to be warped and woofed, "wi conscience." The first quarter of the seventeenth century was a time of great mercantile prosperity to both kingdoms, for the strife for religious liberty had not begun in Scotland, nor that for civic liberty in England. King James held out an encouraging hand to literature and art, and his reign saw the birth of many new manufactures and much improved decoration.

Old oak table chair; 17th Century.

The houses in these early times were far more magnificent than comfortable, and the want of drainage and the crust of dirt often underlying the grass or rushes on the floor a frequent source of illness and death. Handmade carpets were imported from the East, but they were used entirely for hangings and coverings, so a footboard was placed between the chair legs to keep the feet in some degree of comfort. When boarded floors rendered it no advantage

to have the front brace so near the ground, it was gradually heightened to give more freedom, while those at the side were raised to the same level. Then, the primary necessity being lost sight of, the braces were gradually dispensed with altogether till the weakest part of the chair was left without any support at all.

It was the custom of our ancestors to make one piece of furniture serve as many purposes as possible, and in Somersetshire especially, chairs and settles are to be found having a table back fastened to the arms, to be turned down when required, while others, frequently from the same country, have box seats, with locked tops concealed by a cushion.

Turned chair of the 17th Century.

The variety of pattern in the single chairs of the seventeenth century is not nearly so great as in the arm, for they were not so numerous. They are mostly of the "Derbyshire" or "Yorkshire" pattern, with solid back bars curved and godrooned, and little acorn ornaments hanging under the bars.

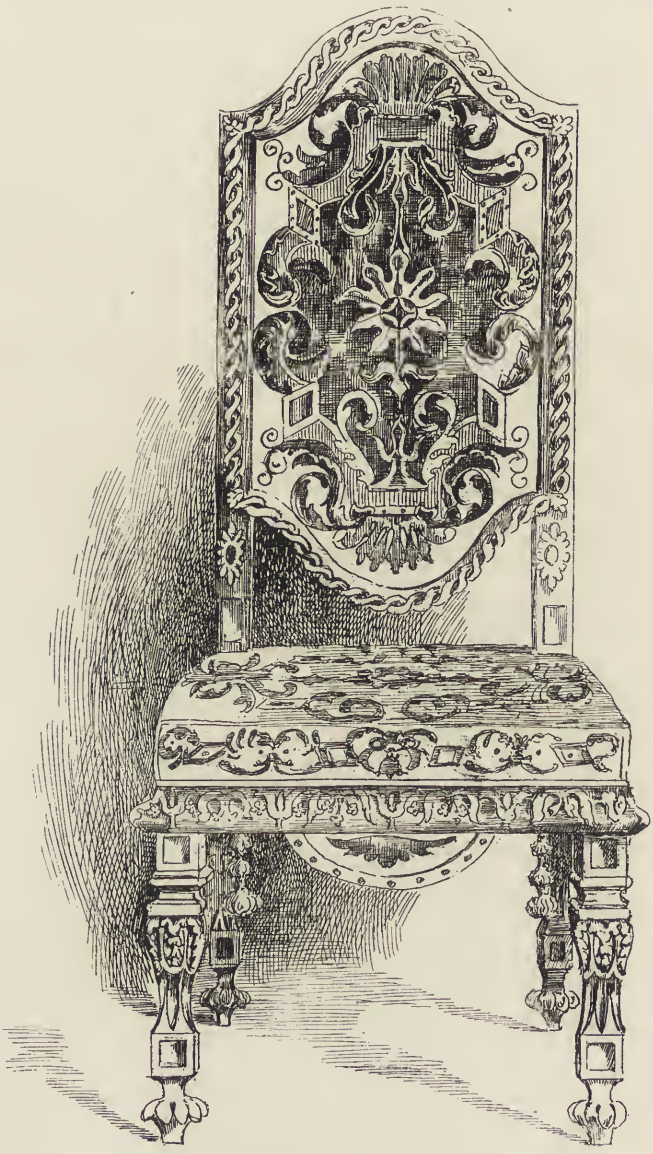
Some of the chairs at Knole are curule shape, two semi-circles reversed, and such folding chairs were carried about in the owner's

carriage, to be used when required. Cane-seated and backed chairs were common, the cane being in fine plats of small and well-worked mesh, and cane may be seen on chairs down to the eighteenth century, when the backs began to be made wholly of wood, as cane was regarded as foreign; and a steady detestation of foreigners and their works, the result of our constant wars, raised up the desire for a more national school.

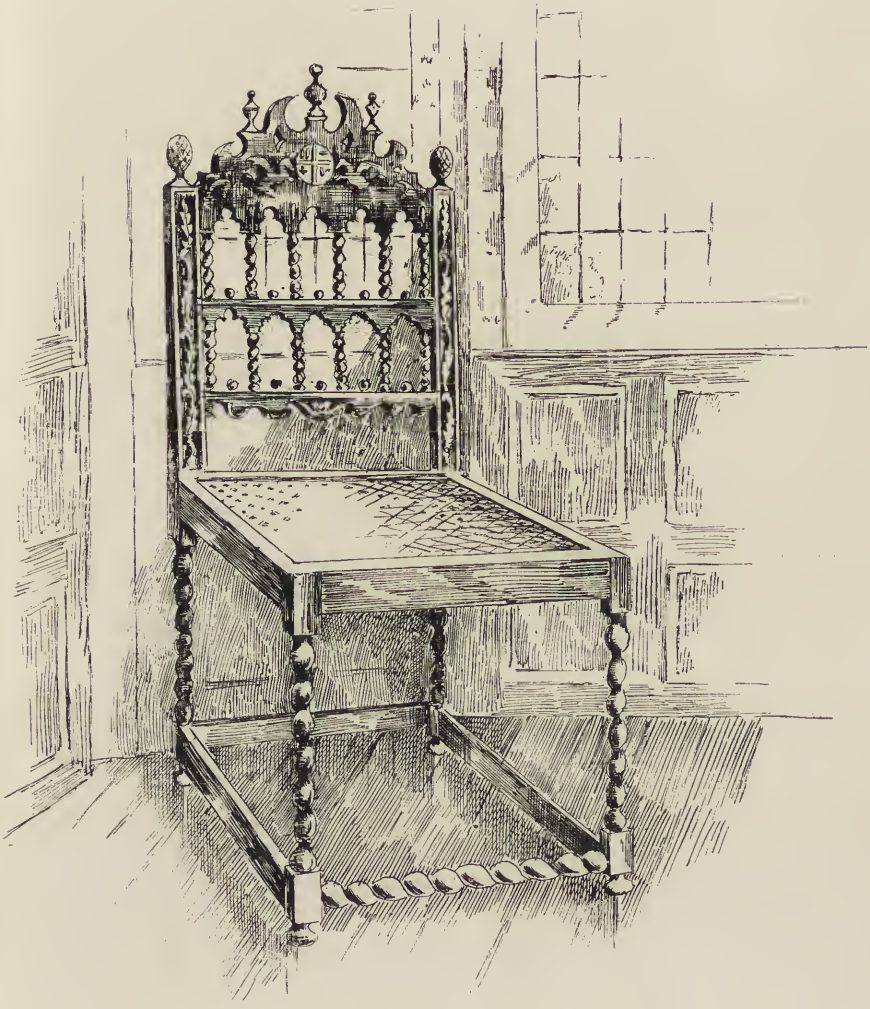
Chair-making and all domestic arts made a great advance in the time of Charles the First, and if the Civil Wars had not thrown us back, there is no saying to what height of artistic production we might not have attained. Charles, like his father, took a personal interest in all phases of industry, and brought everything to this country which was likely to elevate its art and manufactures. The "wrought backe chairs," and "wicker chairs" in the inventories prove how the different makes were extending. Carving, too, rapidly improved, and the tall chair backs were ornamented with a crown, this the shield or floral festoon, like those in Holyrood Palace, which is peculiarly rich in seats of this description.

The Commonwealth stopped all industrial arts, and the Protector and his Ironsides wrote their characters on the plain, serviceable chairs with brown leather seats, bordered with brass nails, which we call Cromwellian, but which actually came from Holland. They are most dispiriting models, with all unnecessary ornament suppressed, for painting, sculpture and industrial art savored too much of idolatry to be encouraged.

When the king enjoyed his own again, he naturally brought back some of the luxury to which he had become accustomed abroad, and the nation plunged into the opposite extreme. Chairs became elaborately carved and gilded, and the most expensive fabrics called into requisition for their coverings. Much of this furniture was of foreign origin, though there was a considerable portion made in England, especially when the French fugitives after the revocation of the edict of Nantes had founded the silk trade in Spitalfields. The Portuguese Queen brought other influence to bear on English furniture, for the King of Portugal had provided her with one of her chief attractions in her husband's eyes by ceding Bombay, and Indo-Portuguese furniture, for the first time, made its appearance in England. Charles presented such seats to his friends, and some at Penshurst and one in the Ashmolian Museum at Oxford make it easy to tell where the open spiral twist and partly perforated carving originated which was seized on so readily and applied to all sorts of furniture, for the craftsmen profited by the new ideas and new patterns, as well as by the increased demand. But the actual shape of the chair was not much affected. The high backs were still retained, and were filled with open woodwork when



Brocaded velvet chairs from Penshurst; time of Charles II.



Chair in Indo-Portugese style; time of Charles II.

cane was not used, but as chairs were moved about much more readily than they had formerly been, the lighter material generally filled the seats. Square chairs with Turkey work back and seats, were another type, for rugs from the last were regularly supplied for chair coverings. Luxury had made rapid strides, but none of these seats was comfortable enough for the pleasure-loving nobility, so stuffed chairs, covered with heavily brocaded velvet, were copied from the French, and became the ancestors of our modern arm-chairs.

There is no record, throughout these early years, of any of the craftsmen's names, but it is certain that the architects of the day brought more than an indirect influence to bear on furniture. The decoration which Inigo Jones favored is found on brackets and fireplaces in some of the houses he built, as well as in the furniture, and though there is no documentary evidence to prove that he actually designed movable articles, still as he was Surveyor of the Royal Palaces, and delighted in conducting Masques and preparing scenery, he must have been well acquainted with all the minutiæ of his art. In the same way, Wren, if he did not actually design or instruct his workmen how to ornament furniture, had his cherub heads and masses of foliage copied largely in domestic ornament, and the chair of the Brewer's Company strongly recalls his decorative design.

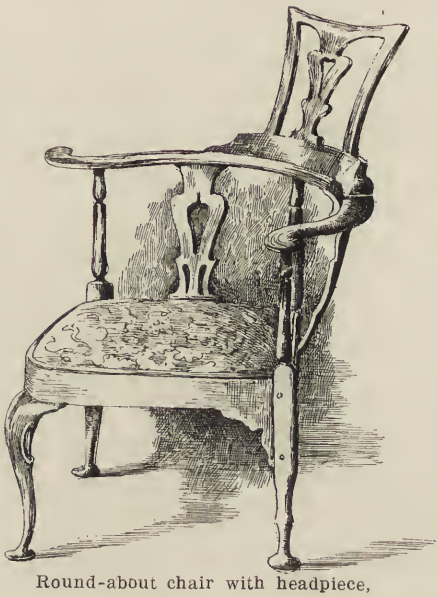
Chairs of turned work, with square or triangular seats, date from about this period in England, though in use much earlier abroad. They were most common in the Cotswold districts, and were frequently made in ash and other home-grown timber, for tough light woods, beech, poplar and ash, were greatly employed in the latter part of the seventeenth century. Hogarth painted such chairs in his pictures of common life, with straight, tapering legs, turned cross-stretchers and side rails, rush seats, and tall backs with upright turned rails or with a varying number of flat slats from side to side. Antiquarians are widely at variance as to their origin, some attributing them to French influence, but though they may have been made after the manner prevailing in Western Europe, still they were undoubtedly manufactured in England, especially in Herefordshire and Gloucestershire, of the timber grown on the hills, Such chairs had become scarce enough by 1761 for Horace Walpole to covet their possession, as he writes to several friends asking them, when in Cheshire, to try and pick up in some of the poor cottages a few of the "ancient wooden chairs, most of them triangular, but all of various patterns, carved and turned in the most whimsical forms, the same as W. Bateman had bought in Herefordshire for a crown apiece." But the quest does not seem to have been successful, or the commission disregarded, for there is no mention of such chairs in the Strawberry Hill Inventory.

Late Jacobean, Queen Anne and Turkey work chairs.

The strong point of English furniture is not its originality, but its catholicity. It is a mirror which reflects the outcome of other times and countries in a frame of its own. The characteristics of Holland were next applied to our seats. Hitherto the legs and backs of the chairs had been straight, with the exception of those based on foreign models. With the advent of the House of Orange the form entirely altered. The backs of the bulging-legged chairs became wider and broader, and we can almost see the burgomaster types of William and Mary's Court in their ampler lines. Though both backs and legs were most often plain, yet the cabriole legs were sometimes finished with shell carving in the knees, while the broad splats had occasionally a little open work, which suggested the "motif" for the subsequent elaboration of Chippendale and his followers. The colored marquetry which came in about this time is usually ascribed entirely to Dutch influence, but it must not be forgotten that the religious wars in France drove large numbers of workmen to Holland, Prussia and England, so the flower inlay of different woods was not altogether without a French derivation. It made but small impression on English furniture, however, and no great change took place in our seats till that most exquisite era, contemporaneous with the best French schools, which we call the Chippendale period. Here, for the first time in our history, English furniture, though still made up of heterogeneous elements, became of such a high order that it was valued above the productions of other countries, and taken abroad to be copied, while the books of design were translated into foreign languages. Chippendale, above all things, was a chairmaker, and his chairs are full of variety, at first with the high back, cabriole leg and claw and ball foot of the so-called Dutch taste. Then rising to lighter fancies, either with vase-shaped ornament, flowing ribbon brows, interlacing frets or Gothic tracery. But what matters it whether the rococo ornament then prevailing on the continent, the Chinese leanings of Sir William Chambers, or Strawberry Hill Gothic were adopted, when the different sources are blended in one harmonious whole? We give Chippendale the first place, simply from his book, for the squat backs and ungainly chairs of Manwaring and the Society of Upholsterers, and the badly designed seats of Ince and Mayhew only serve to accentuate the work of the master hand. Chippendale was probably not the first in point of time, for the unfinished state of the chairs in the Upholsterers' Book seems to indicate an early date before the style was properly formed. Chippendale, Ince, Mayhew and Manwaring were by no means the only designers, for as in the oaken age the furniture lived while the craftsmen sank into oblivion, so in the mahogany era hosts of the makers' names are lost, while their work is merged in that of the few who published illustrated catalogues.

Different versions of the Chippendale chair were rendered all over the country. Strangely enough in Cambridgeshire and the eastern counties, Ince and Mayhew's ladder back predominates. The finest forms prevail in the South and West, while in Scotland the make is heavier, with slightly different tracery, and the old "Luckenbooth" pattern occasionally adopted, of interlacing hearts surmounted by a crown.

Ladder-backed Chippendale chair.

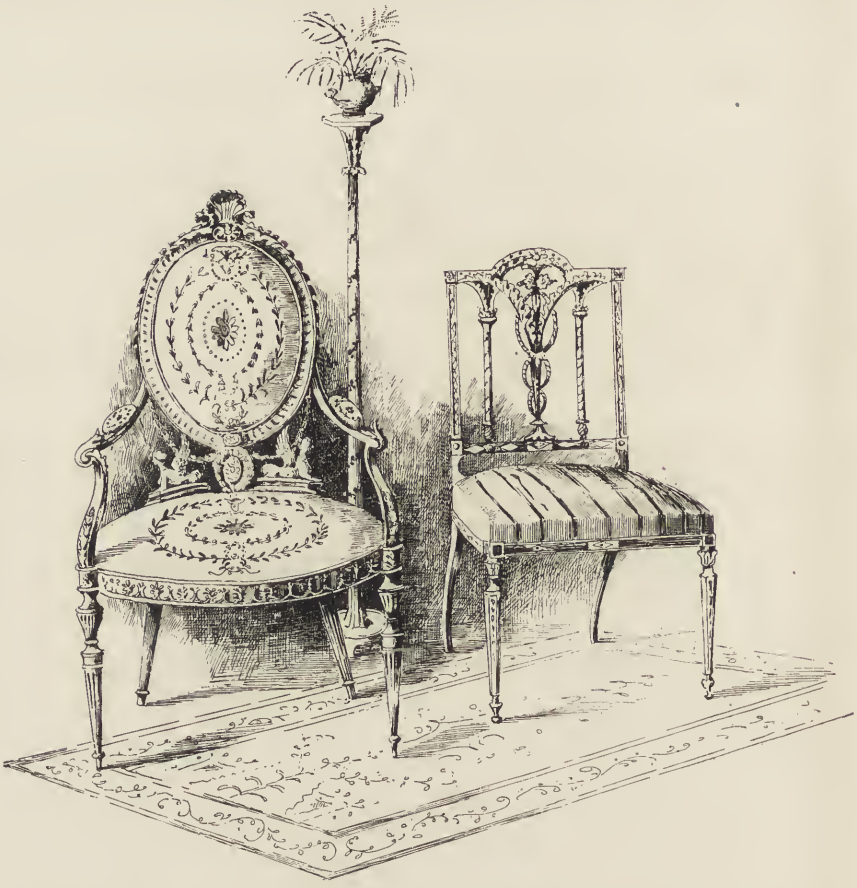


Round-about chair with headpiece, in the possession of G. H. Wallis, Esq., Nottingham; 18th Century.

The number and variety of the chairs of this period are so enormous that it is impossible to do more than allude to the "French Corner Chair," "Back Stool," "Burjour" and other stuffed seats of the early Chippendale school. Upholstered arm chairs grew general later, especially in bedrooms, and were made with wings or side pieces, like Hepplewhite's "Saddle check."

It must not be supposed that there were no other chairs in the century than those to which these designers' names are attached. The familiar "Windsor" were to be seen in every village, though their earliest date is uncertain. The story goes that George III. found one in a hut near Windsor, which a shepherd had hewn with his knife, and the plain shape suiting the simple tastes of "Farmer George" he purchased it and set the fashion. But Lyon, in his Colonial Furniture, disposes of this tradition by proving that Windsor chairs are mentioned in American inventories by 1736.

"Round about," or three-cornered chairs, were made still earlier in the century, and fashioned in all sorts of woods. The back was



Gilded chair designed by Adams, Jr. (Sir A. Hume), and painted Sheraton drawing-room chairs; 18th Century.

sometimes plain, or with fenestrated panels, while the whole chair became afterwards elaborately finished in the style of Chippendale. Some rare specimens have a headpiece rising from the back like that belonging to the curator of the Nottingham Museum, which was presented to him by the late well-known collector, Felix Joseph.

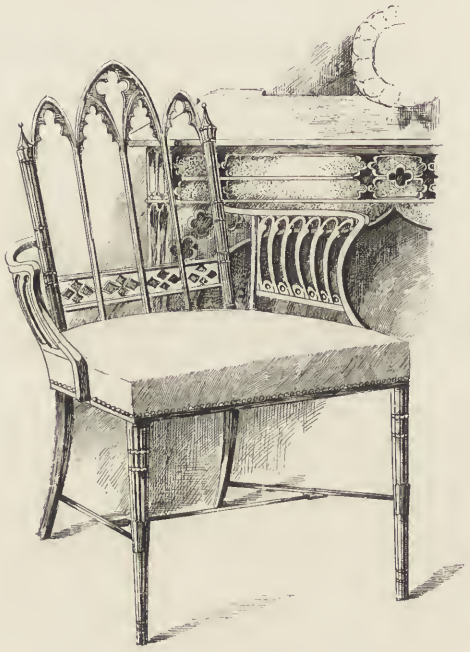
Chippendale's re-introduction of the square leg ought to be noticed, which his successors refined to a tapering support in keeping with the greater lightness and elegance of the classic period. Here the Adams led the way, and though the architect brothers did not make any furniture themselves, Robert designed it largely for the houses they built. It is doubtful if this style would have had any widespread popularity in furniture had not Hepplewhite, Shearer and Sheraton amplified it with less restriction, and many houses,

Chippendale and Hepplewhite chairs; 18th Century.

like Normanton Park, Lord Ancaster's stately home near Stamford, had the furniture supplied by the latter designer.

The shield-shaped back is one of the distinguishing marks of the Hepplewhite chair, though he sometimes adopted oval and even square backs. They are very graceful and delicate, with carved drapery, wheatears or feathers in the shield, and the popularity of the Prince's Party must have been immense, judging from the frequency of feather ornament in the work of Hepplewhite & Sheraton.

Not only did the general form become lighter and more elegant toward the end of the century, but the manner of decoration altered. While Chippendale relied mainly on his chisel, Hepplewhite, besides carving and inlaying, introduced japanning after the style of Vernis-Martin work; and Sheraton, when he had exhausted other forms of ornament, indulged his fancy for brilliant coloring in the most gorgeous painted decoration, mixing it both with inlay and carving. He then passed on to white and gold, in the French style, till at last he finally settled down in his later work to emulating the ormolu mounts and brass inlay of the Napoleonic period. But his glory as a constructor lies in his delicate workmanship and the judicious choice of his woods, and as a decorator

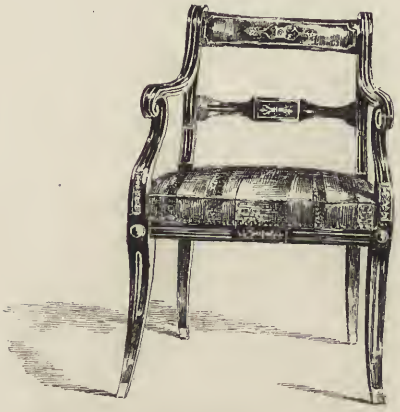


Chippendale chair in Gothic style, belonging to Sir W. Fitz Herbert, Sissington Hall, Derbyshire; 18th Century.

in the color and arrangement of his marquetry and the fact that he never allowed consideration or ornament to affect his work as a whole.

Cane work was again reverted to "for seats" by all this school of designers, though needlework coverings, morocco, striped and variegated horsehair, damasks and finely printed silk, or cotton, became the fashion by turns.

The debased forms of classic which came in as the old school of eighteenth century designers died out had little to recommend it, and how Sheraton, the last of the artist chairmakers, could blind himself enough to adopt it in his later seats, can never be explained. The curved back piece, after a Greek model, which he brought in about 1800, remained the favorite shape of chairs for half a century, though no longer rendered with the brass mounts he intended. Some chairs at Kensington Palace, with Egyptian sphinxes and lion head supports, correspond in date with the victories of British arms in Egypt at the end of the century. The gilded Throne Chair is similar in style, and William Smith, upholsterer to George III. in the early part of this century, is responsible for many such heavy productions. Those of "Anastasius" Hope were even more intensely classic though certainly more refined. But why dwell on this uninteresting cycle, when ponderosity seemed the sole consid-



Chair with flat back piece and brass mounts; about 1800.

eration? The massive framework and heavy scrolls had but a short reign, and though an over-affectation of simplicity afterwards provided us with glorified editions of rush-bottomed Windsor chairs and porters' seats, yet originality of design seemed lost for a period.

K. Warren Clouston.

London, England.

Chair (about 1826) from "Smith's Upholsterers' Guide."

ANGOULÊME CATHEDRAL.—FROM THE SOUTHWEST.

FRENCH CATHEDRALS.—PART XVI.

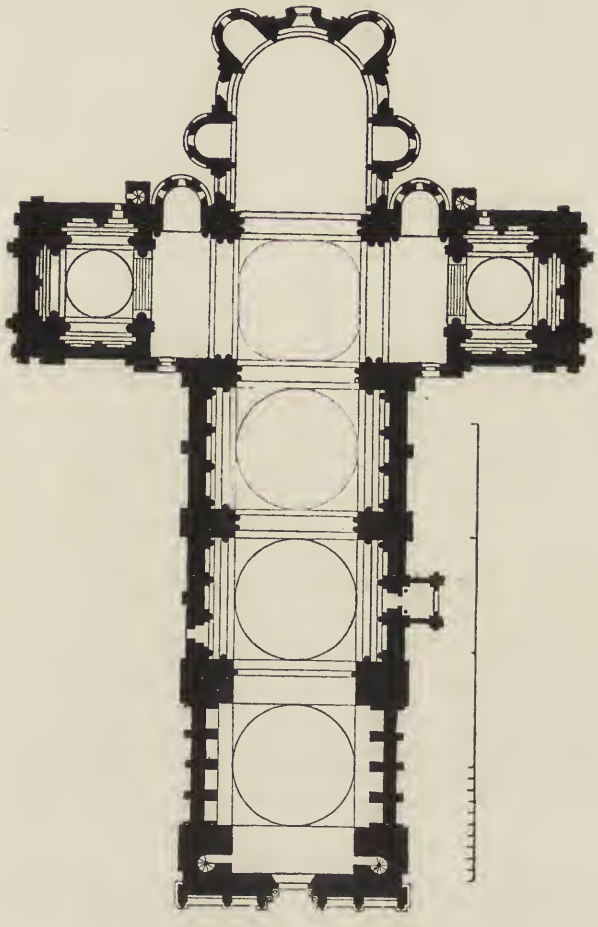
THE DOMED CATHEDRALS. III.

THE CATHEDRAL OF S. PIERRE AT ANGOULÊME.

V.

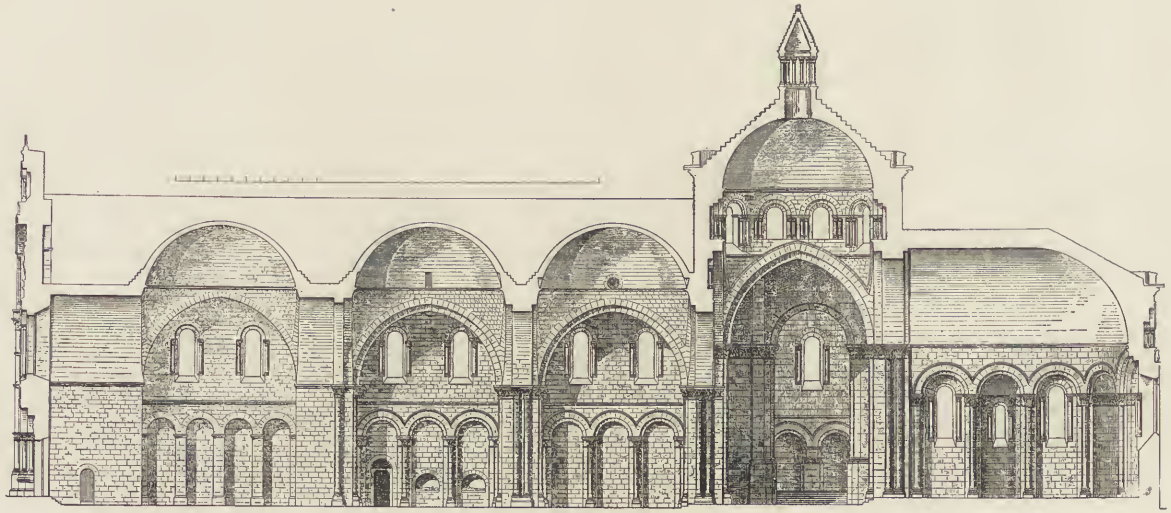
THE cathedral of S. Pierre at Angoulême is special type of domed church. Its plan is a Latin cross, with a broad nave without aisles, divided into three bays, a domed crossing or lantern, two transents, and a central apse or choir. The nave is of great regularity and symmetry, but the first bay, to the west, plainer and heavier than the others, is the earliest portion, and a survival of a previous cathedral built by Bishop Grimoard and completed as early as 1017. Some discoveries made in the restoration begun in 1854 by M. Warin suggest that the church of which this was a portion may have had the form of a Greek cross.

However this may be, it is an unquestioned fact that the cathedral as we now know it was chiefly due to Gérard II. (1101-1136), one of the most noted French bishops of the twelfth century, a man whose life was spent in constant ecclesiastical turmoil, but who still found time to conduct the building of one of the most important churches

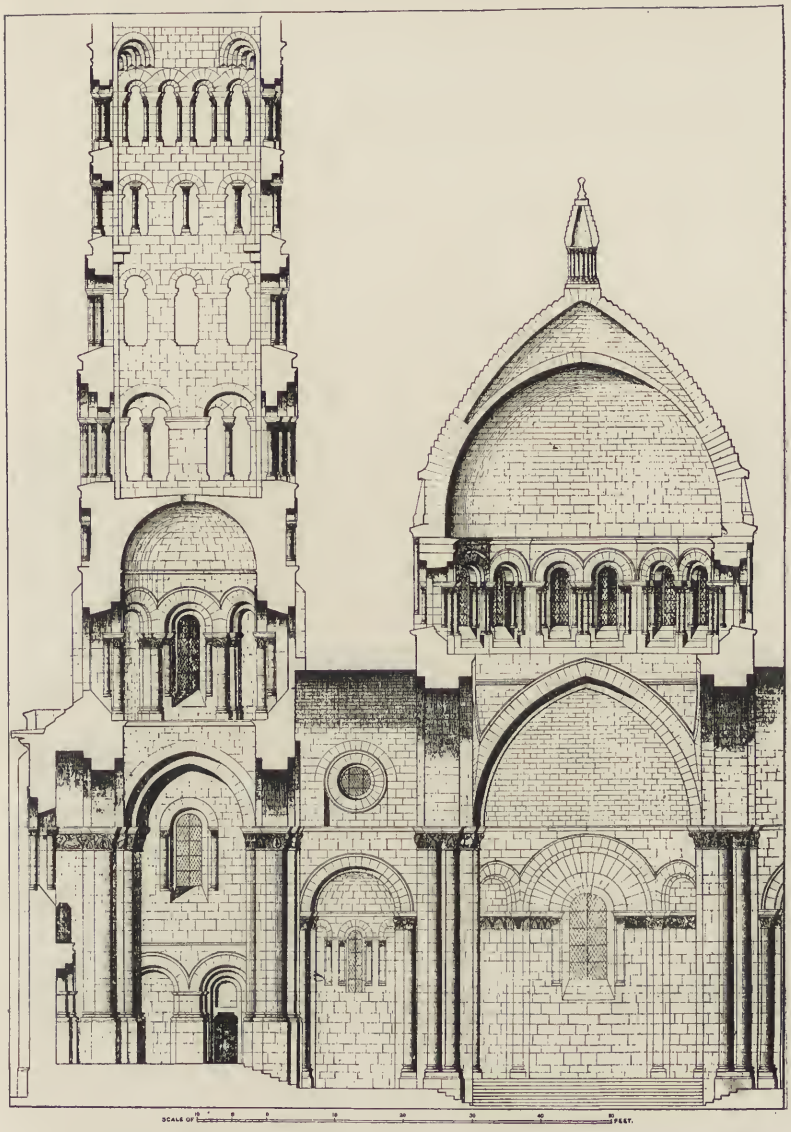


PLAN OF ANGOULÊME CATHEDRAL.

of his age. Though he consecrated his cathedral on the 18th of February, 1128, there was much to be done at the time of his death eight years later. The facade above the great window belongs to this later time, and a letter written in 1259 informs us that work was still being done upon it. At this period the tower which surmounted the south crossing was in process of construction, a Gothic structure destroyed by the Protestants in 1569. Some lesser repairs were made during the XIV. and XV. centuries, and at the time of the Protestant agitation the cathedral must have presented a splendid appearance, with its Romanesque tower on the north transept, the Gothic spire on the south transept, and its dome over the crossing. The Protestant wars left it in a sadly disabled state. The south tower was completely overthrown, the northern one greatly injured, the central lantern in a state of collapse, and the beautiful west front



LONGITUDINAL SECTION OF ANGOULÊME CATHEDRAL.



ANGOULÊME CATHEDRAL.—SECTION THROUGH TOWER AND CROSSING.

much defaced. A vigorous effort to repair these injuries was made in the following century by Jean Mesneau, a wealthy canon of the cathedral, who repaired the lantern, cutting windows in all faces of the octagon, though before they were open in four only, and patched up the west front, completing his work with a dedication in 1634. It must be admitted, from early engravings, that the worthy canon was not successful with his facade, but the preservation of the cathedral to our own time is chiefly due to his loving care. A restoration

begun in 1854, and continued by M. Abadie to 1884, has been made with greater care than that architect exhibited at S. Front; the cathedral has, indeed, been largely rebuilt in our own day, but it certainly exhibits a closer approximation to its primitive form than it did before the recent changes, though the central dome has been somewhat heightened, for when first built it was nearly embedded in the tower or lantern.

Though distinguished by great regularity and simplicity the interior of the cathedral of Angoulême exhibits a very considerable advance on the simple interior of the cathedral of Cahors or the daring audacity of S. Front. The bays are separated by large piers whose heavy form is broken by applied columns; on the outer face arranged

ANGOULÊME CATHEDRAL.—THE NAVE.

in pairs to carry the great cross arches between the bays, and single columns on the lateral faces to help carry the side arches. The arches are utterly plain, and built in two planes, the lower supported by the applied columns, the upper rising directly from the piers, the ornament of the capitals of the columns being continued on the pier as a carved base for the arches. The space between the arches is filled with pendentives. A small ornamental band is applied at the base of the domes with which the bays are covered.

The dividing piers form huge internal buttresses, the side walls being decorated with a round arched arcade of three arches, over which is a shallow balcony that is continued from bay to bay by

openings cut in the piers. Two round topped windows in each bay light the nave admirably, yet not so brilliantly as to destroy the effect of the flood of light admitted through the upper windows of the lantern over the crossing, whose arches are much higher than those of the nave, and where the dome is applied to an octagonal base lighted by windows. The transepts are exceedingly effective, being filled with chapels elevated at some distance above the main floor, that in the north transept being lighted by an upper lantern; an ar-

ANGOULÊME CATHEDRAL.—LOOKING INTO THE CROSSING.

rangement much more impressive than the simple apse of the nave, with its four little semi-circular apses, lighted by small windows, and a single window in a flat projection at the head of the apse, which is covered with a deep plain pointed barrel vault ending in a semi-dome.

Few cathedrals in France present so great a contrast between their exteriors and interiors as that of Angoulême. The Romanesque churches we have seen, except S. Trophime at Arles, have shown few features of interest in their exteriors. At Angoulême we

meet, for the first time in the cathedrals, that glorification of the west façade which is one of the distinctive features of French mediaeval ecclesiastical architecture. The side walls of the church are still plain; only the windows enclosed within slight architectural frames, with very shallow plain buttresses between the bays to express and to emphasize the interior construction. The dome, save for its greater size and its high modern tiled roof, is scarcely more notable than the dome of the cathedral of Avignon. But the marvellous

ANGOULÊME CATHEDRAL.—VIEW OF APSE AND DOME, NORTH SIDE.

west front, with its rich adornment of sculpture, and the great storied tower on the north transept, mark new elements in church exteriors. At S. Front we had, indeed, a tower, but it is really a structure separated from the body of the cathedral: at S. Trophime we found another, this time over the crossing, and an effort and a very successful one, to emphasize the central point of the church in a way seldom excelled by the Gothic chuches. At Angoulême the tower becomes an integral portion of the design, and though not yet on the west façade, where it became the chief feature in Gothic de-

sign, it nevertheless marks a notable step in tower building in France.

But the great glory of Angoulême cathedral is its west front, which for richness of design, for variety of motif, for splendor of detail, for very strangeness of aspect is only equalled, if surpassed, by the marvellous façade of Notre Dame la Grande at Poitiers. It has been greatly restored by Abadie; but with the exception of the central gable, for which no historical reason exists, it has been most admirably repaired. It is divided into five bays, the central one somewhat wider than the others. Slender applied columns carry small round arches just below the separation of the smaller towers, with which the front is finished. At the base the two side divisions include two

ANGOULÊME CATHEDRAL.—ARCH ON WEST FRONT.

smaller lower arches—superb examples of the carving of the locality, with interlaced foliage and strangely grotesqued and intertwined animal forms—within which, in groups of three, are the Apostles. Rude as these reliefs are, their attitudes, costumes and attributes show a considerable power in composition and in technique. The central doorway, with a larger recessed arch, is similarly treated, but has been much restored.

The sculptures of this front form one of the most remarkable series illustrating the Last Judgment to be found in France. That, as we know, was a favorite theme for the main portals, and we have noted many instances where it has been illustrated in the slabs over

ANGOULÊME CATHEDRAL.

the main doorway. At S. Trophime it was spread over the rich main porch, but in the cathedral of Angoulême the sculptors went further than they did in any other instance, and used the whole of the wall as a background for the exposition of this theme, at once the most impressive and the most awe-inspiring in Christian theology.

High up on the facade, under the great central arch that rises into the crowning gable, an arch decorated with a series of full length angels, is Christ, the Judge of the world, standing in an aureole, with

ANGOULÊME CATHEDRAL.—VIEW OF DOME AND TOWER.

both arms extended in benediction. A cloud, with cherubim, is above the central figure, and in the surrounding space are disposed the symbols of the Four Evangelists. In the tympanums of the lower great arches are the dead, risen from their graves, two under each arch; and above them and over the central window, are the angels sounding the last trump and pointing to the grand figure of Christ above. The smaller arches on each side contain many small medallion heads of the blessed already entered into bliss. Still lower

ANGOULÊME CATHEDRAL; RESTORATION.

The tower on the south transept does not exist; originally this was a Gothic spire and not as here shown.

down, under the side arches, and standing within smaller ones, are five Doctors of the New Law, and a woman who may represent the Queen of Sheba. Statues of the Prophets are under arches within the bays immediately adjoining the central bay, and also in niches on each side of the great window. Then, below are two reliefs, modern restorations, one representing S. George and the Dragon, the other S. Martin giving his cloak to a beggar.

The scheme of the sculptures is complete and arranged with consummate skill; their decorative aspects are not less remarkable. A complicated theme has been applied to a very large surface, consisting of many separated parts, and yet the effect and meaning of the whole is unmistakable. Splendid as the sculptures are, and impressive as is their arrangement, the wonderful detail that surrounds them, the carving of the capitals, the elaborate bands, the panels, the medallions, produce an ensemble of marvellous richness and variety. The cathedrals of France offer few more notable monuments than this front of Angoulême, and the student of ecclesiastical sculpture will find few examples more worthy of study than the marvellous sculptures that for more than 600 years have looked down from these walls.

And the cathedral is superbly situated. It is not, it is true, on the highest point within the city; but it stands at the apex of the most closely built portion, a higher hill before it rising in a rather flat slope. The cathedral stands out boldly, showing the south side completely and nearly the whole of the remarkable west front, which is finely viewed from the open space before it. On each side of the nave is a sunken space, forming a sort of garden, through which the side portals are entered; that on the south side is open; that on the north is closed. The palace of the bishop, built originally by Gerard, the builder of the cathedral, adjoins it to the east, the episcopal gardens enclosing the choir. From thence one may study the great tower, rising in story upon story of decorated arches, as well as the choir with its four little apses. The upper wall of this part, treated as a closed clearstory, with an arcade of round arches containing pairs of smaller arches, is the only portion of the cathedral wall, save the façade, that has been designed with special reference to architectural effect. The west front dominate the cathedral, as it does in all French churches, but the other portions of the exterior are not the less interesting nor the less expressive of their time and place because of the splendid façade.

Barr Ferree.

THE TALL OFFICE BUILDING SECTION OF NEW YORK CITY.

Washington Life Building in front. Cyrus L. W. Eidlitz, Architect.

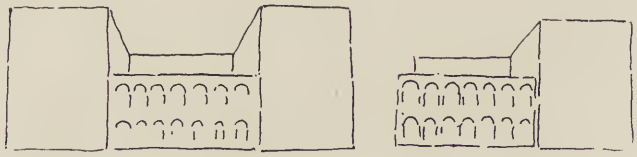
PRINCIPLES OF ARCHITECTURAL COMPOSITION.*

IV.

Grouping of Subordinate Parts.

HITHERTO, although we have given our rules a general application, we have spoken only of the instances in which the masses to be grouped themselves constituted the building.

We are to speak now of masses that are parts of a building in a somewhat different sense. In the former case, indeed, the masses to be grouped were necessarily parts of the whole; but none could be taken away without leaving the building a fragment only. The Pitti palace, for instance, on one side is a group of two pavilions. If one be taken away there remains, not a building with one pavilion, but a fragment of a complete building, as seen in this diagrammatic sketch (46).



46. Sketch of a group of two principal masses; neither can be removed and leave a complete design.

If, however, the parts are such that they may be removed without destroying the completeness of the main mass or group of masses, they are properly regarded as subordinate parts. Thus the two dormers in 47 may be removed, yet still leave a complete single mass.

47. Old building at Lisieux. A single mass with two subordinate masses, so classed because one or both may be removed, yet leave a complete design.

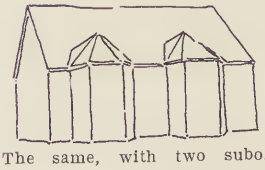
All that we have said with regard to the grouping of the main masses applies to that of subordinate parts, with some slight modifications.

*Continued from Vol. VIII. No. 1.

If, instead of making our two gables the chief part of the design, we apply them to a larger mass which has been previously created, we at once have the second step in a design (49). To begin with, we had a roofed mass, gabled at each end, straight at the side (48). For some reason we wanted to develop further the side. Adding the two gables makes a more complex design of the side, leaving the singleness of the main mass untouched. We may, if we prefer, add

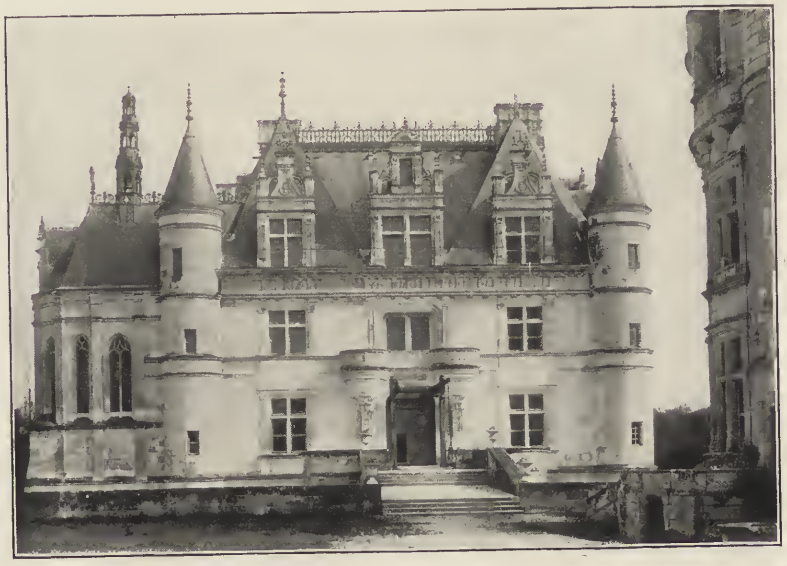
48. A single mass without subordinate parts.

49. The same, with two subordinate gables.



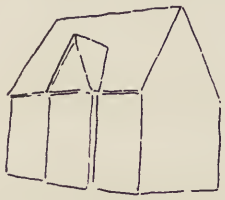
50. The same, with two subordinate bays.

51. The same, both the bays and the main mass having steeper roofs.



52. Chenonceaux. A fine example of both double and triple Subordinate Masses, the two turrets and the three dormers.

two bay-windows, low and wide, like 50, or tall and narrow, like 51: the homology of the designs is evident at a glance. Here is a view, 52,



53. A single central subordinate part.

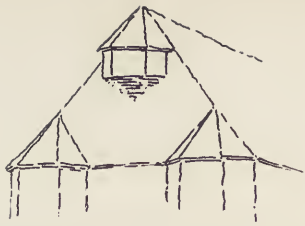
54. A single subordinate part, unsymmetrically placed.

of the Castle of Chenonceaux, showing a double grouping of turrets as subordinate masses; also a triple group of dormers, but nothing that compares with the bulk of the main wall and roof. Instead of two gables or bays, one gable or bay, either central or lateral, would make a satisfactory design, 53, 54, 55; or, if we want to put two subordinate features on the gable end of our main mass, we

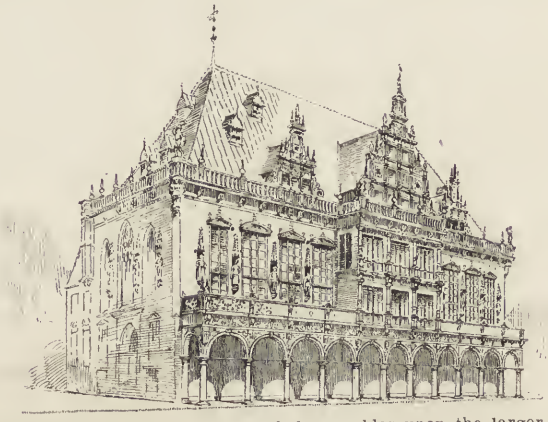
55. The large dormer constitutes a single subordinate mass.

may do so, providing we know what we are about, and either assert our one main pointed mass, by making the two things square-topped (56), or make it a triple treatment out-and-out, by capping all three parts alike as at 57. Here in 58 is a triple group, a gable and two dormers, all treated alike, and in 59 a group of three turrets in which the fault is that they are too big for subordinate masses and not big enough for principal. Hardly anything is more effective than a single large feature upon the main mass. Such a

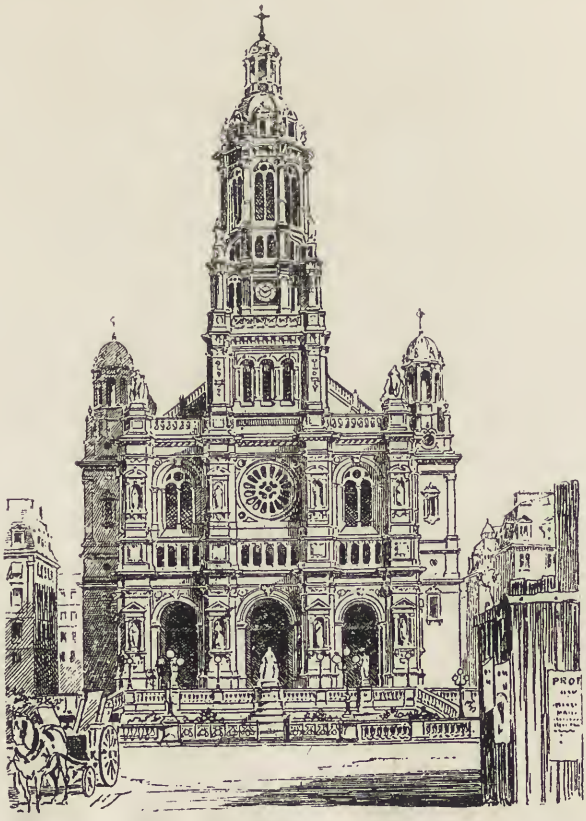
56. A group of two subordinate bays.



57. The same in plan, converted into a triple group by the addition of the oriel.



58. The Rathhaus, Bremen. A group of three gables upon the larger single mass of the building.



59. La Trinité, Paris. A group of three turrets.

60. A single mass with a single subordinate mass.

61. The same as the foregoing.

62. Billing's Library, Burlington, Vt. H. H. Richardson, Architect. The gable is the principal mass in this composition. The taller tower is a single subordinate mass placed unsymmetrically. It is to be regarded as single because the smaller and rather anomalous tower is not large enough to consitute with the other a group of two.

dormer as this (60) is analogous to the single tower upon the Palazzo Vecchio at Florence—the largest thing upon it, yet not large enough to dominate it. Here in 61, is a rustic cottage, redeemed and made beautiful by a single octagon turret-roofed bay.

Such a single feature may also be placed unsymmetrically without loss of either effect or dignity, as the tourelle at 62 and the tower at 63.

63. A single tower placed unsymmetrically.

Two more instances of a single subordinate feature are shown in 64 and 65.

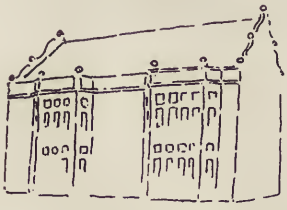
64. Crane Library, Quincy, Mass. H. H. Richardson, Architect. A much better example of a single unsymmetrical mass than is the Billing's Library, 62. The gable is a subordinate mass upon the building and the turret upon the gable, both arranged unsymmetrically.

Returning, for a moment, to our groups of two—besides the equal couplet, we may use the couplet of unequals even more freely and with even better appearance for subordinate than for main

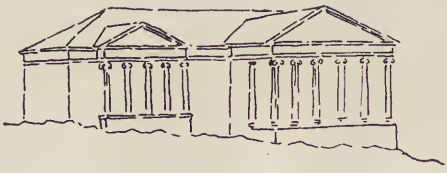
65. Library, North Easton, Mass. H. H. Richardson, Architect. Here again the gable is a subordinate mass upon the building and the tower is the same with respect to the gable.

66. A group of two unequal subordinate masses.

masses. Such an unequal couplet is sketched at 66, and it is seen in the well-known Rathhaus at Rottenburg, 67. Hardly any motive is more available for modern work; whether it be a shingled cottage with bays suggesting towers (66), or a brick and stone house, with wide English-fashion bays, like 68, or even pedimented masses like these at 69.



68. Two unequal subordinate masses.



69. The same as 68.

67. Rathhaus, Rothenburg. The turrets are double unequal subordinate masses.

So far, the grouping of subordinate parts is strictly analogous to that of main masses. Instead of having to connect them, however, by linking masses, smaller than the main masses themselves, they are already connected by the larger main masses, which serve, as it were, as a background upon which the subordinate parts occur.

70. Residence, Frank Hall, Hampstead, London. R. Norman Shaw, Architect. An example of three equal subordinate gables.

When we come to three subordinate objects, the analogy maintains, with one difference: in groups of three masses, one must be larger than the others; in subordinate groups, three things of equal size make a harmony, as well as three things where one predominates. Three equal dormers do very well; so do three equal gables, as 70, 71, 72. But here we are on a precipice. Three equal bays (73)

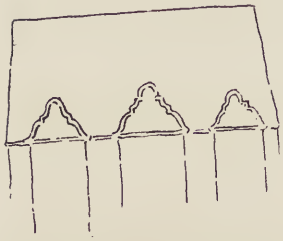
71. An Old House, at Canterbury. Three subordinate gables, equal in effect. The gradation in size is perhaps for perspective exaggeration.

can be made acceptable only by great care. If they are just right, they may be charming; if they are wrong, they will not do at all. Just right and just wrong means this: just right is where the main mass predominates; just wrong is where it fails to predominate. In the latter case the three subordinate masses appear as a group of main masses, and fail to look well owing to their equality.

72. House at Cambridge, Mass. The dormers are three equal subordinate masses; the porch a single subordinate mass.

73. Group of three equal bays.

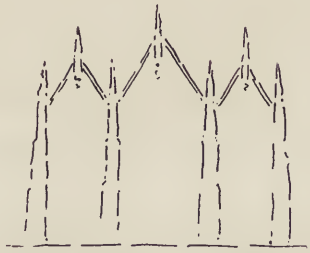
But if we have our group of three with one bigger than the others, all is well. We may do much as we please, all is sure to be well, as far as the number of things is concerned, whether the triplet be symmetrical, as at 74, or unsymmetrical, as at 75.



74. Three gables, the largest in the centre.

75. Three tourelles, the largest in the centre.

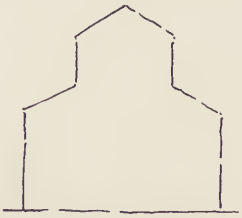
There is another sort of subordinate parts that we must call attention to, although briefly, as the same rules apply to it as to the rest, and to reiterate them would be profitless. It comprises main masses that are divided into parts directly, instead of the parts being placed upon them as backgrounds. Such a case is shown at 76, 77, where the mass is cut up into three gables, instead of three gables being placed upon the mass, at 74.



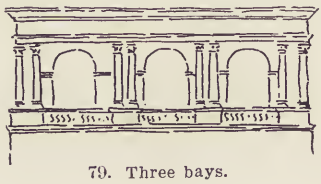
76. Three gables set close together.

77. Cathedral, Sienna. The façade is an example of three unequal gables.

Here is another grouping (78), which we are not yet able to classify, but shall be hereafter; and another (79), perhaps premature, where detail is used to effect the subdivision of the mass. But the great difference between the grouping of main masses and of sub-

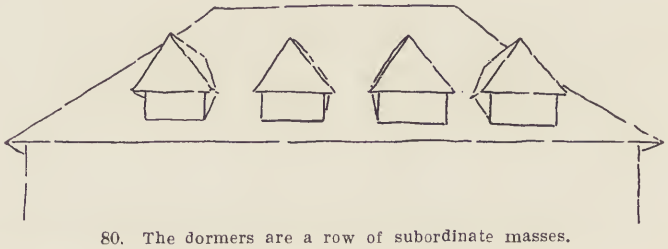


78. Mass with two appendages, to be spoken of hereafter.



79. Three bays.

ordinate parts, is that in the former, more than three parts are not to be used, unless the parts, should they exceed three, are thrown together into groups of twos and threes, as we have said; while in



80. The dormers are a row of subordinate masses.

81. The same. The projection of one gable does not prevent its grouping with the others. There is also a group of three bays between the gables.

arranging our subordinate parts, we continually have to use four or more objects. Nothing could be desired better than a row of four dormers, like this (80), for example, and the reason is that we think of it collectively, as one row and not as four individuals. Here, again, is a row of four gables, 81.

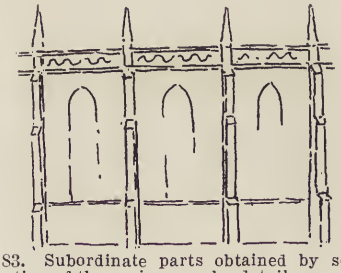
There might be five or six or more, the result would be substantially the same; the exact number to be used if in excess of three being determined by other circumstances. It is as well to note, however, that uneven numbers in rows have more individuality and

82. Design for Building for Horticultural Society and Park Commission, Boston, Mass. A row of five dormers, the central slightly larger.

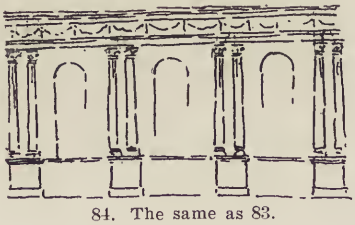
less continuity than even numbers; if we had put five dormers, it would have given more sense of a group of individuals, the eye naturally picking out the central object and regarding the rest as grouped on each side of it (82).

In almost all buildings four or more parts are used on the sides, although usually these parts are hardly important enough to be called subordinate masses, but are merely details, windows, arches, and the like. Yet when, by the use of these details the mass is separated into parts, the parts are naturally classified as subordinate parts, and distinct from the details that mark them.

Thus, a wall, cut up by Gothic buttresses or Renaissance pilas-



83. Subordinate parts obtained by separation of the main mass by details.



84. The same as 83.

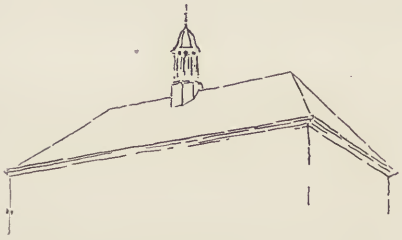
ters, is separated into parts that are distinct from the details—buttresses or pilasters—that define them, as in 83 and 84.

We may then say as follows:

Rule VII. Although four main masses may never be used as a group, four subordinate masses may be used upon a main mass, whenever a sense of continuity is required.

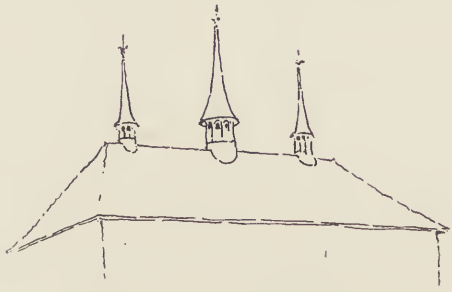
There is one more sort of subordinate parts that we must allude to, besides those that are applied to the front or sides; it includes those that are set upon the top of the main mass, which becomes a sort of base for them—fleches, belvideres, belfries, pinnacles—everything of the sort that is not too big; if it be too large, the objects becomes itself the main mass, as a great dome or tower.

Such things are used in quite analogous ways to those that we have before spoken of; indeed, many dormers, when seen so near as to bring them against the sky-line, are evidently closely allied to such things as belfries. We may plant them on one, two or three



85. A single belfry used as a subordinate mass.

86. Two pinnacles similarly used.



87. Three ventilators, similarly used.

(85, 86, 87), and, by making one much the largest, just as in the case of main masses, we may use various groupings as our fancy suggests, as well with these objects applied to the roof as with the bays, oriels, and other subordinate masses, that are naturally applied to the side.

V.

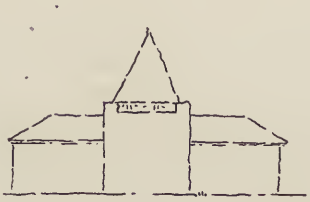
Appendages.

Hitherto we have spoken of but two kinds of main masses—individual units and the linking masses that we use to connect them. This is not quite all that there are in architectural compositions; we must describe one more kind, and that will comprise them all.

The masses that are now spoken of are those which are attached to a main mass, but do not connect any other main mass with it.

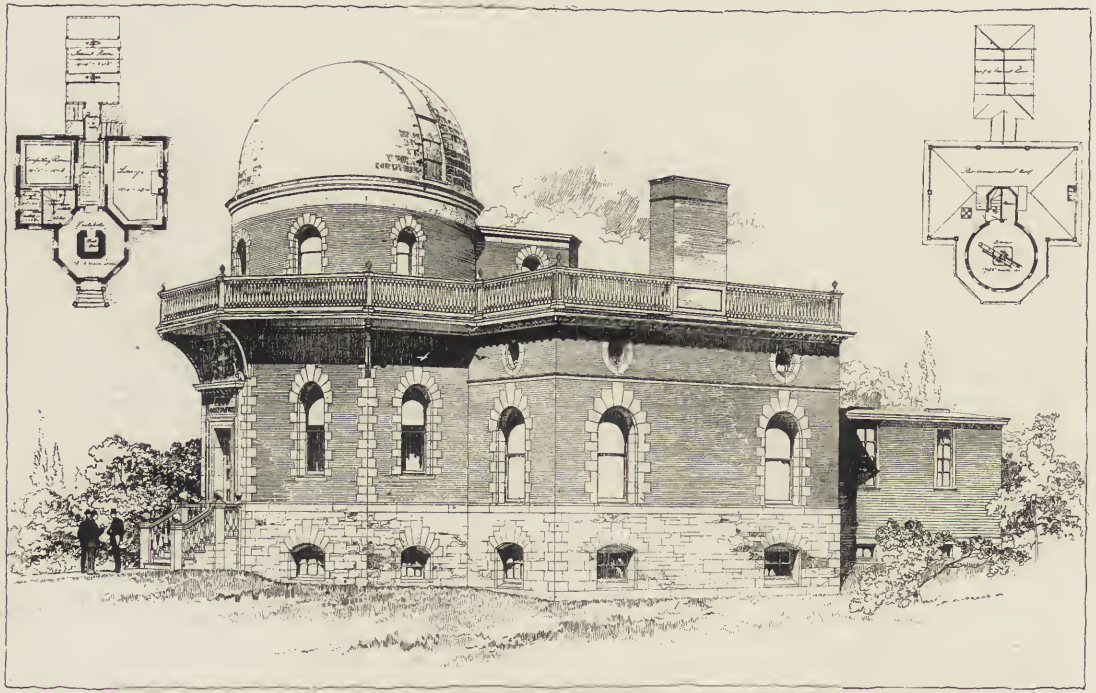
A tower with a building attached, as long as the tower is as important as, or more important than the building, is a case of a mass with a single appendage (88). Where there is one on each side, as at 89, it is a mass with two appendages. Several examples are given of both single, 90, 91; and double, 92, 93, 94, 95, 96, 97, appendages.

88. Mass, with one appendage.

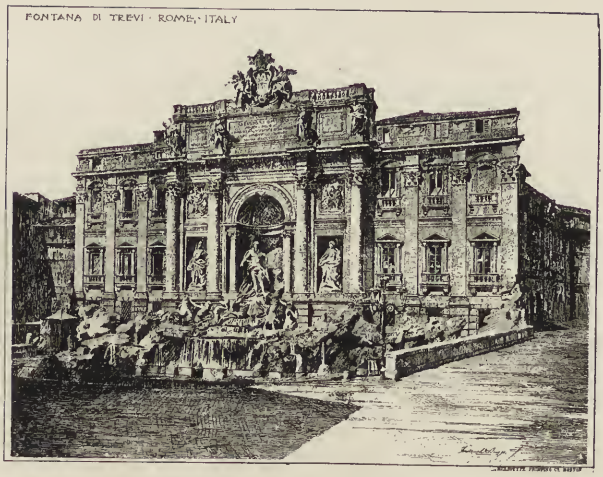


89. Mass, with two appendages.

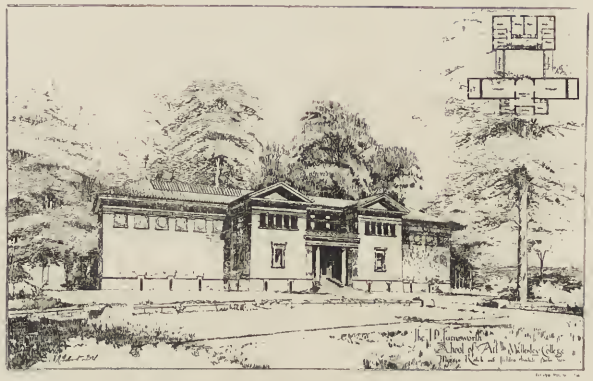
90. Mass, with a single appendage. The one-story portion on the left side is the appendage.



91. Sketch for the Ladd Observatory, Brown University, Providence, R. I. Single mass with an Appendage. The dome is the main mass, the part on the right the appendage.



92. Fontana di Trevi, Rome. The central pavilion is the main mass, the wings are the two appendages.



93. The group of double gables with central link is the main mass. The wings are appendages.

94. Pillsbury Science Hall, Minneapolis. L. S. Buffington, Architect. The high central part is the main mass. The tower is an unsymmetrical subordinate mass. The wings are two appendages.

95. The Van Rensselaer Manor House, Albany, N. Y. Single mass with two appendages.

96. The Commencement Hall, Princeton, N. J. Wm. A. Potter, Architect. The same as 95.

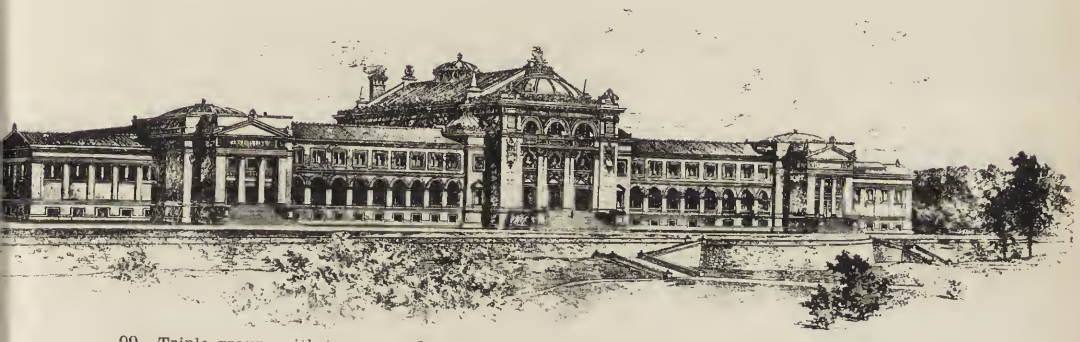
97. Norwich Cathedral, East Front. The central gable is the mass; the square-topped aisles are the appendages.

Westminster Palace that we have already spoken of, is, as a whole, an appendage of the great tower, as we remarked at the time; and our own Madison Square Garden is another specimen (98).

98. Sketch of Madison Square Garden, showing how from one point it groups as a mass with one appendage.

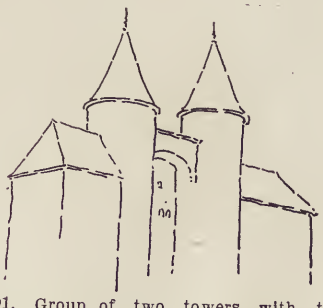
Very often a group that from one point of view is a mass with one appendage, from another has two appendages, as in this last case of Madison Square Garden, and in many churches.

Nor is it necessary that the appendages be long and low, 99. To a tower may be added a tall and narrow appendage, as at 100, or to a group of two towers, either one appendage, or two appendages,



99. Triple group, with two appendages—the end portions beyond the flanking pavilions are the appendages.

100. A single tower with a single tall appendage.



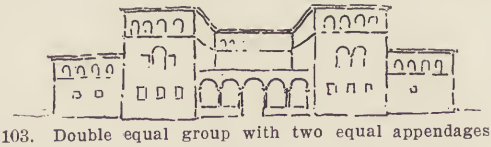
101. Group of two towers with two appendages.

102. A tower with two appendages, and one subordinate mass.

as at 101. But more than two appendages we cannot very well manage, because, if we put a third appendage coming out to the front, it is not as an appendage that it appears, but as a central subordinate mass, as in 102; while if it projects behind, we do not see it at all, and it might as well not exist as far as the composition of the front is concerned. We might, indeed, run them out diagonally, and this is sometimes done, but only in special cases, where the main motive is so large that we are at liberty to do anything, or where other special conditions prevail.

To any of the previously enumerated groups, either one or two appendages may be attached, either of the same size and character, or of different sizes and characters; although here we come to the line again, where the increasing complexity of the group requires more skill in adjusting the various parts.

At 103 is a twin group with symmetrical appendages; at 104 a husband-and-wife group with unsymmetrical, and at 105 another double unequal group with one appendage; 106 shows an unsymmetrical triple group, with unsymmetrical appendages; 107 the possibility of doing the same sort of thing with pedimented orders.



103. Double equal group with two equal appendages.

104. Double unequal, with unequal appendages.

105. Hennebout—Notre Dame du Paradis. Group of two unequal masses with one appendage.

106. Triple unsymmetrical group with appendages, also unsymmetrical.

107. The same as 106.

At 108 is a motive for a modern country-house, with open, square piazzas attached; and at 109 a double mass with one appendage, a reminiscence of Messrs. Carrère and Hastings' design for St. John's cathedral church—an extremely fine thing, in its way.

Although less usually attached to subordinate parts, yet, when desired, appendages may be used in much the same way.

108. House with piazzas attached as appendages.

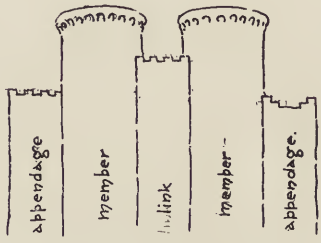
109. Double tower, with the building as a single appendage.

A porch, for example, may be made like 110, a dormer like 111, and so through the list, even unsymmetrical appendages being available with due skill, for details as well as for masses.

110. A porch with two appendages.

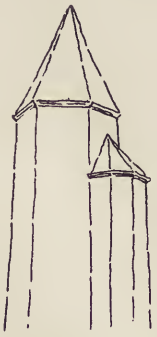
111. A dormer with two appendages.

One or two points to be observed in the use of appendages we may mention. When attached to a group of objects, the appendages must be smaller—not only than any of the objects that form the group, but than the parts which form the connecting links, as at 112.



112. Diagram showing relative importance of link and appendage.

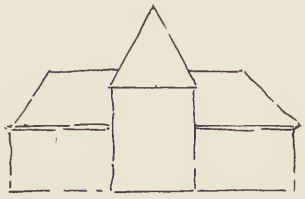
Besides this, appendages must usually be different, to some extent, in shape from the masses to which they are attached. Thus, at figure 113, the smaller tower, although of the same relative size, and in the same relative position as in 114, is, just like the large tower, octagonal in plan, and high-peaked as to the roof; while in 114 it is square in plan and square-topped. The effect of 113 is rather that of a group of two unequals, while 114 is plainly a single mass, with an attached appendage.



113. An appendage treated like the main mass.

114. An appendage treated differently from the main mass.

Sometimes, however, other considerations require the use of similar treatment for appendages, as in 115 and 116, with the same object of accenting their connection with the principal mass.

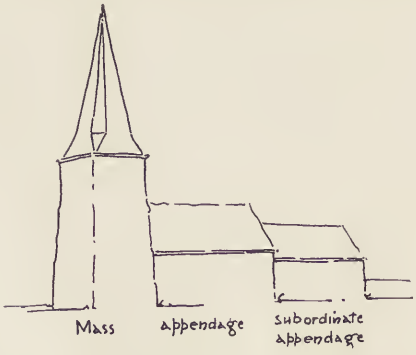


115. Appendages and main mass treated alike.

116. English High School, Cambridge, Mass. Mass with two appendages all roofed alike.

In stating a rule, we are obliged to reserve somewhat. Likeness of treatment must be left, for the time, for the exigencies of the case to settle. But we may lay down the law in this way—good as far as it goes.

Rule VIII. Appendages must be smaller than the members or the linking parts of the groups to which the are attached, and in treatment usually different from the members of the group.



117. An appendage of an appendage.

Finally, appendages themselves may have appendages, as in many a village church, like 117 in general outline.

VI.

Grouping of Details.

We now come to a part of design-making, which, although less important in theory than the fundamental dispositions, is in practice more important; the grouping of details, such as cannot be classed even as subordinate masses, doors, arches, windows, pinnacles, columns, and ultimately, escutcheons, pateræ, festoons, and all the rest of the minor materials of architecture; omitting for the present, cornices, mouldings and such horizontal details, which we shall leave until we have spoken of horizontal subdivision.

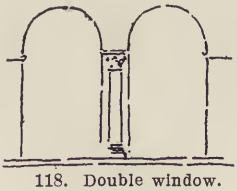
It is, moreover, in practice more important, because very often an objectionable arrangement of masses, forced upon us by circumstances, may be redeemed by skilful detail; and because the volume of possible detail is so great, that the greater part of the time and skill of the architect are necessarily spent upon it.

Details are subject to the same rules, in substance, as principal and subordinate masses, with one important difference and some minor modifications.

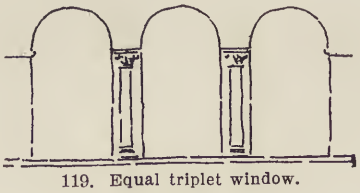
In the first place, groups of details, while composed of individual parts, do not usually have linking parts, but are connected merely by juxtaposition. In the second place, symmetry is almost essential in detail grouping.

The first of these modifications is partly due to this, that the portion of the building itself, upon which the details occur, is a sufficient bond of connection; partly to this other, that the forms of the details themselves usually permit a partial merging of them together, constituting a very satisfactory union.

The details to be grouped are, for the most part, openings—doors, windows and intercolumniations; while the solids, the piers and the columns count only as the boundaries of openings.



118. Double window.



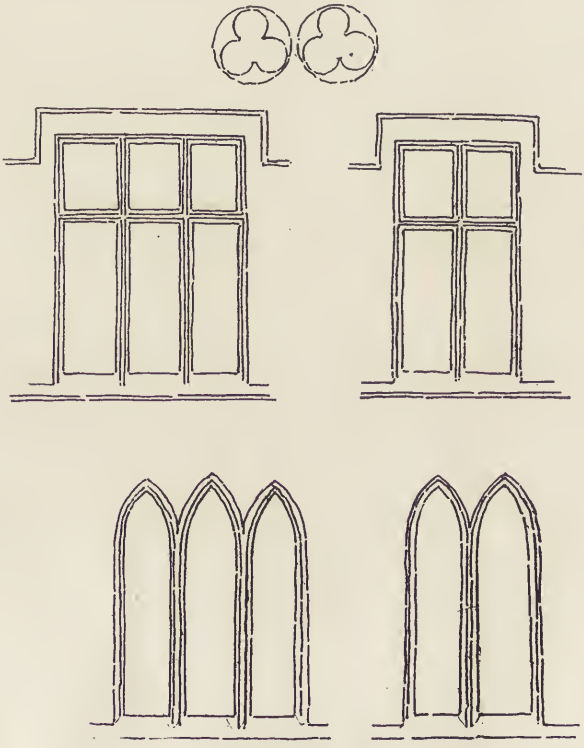
119. Equal triplet window.

120. Unequal triplet window.

Windows, we may, of course, use singly, or in couplets (118), or in triplets, either equal (119) or unequal, with the largest in the middle (120). Yet, even when we use triplets of equals, so strong is the demand of the eye that the middle one should be the largest, that if we make it precisely equal, it will appear to be smaller than the others; we must make it just a little—unnoticeably—larger, but, to the eye, the same, 121.

All kinds of windows may be thus grouped in twos and threes, square-headed, pointed and round-arched, and even circular, or trefoil, 122.

121. Converse Memorial Library, Malden, Mass. H. H. Richardson, Architect. The central arch of the arcade may be seen to be larger than the others.



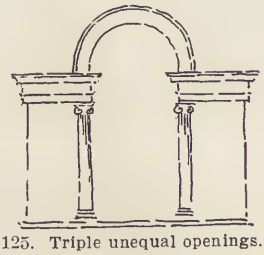
122. Various couplet and triplet windows.

124. House, Place des Halles, Orleans, France. Not only the arches of the first story but the windows above are double unequal groups. It would improve the composition to omit the anomalous niches in the upper stories.

So may doors, if necessary, be grouped, and all other similar details.

In special situations, too, unsymmetrical groups may be formed, like this door and window couplet (123), and compositions more or less elaborate may be made, quite analogous to those of masses. In 124 a rather remarkable instance of unsymmetrical grouping of details is shown.

123. Double unequal details.



125. Triple unequal openings.

In 125, we have the outline of the familiar Palladian window, one of the most graceful combinations ever made. It is a single mass, with two appendages, just the same composition as St. Peter's (126), or any other single domed building (127). And more complex combinations may be made, if required.

126. St. Peter's, Rome. In outline the great dome is the mass, the building appears as two appendages.

127. Outline of domed building resembling that of Palladian window.

As for the grouping of openings and groups of openings upon the building, a vast field opens before us.

Upon a single mass, a very good design may always be made by care in arranging the openings; many designs are nothing more (128).

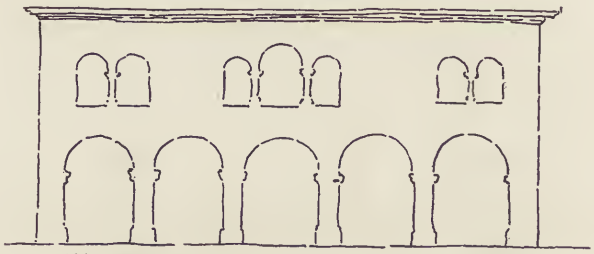
128. A design composed of one opening in the first story and two in the second.

Three openings above, and three below, as here shown (129), always make a good design. So would a single tier of three openings, but it is so simple that mere mention suffices.

129. Triple grouping of openings.

130. Double grouping of openings. This verges upon "double composition." The label over the windows should carry through.

Two above and two below will also make a design (130), although the danger of "double composition" must be avoided; and there are innumerable other compositions of openings alone, such as figure 131, which give perfectly satisfactory designs.



131. Continuous group below. Triple group above.

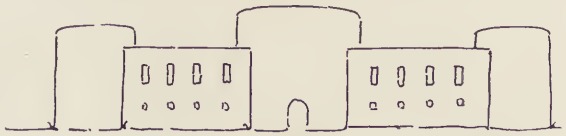
But the important difference in the grouping of details is this: that while subordinate masses seldom, and principal masses never, are arranged in continuity, the continuous arrangement of details is required quite as often as that of individual grouping.

When we come to the consideration of subdivision we shall find the continuous arrangement predominating; but even in buildings in which the horizontality is not marked there are certain situations which demand the effect of continuity in the details.

These situations are those in which the indication of connection is needed, rather than of parts to be connected. Thus in 131 a continuous row of arches in the first tier forms a uniting base for a triplet grouping above; just as the lower mass of a principal grouping might form a base for three towers or three domes upon it.

For all linking masses, a continuous treatment of details is appropriate, and as long as they exceed three, whether the number should be odd or even depends upon circumstances; a central link,

132. Uneven number of openings in central link.



133. Even number of openings in links not central.

like 132, demands an unequal number of openings; but, where the link is not central, as in 133, four openings are better than three or two or one; better even than five, for the eye picks out the middle

one of an uneven number, and at once marks its individuality, which is what should not be marked in a lateral link.

It is one of the indications of the superiority of the æsthetic sense of the Greeks to our own, that their effortless perception of odd and even extended to so many more things than does ours. A Greek took as much care to put fourteen or sixteen or eighteen intercolumniations on the side of a building, in order to avoid a central opening, as we take to put the door in the middle of a room.

134. Design for Soldiers' Home, Minneapolis, Minn. L. S. Buffington, Architect. Grouping of windows. Triplet windows in mass. Four windows in appendage.

And that may remind us that another place where it is important to have an even number of details, windows or otherwise, is on the side of the building; and still another place is on all appendages. In figure 134, the composition looks much better with four windows, in the appendage to the big tower than if it should have three or five. As an example of what can be done in the way of recon-

ciling antagonistic conditions in the arrangement of openings, look for a moment at figure 135, a Greek monument. The designer

135. Outline sketch of Greek monument.

wanted to have his door in the middle, also to have the statue on top in the middle, also to have a pier under the statue for constructive reasons and to satisfy the constructional instinct.

Impossible, manifestly, to do all, but he does the best that he can with it. The central pier he makes as slim as the eye will tolerate; the side piers comparatively massive, making the inevitable two openings one as much as possible.

The statue on top is in the centre, in no danger of breaking through, with the central pier under. But, over each side pier, the designer has put a heavy square block, adding to the importance of the flanking piers and minimizing that of the central strip.

So much of the general arrangement we can penetrate; the methods that enabled the Greek to make everything just right in relative size, we have not yet penetrated.

VII.

Horizontal Subdivision.

We now approach the second grand division of architectural design, that of subdivision into horizontal parts. Just as the vertical subdivision, which we have called grouping, is effected by the advance and retreat of different parts, and the shadows thereby produced, horizontal subdivision is effected by means of mouldings, and the shadows cast by them.

Mouldings are, doubtless, incidentally useful for mechanical purposes—for shedding rain-water from the face of the building, for bonding or leveling courses, or the like; but æsthetically we are to regard them, as a painter his brush, as means whereby we may draw lines where we want them.

136. Romanesque House, St. Gilles, France. Showing the unifying effect of a single large cornice.

Another means of separation horizontally, is by varying treatment; that is, by differences in the size and shape of the porches, windows, doors, and other objects placed upon the building.

It is in the predominant use of horizontal lines that the classical and Renaissance work is radically distinguished from the mediæval. It is natural and proper that one or the other, either vertical lights and shadows, or horizontal lights and shadows, should predominate. Where a building is composed of many parts standing side by side, it is quite instinctive to avoid running heavy black lines around all the ins and outs.

Such lines as there may be, must be light, not comparable at all with the vertical lines. On the other hand, whenever, by choice or necessity, we are limited to a square, flat mass, we as instinctively construct horizontal lines across it.

Given a box, into how many parts must we slice it to make it look well?

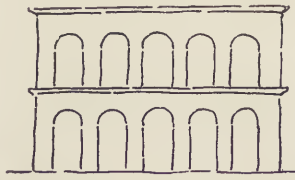
All of the first three formulas apply, as far as the new conditions admit of their application.

In the first place; one thing looks well.

Mark our box by a big black line at the top, 136; or put some one thing, door, or arch, or window, or memorial tablet, or what not, upon it; or, if possible, do both, as in 137, and it is sure, so far, to look well.

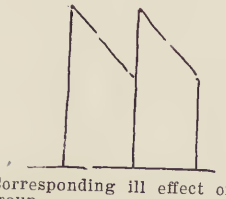
In the second place, in horizontal subdivision, two equal things, of similiar treatment in detail, do not look well, 138. The reason is probably analogous to that which requires an individual member of a group to be symmetrical in itself. Although symmetry in a group is not necessary, in a single member it is usually essential.

137. A single cornice and a single detail.

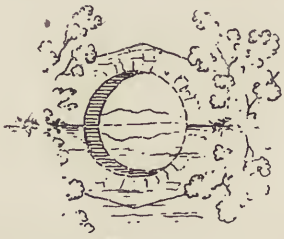


138. Ill effect of similar equal double subdivision.

For in each member of a group the important point is that it be distinguished as an individual, and an unsymmetrical mass appears to the eye but half an individual, as in 139. Now it would seem that two tiers of arches, just alike and placed over each other, as in 90, owed their unsatisfactory appearance to very much the same cause. It is at least certain that if vertical symmetry were constructively possible, it would be as pleasing as horizontal symmetry, as we may observe whenever we see a clear reflection in the water, 140.

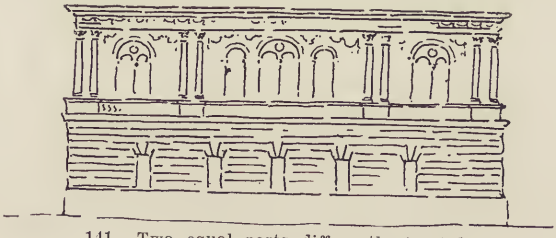


139. Corresponding ill effect of similar double group.



140. Pleasing effect of vertical symmetry.

It is not possible for us to build reflections so, when we are obliged to cut up our mass into two parts, we must do the other thing, and make them as different in treatment as possible, that

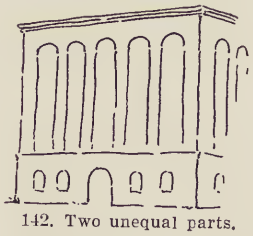


141. Two equal parts differently treated.

there may be no such close resemblance as to seem repetition. We may make our top part with vertical columns and delicately graceful arches, and our bottom with horizontal rustications: anything to make them different (141).

But where the two parts are unequal there is no such difficulty. All gable treatment where the line between the gable and lower part is marked by a moulding, is double; but the gable is intrinsically so different from the square part below, that the treatment is a sort of self-acting treatment, and carries itself out without much effort on our part.

We may have a large lower part, and crown that is less, or we may have a low bottom part, and a high top, as 142, either is capable of looking well, if properly carried out.

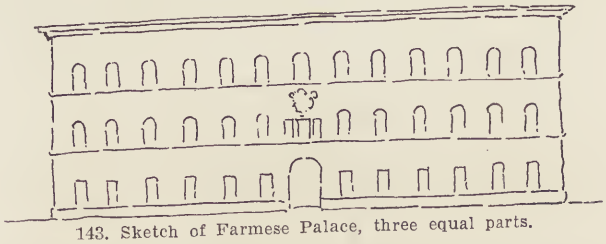


142. Two unequal parts.

Three things look well together when placed on top of each other, whether equal or unequal; but if equal, only when the unity of the

whole composition is asserted by some further means, precisely as in vertical grouping.

In the Farnese Palace there are three parts, substantially equal, as in figure 143, separated by lightly drawn lines, marked by rows



143. Sketch of Farmese Palace, three equal parts.

of windows of a general similarity of appearance. It would be unsatisfactory, were it not for the broad, dark line across the top, which makes it all one.

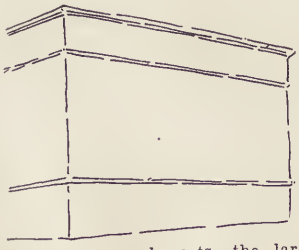
And this is why, in spite of the protests of those who maintain, and justly, that ornament should not be constructed and stuck on, and that one material should not simulate another, the tin cornice maintains its place of honor in city buildings.

City buildings are almost always single masses, and flat-fronted; the simplest way,—not the only way, but the way that requires least effort on the part of the designer,—the line of least resistance, so to speak,—is to draw a big moulding, for that is what it is, across the top. To the mind it is offensive, even when made of stone, to pile up a useless mass, perilously poised; but to the eye it is so satisfying as to counterbalance, more or less, the intellectual objection.

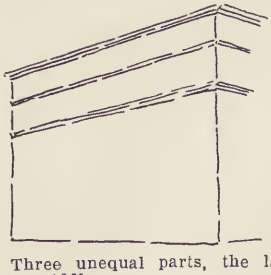
When we come to three unequal parts, we are in free pastures.

We may cut up a building in almost any way, as long as it is into three unequal parts, and can hardly fail to achieve a good result, with respect to the number and size of parts, if we can do as well with the rest of the treatment.

Just as in the case of vertical massing, and for a like reason, the largest must be in the middle, 144. The reason is that if it is not in the middle, the two smaller parts hang together, as in 145, and it resolves itself into a two-part division, one of them being itself



144. Three unequal parts, the largest in the middle.



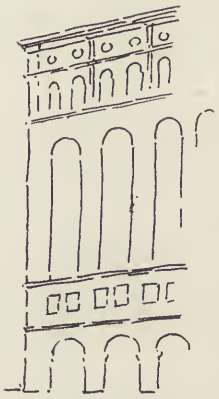
145. Three unequal parts, the largest not in the middle.

148. The Woodbridge Building. Clinton & Russell, Architects, William Street, New York City. A five-part subdivision.

compounded of two parts, which is, indeed, quite manageable, only not so easily managed as a three-part composition.

But if we keep the middle part the largest, we can hardly go wrong; and, after that, we may subdivide the upper and lower parts, but the larger and intermediate part, never; except by lines comparatively light, and excepting, also, the continuous treatment of which we are yet to speak.

This is why it is so natural to put a row of long piers, as the main middle motive, as in 146; and it is the reason, too, why the classics



146. Large middle part formed by piers.

147. Large middle part formed by columns.

fluted their columns, to absolutely deny any subdivision at all to their big middle part (147).

Here, 148, is a five-part division, the same as 146, only divided somewhat differently. And we may carry the process further, and subdivide the top and bottom parts in various ways, but the middle part must be kept undivided.

Beyond three parts, either simple or complex, as we have just said, there is the continuous arrangement of many equal parts over each other, with top and bottom parts added.

Such is the way that the Leaning Tower at Pisa is done, and many Chinese pagodas; and the same thing may be done where any high building or tower is to be treated; but there must always be a top part and a bottom part; the continuous treatment must be for the middle part only, and even then the equally-spaced lines must not be too strong, nor the parts fewer than four.

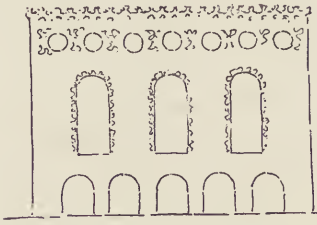
So our first rules stand, for horizontal as well as vertical separation, with such modifications as we have described.

Next we come to a region beyond the range of rule, because new and hardly to be reconciled conditions prevail.

149. The Gillender Building. Berg & Clark, Architects. A tall office building subdivided into five parts.

We have spoken, so far, of subdivision by mouldings alone; the last few examples, showing some windows and enrichment, bring us to the question of subdivision by treatment with other details.

It is possible to subdivide a building, even without the aid of mouldings, by such means. In figure 150, for instance, rows of



150. Subdivision by treatment without mouldings.

differently sized and differently disposed openings indicate the different horizontal parts; and the enrichment between the seven top openings, joining them into a band, to a great extent takes the place of a cornice.

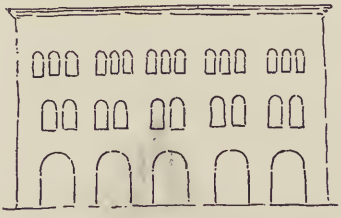
But this result has been reached by a method not always constructively practicable. One of the first dicta of ordinary practice is that piers must be above piers, and openings above openings.

151. S. Maria della Pieve, Arrezzo, Italy.

The reason is partly constructional, as it is known that lintels will crack and arches will fail, with too much concentrated weight upon them; it is, besides, partly æsthetic, being exactly the same feeling that led the Greek designer to put his pier under the statue, be-

cause, even if his lintel were of iron, a statue would not look comfortable thus suspended.

So that there is really no complete solution. The conditions are irreconcileable. A strongly marked horizontality is aided by rows of openings that are not over each other, so that the eye does not find any line by which it may ascend; and the mediævals have left buildings done thus, as in 151, where there are five, thirteen, twenty-five and thirty-two openings in its four tiers, respectively. The horizontality sought is obtained; but the æsthetic objection to false bearings still exists, though minimized; and the constructive objection too, although apologies may be made for the arrangement on that score. Altogether the system of irregularly spaced openings is certainly more graceful where continuous horizontal effect is sought than the system of piers carried through; yet in most cases we are obliged to use the latter, as in this sketch 152.



152. Variation of openings in spite of the continuity of the piers.

Even with this limitation much may be done in the arrangement of openings to aid the effect of mouldings. In figure 153 the main piers run through, but the horizontal bands are marked by the difference in the number of openings in each bay.

153. Variation of openings with continuous piers.

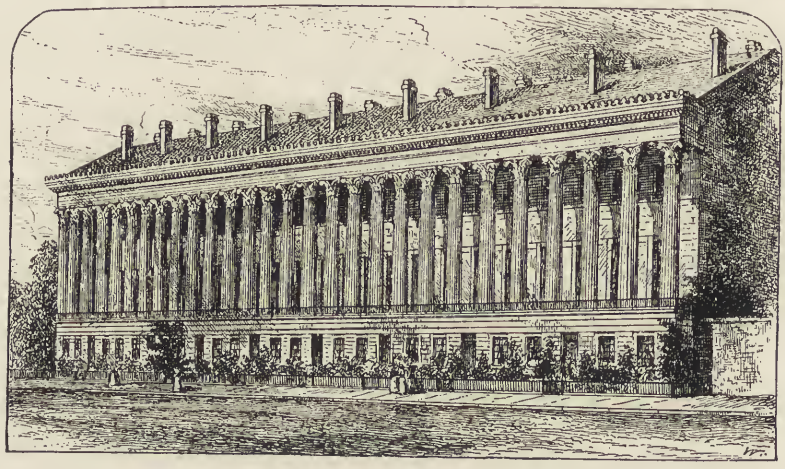
Observe, in the top member, how much the effect of a continuous band is increased by making the small windows four instead of three, although the number of groups of openings is three unavoidably.

Observe further, that in order to make our middle part larger than either the top or bottom, indeed, in order to obtain a middle

part at all, in this four-storied building, we have been obliged to unite the second and third stories under one tier of big arches. This united treatment of two or more stories is often necessary in modern many-storied butildings; and is objectionable only when the detail used for the purpose is inappropriate or exaggerated.

And it is in this that the convenience and availability of the "orders" lie. With the aid of rows of columns of assorted sizes, we can always run a tier through two or three stories, 154, and most effectively and gracefully make them one mass for the requirements of the eye; with the additional advantage of the most delicate and perfect detail, sublimated by the study of centuries.

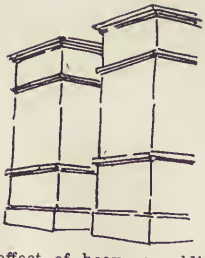
That some such expedient should be devised, the many-storied



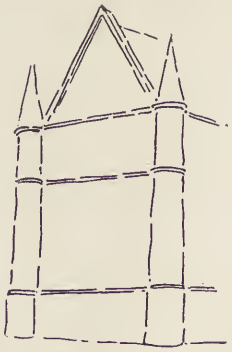
154. Row of houses in Lafayette place, New York. Two stories united by a colonnade.

buildings of modern times required; nor is the vitality of the style remarkable, when we understand how very fit it is to survive.

Bear in mind always that, as we have said, a building should not have many marked vertical parts and many marked horizontal parts at the same time. A series of heavy horizontal bands carried



155. Ill effect of heavy mouldings carried around strong vertical divisions.



156. Good effect of light horizontal lines upon strongly marked vertical parts.

around a series of narrow masses never looks well; nor even a single cornice so used (155).

Invariably, upon comparatively narrow and high parts, rather light lines of mouldings are best used, 156, and the heavily marked horizontal divisions kept for comparatively broad and straight fronts.

Just the same rule prevails in the subdivisions as in the masses. After we have determined upon our row of columns or piers as our middle motive, we must beware of blocking or banding them in any way. And after we have arranged the horizontal lines of our rusticated basement, we shall do well not to break it around the piers. or, if there must be such breaks, to let them be of not too great projection, nor otherwise interfere with its horizontal lines.

For all of this judgment is required, and that delicacy of apprehension which we call taste; to a great extent obtainable by cultivation, that is, by looking at things with the view of judging whether their appearance is pleasing or not; but, in its extreme degrees, inborn, like extreme degrees of other faculties, musical and poetical apprehensions, and even mechanical and mathematical.

John Beverley Robinson.

8 EAST 67TH STREET, NEW YORK CITY.
Chas. P. H. Gilbert, Architect.

BOOK REVIEWS.

THE ECCLESIASTICAL ARCHITECTURE OF SCOTLAND FROM THE EARLIEST CHRISTIAN TIMES TO THE SEVENTEENTH CENTURY. By David MacGibbon and Thomas Ross; Authors of "The Castellated and Domestic Architecture of Scotland." Vol. III., pp. xiv.; 649. Edinburgh: David Douglas. 1897.

The work named above has now, at the close of last year, reached its third volume, the preface of that volume being dated October, 1897. A previous notice in No. 21 of this journal, has dealt with the earlier volumes. This book is the result of the joint labors of the same faithful students and admirable exponents to whom we owe the Castellated and Domestic Architecture of Scotland, which was completed in five volumes in 1892.

The newer book deals with a subject which is far more familiar to the student; because, as, indeed, the authors say in their preface, "the various styles and periods of Gothic architecture, both in this country and abroad, have for long been carefully investigated and defined." It is not to be supposed, however, that the buildings here treated are all, in any strict sense, Gothic in style. Although ecclesiastical architecture retained in Scotland as well as in England, traces of Gothic feeling at a time when the rest of Europe had abandoned the mediaeval styles altogether, yet the XVII. century brings us to buildings whose mediaeval character is but slightly marked and has to do with details even as extensive and important as are large tombs, porches, towers, and the like, in which there cannot be said to be any Gothic feeling at all. In the three volumes of this work there are nearly as many pictures as in the five of the earlier work; and they are of the same general character as those which have been praised not more than they deserve in the previous notice. If they are somewhat less spirited the cause of that may be in the more complicated character of the buildings. The text, on the other hand, rises to a high excellence of historical demonstration, as is natural in a case where with equal knowledge, equal critical faculty and equal care the subject treated is larger and more attractive. It must be said in the plainest way that nowhere in the English language is there a better piece of historical and critical work in the department of architecture. It is certain, too, that the great continental treatises, with all the labor and pains that have been spent upon them, and the comparative thoroughness of the archaeological research which has preceded them, can seldom rank with this one in useful and interesting presentation of the subject. In fact, we have in this book, a model study of its kind; that is to say, a general study of the whole architectural wealth of a kingdom, not, indeed, of the first rank in wealth or in architectural splendor, but not on that account the less worthy of investigation. To apply such a method to France west of the Vosges, and north of the Cevennes—or architectural France proper—would require, no doubt, one hundred such volumes and a lifetime of two diligent students; and, therefore, it will not be done.

It is to be observed, too, how skilfully the contents of the book have been fitted for the task in hand. The study of any one great monument carried out in large-scale measured plans, and elaborately drawn elevations and sections, with photographic views and enlarged details, would equal in cost the preparation of all these volumes together. Such work as that must be left to makers of monographs, and their easier, if more elaborate, work is to be encouraged in every way. To ask, or to expect, any such treatment of the buildings in a general treatise like the one before us is to show ignorance of the conditions under which such work is done. There is really nothing to be said of these books that is not in their praise.

THE CASTLES OF ENGLAND: Their Story and Structure. By Sir James D. Mackenzie, Baronet, of Scatwell and Tarbat. With forty plates and fifty-eight text illustrations and seventy plans. In two volumes. Vol. I., pp. XXII., 475; Vol. II., 448. New York: The Macmillan Company, 1896. $25.00.

To architects and students of architecture this book is valuable chiefly for its illustrations. It contains about forty full-page plates of photographic process, representing some

buildings of primary importance, such as the Tower of London as it is seen from the river, the Keep of Rochester Castle, St. George's Chapel at Windsor, Kenilworth Castle, Newark Castle and Bolton Castle, and also minor structures which are yet very interesting in their architectural character, such as Dunster Castle, Compton Castle, and the following, namely: Hogthon Tower as seen from within the court, and Skipton Castle, viewed in the same way from within. In addition to the plates, there are, as the title page tells us, 158 half-tone pictures in the text, some of which are as large as the plates themselves, and, in addition to these, 70 plans. These plans are a disappointment because they are small and of the kind often furnished by guide-books, and show, in no instance, perhaps, any special research into the probable original structure. One apparent exception must be noted. It is in the first volume, at pages 76 and 77, where the great fortified palace of Hurstmonceux is explained by two plans taken "from an old drawing." Indeed, the text makes no claim to represent or describe the results of any archaeological researches. Documents, indeed, have been consulted, and a history of each separate structure is given at some length. One learns how Castle Rising, for instance, is located on ground which was once at the very edge of the sea, as is set forth in the old stanza here quoted.

"Rising was a sea-port town
When Lynn was but a marsh;
Now Lynn it is a sea-port town
And Rising fares the worst."

How Roman and British work is recognizable in the fortress, how it was dealt with in its early state of being by the Conqueror and his followers and their successors, how its special tradition is that it was the prison for twenty-seven years of Isabella, Queen of Edward II., "the she-wolf of France," as Gray calls her, where, however, she was by no means strictly confined, for, as is here shown, the Castle was her own property and she lived there, and sometimes elsewhere, with great state and ceremony. One of the large pages is occupied by a description of the building which is likely to be of use to any student of historical domestic architecture, or of fortification treated historically. A small and very general plan, on page 298, of the first volume shows the ancient earthworks of Castle Rising, of which very important traces remain, fortunately not too much marred either by time or by wilful destruction, and the keep, chapel and minor stone buildings are also laid down. There is, moreover, one half-tone print showing very effectively the half-ruined keep, with traces of the minor buildings not all shown on the plan. This example will explain quite sufficiently what the general value of the book is to students. It offers no analytic account of the buildings nor any minute description of their details, nor does it make any pretension to be the result of special researches. Indeed, the instances are few in which an English civic building has been made the subject of careful researches, at any time since archaeological study began. What this book offers, then, is the record of a very great number of ancient fortified residences, small and large, divided under the three heads, "Chief," "Minor," and "Non-Existent," and these arranged under the different counties, but referred to by a sufficient index. A table on page xxiii. sums up the number of buildings treated as 112 "Chief" Castles, 277 "Minor," and 271 "Non-Existent" buildings, in all 660. This, it will be seen, is no small promise to the student. If he does not receive from this book the immediate help which he earnestly desires, at all events the book contains a classified and organized catalogue of a vast number of important structures, and the bibliography, which occupies seven pages, and is also divided according to the countries, gives him the means of readily increasing the sum of his knowledge.

MODERN ARCHITECTURE.—A book for Architects and the Public. By H. Heathcote Statham, Fellow of the Institute of British Architects, Editor of "The Builder," Author of "Architecture for General Readers," "Form and Design in Music," "Changes in London Building Law," Etc. With numerous illustrations of Contemporary Buildings. Pp. x; 281. Charles Scribner's Sons, New York. 1898.

This is the first attempt it would seem to pass in review the subject of modern buildings, that is to say, of the buildings erected during the second half of the nineteenth century. It is fortunate that the first attempt should have been so intelligent and instructive. The field is so very large that no one can feel sure that he has examined every part of it. The most suggestive buildings, if they are small and if no advertising dodges have been resorted to, may be ignored by the architectural journals and the supply of photographs of recent buildings is intermittent and very uncertain. Ancient buildings become known, and these are catalogued and ticketed, and the student is able to get access to every record in such a way that comparison among them is possible. The writer of criticism may, with reasonable care, be sure that he is using adequate examples of the truths he wishes to insist upon. With contemporary buildings the case is obviously dif-

ferent, and this is why Mr. Statham's position as editor of the (London) "Builder" and at the same time a practicing architect of experience, enables him to produce a book of singular completeness. He has used his knowledge of the accepted material even to the extent of giving designs not carried out. This is important; no really adequate history of modern architecture can reject these designs. Often it happens in our benighted system of competition that admirable designs, full of spirit and movement, are thrown aside, while inferior ones are selected. If it were a question of enlarging this book to ten volumes quarto, which is what a sufficient history of modern architecture would run to, the experience of every great city and architectural centre would furnish many instances of such wasted architectural ability. The book before us is small, and it is evident that only a few examples, comparatively, could be given in it, but the completeness lies in these being well chosen for the purpose which they had to fulfill.

In one way the book is depressing. It points to very few instances of originality of conception. The Clerkenwell Church, by Mr. Sedding, shows classical forms treated freely, and that is a thing we have been waiting for anxiously. The Brussells Palais de Justice, by Mr. Poelaert, is a singular and questionable but most interesting development of a similar spirit. Buildings of mediaeval spirit, but of novel treatment, and those, which the last twenty years have seen put into shape, of Renaissance or later design, but picturesque in treatment with high roofs and a tendency toward towers and lofty dormer windows, are included in Mr. Statham's record, and full justice is done them. Especially to be liked is the spirit of his remarks upon the Gothic Revival in England, its tendency and its results. In this we have the words of one who is neither the enemy nor the advocate of that movement, who sees the impossibility of its success along the lines laid down for it, and who does justice to the good work, and to the work which is not so good, of its ardent advocates.

Americans will feel that the examples given of American work are not always the best that might be chosen—but is there any known means of satisfying the people of one country by a foreigner's treatment of their productions? An American with a very large collection before him of views of his countrymen's productions might make a stronger choice, and yet he might easily make a weaker one.

The book consists of five chapters devoted to such divisions of the subject as Church Architecture, Street Architecture, etc., with a final "Note as to the Influence of Iron." It has an index which seems well made. There are 145 illustrations, generally small, but well calculated to tell their story and seldom forming blots on the printed page. The book should be read by every one, as it cannot fail to aid greatly in the desirable improvement of the public appreciation as to the difficulties and the possibilities of modern architectural design.

DECORATIVE HERALDRY: A Practical Handbook of Its Artistic Treatment. By G. W. Eve. London: George Bell & Sons, York St., Covent Garden; and The Macmillan Co., New York. 1897. $3.50.

Heraldry occupies a curious position in America. The dictionaries which include technical terms have found it necessary to give the terms of heraldry with great fullness and there is a disposition to use armorial bearings in book-plates, and, to a less degree, in architectural decoration. On the other hand the proper use of such bearings is not common, and even an attempt to ascertain one's rightful arms or to assume an escutcheon properly marshalled and good in heraldry is so very rare that such attempts can hardly be said to exist. Escutcheons and crests with their lambrequins and mantlings are used as if they were the flowers of the field for elements of decorative design. A room of German Renaissance decoration is not considered complete without the escutcheon of robber barons somewhere in its decorative glass or in the carvings of its chimney-piece, and yet the mediaeval speculator in other men's goods would find it hard to recognize his own achievement or to select it from among the others, so much are they misconceived and misrepresented by the modern workman.

It is always possible that a real interest in heraldry as furnishing the distinctive mark of a family and of the position of the individual in a family may develop itself. This may happen at any time and most unexpectedly. It is far more probable, however, that heraldry will continue to be what it is now—a decorative appliance. This is, perhaps, regrettable, but if heraldic decoration is to be used in this way it should be used with intelligence, and the book before us is likely to aid students very greatly in this respect. For the proper scientific use of bearings and tinctures and the proper marshalling of an escutcheon the designer must go to the grammars of heraldry, which are numerous, and which, though not ideal in their arrangement, or their literary style, can be trusted to teach the pseudo-science aright, but for the decorative display in sculpture or in flat pattern of the devices of heraldry such

a book as Mr. Eve's has been needed. It is not in buildings of the Gothic styles alone that heraldic decoration is in place; it is equally the affair of XVII. century architecture, nor would a cardinal or a prince even of the XVIII. century have been inclined to relinquish his sculptured escutcheon or the tapestry in which his whole achievement was displayed. Moreover, there must be some way of redesigning the heraldic bearings that they may be in harmony with modern design, and, indeed, some few attempts not unsuccessful have been made in that direction.

All of these truths are well set forth in the book under consideration whose chief fault it is that it is not large enough to contain all the matter which it would be well to present. At the same time, one has to protest against the use of the valuable space for the discussion of Egyptian, Sassanian and Persian emblems, which are, in no true sense, heraldic at all.

A BOOK OF STUDIES IN PLANT FORM, with Some Suggestions for Their Application to Design. By A. E. V. Lilley and W. Midgley. New York: Charles Scribner's Sons. 1896.

It has been a truism, ever since people began to talk and write about decorative art, that pattern designing was a thing of the past, so far as Europe was concerned. Persons whose duty it was to make drawings for wall papers or textile fabrics, or for borders and patterns to be painted on walls, have, for fifty years, simply appropriated the designs made by the men of old times for totally different purposes; and the more intelligent and ambitious have tried to found new designs of their own upon the work of the ancients and have really fancied that they had reached originality. There is, at last, an evident reaching out for better things. There is something very interesting in the attempts which are now being made to produce quite novel patterns by the conventionalizing of such refined natural forms as plants can furnish. This is not the hard "foliation" which the Gothic revivalists of fifty years ago indulged in. That work, as offered the public by Owen Jones, the younger Pugin and their followers, consists in taking a group of leaves, pressing them flat and then taking all possible life out of them by making the leaves and leaflets on one side of the group the exact counterparts of those on the other. It was the attempt of those would-be revivalists of mediaeval decoration to turn natural forms into ornament by divesting them of all play, of all variety, of all movement. The modern designer of the better sort is in search of a very different result. Some few of the modern specimens of commercial book-binding have afforded very interesting surface patterns studied rather closely from the vegetable forms and yet full of originality, individuality and charm. Much of that merit is to be seen in the designs contained in this little book. Moreover, not only are the designs themselves often of interest, but careful drawings made of the natural plants are also of considerable possible utility to the student as suggesting at once by their natural forms other combinations.

This suggestion may really be more forcible when made by a drawing than when offered by the plant itself. Pierre Victor Galland has left it on record that his decorative design came the most easily when he hung up in his studio his own large drawings from nature and worked with them, and not with the natural object in his eye and in his mind. Every practiced designer will know what this means and will realize that the human presentation of plant form may suggest to humanity a practical use of that form in further developments.

LIVES OF SEVENTY OF THE MOST EMINENT PAINTERS, SCULPTORS AND ARCHITECTS. By Giorgio Vasari. Edited and annotated in the light of recent discoveries by E. H. and E. W. Blashfield and A. A. Hopkins. New York: Charles Scribner's Sons, 4v.; $2 each.

Vasari's "Lives" is one of the few certainly immortal works in the literature of art. There are, indeed, not many classics in that department, and assuredly there is none that maintains so lively and friendly an intercourse with all sorts of men, generation after generation, as the "Lives." Modern research and criticism have made sad havoc of Vasari's facts, so that there is scarcely a page that does not require correction or amendment; his artistic insight, moreover, was not deep, and his appreciation, though lively, not profound —yet his book survives, still vital, after the lapse of more than three centuries. Undoubtedly Vasari owes much to his period—for all subsequent ages, Italian art of the Renaissance must be of supreme importance. The Aretine lived when our world was young, a witness, as it were, albeit a late comer, of the creation from which our art is so consciously derivative. There are moments in human affairs when mere contemporaneity is a happier circumstance for a writer than a later wisdom or a profound philosophy speaking from afar. How many exhaustive modern art histories would not the world give for the writings of a busy gossip of the Periclean days. Vasari is not, for his particular time, exactly such a

person, but he is somewhat a tattler in the better sense of the word, and the world, we see, has ever dealt kindly with these talkative historians of the hour. The perennial interest of the "Lives" is due in large measure to these circumstances, but not to them alone. In spite of failings they are still original documents of a precious sort, and they possess intrinsic charm and interest, good-nature and honesty, impartiality and sympathy, which have not contributed a little to their long preservation. To be valuable, however, to most readers, the "Lives" require a minute, critical commentary. As already said, scarcely a page can be left untouched. German, Italian, French, British and American scholarship have long been busy with the Italian Renaissance, and the fruits of this research must be read into Vasari if the "Lives" are to retain authority for the ordinary reader. The performance of this vastly useful work was the task which the editors of the new edition undertook. They retained Mrs. Foster's well-known English translation, and in order to make room for a "relatively complete annotation" selected seventy of Vasari's biographies for critical treatment. The selection made may, no doubt, be questioned in part by the special student, though in the main from the general point of view the choice decided upon is judicious, but the critical apparatus supplied by the editors is so entirely excellent that any small objection to the selection would be frivolous. No more conscientious and thorough piece of work than theirs has been done recently. It is of the highest quality, and follows the text with a closeness, minuteness and lucidity which is hardly to be overpraised. It renews Vasari, and renders this edition of the "Lives" indespensible to every student and lover of Art.

THE RUINS AND EXCAVATIONS OF ANCIENT ROME.—A Companion Book for Students and Travellers. By Rodolfo Lanciani, D. C. L., Oxford, LL.D., Harvard. Professor of Ancient Topography in the University of Rome, Author of "Ancient Rome in the Light of Recent Discoveries," "Pagan and Christian Rome," "Forma Urbis Romae," Etc. Pp. xxiv.; 619. Boston and New York: Houghton, Mifflin & Co. The Riverside Press, Cambridge. 1897.

This book is a marvel of compact information concerning a subject which is most interesting to all students of classical architecture, of ancient sculpture and the tremendous epoch which we call the time of the Roman Empire. The author's previous works, "Ancient Rome in the Light of Recent Discoveries," and "Pagan and Christian Rome," may have led the reading public to expect another book made on the same lines, that is to say, a collection of essays detached and made mutually interaiding, essays on special topics connected with the Imperial City in its greatest epoch and at the time of its first passing into decline. Such, however, is not the character of the book before us, which is rather a guide-book to Rome as it can now be visited and studied, the information being grouped according to a topographical division of the city—the Palatine treated apart from the Forum or the Sacra Via, the Esquiline Hill or the Walls. The preface states that the author has not intended to produce "a complete manual of Roman topography," but that, of course, a book ten times this size could not be. In this volume, however, containing about as much matter as Murray's Handbook for Rome and rather less than Gsell-fel's Handbook, there are treated the Tiber and its bridges and the ancient works near its mouth, the walls and gates, the buildings on the Forum, the great buildings about the city of which new parts have been discovered, and the other buildings only less great which have of late been properly located for the first time, the vestiges or records of buildings now wholly destroyed and the works of painting and sculpture which recent investigations have brought to light. The information given about well-known buildings in Rome and confirmed by illustrations taken from drawings by the early explorers of the Renaissance time will have much in it to surprise even the architectural student unless he has made a specialty of Roman topography. Such a body of information there is concerning the Praetorian Camp; and again concerning the Arch of Marcus Aurelius, of which a drawing is given in fac simile. Again, a drawing of the tepidarium of the Baths of Diocletian is given, dating from a period before the restoration of these halls into their present form as the Church of St. Mary of the Angels. Vestiges of the prow and stern of that singular ship of Aesculapius into which was cut and built the Island of the Tiber, are given in the first chapter; and the last chapter gives studies of Hadrian's Mausoleum, its ancient details and the order in which were placed the Imperial commemorative slabs. Throughout the book, at every pause after the description of an important monument or region, a brief bibliography is given by which the student may find immediately where further information is to be had. Maps and plans are given where needed and are of great value, and the reader is reminded from time to time of the great general map of ancient and modern Rome which the same author has published and which is now, at last, complete.

There can be no more sad or disheartening study than such a record as this of the brutal and senseless destruction by barbarian conquerors carried on and even surpassed by the men who thought that they were cultivated and studious. A curious habit of the present age which excites the wonder of everyone who thinks about his own time, its habit of admiring ancient works of art sincerely and then "restoring" them out of existence, is matched by the habit of sixteenth century and seventeenth century popes and cardinals of admiring newly discovered classical works so much that they could not refrain from breaking them to pieces and using the fragments for work of their own. Thirty years ago when the Western world began to be interested in Japanese works of art, it was said of a great lady—a European sovereign—that she admired Japanese bronze vases and collected them; that she took the handles for paper-weights, the bodies for flower pots and the bases, turned upside down, as saucers for the same pots. In this way all the requirements were supposed to be fulfilled; the foreign work of art was domesticated, so to speak. Much in the same way the art lovers of the sixteenth century admired Roman remains. The Triumphal Arch was splendid indeed; it was, however, highly expedient that a certain street should be straightened or widened; therefore let the Arch be torn down and let the sculptured slabs be conveyed to some papal palace or given to some princely house which would undoubtedly take care of them. The hall of some thermae was magnificent, with its granite shafts still in place and the sculptured friezes above them; therefore, let two of the columns be cut up into pedestals; let two others be given to the builders of a new church, and let the fifth perfect shaft be erected to our own glory at the corner of a neighboring street. The idea of preserving the work of art is it stood and for its own sake did not occur to the sixteenth century pope, or suggested itself only to be rejected. The same idea hardly occurs to the modern municipality; but the difference is in this, that the modern municipality restores the building out of its original character into something quite different, being as self-complacent the while, we suppose, as was the pope of the older time.

Note.—In Vol. VIII., No. 1, of this magazine, some illustrations were given (see page 68) of modern French work in Paris and elsewhere, for which we were indebted to that excellent architectural publication, the Moniteur des Architectes.

INDEX TO VOL. VII.

Subscribers desiring Indexes to Vol. VII. of this Magazine can obtain the same by sending 2 cts. for postage to the office of publication, 14 and 16 Vesey Street.

THE PARK ROW BUILDING.
The largest office building in the world.
Nos. 13 to 21 Park Row, New York City. R. H. Robertson, Architect.

P. & F. CORBIN,

Art Workers in Metal,

AND MANUFACTURERS OF BUILDERS' HARDWARE.

Offices, 11, 13 & 15 Murray Street, New York.

Works, New Britain, Conn.

The following are among the many prominent and important buildings supplied with hardware by this firm :

WASHINGTON LIFE INSURANCE BUILDING,	CYRUS L. W. EIDLITZ, Architect
SINGER BUILDING,	ERNEST FLAGG, Architect
PARK ROW BUILDING,	R. H. ROBERTSON, Architect
EMPIRE BUILDING,	KIMBALL & THOMPSON, Architects
PARK BUILDING,	GEORGE B. POST, Architect
DAKOTA APARTMENT,	HENRY J. HARDENBERGH, Architect
EDISON BUILDING,	CARRERE & HASTINGS, Architects
SHOE AND LEATHER BANK BUILDING,	CADY, BERG & SEE, Architects
LAKEWOOD HOTEL,	SCHICKEL & DITMARS, Architects
FRANKLIN BUILDING,	CLINTON & RUSSELL, Architects
VANDERBILT BUILDING,	McKIM, MEAD & WHITE, Architects

N. Y. Life Banking Room, Leonard Street and Broadway.
McKim, Mead & White, Architects. Executed by R. Fisher & Co.

Setting, pointing and backing Lime Stone, Granite and Marble with "LaFarge" Cement will prevent discoloration. It is the finest ground and strongest Portland Cement manufactured. It has been used with success for preventing discoloration in brick construction. "LaFarge" is the best cement to use for all purposes and especially for the finer uses, ornamental work, artificial stone, statuary, mouldings, interior and exterior stucco work, etc. Pamphlet on application.

THE J. L. MOTT IRON WORKS,

84-90 BEEKMAN STREET, NEW YORK.

34 Boylston Street, Boston. 311-313 Wabash Avenue, Chicago.

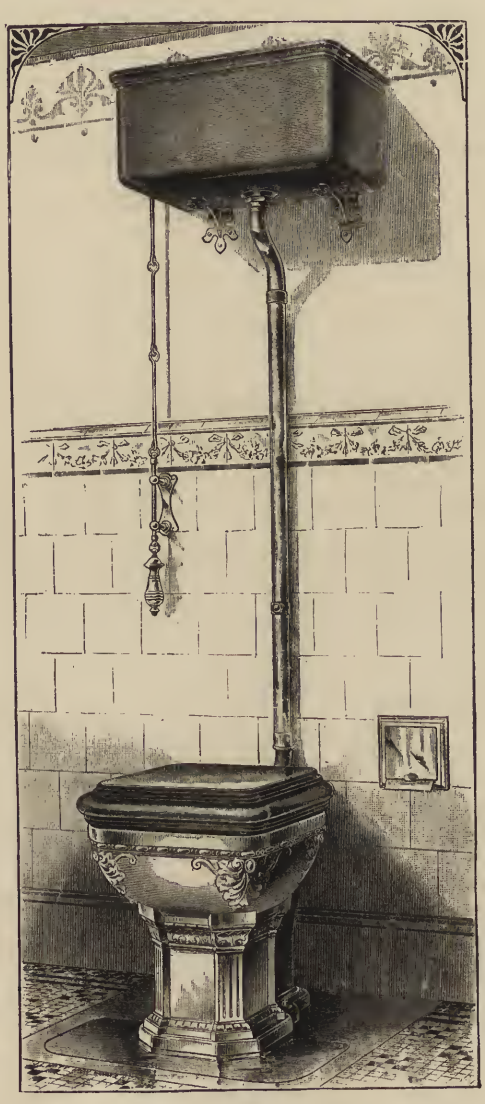


PLATE 5016-R.

The "Renaissance" Improved Syphon Jet Water Closet.

(PATENTED)

FOR FULL DESCRIPTION SEE CIRCULAR, WHICH MAY BE HAD ON APPLICATION.

THE BROOKLYN BRIDGE BRAND OF ROSENDALE HYDRAULIC CEMENT WAS USED IN THE CONSTRUCTION OF THE ABOVE BUILDING.

THE ASTORIA HOTEL.

MANUFACTURED BY
NEW YORK & ROSENDALE CEMENT CO.
OFFICE, 280 BROADWAY, NEW YORK.

THE SKY-SCRAPER UP TO DATE.

Vol. VIII. No. 3. *For Quarter ending March 31, 1899.* Whole No. 31

THE ARCHITECTURAL RECORD.

CONTENTS

100 ILLUSTRATIONS.

THE ARCHITECTURAL RECORD CO., 14-16 VESEY STREET, N. Y.

ST. PAUL BUILDING,	Geo. B. Post, Architect
STANDARD OIL BUILDING,	Kimball & Thompson, Architects
HARTFORD FIRE INS. BUILDING,	Cady, Berg & See, Architects
NEW YORK LIFE BUILDING,	McKim, Mead & White, Architects
SEIGEL–COOPER BUILDING,	DeLemos & Cordes, Architects

CENTRAL NATIONAL BANK BUILDING,	J. T. Williams, Architect
SPINGLER BUILDING,	W. H. Hume & Son, Architects
GILLENDER BUILDING,	Berg & Clark, Architects
COLUMBIA COLLEGE BUILDINGS,	McKim, Mead & White, Architects
NEW YORK ATHLETIC CLUB,	W. A. Cable, Architect

THE RESIDENCE OF ELBRIDGE T. GERRY, ESQ.
5th Avenue and 61st Street, New York City. Richard Morris Hunt, Architect.

Please notice what Commodore ELBRIDGE T. GERRY says regarding the heating of his large new residence, No. 2 East 61st St., City. House is 100x110.

NEW YORK, March 14, 1895.

Richardson & Boynton Co.,

Gentlemen :—I write to express my great satisfaction with your admirable system of Perfect warm air furnaces recently placed in my house, No. 2 East 61st Street, in this city. They possess the advantage, as to the character of the warm air, that it is neither the disgusting steam heat which dries up the skin and affects the head, nor, on the other hand, is it the almost equally dry hot water heat, as it is called; but during the entire cold weather of the late winter, even during the blizzard, my house has been thoroughly heated. The heat is uniform and the ventilation perfect.

Very truly yours,

ELBRIDGE T. GERRY.

ASTORIA HOTEL.

CORRIDOR OF THE EMPIRE BUILDING.
Messrs. Kimball & Thompson, Architects. Marble Work Furnished by Robert C. Fisher & Co.

MORMON TABERNACLE, SALT LAKE CITY
(Painted with Dixon's Silica Graphite Paint.)

DIXON'S SILICA GRAPHITE PAINT

Nearest to an ideal paint for protective purposes that has ever been made.

Roofs and iron work well painted with Dixon's Silica-Graphite Paint have not required repainting for ten or fifteen years.

Should be used in the construction work of all Iron or Steel Buildings, Bridges, etc.

JOSEPH DIXON CRUCIBLE COMPANY,

JERSEY CITY, N. J.

N. B. — Architects and Draftsmen who are not familiar with DIXON'S 219½ PENCIL should send for a sample. For fine line work it is without an equal. Sent free when business card is sent us.

Yale Locks and Fine Hardware

were used in the New York City residences shown in list below. These are but a few of the many such residences equipped, in New York City alone, by the

Illustration one-fifth actual size.

Yale & Towne

Manufacturing Co.

The General Offices of the Company are at Nos. 9, 11 and 13 Murray Street, New York City. Works: Stamford and Branford, Conn.

In many cases the Hardware in the residences named below was prepared by the Company from Special Designs furnished by the Architect.

Residence and its Architect.	Residence and its Architect.
Gen. Horace Porter, MONTROSE W. MORRIS.	Mrs. Ogden, PEABODY & STEARNS.
Hon. Levi P. Morton, MCKIM, MEADE & WHITE.	Robert Garrett, RENWICK, ASPINALL & OWEN.
E. C. Benedict, CARRÈRE & HASTINGS.	F. L. Stetson, ALGERNON S BELL.
George J. Gould, BRUCE PRICE.	Jos Pulitzer, C. A. GIFFORD.
Chas. T. Yerkes, R. H. ROBERTSON.	Col. McAlpin, E. S. HAPGOOD.
Maj. F. Bartlett, BORING & TILTON.	Morris K. Jessup, JARDINE, KENT & JARDINE.
Hon. Wm. C. Whitney, GEO. A. FREEMAN, JR.	Isaac V Brokaw, H P. KILBURN.
L. M. Domerick, C. P. H. GILBERT.	Mrs. G. P. Waldo, KIMBALL & THOMPSON.
W. Bayard Cutting, C. C. HAIGHT.	U. S. Grant, Jr., CHAS. S. NORTH.
A Duryea, M. C. MELLEN.	C. H. Dickerman, F. CARLES MERRY.
Dr. Quimby, CLINTON & RUSSELL.	Collis P. Huntington, GEORGE B. POST.
Elbridge T. Gerry, RICHARD M. HUNT.	Isaac Stearns, SCHICKEL & DITMARS.

A handsome Exhibit Room is provided in each of the Company's offices. It contains samples of its products and is intended for the use of architects and their clients in the selection of locks and metal work. Ladies are especially invited to make use of these facilities.

(WHOLE No. 31.)

Vol. VIII. ONE DOLLAR A YEAR. No. 3.

The Architectural Record

January-March, 1899.

25¢

25¢

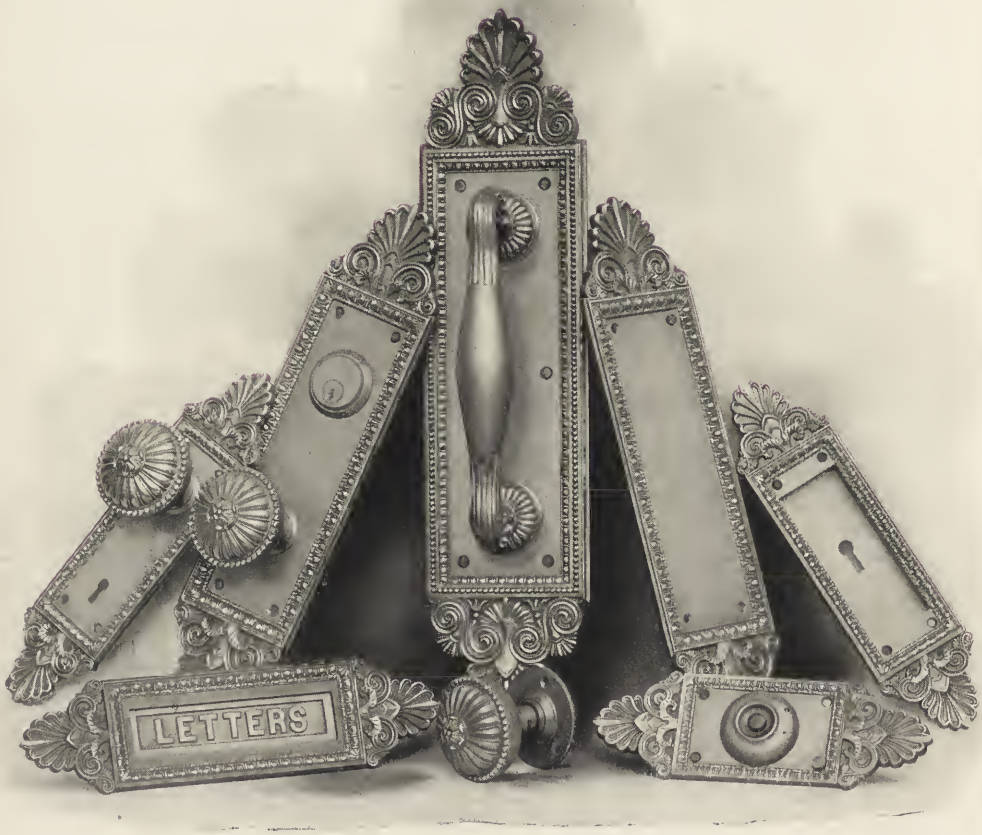
CONTENTS

100 Illustrations.

Illustrated Published Quarterly

ADVERTISERS' DIRECTORY.

ADVERTISERS' DIRECTORY.—*Continued.*



BULIS DESIGN. GREEK.

The
Architectural Record.

VOL. VIII. JANUARY-MARCH, 1899. NO. 3.

THE "SKY-SCRAPER" UP TO DATE.

IT is strange that the solution of a building problem so new as that presented by the steel-framed tall building should have apparently so largely ceased to be experimental. The American architect is a good deal fonder than his co-worker in other countries of proving all things; he is by no means so much inclined to hold fast that which is good. On the contrary, he is still altogether too much disposed rather to vindicate his own "originality" than to essay the task, at once more modest and more difficult of "shining with new gracefulness through old forms." Of course his originality will be less crude, and more truly original, in proportion to his education, meaning both his knowledge and his discipline. Nothing can be more depressing than the undertaking to do "something new" by a man who is unaware what has already been done, or who has not learned how it is done. When, within a quarter of a century, the practicable height of commercial buildings has been raised, by successive movements and successive inventions, from five stories to twenty-five, we should expect, given the preference for originality that is born in the American architect, and the absolute necessity for originality that has been thrust upon him by these new mechanical devices, some very wild work, indeed, much wilder than we have had. What nobody could have expected, when the elevator came in to double the practicable height of commercial buildings, and even less when the steel-framed construction came in again to double the height made practicable by the elevator alone, is what has actually happened, and that is a consensus upon a new architectural type. The general treatment of the "sky-scraper" is already conventional, in the sense of being agreed upon. It is nearly as distinct an architectural type as the Greek temple or the Gothic cathedral. The fury of experimentation seems already to have subsided, and the designers to be all working upon recognized lines and executing variations within understood limits. All this is the work of twenty-five years, since the vertical extension made possible by the elevator began to be recognized in building. Nay, it is really the work of ten, since

the steel-frame came in to supplement the elevator. The elevator doubled the height of office buildings, and the steel-frame doubled it again, and yet there is less of eccentricity and freakishness; more of conformity and homogeneousness, among the twenty-story buildings than there used to be among the five-story buildings.

The first business buildings in which the possibilities of the elevator were recognized were the Tribune Building and the Western Union Building in New York, which were concurrently under construction twenty-five years ago. They were much more conspicuous and comment-provoking than even the St. Paul and the Park Row now are, because they were alone and because lower New York then had a skyline, from which they alone, excepting the church spires, were raised and detached. The skyline was "the purple line of humbler roofs," built to the limit as that limit was set by the power of ascension of the unassisted human leg. Through this line of five stories the new monsters protruded in a portentous fashion, and though really they were but of half as many stories again as the older edifices that formed the skyline, they were more distinctive features than the successors which are four and even five times as high as the old-fashioned edifices. Now, New York has no skyline at all. It is all interruptions, of various heights and shapes and sizes, not even peaks in a mountain range, but scattered or huddled towers which have nothing to do with each other or with what is below. A clever British observer says with truth that New York from either river is "hideous and magnificent," for that it "cries aloud of savage and unregulated energy."

It is true that the first two elevator buildings had visible roofs, the one a lofty mansard with three-story dormers, the other a steep wedge, and that they were, therefore, taller than some of their successors which contained more stories, as well as more shapely. But they were in reality timid beginnings. It came soon to be seen that, even with walls of actual masonry, it was profitable to build full twice as many stories with the elevator as had been practicable without it. Ten or twelve stories became the limit. When the height varied from seven stories to twelve was our period of experimentation in commercial building. There was a great deal of wild work, and some interesting work, but there was no entirely successful work. There was no "convention." Designers were not agreed with each other, and a designer often appeared to be at odds with himself, upon the very data of his artistic problem. They divided their fronts and grouped their stories capriciously and eccentrically. In the face of the new requirements they ignored that primary truths of design were as applicable to ten stories as to three. They would have saved themselves and the people who had to look at their work a grievous trouble by merely reverting to Aristotle and bearing in

mind the precept of the father of criticism, that a work of art must have a beginning, a middle and an end.

The architect who first impressed upon his contemporaries and the public that this precept was applicable to high buildings was a public benefactor. It was from his inculcation of a forgotten truth that the consensus in the design of tall buildings began, of which we everywhere see the results. Confusion became order in his path. I do not undertake to say who it was who first designed a tall front in conformity with this ancient truth, and sharpened Aristotle's wise saw with a modern instance. But I should say that the designer who enforced it most powerfully was the architect of the Union Trust Company's Building on Broadway. He had come from making, in the north front of the Times Building, a success which was only partial by reason of the indistinctness and confusion of the primary divisions, when he perceived, from a contemplation of the executed work, what was the matter with it, and proceeded, in the design of the Union Trust, to remedy those defects. There is here no confusion about the principal features of the composition nor any doubt about their forming an architectural countenance. The basement is distinctly set off from the superstructure, and this in turn from the crowning feature, the roof and its appendages, and the intermediate stories are plainly intermediate and connecting. The force of the arrangement is independent of the style, a more or less Richardsonian Romanesque, independent of the detail, though this is studied and successful, independent even of the features adopted to carry it out. It does not essentially matter whether the central and chief division be formed by openings running through it, as in the Union Trust, or by rows of small and similar openings, which leave the shaft to assert itself as nearly as may be as an equal and monotonous surface. The essential point is that there should be a triple division, and that the three parts should both assert themselves as parts and combine into a whole.

This is the agreement, the convention, which so many designers of sky-scrapers have adopted that whatever sky-scraper does not conform to it becomes what a contributor of yours is in the habit of calling an "aberration." Let it be noted, however, that aberration is not necessarily a term of reproach. It is, according to the dictionary, "a deviation from the customary structure or type." Such a departure may or may not be justified by its result. If there is less reason in it than in the customary structure, if the deviation seems to come from mere caprice, then the designer has failed to justify it. If, and in so far as it is more reasonable, more expressive, more beautiful, then the designer has justified it and is to be congratulated. Our latest architecture contains in its sky-scrapers, examples of both kinds. But let us first consider the more noteworthy

of recent tall buildings which conform to the convention. In these the connection is more specific than that of a mere triple division. It is founded upon the analogy of a column, with its division into base, shaft and capital, and even conforms, as far as may be, to the proportions of the classic column. That is to say, the shaft, the middle division, is much taller and very much plainer than the base or the capital. The plainness of it is as essential to the analogy as the excess. The nearer it comes to being a quite monotonous mass the more value have the variations and ornaments of the base and the capital to which its plainness is a relief and a foil. It may doubtless be subdivided, so as to be an organic whole within a larger whole. But this subdivision is difficult to manage, for several reasons.

While the inheritance of three thousand years may be taken as a warrant for the primary triple division, which thus passes without challenging inquiry, a subsequent subdivision needs an explanation. To be "rhythmical," this subdivision must itself be triple, and to triply subdivide a member of a triple composition, without thereby confusing the primary division and thus the unity of the work is a difficult feat, of which the success has not been worth the trouble in any example of the tall building known to me. It is, of course, possible to introduce at the bottom and at the top of the shaft a story recalling the transition, in the actual column, to the base and to the capital. This has been done in the Union Trust with success. But the bonding of the shaft itself is recognized in the column as a modern and corrupt interference with classic purity. In the Empire Building, this bonding has been attempted by means of stories intercalated at equal distances, framed in emphatic mouldings, and treated with some separateness, in what we may still call the shaft. The principal front of the Empire, the side, is, however, so fortunate in its extent, that its altitude is no longer the principal dimension, and that the analogy of the column is not directly recalled. But even here it seems that the decorative top and the decorative base would be more effective, and the composition clearer, if the central mass had been treated with absolute uniformity. The most that can be said for the intercalated stories is that they do not much interfere with the monotony of the central mass. But they interfere enough, it seems to me, to indicate that the architect did not appreciate the high architectural value of the monotony, in conjunction with the more ornamental parts. Any difference in the treatment of the several stories not only is, but must appear, arbitrary and capricious. By this device, one story is made to differ from another story in importance, whereas it is not only true, but it is known to every believer that above the ground floor, or the ground floor and the first floor, the stories are all alike. In the Washington Life, it is true, it is the third story which is the quarters of the corporation that is the

ST. PAUL BUILDING.

George B. Post, Architect.

builder and owner of the edifice, and this fact is properly enough recognized in signalizing the story in question by a somewhat greater ornateness, which, however, by no means amounts to a separateness of treatment.

Indeed, nothing is to be gained by cloaking or dissembling facts that everybody knows, and such a fact it is that the rentable stories of an office building are all identical in function and equal in dignity. An attempt to disguise this takes away from the architecture in which it is made the excuse of honest utilitarian necessity. The famous plea of the pickpocket is the best the "sky-scraper" can make for itself: "Il faut vivre." It is ill with that "sky-scraper" upon which the magistrate can retort "Je ne vois pas la necessité." To that crusher the architect exposes his sky-scraper who makes capricious distinctions between stories that everybody knows serve similar purposes. The St. Paul is laid wide open to it by the presentation of its stories as half stories, and the inclusion of two of them in each apparent story, as is done throughout the "architecturesque" part of the work, the three-sided tower faced with limestone, that occupies the truncated angle, and is crowned by the rich order. Doubtless the doubling of the stories "gives scale," and a swaggering aspect to the structure, and avoids the squareness of the openings that would result from leaving the actual arrangement undisguised. But it is plain even from the architecturesque parts, that the facts have been suppressed instead of being expressed. A cellular arrangement as equal and monotonous as that of a honeycomb has been overlaid by an architectural arrangement which has as little as possible to do with it, and deprives it of its one excuse for being, that it is as it must be. "I do not see the necessity," the spectator may and must exclaim. The tall and lanky opening which results from overlaying the real wall with an architectural trellis is no more graceful a form than the nearly square opening which would have ensued if the wall had been let alone. It is true that the orders could not have been applied. But it is very questionable whether the ten orders are as effective as the twenty actual stories would have been. In any case the twenty superposed stories appear alongside, in the parts that are not architecturesque, and put the architecture to an open shame. Not only do we not see the necessity, but we see that there is no necessity, and a caprice like that is fatal to a building which must be justified by its necessity or not at all.

Upon the whole the most successful of the sky-scrapers are those in which the shaft is made nothing of, in which the necessary openings occur at the necessary places, are justified by their necessity, but draw no attention to themselves. They become impressive not as units, but as a series, and this may be a very fine impressiveness. Rectangular holes are not pretty, but ten stories of them all alike

ST. JAMES BUILDING.

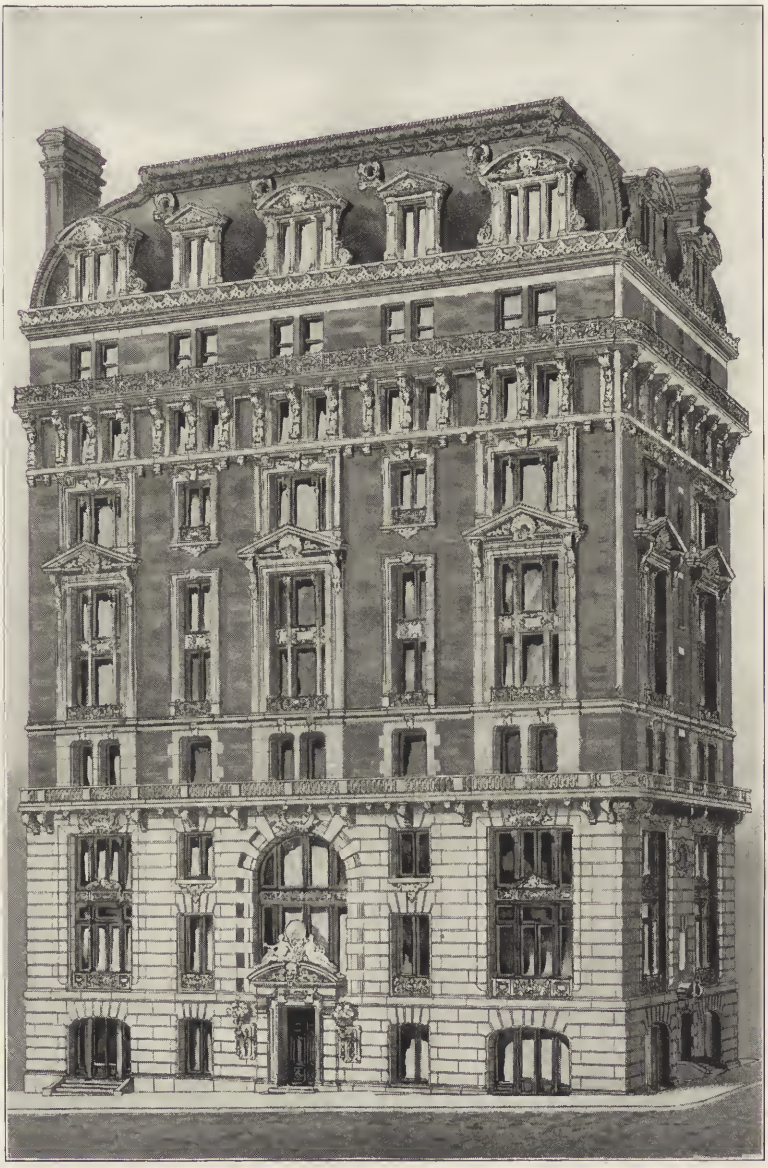
Broadway and 26th Street. Bruce Price, Architect.

are sure of making their effect. In the St. Paul, the unarchitecturesque fronts which the spectator is requested to ignore, but cannot, in which the square holes stand confessed and nothing is done to them, are to one spectator more impressive than the evidently factitious architecture alongside of them. They would be more impressive still if the cornices which mark the arbitrary architectural division of the truncated front were not continued across them to the impairment of the effect of reality that they would produce if they were left alone, and to the interruption of a monotony so often repeated that it would become almost sublime. The question which Lord Melbourne was in the habit of asking his colleagues, when they asked what ground he meant to take on some new political issue, is one which might properly be addressed to a good many designers of sky-scrapers who are solicitous what to do with the main body of their buildings: "Can't you let it alone?"

Of course, a shaft can be effectively variegated without denying either the equality of importance and similarity of purpose between its different stories, or compromising its own importance as an organic part of the building. This may be done, as we shall see hereafter, by the introduction of moulded ornament in terra cotta, which is so plastic that it seems to require ornament, and in which elaborate ornament is so cheap, if it be often repeated, as not to be out of place even in a building of bare utility. It may also be done in color, and that is one of the lessons of the St. James, on many accounts a very interesting building. It is doubtless a good thing that most of the designers of tall buildings have avoided any contrast of color, and have brought their baked clay as nearly as might be to the tint of their stone work. There is safety in monochrome, and whoso departs from it does so at his peril. But few critical observers of the St. James will be disposed to deny that its designer has vindicated his right to leave this safe refuge. It is a pity, of course, that the emphasis of color should not go with the emphasis of structure, that the weak tint should cover the frame and the strong tint the filling. It is a mistake to introduce recessed courses in a screen of red brick for the sake of the shadows, and then to nullify the shadows by introducing a course of white brick at the bottom of the recess. But the middle part of the St. James is nevertheless effectively relieved of monotony without denying the identity of purpose in its different stories and without confusing the composition.

This successful exception does not invalidate the rule that the shaft is impressive by its extent and its monotony of repetition, and as an interval of plainness and repose between the more elaborate base and the elaborate capital. It is these features which may properly appeal to attention on their own account, as well as on account of their contribution to the total results. The ornament which is

meant to be worthy of the closest inspection is naturally given to the base, although the capital is properly the more ornate member. There is a dictum of Ruskin which is rather exceptional among his dicta as being the expression of mere and obvious good sense. Ornament, he says, may be, or must be, in greater effective quantity at the top of a building, but the most exquisite should be kept at the bottom. Accordingly all the designers make their entrances as well worth looking at as they can, and, indeed, it would be a solecism not to signalize the means by which a population mounting into the hundreds gains and leaves its place of daily business. Perhaps the commonest device for giving importance to the entrance is to extend it through two stories. Of course this device in a building of which the primary purpose is to get the maximum of rentable area is illogical as well as wasteful. But it must be owned that the architects who have fined their clients in the rental value of the space in the second story over the entrance, space which might have been rented for a hundred pence and given to the poor owner, get their architectural compensation from the process. The Broadway entrance to the Singer Building has the air of a burrow, and there is an inadequacy bordering on meanness in the actual entrance to the Park Row. Many designers who, although on architecture they are bent, have yet a frugal mind, reconcile their conflicting emotions by confining the actual entrance to the ground floor, and still signalizing it by some special treatment of the opening above it, with which the entrance is supposed to be architecturally incorporated. This is the arrangement adopted in the Dun Building, where, indeed, in the Broadway front, the "feature" is not even over the entrance, and in the longer front of the Singer Building. In the St. Paul it is the sculptured figures which are represented in the act of carrying twenty stories of wall that emphasize the entrance without sacrificing space. In the Washington Life it is the two-story order at the centre of the longer front, which is too nearly an engaged order to constitute or represent a portico, and has the air of having been set up against the building. The same thing is true of the much larger and more conspicuous order in front of the New York Life, an impressive feature in itself which loses much of its impressiveness when it is seen in connection with the building with which it is not architecturally incorporated. The effect of the actually engaged order of the American Surety Building, with the columns in antis behind it is very much better than either of these inadequately projected orders, and is, indeed, about the most successful entrance upon this scheme that any of the tall buildings has to show. Another scheme is that of confining the entrance to the ground story, and surmounting it with a decoration which does not pretend to subserve any other function than that of signalizing it. This is the case



SINGER BUILDING.

Northwest cor. Broadway and Liberty St. Ernest Flagg, Architect.

THE DUN BUILDING.

Northeast cor. Broadway and Reade St. Harding & Gooch, Architects.

with the free standing circular pediment or panel over the entrance to the Bayard Building, and it may be commended as an example to such architects as are quite sure that they can equal the author of that work in the attractiveness of their surface decoration. To other designers it may be said that the most eligible method of giving importance to their entrances seems to be that of running the opening into the second story if they can gain the consent of their owner to that sacrifice.

The entrance is in most cases the chief feature of the basement, of the architectural base. But it is not the only feature—and, indeed, the most effective treatment is that in which the whole substructure becomes a feature. If one is to forego detailed functional expression in favor of abstract architectonics, the height of a commercial building before the elevator came in suggested a height of base which is in agreeable proportion to the "sky-scraper." This suggestion has been acted upon by many designers who have underpinned the shafts of their tall buildings with a four- or five-story building, designed as such and fairly complete in itself. The basement of the Dun Building offers a very fairly successful example of this treatment. The crowning member, including all above the eleventh story, seems distinctly infelicitous, both in proportion and treatment, and the variegation of the shaft sufficient to destroy the effect of repetition, which becomes more impressive in proportion to the extent of the series, without substituting any other. But, granting the author his two-story openings, which may at least conceivably light a lofty apartment with a mezzanine floor, the four-story basement seems to me a very well designed building, a composition fairly complete in itself and at the same time a fitting preparation for the superstructure. In this latter respect the executed work is a distinct improvement upon the original design, which showed the basement as a five-story building with a quite unmeaning trophy to signalize the entrance which it does not designate, and especially with a continuous balcony which emphatically cuts it off from what is above. The restudy the basement has received has done it a great deal of good. The removal of a story from the lofty openings has made them much more tractable. The omission of the huge window-frame of the front is a clear gain. But especially the confinement of the balcony to the centre of each front, while continuing its line in a belt along the interval of wall, while it still leaves the basement to assert itself as a feature, also allows it to be allied with the superstructure, and substitutes at the angle the effect of continuity for that interruption.

The effect of the triple arcade in the long front of this basement has been very much amplified and extended in the long arcade which is the most striking feature of the flank of the Empire Building. This flank, confronting Trinity churchyard, and thus having as good an

assurance of permanent visibility from an effective distance as can be had in New York, offered a very unusual opportunity, of which it will not be disputed, that, so far as this arcade is concerned, the designers have fully availed themselves. Doubtless the tenants of the floor above the springing may consider that they have been sacrificed to architecture. But this arcade of seven openings, on a scale twice that employed elsewhere in the building or in its neighbors, is really architectural, really a stately series, with its effective abutment of a much more solid flank of wall and its effective correspondence in scale with the order, also embracing two stories, at the top of the building. It must be now evident how much these two features, and with them the building, would gain in effect if the interval between them were an interval as nearly as might be of complete repose, a repetition twelve times of an identical design for a story of offices.

But it is the crowning member, the capital, which offers the greatest opportunity for individuality and variety of treatment. It is apt to be the only part which is visible from a distance. Anything like conformity is out of the question. New York has no skyline, and is not likely to have any, so long as the estimates of the most profitable height of commercial buildings vary from ten stories to thirty, and as the law does not intervene to draw the line of altitude. It is impossible for a designer to conform to what exists, much less to what may exist after his building is completed. All that he can do is to make his own building as presentable and shapely as the conditions will admit. It is maintained by some critics that a strict adherence to the conditions compels an architect to stop with the completion of his paralleloped, and to forbear a visible roof. Doubtless the flat roof enables him to fill his honeycomb level to the top with a row of cells for the working bees. But it does not enable him to give any form or comeliness to the skyline of his building. The parallelopiped is not an architectural form, as anybody will have impressed upon him by looking at the random row of parallelopipeds in lower New York from across the East or the North river. The practical owner may have had some reason who objected to his architect's design for a steeply-roofed ten-story building, upon the ground that "That's all right on the Rhine, but it ain't business." Nevertheless, he was insisting upon a defacement of the city, which is in great part wanton. For a visible roof will obviously supply additional accommodation at a less cost than that of building "to the limit" all the way up. Few sensitive spectators can have observed from afar the towering mass of the American Surety Building without feeling that the tall shaft needs the crown that would convert it into a campanile. On the other hand, few sensitive spectators can have failed to experience a touch of gratitude to the archi-

EMPIRE BUILDING.

Southwest cor. Broadway and Rector St. Kimball & Thompson, Architects.

AMERICAN SURETY CO. BUILDING.

(Across Trinity Churchyard.) Bruce Price, Architect.

tect of the American Tract Society for having enclosed part of that edifice in a picturesque hood, even though the hood be avowedly extraneous to the building, which is visibly enclosed in it and completed without reference to it. The St. Paul has no visible roof, but it has a true crown in the tall order, incrusted with decoration effective from every point from which it can be seen at all, which surmounts the three-fronted tower which the architect has arbitrarily set off as the "architecturesque part" of his building, leaving the architecture of the more shameful parts to take care of itself. This crown is in itself a grateful object, and the more grateful from a point of view from which the edifice it crowns cannot be made out in detail and may be ignored. Of substitutes for a visible roof, in cases where the architect felt bound to build to the limit, vertically and laterally, one of the most successful is the crowning order of the St. James, with an oriel framed in metal in each intercolumniation, and the effect of the whole feature greatly enhanced by its projection from the plane of the wall below. This overhanging of the top is evidently as feasible and legitimate in a steel-frame as in a timber frame, in which it has been so often and so effectively employed. It offers an architectural opportunity which it is strange should not have been oftener embraced. In the present instance, it has been done rather timidly, as very likely it had to be. But in a free-standing building, or even in a corner building, it seems that it might sometimes be done more boldly and with a corresponding increase of effectiveness.

The same device is employed, though with even less emphasis, although to an excellent result, in the Washington Life Building. This building is acclaimed by everybody as one of the very best of the sky-scrapers, and it owes its whole effectiveness to the treatment of the capital, to the introduction and the treatment of a visible roof. The base is without pretensions, except in the portico of the entrance, where, as has already been remarked, the practicable projection does not suffice to give it the effect of a portico, while on the other hand it is not incorporated with the building. The shaft is reduced to its very simplest expression, a mere repetition of the openings of the tiers of cells, which leaves it as nearly as may be a plain shaft. The detail of the lower stories, successful in scale and careful both in design and execution, offers nothing striking. But the steep wedge-shaped roof seems to have been designed "not laboriously, but luckily." It gives character to the building below it and makes it a picturesque object equally in a near and in a distant view. The projection of the order, slight as it is, is very effective, almost indispensable as a detachment of the capital. The dormers are exceedingly well designed in themselves and most effectively relieved against the greenish bronze of the tiles, the color of which is one of the chief successes of the work, from the pictorial point of view.

THE WASHINGTON LIFE BUILDING.
(From the West.)
Southwest cor. Broadway and Liberty St. Cyrus L. W. Eidlitz, Architect.

THE WASHINGTON LIFE BUILDING.
(From the East.)

Southwest cor. Broadway and Liberty St. Cyrus L. W. Eidlitz, Architect.

WASHINGTON LIFE BUILDING.

Broadway and Liberty St., N. Y. City.

Cyrus L. W. Eidlitz, Architect

The widening of the building at the rear gives rise to an unavoidable awkwardness in the roofing, as seen from the south, the quarter from which the illustration of the Broadway front is taken. The awkwardness is mitigated as much as possible, and will disappear when the side comes to be concealed by another tall building. This contingency is contemplated by the evidently provisional treatment of the south wall, a treatment which is an unusually judicious compromise between the conflicting claims of the owner's pocket and the architect's wish to bestow comeliness upon "the more shameful parts," and to make them presentable so long as they are visible. Meanwhile, however, the most favorable view of the Broadway front is that from the northwest, from which the provisional architecture is not seen, and which the illustrations do not include. Our street architecture offers very few glimpses so satisfying as that of this wedge of furrowed bronze, with the single bold dormer, so lucky in scale and in design, relieved against it. Not less good in its way is the broad northern flank with the four dormers, and scarcely less good the west front, which "shines over city and river" standing knee-deep in the lower buildings of the waterfront. If this had been the principal front, the architect would very probably have introduced a single dormer above, to unite and dominate the two, and thus have reproduced the effect so familiar and always so effective in the timber work of the German Renaissance. The conspicuous roof, with the separate treatment of the upper stories of the wall, emphasized by the order, and the slight expansion which it marks, constitute the capital of the building, and it is plainly a feature with which no equal and uncompromising parallopiped, built to the limit in all dimensions, can at all compete.

* * * * * * * *

All the buildings thus far mentioned have been designed in general conformity with the convention which enforces not only the Aristotelian triple division, but the more specific analogy of the column. But it should not be forgotten that the assumption of that analogy, convenient as it is, is, after all, only an assumption, and a more or less arbitrary assumption, since it not only does not facilitate, but may even obstruct, the detailed expression in design of structure and of function. That the Aristotelian maxim itself is an assumption, or that the application of it to architecture is arbitrary, not many designers or critics can be prepared to admit. It is not necessary that they should be psychologists, and able to explain in words why a building triply divided should be more "agreeable to the spirit of man" than a building which consists from top to bottom in tiers of similar cells, any more than that they shrould be able to explain why in fenestration the arithmetical progression 3, 5 and 7 is agreeable. On either point they can safely take an appeal to universal

consciousness. Securus orbis judicabit. But it is also true that the "sky-scraper" is in fact a series of equal cells, and that the only suggestions for a triple division that inhere in the conditions are the facts that the ground floor has a different destination from that of the floors above, and suggest a distinctive treatment of the bottom, and the fact that a visible roof or in default of it the necessity for a protective and projecting cornice, compels a distinctive treatment for the top. Almost without exception, the designers of the tall buildings make a further assumption, which is not only arbitrary but manifestly baseless, and that is that in designing them they are designing buildings of masonry, instead of merely wrapping skeletons of metal in fire-resisting material. That basements should be more solid than superstructures; that arches should have visible abutments; that walls should "reveal" their thickness; these and many more of the traditions of masonry have no relevancy at all to the new construction. If architects make and we allow these assumptions, we ought not to forget that they are baseless assumptions, and that the best work done according to them is not a solution, but an evasion of the problem presented by the modern office building. That is why an aberration, a "deviation from the customary structure or type," is not necessarily condemnable, may, on the contrary, be highly laudable. It all depends upon whether the departure is a mere caprice of the designer, or an attempt to come closer to reason and reality than is possible under the conventional treatment.

Decidedly an aberration is the Singer Building in lower Broadway. This scarcely comes within our scope, since the building is not an example of the skeleton construction, and rests at the modest ten stories, which seems to be the commercially practicable limit of a structure with real walls. Considering the enormous costliness of the land on which it stands, this self-restraint indicates either a very obstinate or a very facile owner, who may well be astonished at his own moderation in contenting himself with half the rentable area he might have had. Commercially, and in spite of the brand-newness and smartness of its modish Parisian detail, the Singer Building is a reversion, advantageous as it might be, on civic grounds, to restrict the height of all commercial buildings to the height to which its owner has voluntarily restricted himself. Moderate as this height is in comparison with the neighbors it has yet seemed excessive to the architect, who has bent his efforts to the task of keeping it down. This he has done by a triple division, accentuated not only by horizontal members emphatic to the verge, if not beyond the verge, of extravagance, but by a change of material in the different divisions, the lower being a monochrome of light stone and the middle a field of red brick relieved with stone. Nay, the principal divisions are so emphasized and the subordinate divisions so

THE PARK ROW BUILDING.

New York City. R. H. Robertson, Architect.

slurred that a ten-story building presents the appearance of one of three stories, with a corresponding exaggeration of scale. At least until a legal limit is put upon the height of buildings, this is likely to remain unique. But while it does not invite imitation, one has to own that a thing of which it is questionable whether it was worth doing has been unquestionably well done.

Of another deviation from the customary type, the Park Row Building, it is not easy to discern the motive. This structure has the distinction, which is to be hoped it may retain, of the tallest yet, and confronts the next tallest, the St. Paul, across the street which is more properly an alley. It can scarcely be said to be "by merit raised to that bad eminence," although, like its neighbor, it has the salutary effect of a warning rather than of an example. In each case there are inherent awkwardnesses in the problem which were obviously difficult to surmount, and which have obviously not been surmounted. But the design of the principal front of the Park Row, which in effect comprises the architecture, is noteworthy for its rejection of the convention upon which most of the recent tall buildings have been designed, without substituting for it any scheme that is obviously more rational, or that is even readily apprehensible. Laterally there is an emphatic triple division, into flanking walls kept as plain and solid as the practical requirements will allow, and a more open centre, consisting of five superposed orders, not counting the two-story colonnade of the basement. The relation of these orders is by no means felicitous. Some are stilted on pedestals of a story in height, while others stand directly upon the entablatures of those below, without apparent reason. Vertically, there is no clear division. It is not apparent whether the first two stories or the first five constitute the architectural base. The upper five pretty clearly constitute the capital, being occupied by an order more developed than those below, although the cornice that marks them off from what is below is no more important than other horizontal lines which can have no such special significance. The sixteen stories below this cornice may be taken as the shaft, and by looking very hard, it is possible to discern that this is meant to be triply subdivided into a beginning of five stories, containing an order furnished with pedestals, a middle of seven, containing two orders directly superposed, and an end of four, containing another order, while the intermediate divisions are marked by balconies. But the principal and the subordinate divisions are so nearly equal in emphasis as to produce uncertainty and confusion, and to excuse the cursory observer for declaring that the front shows no composition at all. Without going so far as that, it seems safe to say that the architect would have done better if he had accepted and abided by the current convention.

BAYARD BUILDING.

Bleecker Street. Louis H. Sullivan, Architect

Very different is the aberration presented by the Bayard Building in Bleecker street. There is nothing capricious in the general treatment of this structure. It is an attempt, and a very serious attempt, to found the architecture of a tall building upon the facts of the case. The actual structure is left or, rather, is helped, to tell its own story, This is the thing itself. Nobody who sees the building can help seeing that. Neither the analogy of the column, nor any other tradition or convention, is allowed to interfere with the task of clothing the steel frame in as expressive forms as may be. There is no attempt to simulate the breadth and massiveness proper to masonry in a frame of metal that is merely wrapped in masonry for its own protection. The flanking piers, instead of being broadened to the commercially allowable maximum, are attenuated to the mechanically allowable mimimum. Everywhere the drapery of baked clay is a mere wrapping, which clings so closely to the frame as to reveal it, and even to emphasize it. This is true at least of the uprights, for it seems to me a defect in the general design, from the designer's own point of view, that it does not take enough account of the horizontal members. As anybody may see in a steel cage not yet concealed behind its screens of masonry, these are as important to the structure as the uprights. In the Bayard they are largely ignored, for the panels which mark the different floors are apparently mere insertions, answering no structural purpose, and there is no suggestion of any continuous horizontal members, such as, of course, exist and are even necessary to stability. Mr. Sullivan, some years ago, wrote a very interesting paper on the æsthetics of the tall building, of which the fundamental position was that form must follow function, and that "where function does not vary form does not vary." These are propositions from which nobody who believes that architecture is an art of expression will dissent, and with which the present writer heartily agrees. But in applying them to the case in question, Mr. Sullivan declared that the lower two (or possibly three) stories of a tall office building had a destination so different from that of the superstructure, that a distinguishing treatment for them was not only required but demanded, and that the uppermost story in turn, being in great part devoted to the "circulating system" of the building should also be differentiated. I remember suggesting to him that it was in fact only the ground floor which could be said to differ in function from its successors and that his inclusion of additional stories may have been inspired by an instinctive desire to obtain a base more proportional, according to our inherited notions of proportion, to a lofty superstructure than a single story could furnish. However that may be, in the Bayard it is the ground floor that is treated as the base. Even the second story "counts in" with the superstructure, to which logically it be-

longs. In spite of the separate treatment of the ground floor, the continuity of the structure is felt and expressed, even in the design of the capitals, which are plainly not real capitals, spreading to carry a weight of greater area, but mere efflorescences of decoration. It is not a question whether two or three stories would not be more effectively proportional to the superstructure than one. Is is a question of fact. The result, whatever else one may think of it, is a sense of reality very different from what we get from the sky-scrapers designed on conventional lines. It puts them to the same sort of

PORTICO OF THE AMERICAN SURETY BUILDING.
Bruce Price, Architect

shame to which the great roof trusses of the Manufactures Building in Chicago put the imitative architecture with which they were associated. Not that the gauntness and attenuation of the resulting architecture are in this case altogether agreeable to an eye accustomed to the factitious massiveness of the conventional treatment. But, at the worst, this front recalls Rufus Choate's famous toast to the Chief Justice: "We look upon him as the East Indian upon his wooden idol. We know that he is ugly, but we feel that he is great." We feel that this front is a true and logical exposition of the structure. If we find it ugly nothwithstanding, that may be our own

fault. If we can find no failure in expressiveness, the architect may retort upon us that it is no uglier than it ought to be.

Meanwhile the æsthetic, as distinguished from the scientific attractiveness of the Bayard Building without doubt resides in the decoration which has been lavished upon it, and which is of a quality that no other designer could have commanded. I am unable to agree with Mr. Sturgis's condemnation of the crowning feature of the building, in a recent number of this magazine, as "most unfortunate." In fact, the upper two stories are internally one story, the upper floor being a gallery surrounding a well extending through both, and lighted from above. Doubtless the arches and the rudimentary tracery are not forms of metallic architecture, but they do not belong to metallic architecture. The arches are in fact of brickwork, faced with terra cotta, and the thrust of them is visibly, as well as actually, taken up by the tie-rods at the springing. The intermediate uprights, the mullions, cease at this level, while the prolongation of the principal uprights is clearly denoted by the winged figures under the cornice. A designer who has adhered so strictly to the unpromising facts of the steel cage through eleven stories is scarcely to be severely blamed for "treating resolution" to this extent in the twelfth. If the building, apart from its wealth of decoration, recalls the works of contemporaneous engineering rather than of historical architecture, that also is "as it must be." The Bayard Building is the nearest approach yet made, in New York, at least, to solving the problem of the sky-scraper. It furnishes a most promising starting point for designers who may insist upon attacking that problem instead of evading it, and resting in compromises and conventions.

Montgomery Schuyler.

WASHINGTON LIFE BUILDING
From the Northeast.
Cyrus L. W. Eidlitz, Architect

TRINITY CHURCH AND NEIGHBORING OFFICE BUILDINGS.

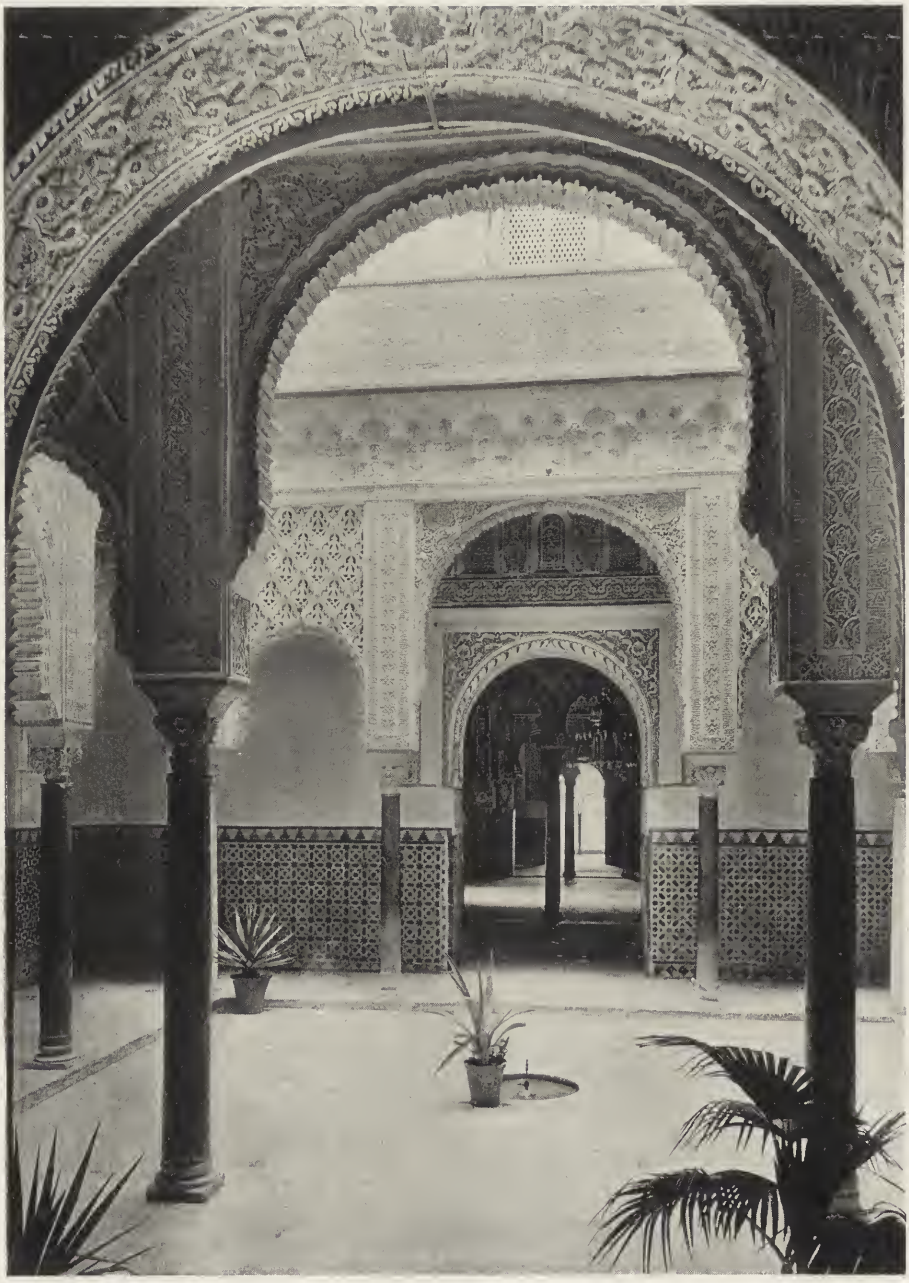
OLD STYLE OFFICE BUILDING -THE PARK NATIONAL BANK, 1867-8.
Broadway, New York City.

The Alcazar,

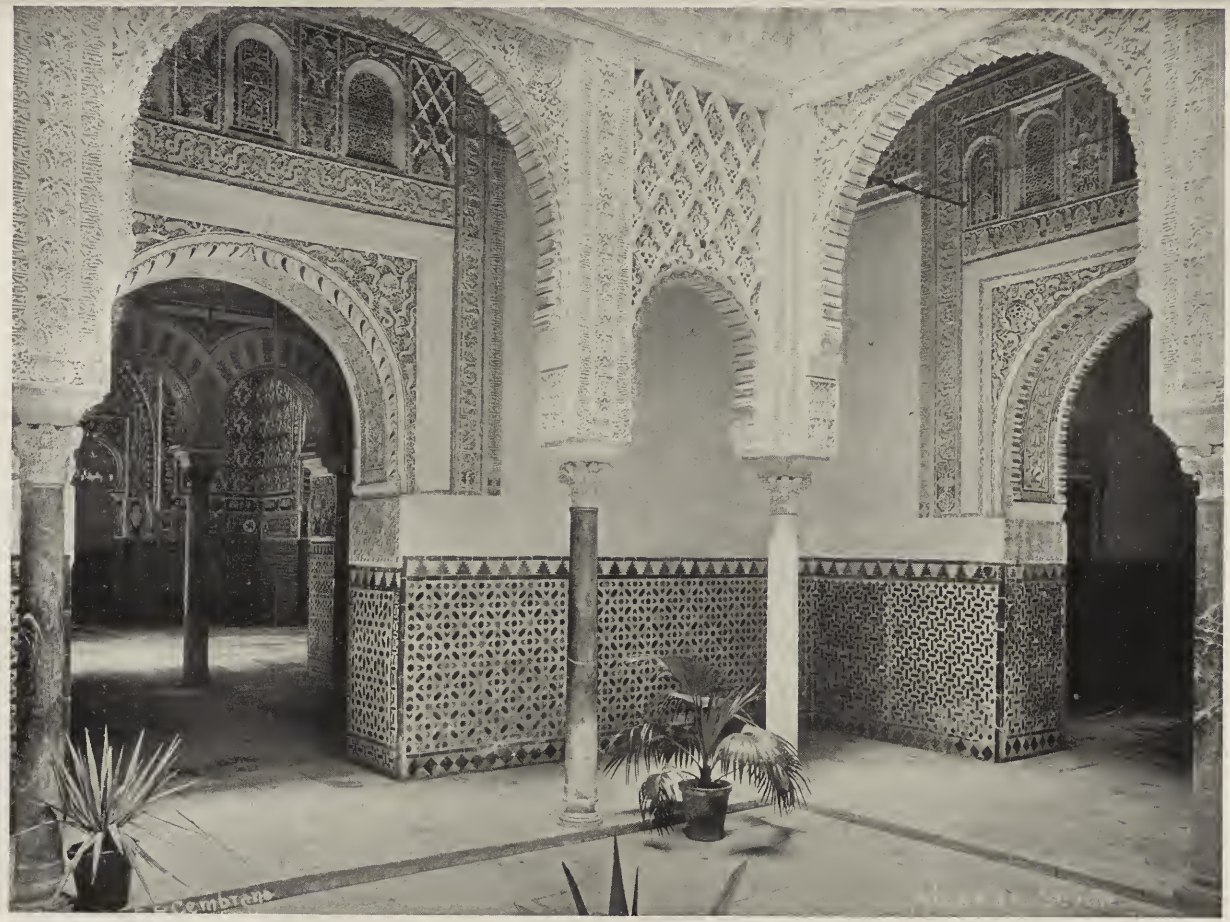
Seville, Spain.

THE ALCAZAR, SEVILLE, SPAIN.

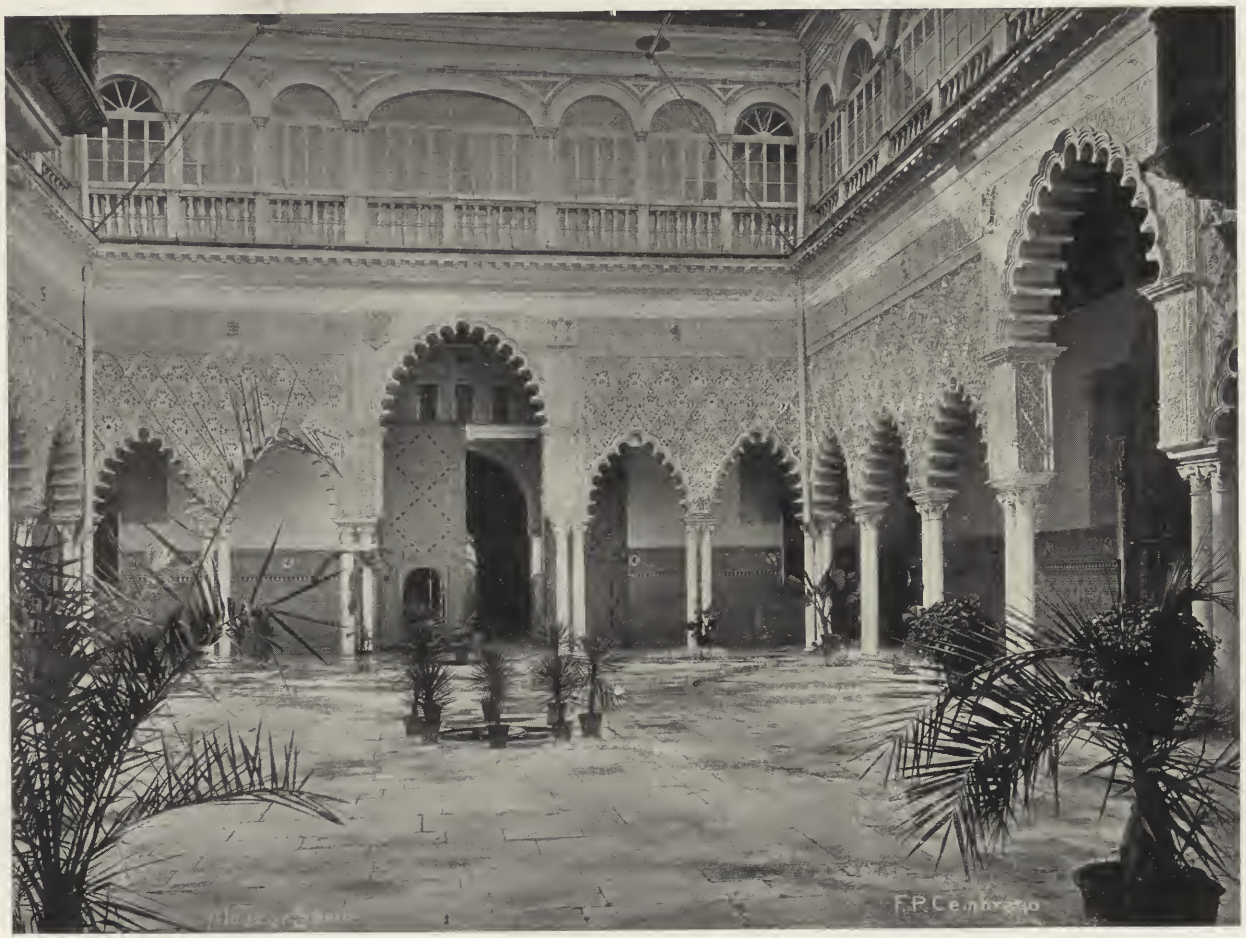
THE ALCAZAR, SEVILLE.



THE ALCAZAR, SEVILLE.



THE ALCAZAR, SEVILLE.



THE ALCAZAR, SEVILLE

Architectural Views

of Old and New

Brooklyn

OLD SUYDAM RESIDENCE, EVERGREEN AVENUE, BROOKLYN.

OLD DUTCH REFORMED CHURCH, FLATBUSH AVENUE, BROOKLYN.

"MIDWOOD," FLATBUSH AVENUE, BROOKLYN.

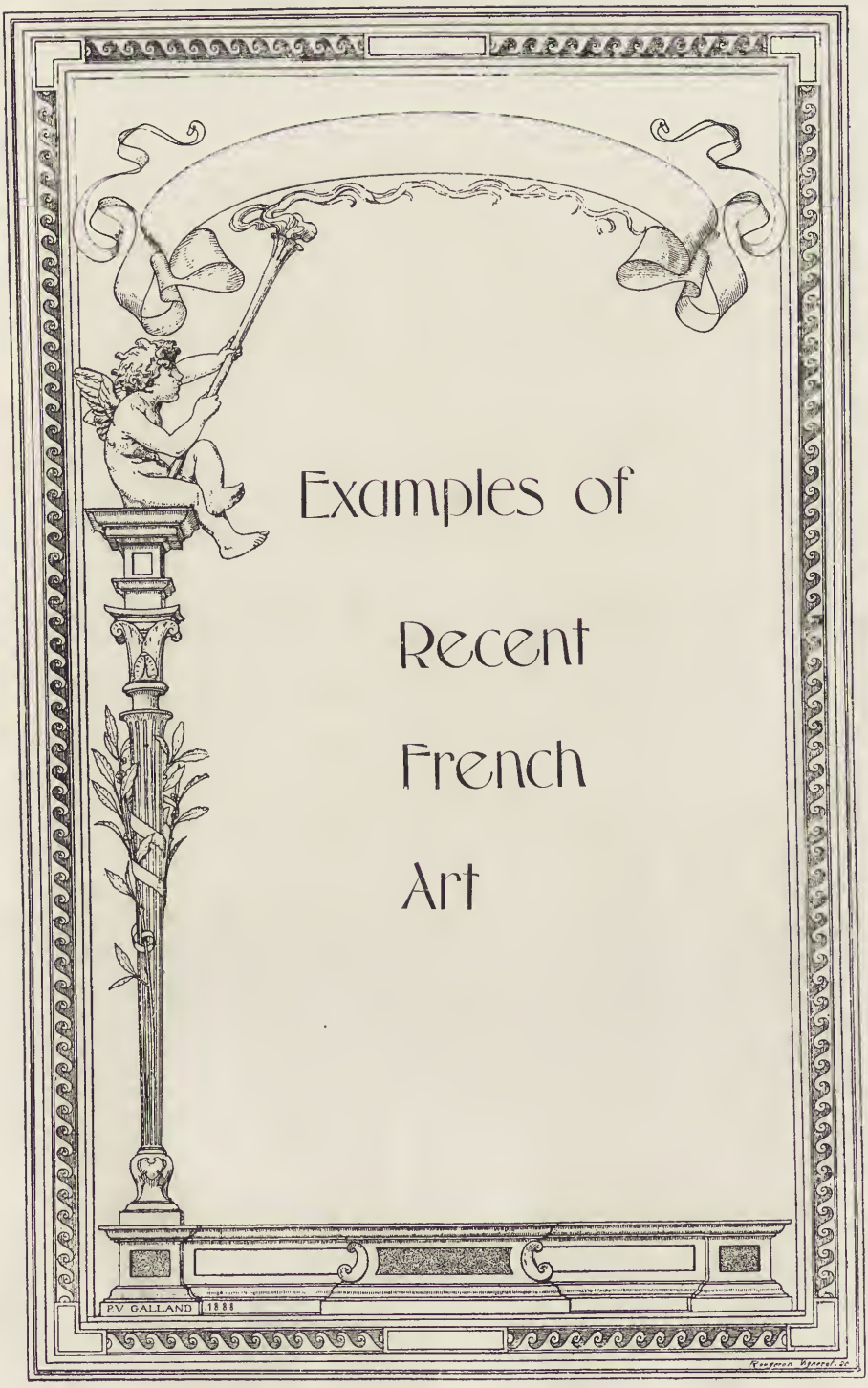
MEMORIAL ARCH, BROOKYN.

ENTRANCE TO PROSPECT PARK, BROOKLYN.

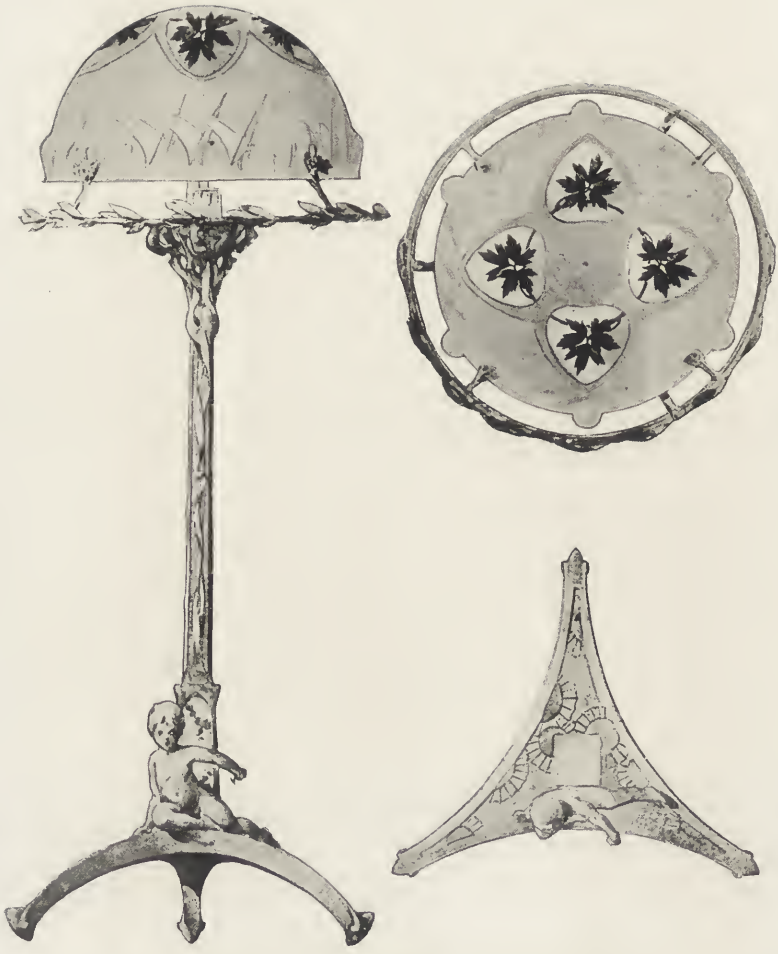
BUILDING OF THE SOCIETY FOR THE PREVENTION OF CRUELTY TO CHILDREN.

Schermerhorn Street, Brooklyn.

MECHANICS' BANK BUILDING.
Fulton and Montague Streets, Brooklyn.



Examples of Recent French Art



ELECTRIC LIGHT DESIGN, BY M. GUYOT.
(Portefeuille de la Revue des Arts décoratifs.)

PAINTING INTENDED FOR THE PANTHEON.
Puvis de Chavannes.

TIGERS AND LIONS.
For the Chateau de Vaux-le-Vicomte, G. Gardet.

THE CATHEDRAL OF TROJA.

VAGUE memories of a mention in Fergusson hastily read some thirty years ago had inspired me with a wish to visit Troja during the Apulian trip, which was described in the last Number of the "Architectural Record." What was to be seen there was, however, by no means clear. If an Italian Cathedral is not mentioned by Jacob Burckhardt's "Cicerone," it may be taken for granted that it is not worth visiting, and Burckhardt mentions only the bronze doors at Troja, and does not otherwise even mention the Cathedral. The same oversight has been made by Huillard-Bréholles, one of the supposably special authorities for Apulia, and Burckhardt has probably relied on this authority. At the time of this trip I had no knowledge of the monumental publication on Apulia by Schulz, which has been quoted and described in the last number of the "Architectural Record." Murray mentions a "fine Cathedral," but the remark that "the interior shows some traces of the architecture of the Lower Empire" is a curious anti-climax to the student, spurning restored interiors and searching for intact monuments. After one has really seen the interior capitals at Troja one quite despairs of Murray. Indeed they do show some traces of the architecture of the Lower Empire, being quite the finest things which the "Lower Empire" has bequeathed to the history of mediæval architectural detail. Bædeker's hint of "an interesting Cathedral with ancient bronze doors" was vague and encouraging, although not comprehensive; but the remark in Bædeker that Troja was a Byzantine colony was the really inspiring cause of the resolution to see for oneself what kind of a thing this interesting Cathedral might be. The Italian surveys of 1895, which have been described in seven numbers of the "Architectural Record," were inspired by the belief that Byzantine architecture was the source of the mediæval refinements of Pisa and of Venice. Hence the fixed resolution to visit Troja, as a known Byzantine centre. The discovery of the curious schematic variations in the arcades of the south wall which rewarded this resolution has been previously published, but the survey of the south wall is reprinted in this issue (page 293). See also the ground plan on page 295 and remarks on its peculiarities as also found in other churches in No. 3, Vol. VI.

In this case a fixed resolution was an important factor in the problem. The guide-books tell one to go to Troja by way of Giardinetto, but they do not tell one that Giardinetto consists of one small railway station and one malarial station-master, and that it does not boast one single house, to say nothing of not having one

single public conveyance. The guide-books advise you to go by way of Giardinetto, but they do not advise you that the only connection from Foggia drops you at Giardinetto at five o'clock in the afternoon and leaves you to await the Troja diligence at five o'clock on the following morning, at this station, so-called, which does not offer

WEST FRONT, TROJA CATHEDRAL.

even the accommodation of a wooden bench or the comfort of a crust of bread.

The malarial station-master hates Giardinetto, where he lives, and Troja, which he has seen. As he was an Italian of some refinement and education, one could not listen to his depressing accounts of the Cathedral without forebodings that money and time would be wasted at Troja. Mr. McKecknie was with me with his camera and surveying instruments, and a proposal to walk the nine miles to

INTERIOR OF TROJA CATHEDRAL.

Troja that evening did not meet his approval. We were told of a farm-house a mile away where a horse and cart might possibly be procured. The farm-house was looked up and the owner was offered his own terms for transportation, but the farmer was rich and unimpressionable. Horses were to be seen in plenty about his place and vehicles of various descriptions. We offered to accept an ox-cart as a compromise, but nothing could be done with this Italian.

Two courses were open on return to the station. One was to take an evening train for Naples, the other was to return by rail to Foggia and there hire a carriage on the following day. The temptation not to go back to Foggia was a strong one, but Bædeker's mention of a Byzantine colony had made me obstinate. It happened to be the Fourth of July, and after our return to Foggia, Mr. McKecknie and I duly celebrated this festival by eating the supper which

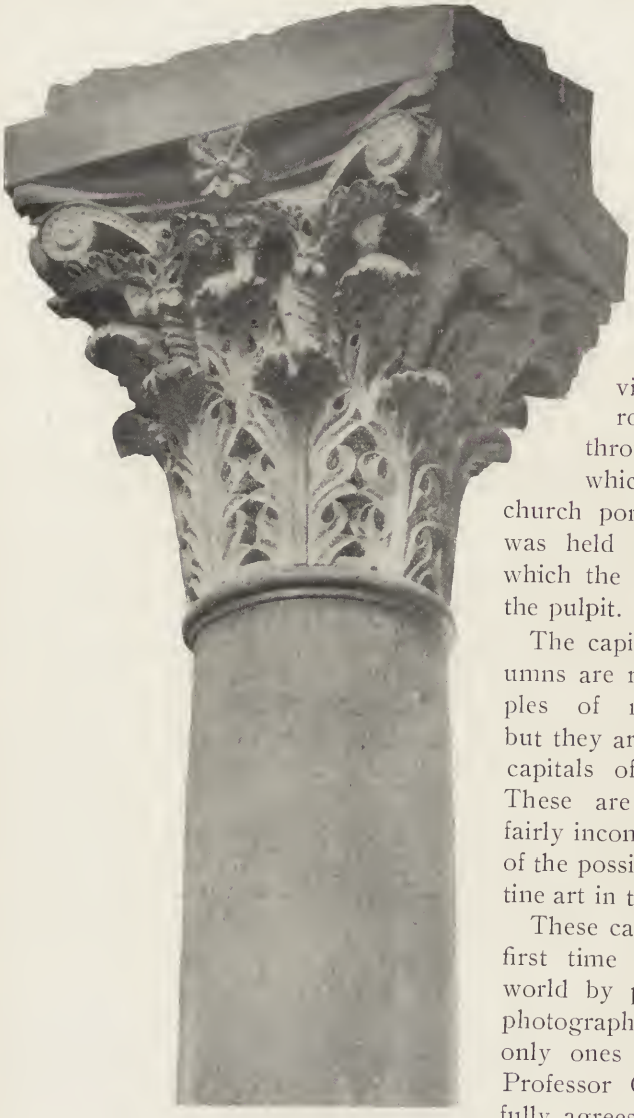
THE PULPIT, TROJA CATHEDRAL.

Giardinetto had refused us. On the following morning a carriage ride of twelve miles brought us to Troja.

As we drove up the single main street and stopped in front of the Cathedral the first glance was enough to show that we had found one of the greatest churches in Italy. Not one trace of a restoration was to be seen on the splendid exterior. It was all intact early twelfth century work. The interior proved to have a modern coloring on the walls, but, strange to say, this color is in excellent taste and harmonizes with the style of the building. There is no stucco, and the interior is, to my mind, the purest and most genuine survival of an important church in the style of one single period, to be found in Italy. There are no Renaissance chapels, shrines, or other disfigurements.

The remarkably fine pulpit (page 282) belongs to the style and period of the building, being dated to the year 1169 by its inscription. The relief of the animal combat is in a gray-greenish tufa, in contrast to the main body of the pulpit, which is of fine-grained yellowish limestone. This relief is undoubtedly the most remarkable work of its time in all Italy for style and action. It precedes the first pulpit of Niccola of Pisa, by nearly a century, but in Niccola's period or even in considerably later time it would be difficult to match the fury, vigor and realism of the action and its decorative composition in space. This relief has been published in engraving by Perkins in his "Italian Sculptors." Perkins, who does not appear to have known the original personally, follows Schulz in speaking of the larger lion as attacking a sheep. To my memory the animal attacked is rather a calf or young bull, an impression not antagonized by the engraving or by the photographs. In either case the design is undoubtedly a traditional survival of the representation of a lion attacking a bull, which in early Oriental art was an astronomical sign of the entry of the solar lion into the sign of the bull. The ceremony of loosing a trained hunting lion to attack a bull, as a celebration of the Vernal Equinox, was witnessed by Lajard, the French Ambassador to Persia, as recently as 1808. What, if any, symbolism, was attached to this subject by Christian art it would be difficult to say, for in the mediæval Bestiaries the lion is quoted as a symbol of both good and evil qualities, and of various and contradictory ideas. There is no other mediæval pulpit in which any similar subject is treated, and it may be purely decorative here. In ancient art, the solar significance of the subject was often indicated by association with the lotus, another solar symbol. This has also survived in the given relief, of course wholly without symbolism here, in the shape of a plant with a trefoil flower which crosses the body of the larger lion.*

*For Phœnician and early Greek representations of this subject, see my "Grammar of the Lotus," pl. xl.



A CAPITAL OF
TROJA CATHEDRAL.

Moscioni's phototograph of the pulpit is superior to Mr. McKecknie's in the clearness of the ornamental borders, but the lion relief is in deep shadow in his picture. Our own is clearer in this respect, owing to Mr. McKecknie's device of using two mirrors. Sunlight was thrown from one of these which was held on the church porch to another which was held near the camera, by which the light was reflected on the pulpit.

The capitals of the pulpit columns are remarkably fine examples of mediæval Corinthian, but they are far surpassed by the capitals of the nave columns. These are an astounding and fairly incomprehensible revelation of the possibilities of Italo-Byzantine art in the twelfth century.

These capitals are here for the first time made known to the world by photographs, and our photographs are believed to be the only ones ever taken of them. Professor Charles Eliot Norton fully agrees with my estimate of them. The single capital published by Schulz is most inadequately rendered and also represents a type less interesting than those of our photographs. I subsequently asked Signor Moscioni how it was that he had made photographs at Troja which neglected these details. His explanation will illustrate the primitive conditions of the town. He said: "The government official under whom we were working could not allow time for us to send to Foggia for timber, and there was no wood at Troja from which we could make a platform on which to raise the camera." He added: "Some

A CAPITAL OF TROJA CATHEDRAL.

people have a swing-back, but we did not happen to have that affair." Mr. McKecknie's camera had a swing-back of such great reach that, with the low platform obtainable, he was able to make the excellent pictures reproduced. We had a similar experience of the inability of the village carpenter to supply us with timber for a platform of the desired height.

Our own great misfortune was of another character. There is no town in Apulia, not even excepting Bari, where photographic plates are obtainable. Troja was our last stopping point on the return to Naples. We had only twelve plates for the whole Cathedral, remaining from the lot originally carried from Naples to Apulia. Only four of these could be alloted to the capitals, and one of these four plates was a failure. Hence the limited number of these details in the illustration.

They are a phenomenal apparation, compared with our best examples of Byzantine art as otherwise known. That they are essentially more beautiful than some of the capitals of S. Vitale, at Ravenna, or than some of those in the vestibule of S. Mark's, need not be dogmatically asserted. That they are wholly unlike these, cannot be denied, and that this unlikeness lies in the character of their approach to classic quality is equally undeniable. On page 284 we have an approach to classic Corinthian which has no extant parallel in mediæval art. The suggestion that this capital has been borrowed from a classic monument, is untenable in view of the Byzantine

A CAPITAL OF
TROJA CATHEDRAL.

quality in the acanthus detail. On page 285 we have a most original and wholly unprecedented variant of a Corinthian form. That the returning spiral scroll at the top of this capital is in principle simply a variant of the Ionic and Composite volutes, and that all are lotus derivatives has been elsewhere demonstrated by the writer. It is barely conceivable, therefore, that this capital may have an unknown classic predecessor in some lost monument. Under any circumstances, the originality of this design is sufficiently apparent. In extant examples of either classic or mediæval art it has no parallel, and the classic tendency of the capital speaks for itself.

The third example p. 286) is a most interesting case of the reaction of the mediæval design on an Italo-Byzantine classic revival. The faun's head is inconceivable in unmixed Byzantine style. it would be inconceivable, for instance, among the capitals of Ravenna or of Sta. Sophia, which represent Byzantine style free from the later Western mediæval reaction, occasionally found in the capitals of St. Mark's. For the grotesque human or animal form is not found in any Byzantine capital, which does not show the mediæval Western influence. Notwithstanding, this grotesque head is treated in a spirit which moves toward the classical and away from the mediæval.

Prof. Charles Eliot Norton wrote me some months ago concerning these details as follows: "These capitals are indeed extraordinary work for the twelfth century. The man who designed the one which is represented in the mounted photograph (page 286) had a genius in which the classical and the mediæval spirit were fused in astonishing combination. I know nothing like it in any of the arts. These capitals ought to be published."

If these capitals were made at Troja, who shall say that the world has nothing to learn and that the history of Italian mediæval art is a finished book? It would be, of course, wholly conceivable that they had been made elsewhere and imported. The records of Amalfi mention that Robert Guiscard caused a number of columns and capitals to be taken from Palermo to Troja. There are, however, no similar details now surviving at Palermo or in Sicily; although it must be confessed that the capitals of Monreale Cathedral are worthy of the best period of the Renaissance.

It has to be conceded that there are almost untouched problems in the history of Byzantine art and of the earliest mediæval Italian classical revivals, such as those of Pisa and of Troja. As far as miniatures go, it is already known that there was a Byzantine Renaissance in the eleventh century, producing designs of really classic drawing and composition. The figure sculpture of the two Salerno pulpits precedes Niccola of Pisa's work in the Pisa Baptistery. The candelabrum reliefs of Gaeta and the pulpit sculptures of Sessa Aurunca both antedate the first pulpit of Niccola. The figure designs on the bronze doors of Ravello and of Trani are twelfth century work. None of these works have contemporary equals or rivals in North or Central Italy. All these instances of the precedence of South Italy in the history of art assist one to understand the capitals of Troja, when the historic importance of the town at the given date has been considered.

Moreover, we find at Troja still other phenomenal works of art in the bronze doors of the Cathedral. There are two pair of these. The doors of the south side entrance are shown at page 293. Beside the visible lion heads of fine design, the door panels are decorated with incised figures of bishops of Troja which are not shown by the drawing. The incised lines were originally filled in with silver. These doors, dating 1127, are far surpassed by those of the main entrance (pages 288 and 289), dating 1119.

Both are recorded, by inscriptions on the doors, to be the work of Oderisius of Beneventum, and the figure of the artist is incised on the left upper panel of the main door.

The details of these remarkable bronze doors were well taken by Moscioni, as well as by Mr. McKecknie. The incised figure designs of saints and bishops of Troja which fill the upper row of

panels are not above the average level of the art of the time, and are far inferior to the figure reliefs on the bronze doors of Ravello and of Trani, which date later in the same century. On the other hand, the dragon knockers and the lion heads, all of different

MAIN PORTAL AND BRONZE DOORS, TROJA CATHEDRAL.

designs, are without parallel in mediæval art and experts will agree with me in pronouncing these details as fully equal to the best metal work of the fifteenth century Renaissance.

The left lower panel of the main doors has an inscription recording that Bishop William II. founded them in 1119. From the placing of the doors, as well as from the continuation of the inscription, it would appear that the church must have been nearly finished at that date. The coats-of-arms filling the four panels below the upper line of lion heads are restorations of the sixteenth and seven-

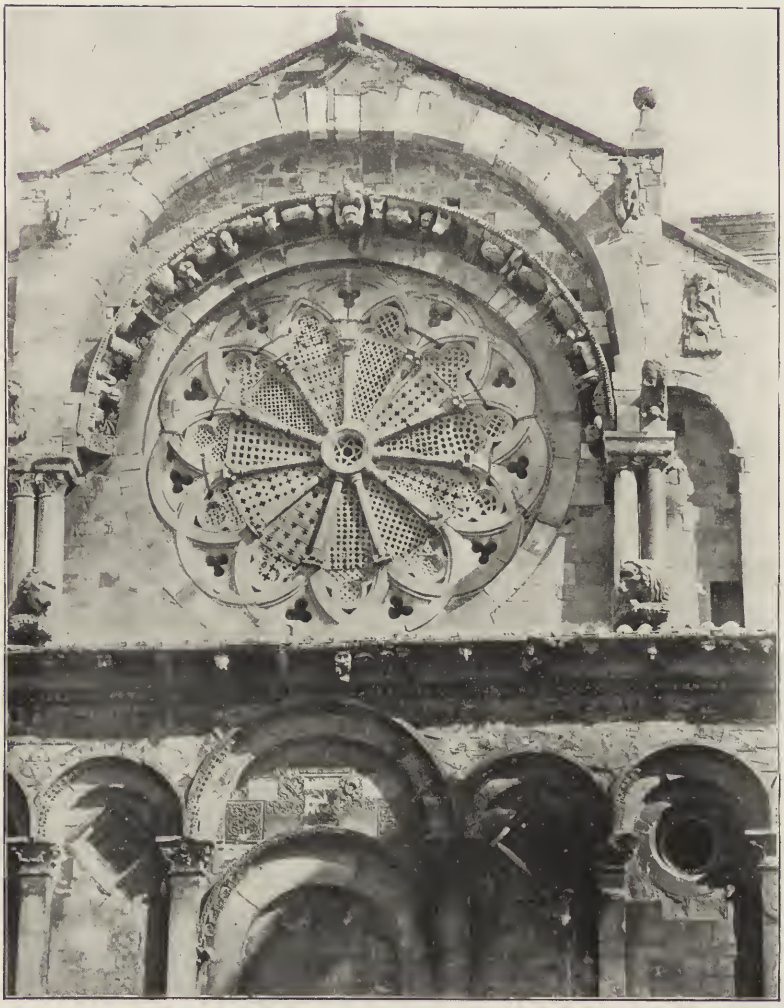
DETAILS OF BRONZE DOORS, TROJA CATHEDRAL.

teenth centuries, as are also the crosses on the two exterior panels next below, and the incised figures next above the lowest panels. The subjects of these last; early saints and bishops of Troja; undoubtedly repeat those which they replaced. Schulz notices that the heads, which I have designated as lions, show a combination of traits taken from the lion, dog and swine. The corresponding heads of the side door are scarcely equal to these.

The rose-window, over the principal entrance (page 291) has no rival in Italy or in Romanesque Byzantine art. The patterns of its screens attract attention as being unlike the usual decorative types, which are known to their period in Italy, and at first glance appear to be Saracenic in quality. The reaction of Saracenic art on the mediæval christian art of Sicily is undeniable, and there are traces of such influence in details at Amalfi and Molfetta. In this case, however, we are probably face to face with the fact that the original elements of Saracenic detail are Byzantine. The closest analogies to the panels of this rose-window are found in the Mohammedan wood-carvings of Cairo, but these are well known to be originally Coptic patterns and originally Coptic work—that is to say, work of the Byzantine art of Egypt. We shall, therefore, suggest that we are here in contact with original Byzantine designs, such as passed from the Byzantine Copts to the Mohammedans, and which have hitherto been familiar to us only in the Saracenic copies. This suggestion is supported by the fact that fragmentary remains of a similar tracery are found in the basilica of Castel St. Elia, south of Viterbo, and that a Saracenic influence can hardly be imagined there.

The effect of this rose-window, and of the exterior in general, is much enhanced by the polychromy of the masonry. The screens of the window are of white marble. The radiating spokes of the wheel are alternately of rose-colored and of white marble. The intersecting arches are alternately of green and white marble, and the triangular spaces made by the intersecting arches are also alternately green and white. The window is framed in a hood consisting of two arches, one above the other, resting on coupled columns with supporting lions. These columns are alternately of rose-colored and white marble. Of the two arches which form the hood, the lower is recessed and composed of blocks, all of which are carved to represent grotesque heads and monsters of all descriptions.

In the clerestory side walls polychromy also prevails. On the south clerestory wall, which has a decoration of projected arcades (page 293), wanting to the north wall, the columns and their bases are yellow, while the masonry of the arches is alternately yellow and green. The inlaid mosaic patterns of the cofferings and of the spaces between and above the arches, best seen on the detail for the façade (page 291), are of green and yellow stone throughout the whole exterior.



UPPER FAÇADE AND ROSE-WINDOW, TROJA CATHEDRAL.

As regards the masonry of the building, we agree with Schulz, who declares it to be *vorzüglich*, or most excellent, but also notice with him a slight deterioration in the masonry of the clerestory as compared with the lower story, which indicates greater haste and a slightly later period of construction. The heavy cornice crowning the lower story rests on consols in the form of grotesque heads. Its projection is unusual, and probably unparalleled, in church architecture. The wings of the upper façade are projecting walls which have no constructive relation to the clerestory (see page 293), but they are needed as buttresses against the thrust of the arches which frame the rose-window. The function of a buttress is indicated by the open

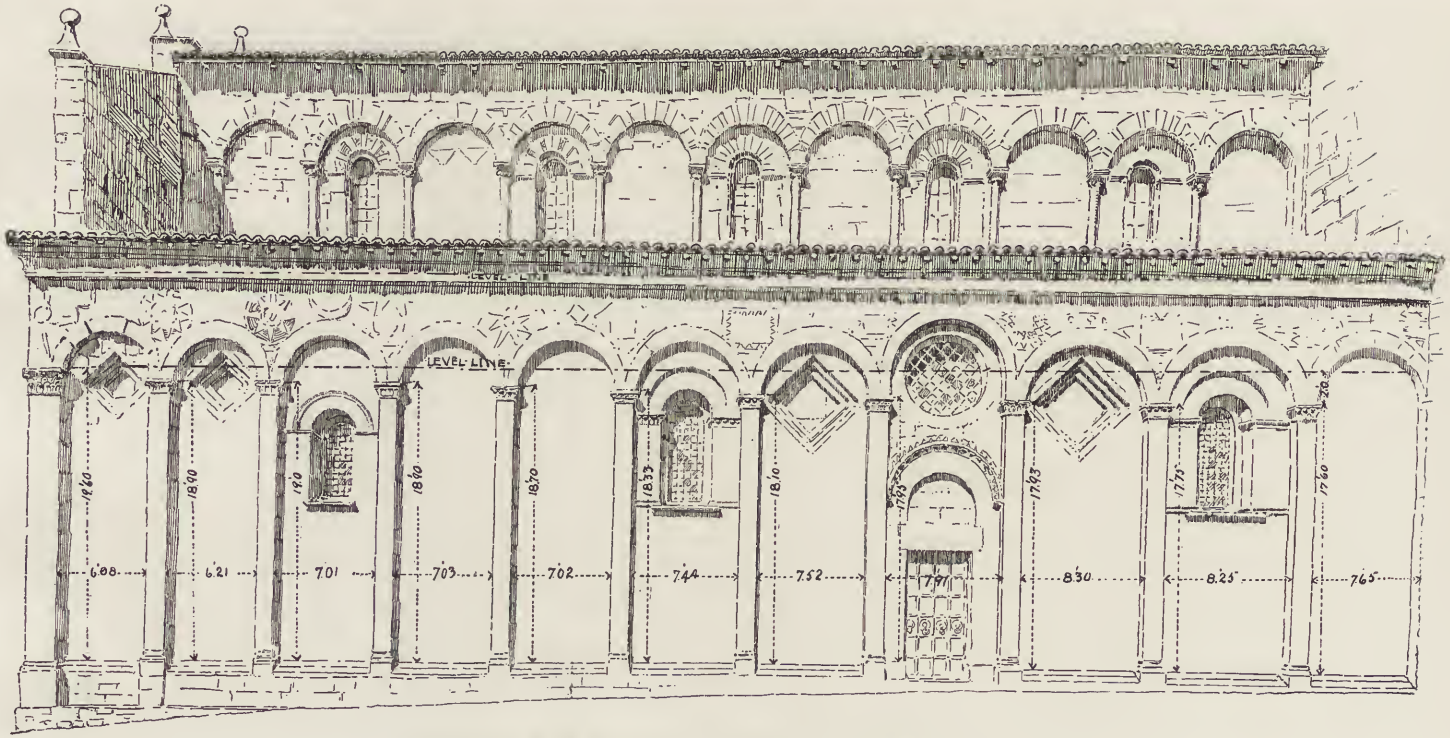
spaces in form of half-arches where the wings join the central façade, and by a slight recession of the wings, as compared with it. The downfall which would have befallen the upper façade without this support is argued by a slight settlement in the crown of the upper arch.

The balls which top the gable apex and the gable offsets are undoubtedly Renaissance additions. The bulls and lions which project from the upper part of the façade remind one of S. Pietro at Toscanella, where a much more profuse use of this system of decoration has been made. The mediæval and semi-barbaric quality of these projected animal forms contrasts curiously with the classical spirit of the lower arcade pilasters, and with the refinement of their detail in capitals (best seen on page 291).

In face of this detail, or of the lower façade (page 280), we are also best aware of the close similarities of masonry details of pilasters and coffering to those of the Pisan Romanesque. Such close resemblances are not usual in Apulia, but they are also found in the ruined Cathedral of Siponto on the Gulf of Manfredonia; in the much defaced Cathedral of Foggia and to a slight extent in the Cathedral of Beneventum.

The most obvious explanation of this Pisan quality would lie in an influence through relations of Pisa to South Italy, which relations are attested by a Pisan settlement at Trani, and possibly by a Pisan trading post at Bovino, near Troja. The date of the Troja Cathedral would not, taken by itself, warrant the contrary hypothesis, that the Pisan Romanesque was derived from Apulia. The Troja Cathedral was begun in 1093. The Pisa Cathedral was begun in 1063, and it is by no means the earliest instance of the peculiar Pisanesque pilaster and coffering style. But general historic conditions and the distinct (though rarely recognized) precedence of South Italy in the revival of sculpture and decorative detail would favor the theory that the traits of the so-called Pisan Romanesque, as found at Troja and Siponto, may have had still earlier examples in South Italy, which have disappeared.

The Cathedral of Ani in Asia Minor dates A. D. 1010, and it has a similar system of pilasters and coffering. In view of this fact, it would be another tenable theory that the Byzantine Orient had given the germs of the so-called Pisan Romanesque both to South Italy and to Tuscany. As a matter of general history, both of civilization and of art, Bari, Salerno and Amalfi, and the towns of Apulia generally, preceded Pisa, just as Pisa preceded Florence, and just as Venice and Genoa preceded Antwerp and Amsterdam. I have been led to the tentative suggestion of a South Italian origin of the Pisan Romanesque by the profound conviction that Niccola of Pisa's ten years' employment in the States of Naples, under Frederick II., had



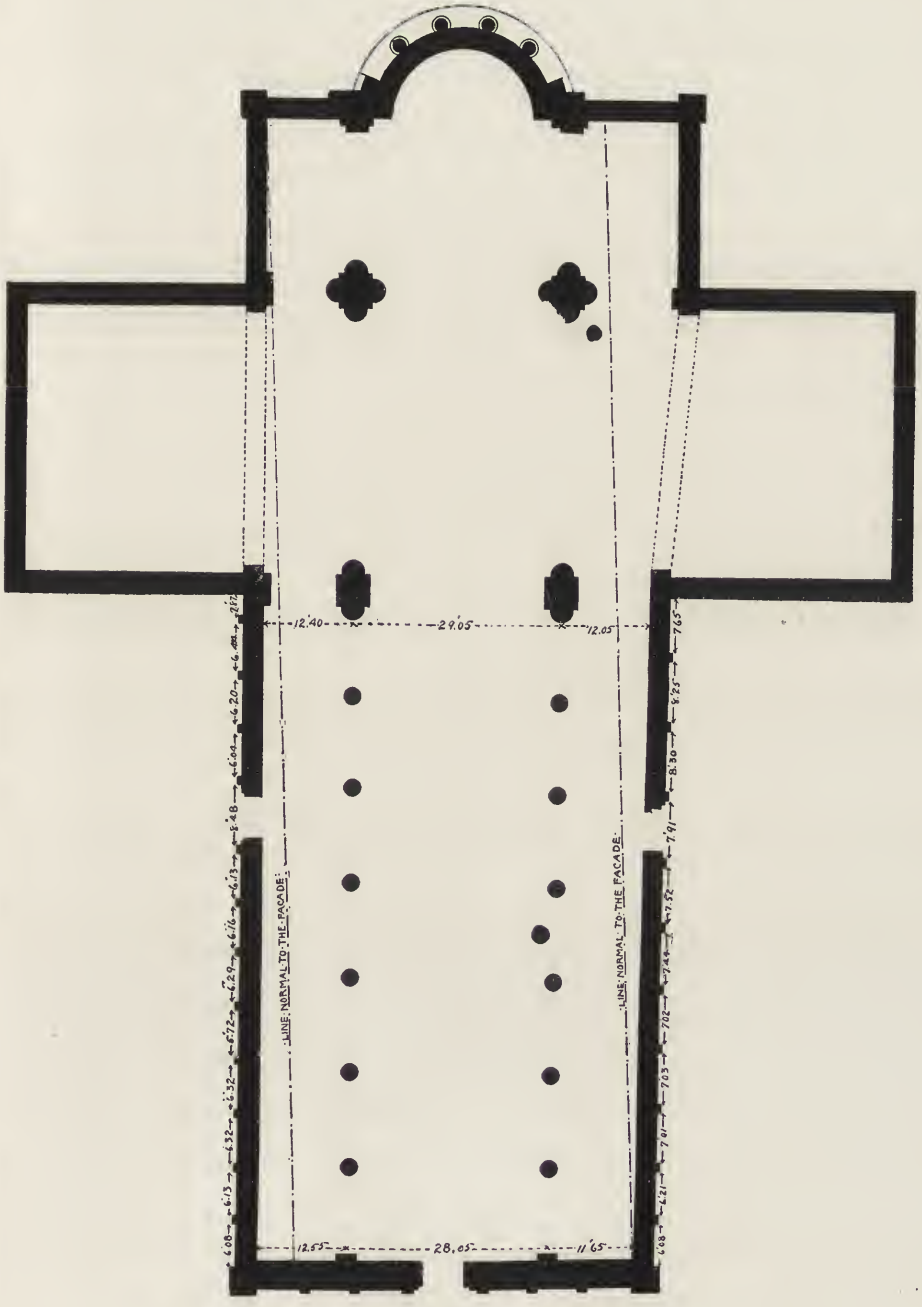
SURVEY OF SIDE WALL OF TROJA CATHEDRAL.

much influence on his artistic training, and by the personal experience that the importance of the monuments of sculpture antedating Niccola in South Italy has not been properly apprcciated up to date. The father of Niccola of Pisa is by many authorities supposed to have been a native of Apulia, but both those who have asserted and those who have contested this origin, have laid too much stress on the mere question of birth and too little on the prolonged early residence of Niccola in the South, and far too little stress on the remarkable priority and excellence of the South Italian sculpture. In fact, the acquaintance by personal observation with most of its monuments, and certainly with its most important ones, is still lacking to the majority of archæologists.

Our account of the Cathedral of Troja would be incomplete without some mention of the history and fortunes of the town. As a hill citadel, its importance would clearly lie in the offensive and defensive relation to the mountain defiles leading from Beneventum, from which town it is only twenty-eight miles distant, and Beneventum was the capital and military centre of the Lombard Duchy, which was often engaged in hostilities with the Byzantine authorities of South Italy. Hence we may understand the location of a Greek colony at this point, about the year 1018, by the Greek commander Bubagnanus. In 1059 Troja was added to the South Italian conquests of the Normans under Robert Guiscard, but as a bishopric it was held to be under the immediate authority of the Roman Popes and so continues to this day. A bull of Pope John XIX., claiming this authority and dating 1020, is engraved on a stone which is part of the cathedral walls. Troja continues to figure as an important citadel, and an important town, throughout the centuries of Norman, Hohenstanfen, and Anjou rule. It is mentioned as an important military post during the wars of Alfonso of Naples and Ferdinand of Aragon, but disappears from history after that time. Three Church Councils were held there during the eleventh and twelfth centuries.

The present Cathedral was begun in 1093, by Bishop Gerardus, and was rapidly pushed to completion under Bishop William II. after 1105. The bronze doors were donated by this bishop in 1119 and 1127, as already described. The plan of the church is cruciform, as shown at page 295. The apse is well developed, and although mainly concealed by later buildings, enough of it is visible to illustrate its decorative features.

The entire width of the church is 52 ft. (at the entrance), its length is 157 ft. (interior measures). The side aisles and choir are vaulted. The transept and nave have timber ceiling. The nave has seven bays, with columns of polished granite. These rest on double plinths. The peculiarly low and wide proportions of the under plinths are an unusual feature, and contribute greatly to an appearance of elegance in the interior (page 281).



GROUND PLAN OF TROJA CATHEDRAL.

The obliquity of plan, the curious mystification in the arcades of the south wall (page 293), and the drop toward the choir, in the height of the capitals of the nave, have been described in earlier numbers of the Architectual Record.

Those who wish to visit Troja without taxing the hotel accommodations described in the preceding Paper, would do well to avoid the route by Giardinetto, which is suggested by Bædeker. By proper attention to trains one may also avoid the delay caused by stopping at a Foggia hotel. The railway restaurant at Foggia is excellent and offers the best eating to be had in the town. One may hire a carriage at the railway station for the twelve-mile drive, and return directly to that point. Luncheon should be taken from Foggia.

Wm. H. Goodyear.

With two exceptions the photographs reproduced in this article belong to the series of the Brooklyn Institute Survey of Italian Mediæval Buildings.

157. 158. 159. 160.

Progressive raising of the lines of the gable with the lengthening upward of the front.

PRINCIPLES OF ARCHITECTURAL COMPOSITION.*

VIII.

Proportion.**

THE word "proportion" although commonly used somewhat indefinitely, always refers to the size of objects and of parts of objects, and not to their number.

More precisely, the word should be used as in ordinary arithmetical language, not of what arithmeticians call a ratio, that is of the relations between two dimensions of an object, but rather of the relation between two objects, each having two dimensions related to each other in some way. Thus it is rather vague to speak of the proportions of a column, meaning the relation of height to diameter. Apart from precedent, there seems to be no reason why this should not be anything we may wish to make it. If, on the other hand, we ask what should be the height and length of the lintel, if the height and diameter of the column are so-and-so, we have a true question of proportion.

Almost always, too, the question of proportion is discussed entirely as a matter of precedent. Examples of various styles and periods are brought forward, and we are called upon to admire, in one breath, the exquisite proportions of the low Greek pediment, and the very fine proportions of the high Roman pediment, and the noble proportions of the Gothic gable; without any clear perception of why we should admire low, and high, and higher, all at once.

This is the true idea. The Greek temple—the typical Greek temple—was of considerable breadth of façade and moderate height. Be-

*Continued from Vol. VIII., No. 2.

**The following conception of a theory of proportion was suggested to the author by two magazine articles, neither of which is at hand. The first propounded the principle of exact similarity as indicated by diagonals, and applied it to classical façades; the second announced the theory of musical proportion in place of arithmetical, and worked out the dimensions of the triglyphs and other details of the Greek temple, as well as the principal dimensions, in a very interesting manner.

ing cut up, as to its middle and bottom parts, into long and low horizontal slices, the pediment, quite naturally, and as the merest beginner may feel it proper, shared the same character. (157). The Roman type of temple was quite a different matter. The columns were higher, and the width of the colonnade not so great for the height; the whole thing standing on a lofty stylobate, with imposing stair-flights in front. Quite as reasonably, the pediment was made steeper, in sympathy with the general prolongation upward, as at 158.

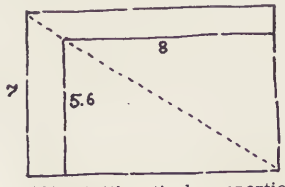
So, when men began to build things higher than they were wide, like a Gothic front, the gable grew likewise, and became itself higher than wide, in effect. (159). Finally, when the rectangular mass below sprouted upward into a tower (160), the pointed part on top stretched upward into a spire. It is as if a Greek temple were drawn on elastic india rubber, and stretched; each part stretches its own share—that is the fundamental idea of proportion.

It is that all parts shall share the same general character—be what geometricians call "similar"; that is, that if one part is seven high and ten wide (161), another part that is only eight wide shall be about, or exactly, five and six-tenths high.

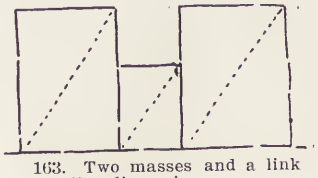
Used in this way architectural proportion becomes equivalent to arithmetical proportion, the dimensions of each part having the same ratio to each other as those of every other part.

There are several reasons why this rule, although sound in its principle, cannot be laid down as a general rule.

In the first place, there are parts of buildings which, from their nature, cannot assimilate their dimensions to those of other parts. A column, for example, must be long and comparatively narrow; the ratio of its width to its height quite different from that of the main dimensions of the building, or from that of the width to the height of the inter-columniation, or of a door, or window opening. So it is also with such things as chimneys, and angle turrets. In 162, for instance, the slender minarets cannot by any means even approximate the square bulk of the mass of the building.



161. Arithmetical proportion of breadth to height, indicated by diagonals.



163. Two masses and a link of similar dimensions.

In the second place there are objects, such as circular windows, of which the ratio of dimensions is fixed.

Beside this, there is the question of the horizontal subdivisions.

which are necessarily of dimensions of different ratios, for the fundamental point in such horizontal bandings, is that they shall have different heights for the width of the façade, which is always the same.

Finally, if it were possible to make all the parts of a building conform to a single arithmetical ratio, the result would be of cast iron stiffness, devoid of the continual variety, which is essential to grace.

162. The proportions of main building and minarets are quite dissimilar.

Nevertheless, such variations from the exact dimensions prescribed by rule cannot be formulated; and, in spite of its only partial applicability and other shortcomings, the most practical guide for approximating the proportions of the parts of a building is this rule of similar parts.

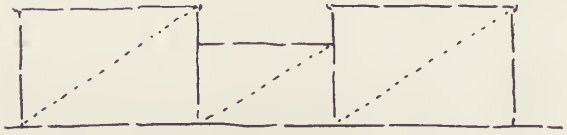
The simple drawing of diagonal lines, parallel to each other, is an admirable guide to a satisfactory result, when used with discretion and modified by good taste.

In 163 we have a group of two equal parts, joined by a lower part; the diagonals being parallel, the linking mass is similar, geometrically, to the main masses.

Here is a sketch of a typical church façade, 164, for example, all of which were arranged upon something like this method

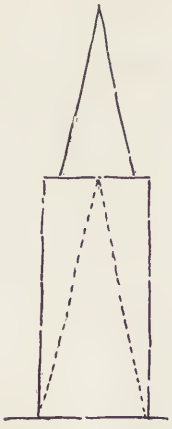
With masses broader than they are high, like 165, the method gives as reasonable an approximation.

164. Typical proportions of many church fronts.

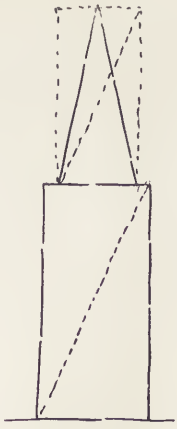


165. Comparatively low and wide masses related to the central link by similarity of dimensions.

166. The Law School, Harvard University, Cambridge, Mass.
The ratios of length to height of mass and appendages are about equal.



167. Arithmetical relation of spire to tower.

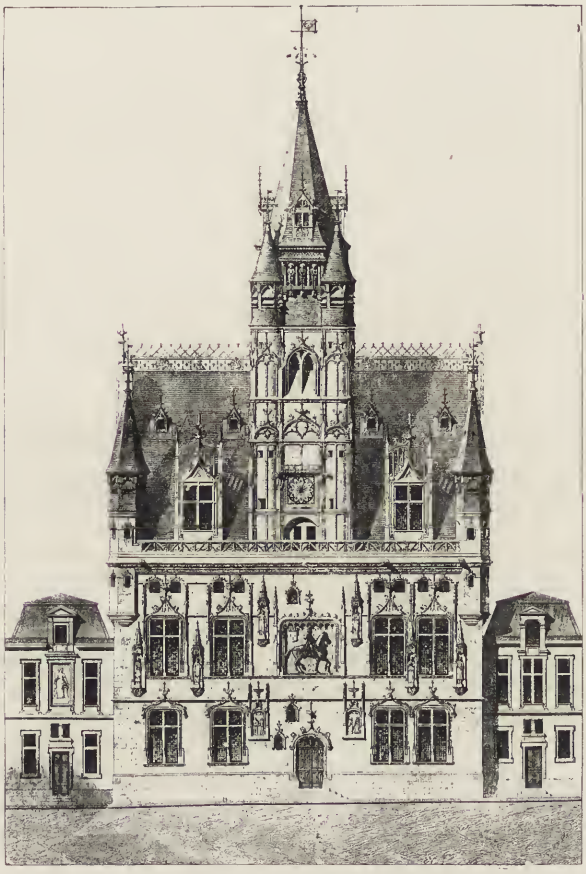


168. The same, compared by diagonals.

At 166, again, the relation of the dimensions of the side pavilions is about that of those of the central pavilion.

So, in 167, the result is good in arranging a spire or a tower, 168, being the same thing, illustrating the connection a little more clearly by diagonals than can be shown by the triangles of 167.

An example is given in 169, where the effective angle of the spire,

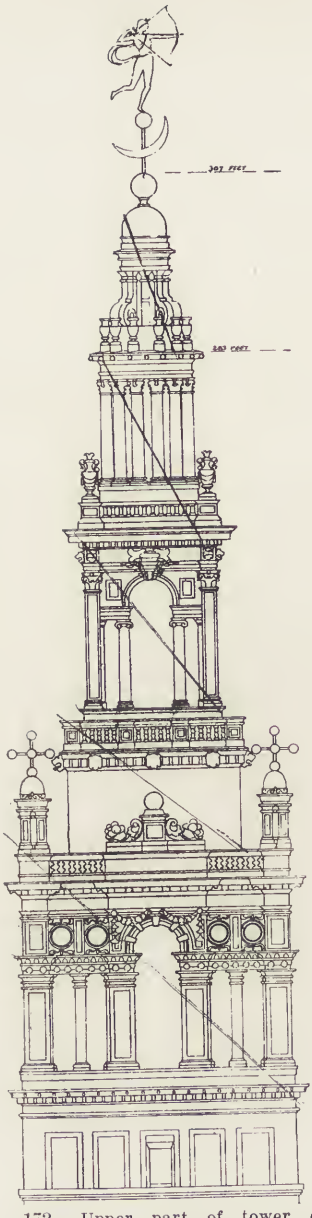


169. Town Hall at Campiègne, France.
Diagonal of tower, from main cornice to base of spire, is nearly parallel with angle of the latter.

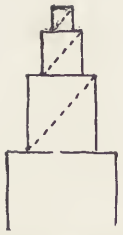
always less in a hipped construction than the elevation shows, nearly approximates the diagonal of the tower.

In 170, the deficiencies of the method are seen. The successive stages of a storied tower, when proportioned by this method, are always wrong; the farther up you go, the more squat they seem. Such stories should be each a little higher than the rule would indicate, as shown in 171. The upper part of the tower of the Madison Square Garden, which well illustrates this prolongation upward of the ascending stories, is shown in 172.

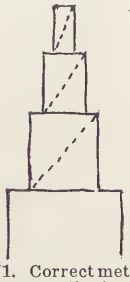
Yet there is no doubt that the rule approaches the truth, the ques-



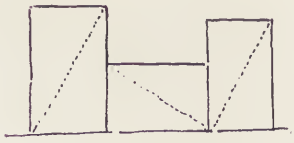
172. Upper part of tower of Madison Square Garden. Each story, above the lowest, is elongated upward beyond the arithmetical ratio.



170. Failure of the method of similar dimensions, as applied to a storied tower.



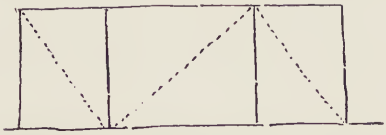
171. Correct method of proportioning a storied tower.



173. Reciprocal relation of masses to link.

tion only is as to the rule for divergencies from it; for which we are compelled, for the present, to trust to the vague faculty called taste.

The rule, moreover, as rules ought to do, works both ways, for horizontal parts in connection with vertical, as well as for horizontal and vertical parts in connection only with each other. In 173, where we have two unequal masses, connected by a low part, the



174. The same where the link is distinguished by retreat in plan.

diagonals are drawn perpendicular to each other, dividing each part into similar triangles, although the middle triangles lie on their sides, instead of standing on their ends.

In 174, again, we have two pavilions, joined by a central mass of equal height, which must be supposed to retreat from the plane

175. Chalêt at Deauville sur Mer.

Shows the reciprocal dimensions of mass and link of mass and appendage, and of link and whole front.

of the pavilions, for proper subordination. The method gives fairly good results in every case.

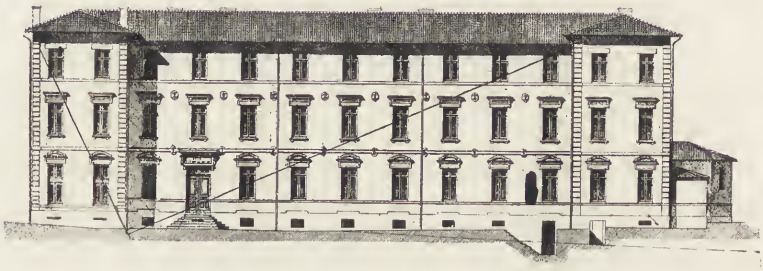
A French country house is shown in 175, wherein such relations obtain. The ratio of height to length of the linking piazza, are about those of width to height of both gables, measured to the chopped-off part, as shown by the diagonals. The ratio of the link

from rail to eaves is almost exactly the same as that of the whole front. Here again, the effective angle of the roof nearly corresponds with the diagonal.

At 176 another French design is shown, in which the relation of the pavilions to the link is a reciprocal arithmetical one, the link being relieved in plan.

At 177 is an excellent example of assimilation of both horizontal and vertical parts, as shown by the diagonal lines.

The method is equally available for the details of a design. If



176. Night Refuge for Poor Women, Marseilles.
The relation of the pavilions to the link is nearly a reciprocal arithmetical ratio.

the doors and windows of a front are made similar rectangles to the front itself, as in 178, it can hardly fail to give a good result.

The Farnese Palace is shown in 179, in which the general dimensions of the windows and of the doorpiece closely approach those of the whole front, with a reciprocal relation.

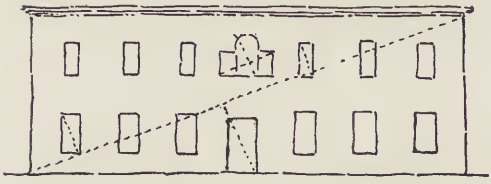
Valuable suggestions often occur. Over the doorway, in 178, the space seemed too crowded for three windows; two would not look well; neither would a huge horizontal window, as high as the rest, and as broad in proportion as the front of the building is to its height. But, by a lower and narrower rectangle, still similar, the problem is solved; a central semi-circle defining a central portion of the same relative dimensions as all the windows.

For a tower, too, as in 180, the method suggests, what at once recommends itself to the judgment, that the dimensions of the windows in relation to each other should be about those of the tower itself.

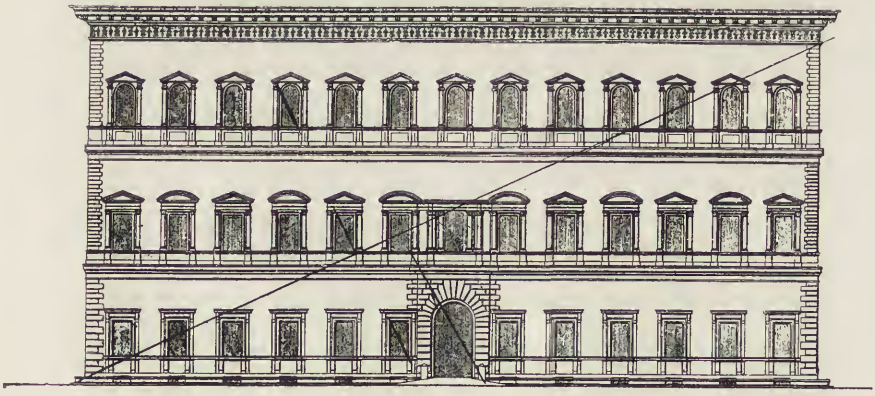
In the matter of cornices, a new light is shed. The usual view is that the projection of a cornice is determined by the height of the building, regardless of its length. At a time when the general dimensions, in relation to each other, of all monumental buildings were much the same, all being on the same columnar model, such a doctrine might be held.

But, carried out on tall and narrow buildings, it leads to such un-

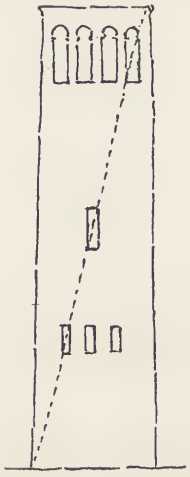
177. Cambridge City Hall.
The front of the tower and of the building, also the central subdivision of each wing, are approximately similar rectangles.



178. The openings are of reciprocally similar dimensions, compared with the whole front.



179. Farnese Palace.
The diagonal lines show the general approximation of door and window forms to that of the whole front.

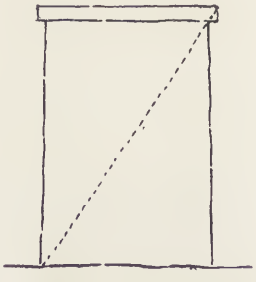


180. The windows of a tower made narrow and high to correspond with dimensions of whole tower.

happy endings as this (181), a huge classical cornice poised on top of a mass, of which the dimensions are very much the classical dimensions reversed, stood on end, so to speak. The reasonable thing to do, is to stand the cornice on end too—to make the projection of it to the height of it on the same diagonal as the diagonal of the building (182).

181. Bad effect of cornice of heavy projection on a tall and narrow front.

182. The proper cornice for such a front is the high one of slight projection.



183. The same for a building where the height exceeds the width.

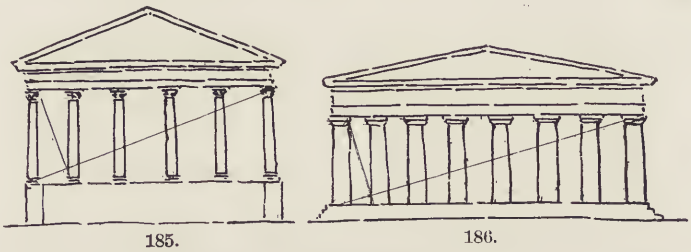
Our method thus guides us to the eminently reasonable result, that the height and projection of the cornice should be to each other about as the height and length of the building—a low and wide cornice for a long and low building (184), a high and narrow cornice for a high and narrow building (183).

So again, between the short and high rectangle of the Roman front (185), and the comparative wide intercolumniations, there seems to exist some such relation; and a parallel relation between

184. Rectangle of cornice the same as that of front.

the long, low front, and the narrower intercolumniations of the Greek (186).

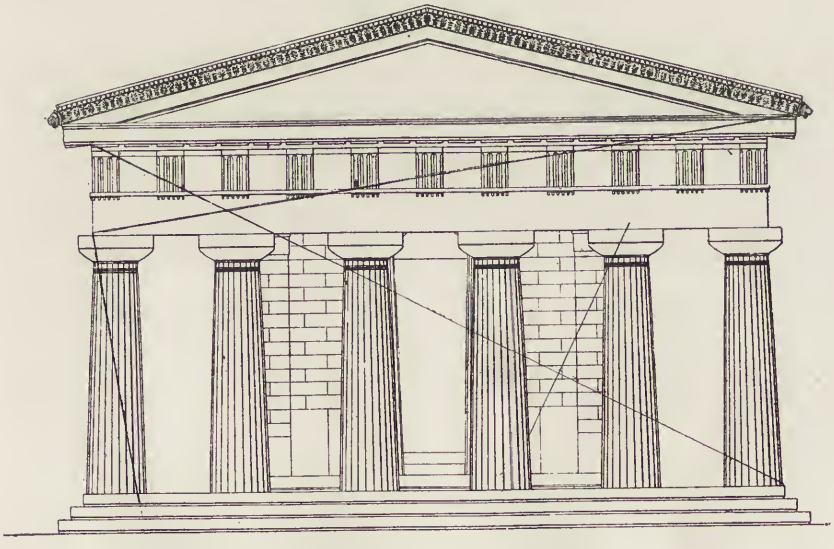
In each case, the general dimensions were assimilated, although perhaps not geometrically similar.



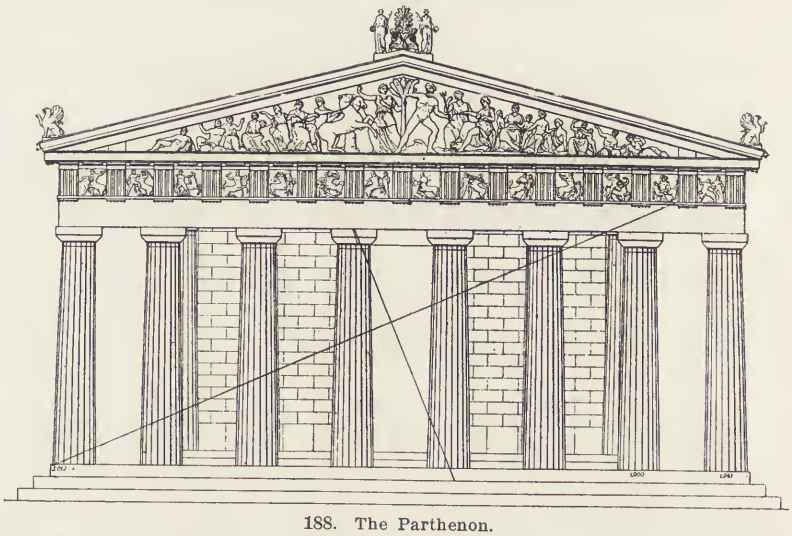
185. 186.

Diagrams suggesting, in an exaggerated manner, the relation of parts to the whole.

The temple of Poseidon, at Pœstum, is shown in 187. The spacing of the columns on centres seems to correspond reciprocally to the dimensions of the front; while the ratio of height to length of entablature is nearly that of diameter to height of column.



187. Temple of Poseidon at Pœstum.
The diagonals indicate the approximate relations between the parts.



188. The Parthenon.

The relation of the general dimensions of the front to the spacing of the columns is shown by the diagonals.

The Parthenon is shown at 188. Here again the centreing of the columns closely matches the rectangle of the front. No other simple relation, however, seems traceable. Although the columns are slimmer than in the Pœstum example, the entablature is even more elongated, so that, whatever relation there may be, it is not that of reciprocal proportion.

Notice, too, how the face of each abacus is an elongated horizontal parallelogram, suggestive of, but not similar to, that of the front. The triglyphs, too, are upright oblongs, more or less like those formed by the centreing of the columns.

At 189 is the front of the Nike Apteros temple, of which the general outline is a square. Here the intercolumniation is nearly similar to the entablature, although this relation is perhaps accidental.

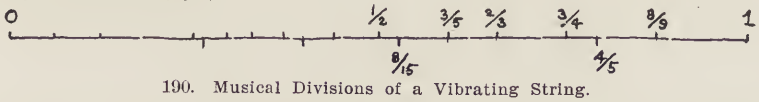
It will be observed that no attempt has been made to show anything like a minute or precise relation in any case that has been quoted. Nothing like precision in such matters is possible, nor even desirable. It is not possible, because in a constructive art like architecture, other than merely theoretical considerations must have some weight accorded to them; and it is not desirable because the excessive formality and stiffness that would be produced by an insistence upon exact similarity of parts, would be fatal to beauty in the completed work.

Indeed, the Greek examples shown would indicate what reason would appear to confirm, that some rule is to be desired which would produce general conformity to a certain ratio of dimensions, combined with a continual avoidance of an exact coincidence.

189. Temple of Nike Apteros.
Diagonals show relation of intercolumniation to entablature.

It is possible that the theories of musical intervals, which we know were used by the Greeks in architecture, may have produced this result. As to this use, much has been surmised, but little is positively known. Although in the nature of a speculation, perhaps an attempt at a practical interpretation may not be out of place.

The divisions of the stretched string that produce harmonious musical notes have been known from antiquity for their simplicity. They are these (190):



190. Musical Divisions of a Vibrating String.

If the length of a stretched string be called one, half of it will give the octave above; a quarter, the octave above that; an eighth, and a sixteenth, the octaves still higher up.

Taking any one of these octaves—the first, let us say—from one to one-half, the subdivisions as shown, will give the notes of the gamut: 1-2, 8-15, 3-5, 2-3, 3-4, 4-5, 8-9.

The noticeable character of this succession is that most of the fractions advance by adding one to both numerator and denominator. We have 1-2, 2-3, 3-4, 4-5, and 5-6, although not in the diatonic scale, constitutes the minor sixth. Six-sevenths and 7-8 are wanting—numbers involving 7, 11 and 13 are not found in musical intervals.

Now, the important point about a series formed by adding the same increment to both terms of a fraction, is that the ratio thereby continually approaches unity. We may begin with what fraction we please, and form such a series:

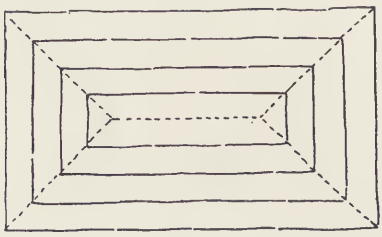
1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12.
1-3, 2-4, 3-5, 4-6, 5-7, 6-8, 7-9, 8-10, 9-11, 10-12, 11-13.
1-4, 2-5, 3-6, 4-7, 5-8, 6-9, 7-10, 8-11, 9-12, 10-13, 11-14.
1-5, 2-6, 3-7, 4-8, 5-9, 6-10, 7-11, 8-12, 9-13, 10-14, 11-15.

Each series approaching unity, as 10-11 is nearer one than 2-3 or 3-4.

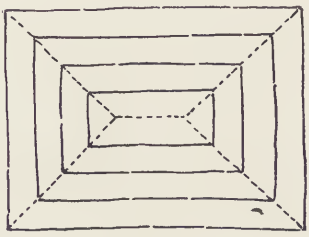
If these ratios be regarded as the sides of rectangles, each series will give us a succession of rectangles less and less elongated—more and more approaching a square, each one nearly similar to its neighbors, the next larger and the next smaller, but totally different from the extremes either way.

To lay out such a series geometrically is simple.

Draw a straight line of a certain length. From the extremities draw diagonals of 45 degrees. Using these as mitre lines surround the line with rectangles at intervals of half a unit. The result is as desired, a series of rectangles of which both dimensions differ from those preceding and those succeeding by a unit; yet all connected by a regular system (191, 192).

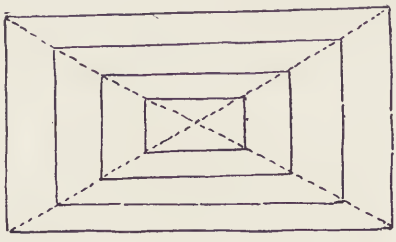


191.

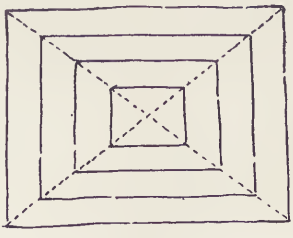


192.

Geometrical interpretations of musical ratios.



193.



194.

Geometrical interpretations of arithmetical ratios.

The first described system of perfect similarity is shown in 193 and 194. In this, instead of starting with a line, we start with a point, and draw our diagonals at any angle.

The resulting rectangles are all of the same character, all elongated or all shortened; while in 191 and 192 there is a general similarity with continual variation.

Arithmetically this means a series of ratios related to each other by a different connection than that of equality.

Instead of having 1 : 2 : : 2 : 4 we shall have 1 : 2 : : 2 : 3, the ratio proceeding by addition instead of multiplication. The greater the difference between the first terms of the series that we determine upon as the basis of a design, the more delicate will be the resulting variations. Begin with the ratio 1 : 11, we have this sequence: 2 : 12, 3 : 13, 4 : 14, 5 : 15, 6 : 16, 7 : 17, 8 :18, 9 : 19, 10 : 20, and farther if we please. Now, if the dimensions of our front be 10 : 20, or 1 : 2, our windows, instead of being precisely 1 : 2 may be 9 : 19 or 7 : 17, and our columns may be the first term, 1 : 11.

Just what variation to make in each case we can find no rule to determine; we may only say that some such variation is to be desired.

IX.

Classification of Buildings.

With the aid of the fundamental rules that we have laid down, we are able to classify buildings, according to the disposition of their parts.

Such a classification must be only approximate, and is of service chiefly in helping us to a clear conception of what we are going to do, when we are about to make a design, by setting in order our knowledge of what has been done.

195 is a diagram of classification that will present the facts to the eye, more clearly than words could to the ear. We have divided buildings, roughly, into three classes, square top, round top, and pointed. Under the first head, we may include, not only all undoubtedly square-topped buildings, such as those with cornices, but many whose general effect presents a horizontal sky-line, in which, although there may be gables in certain aspects, the general horizontality is characteristic.

Under the head of pointed top, we must class all spires and pyramidal terminations, as well as all gables, and pavilions tapering by stages to an apex. Mansard roofs are difficult to classify, but they may be placed under the head of square tops or of points, according to the kind of mansard roof in question—square top for the customary mansard of a façade; pointed, for that of a pavilion or bay, or main roof, for that matter, which gives more an impression of a tapering than of a square object.

Round topped main masses, except domes, are rare, but there are

195. Diagram showing classification of buildings.

some round gables, ends of railroad stations perhaps, which would come under this head.

Almost every building of any size or complexity, that stands isolated, or is more than a façade only, must be classified more than once. The first classification is of the building as a whole, conceived as if seen from a distance, in silhouette. After that, each front may be separately classified; and it would be possible to carry out in the same way the classification of the details of each part of each front. In the case of simple buildings, where there is nothing but the arrangement of details to the design, this may well be done; otherwise, it is unnecessary.

For all façade designs, and for a good many that are meant to be

seen from one principal point of view, although something more than mere façades, the first distant, silhoutte classification is superfluous.

If we include all the buildings in existence, we must count a very large number under the first head in the diagram—single, square topped. Of all the vast volume of modern buildings, however, in all the miles of rows of private dwellings—not even to mention tenements; among the solid blocks of portentious stores and offices, in fifty cities of two continents, there is but here and there a rare specimen that even pretends to challenge æsthetic criticism.

Including only those of some artistic pretension, there must still be a considerable proportion of all buildings that we must classify under the first head, as single, square topped masses.

Among buildings meant to be seen from a distance, there are few square topped; most of such are topped with a dome or a spire. Nor are there very many of the square topped so simple as to come under the first head of our classification. The most important are all isolated, corniced buildings, such as many of the larger Italian palaces that are more than façades, as the Palazzo Strozzi, at Florence, and the Farnese, at Rome. This latter ranks as a single mass in the first classification, although in the subsequent classification of the façades, one is composed of double, equal masses.

Next to these are the isolated Greek and Roman temples, and buildings modelled after them, of simple rectangular plan. All of these are classed as square topped, notwithstanding their pediments, although in the classification of each front, the pedimented fronts will be accounted points.

196. Lusthaus at Stuttgart—a single pointed mass.

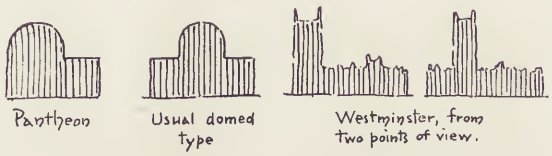
Circular plans, also, like the Castle of St. Angelo, and the tomb of Cæcilia Metella (although the latter once bore a pyramidal termination), we class as single, square tops, and oval plans as well, as the Colosseum, must be included in this class.

Of single round tops, we may instance the Baptistery at Pisa and of pointed tops, here at 196 is an example.

The only round top that occurs at once to the mind which has but one appendage, is the Pantheon, at Rome (197).

Pointed tops with single appendages are many, almost every church with a western spire is to be so classified.

The most frequent type of domed building, such as St. Peter's or St. Paul's, or the Invalides, is to be classified as a round top, with two appendages, the building which constitutes the base appearing thus (198) in silhouette.



197. 198. 199.

Types of Classification.

Westminster Palace is a square top, with one appendage, when the tower is seen at one side; with two, when it shows a part of the basal mass on each side (199). Of a similar double classification is our own Madison Square Garden; but in this case the dominant mass is a point.

Twin objects alone, as the motive of an isolated composition, are infrequent, it being difficult to avoid the condemnation of "double composition"; but with an appendage, namely the whole mass of nave, transepts, and aisles, are the scheme of most of the large French churches, and of the typical Egyptian temples, in which the twin pylons take the place of the twin steeples. Twin steeples are found both as towers, and with spires—the former, the square topped towers, are best for a twin composition. The reason is that a pointed mass is so much individualized by the point, that two such masses cannot be so perfectly welded together into a compound mass as they can when topped by a horizontal line.

A church like Notre Dame, in Paris, is classified in mass as double with one appendage. The front is double simply. Each side is single with one appendage; while the rear, giving the outline of the apse and aisles, is single, with two appendages.

Buildings like St. Mark's, at Venice, and the Taj Mahal, in which a central dome is surrounded by smaller domes, are classified in general, as triple, because, in silhouette, only three domes appear. In classifying each façade, the retiring parts are neglected; in the case of the Taj, the central dome, which leaves each front a double motive.

The Capitol, at Washington, in general classification is a single, round topped mass, with two appendages, these being the whole of

200. Santa Maria Della Salute, Venice.
The domes are of unequal size.

the building below, from whatever point it is viewed. Separately, the principal front is double; the rear is triple; and each end is single.

Of double, unequal, round topped groups, the Salute, at Venice (200), is a good example. 201 is a square topped mass with two symmetrical appendages, although these last differ in detail.

This is a very frequent motive. It appears again in 202, in which the oblique plan does not affect the grouping. The semi-circular bays are subordinated to the main ridge line, and do not

201. A square-topped mass, with two symmetrical appendages.

count in general classification. 203 is nearly the same motive, the appendages being unsymmetrical, and 204 is the same as 201, and is furthermore an instance of very unfortunate lack of proportion between the central mass and the wings.

205 is a double pointed group, and 206 is a triple one.

207 is a group of two unequal points, with a complex appendage at the left, and 208 is a triple group of points, of which the central exceeds the others in size, and differs in treatment, being itself a group of two equal points.

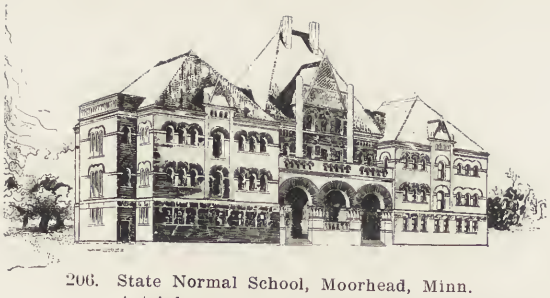
Enough has been said to indicate the general applicability of the system, and to serve as some guide in determining the motive of designs.

202. Square-topped mass with two symmetrical appendages.

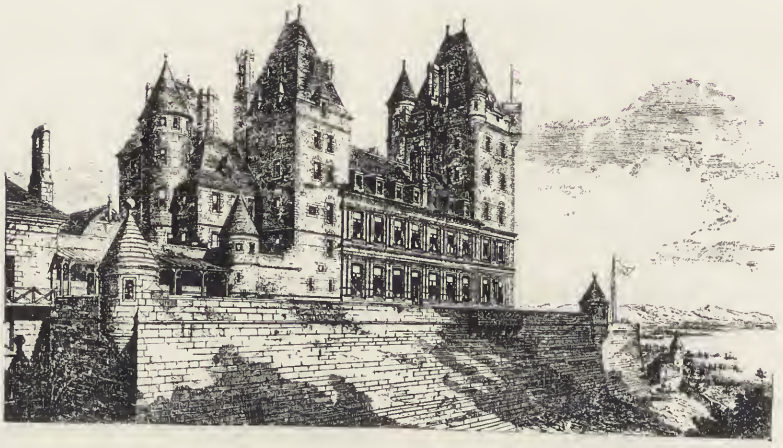
203. Square-topped mass with unsymmetrical appendages.

204. The Mint, Paris.
A single square-topped mass with two appendages.

205. Craigston Castle.
A double pointed group.



206. State Normal School, Moorhead, Minn.
A triple group of pointed masses.



207. Chateau St. Louis, Quebec.
Unequal double group, with one appendage.

208. Marine Hospital, Stuttgart.
Triple group of pointed masses, of which the central is a double group.

X.

Practical Examples.

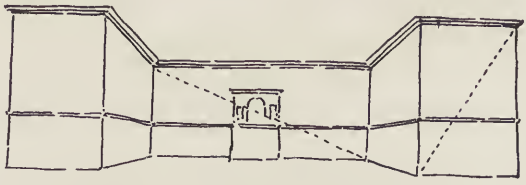
We are now ready to try our hand at making a design by the use of the rules that we have laid down.

A general conception of the result that we wish to reach must be formed in the very beginning. Even before we think much about the plan, we must make up our mind as to the general character of the exterior that we are about to try to create. And a clear idea of a good motive for an external design is quite as much of an aid in working out a plan, as a good plan is in working out an exterior.

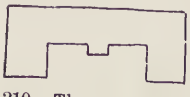
In practice, both go together. The skilful designer knows by experience what plan will work out easily; what will require labor and study.

Every designer knows instinctively that a plan like this (209) is always the basis of a good design, in any style. Every designer knows, too, that, if a narrow middle projection must occur (210) it will require extraordinary effort and skill to make it look well, if it must be equal to the wings in height. He will either try to make it only a porch, one or two stories in height, and much lower than the wings, as at 211, or he will try to increase its breadth, as at 212, giving either 213 or 214 externally; that is, making the whole,

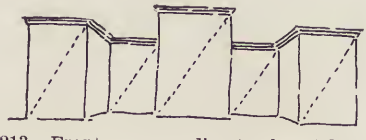
209. An available plan.



211. Front corresponding to plan at 210.

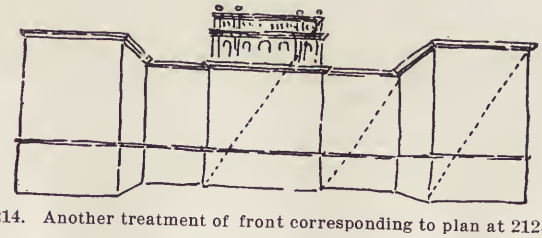


210. The same plan with a narrow central projection.



213. Front corresponding to plan at 212.

212. The same plan with the central projection made wider.



214. Another treatment of front corresponding to plan at 212.

definitely, either a double or a triple group. Instinctively, too, he will keep his central and side members, and the parts between, of somewhat similar dimensions, either all one way, as at 214, or some horizontally and some vertically, as at 211.

Observe, incidentally, that in order to make the central mass of 214 higher, we have been obliged to add an attic treatment; and something of the sort is necessary where the horizontal lines are strongly marked. It is necessary, above all things, in strong horizontal treatment, that the lines be carried all the way through; nothing is more fatal than any infringement of this rule; but the requirements that the central mass shall be larger than the flanking masses, and at the same time, of like character, are, when both are enforced, incompatible with carrying the lines through. To make the masses of similar character, we should have to lift the cornice of the certral mass, as at 213, thereby failing to carry our lines through; while, if we carry the lines through, as at 214, we cannot possibly make masses of similar character.

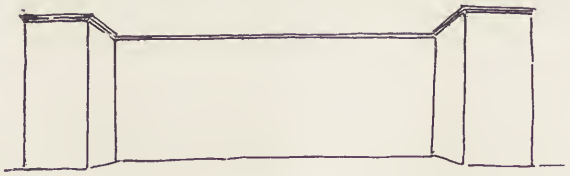
In making the first sketch, there is usually either some favorite treatment in the mind of the designer, to which he tries to bend the exigencies of the plan; or there are certain data, as to the plan, of requirements that must be fulfilled, to which, sometimes only after long struggle, a practicable external design is reconciled.

Given, a building to design; the requirements of the plan being

215. Plan required by the exigencies of a certain problem.

like 215, a front of 200 feet, with two pavilions each of 25 feet frontage, and 40 feet projection.

It is a difficult matter to handle this, on account of the narrowness of the side masses, compared with the magnitude of the central link. Any direct carrying out of the plan, with a straight cornice, would mean something like 216—an anomalous group, the side



216. Front corresponding to plan at 215, showing the difficult proportions resulting.

masses being too small in proportion to the connecting part for it to be reckoned a double group; and too large in proportion to it, for the central part to seem a single mass, with the side masses mere bounding turrets.

If we could do anything to accentuate either the central part or the side parts, we could solve the problem.

First, we wrestle with the plan; and try to find some way of widening the side masses, not at the expense of the plan, but so as to improve that as well. Often, indeed, such careful study discovers some unthought-of and welcome idea, that makes a plan, before only passable, very much more to our taste, and at the same time makes a good external design easily attainable.

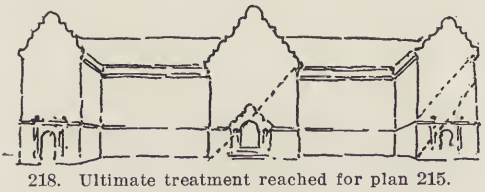
In this case, however, we wrestle in vain; no enlargement of the wings is possible. Next, we try to reduce the projection of the wings, having in mind something like 217, with an idea that we

217. Showing what might be done with 215 if the projection of the flanking masses could be reduced.

can put an entrance for each tower, and one in the centre, quite appropriately for our purpose.

Here, again, we fail; the wings must stay as they are.

Finally, we relinquish our attempt at a double motive, and manage a projection in the centre, less in depth than the wings, but of greater width, and determine to use a triple motive (218).



218. Ultimate treatment reached for plan 215.

Partly because it would not do to spend money upon useless erections of towers and things on top, partly because we think it really looks better, we determine to make the three objects gables, and not towers, with as steep roofs as we dare, so that we may not lose too much room.

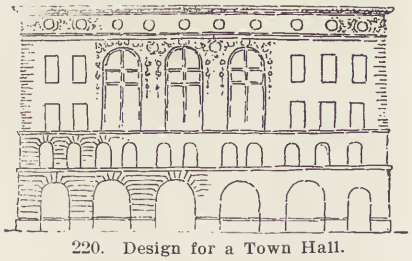
With all our efforts, we cannot make our gables of at all similar dimensions. What we should like to do, would be to lower the side gables to about the point where the diagonal strikes; and it would manifestly improve the design if this were done.

But it may not be; space is of vital moment, and to cut down the height of the wings is not to be though of. We manage, however, to run a light string course above the first story; which leaves the part of the side gables above it somewhat similar in dimensions to

the whole of the central one. Although far from what we should like it to be, we let the design go, as about the best that can be done, under the cast iron conditions of plan; adding only the necessary three doorways, and the windows, which are determined more by the need for as much light as possible, than by any considerations of appearance.

Almost all designs have to be executed in a partially developed, incomplete and unsatisfactory condition. The skill of the designer is exhibited in his aptitude for reconciling practical requirements with the demands of beauty; yet the former may be so stringent that genius itself cannot relax them nor adapt the design to them. It is futile to urge that practical requirements fulfilled constitute beauty; for not even in nature is this true. The practical requirements that have produced the Gila monster, the horned toad, and the sea-devil (219), have certainly not produced beautiful results.

219. The Sea Devil, illustrating the incompatibility in some cases of beauty and utility.



220. Design for a Town Hall.

Taking another problem, let us suppose a town hall, of which the plan is limited to the usual rectangle. We may adopt either a horizontal treatment, with a flat roof; or a vertical treatment with a pitched roof; let us take the former; (220).

The hall proper is to be a large room, two stories high, and in the upper part of the building, being used but rarely; this prevents us from placing our three large windows as the middle horizontal division. The main stairs is at the rear, immediately opposite the doorway, and, after reaching the floor of the hall, quite naturally divides into two flights, one to each portion on each side of the hall. These, nevertheless, are unavoidably unsymmetrical; not altogether to our regret, as assymmetry is not always offensive; often interesting rather.

The lower part must be designed with continuity of treatment, as we should have preferred to treat the upper part too, had not the two-story central hall almost forced upon us a single central motive.

We will, therefore, space the openings as nearly equidistant as possible, and make them all of as nearly the same width as may be, remembering that slight variations are not easily detected by the eye.

Under the central large window we put a couplet, which is unavoidably wider, as a whole, than the large window above.

This forces the couplets under the two large windows on each side of the central still more off centres, yet we still manage to retain continuous vertical lines of pier. Two more openings on one side, and three on the other, come pretty nearly under the windows above. The effect of the incomplete coincidence is to attract the eye rather to the horizontality of the band of windows, than to the verticality of the uncentred piers between, which is precisely what we expected to do.

Our first tier of openings gives us more trouble. The doorway must come under the central large window, which is fortunate, and we determine to put an arch on each side, of not quite, but nearly, the same size as the doorway itself.

On each side of this, the space baffles us. There is room for about half an arch, only, on one side, the dexter, and an arch and a half, scant, on the sinister. On the latter, we finally put one more arch of like size with the others, and another much smaller, which we arrange to serve as a special private doorway that we had desired; while on the other side, we put one not so small as this postern, and not so large as the row of large arches.

Although we should have preferred a row of more nearly equal arches, that which we have worked out looks fairly well.

The arches, we have made all of about the same height; the doorway arch two inches higher, and five inches wider than the others alongside of it; the extreme dexter arch three inches lower, simply because it is unavoidably so narrow; the postern, sixteen inches lower, for the same reason. Yet with even as much variation in width and height as this, the first impression to a spectator approaching from any direction, except directly in front, would be that of a row of equal arches.

In the same way, we make the large, central, two-storied arch four inches wider and two inches higher than the others, a difference only distinguishable by the most minute observation, yet having a wonderful effect on the feeling of the whole front.

Although we have secured a triple horizontal division, our largest part is at the top, and not in the middle, as we should have preferred it to be. We must, accordingly, do all that we can to divide the whole front into two parts, throwing together the two lower by sameness of treatment. Rustication, we determine upon, executed in brick, the only available material.

Fortunately we are able to procure a soft-brown brick and we make the enriched parts of terra-cotta matching in color.

The cornice we make as small as we dare; with its profile upon a diagonal of the whole front, and its height increased by an enriched band under it, with bull's-eyes that serve as outlets for our ventilation system.

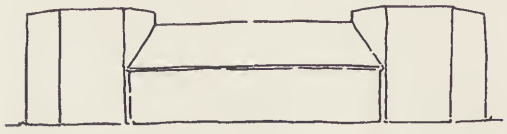
In originating a design, the requirements of utility will usually guide us in the choice of a motive. Once chosen, the important thing is to carry it out completely, and not bungle it with features that contradict the leading idea with which we began. Should it prove impracticable, it must be relinquished, and a different motive adopted.

Let us suppose that a design is required for a large country house. The owner is a man of wealth, having no occupation. His tastes are for hunting, shooting and other out-of-door sports, and he entertains a good deal. The situation is to be in a flat country, not far from the ocean, with not many trees, and such as there are, low and scanty.

The first hazy glimmer of an idea that comes to us is that we have long had a desire to make a large, low tower, like that which distinguishes Windsor Castle, the keynote of a design.

This is our opportunity: why not take something of the sort here and use it, internally, as a large dining-room, perhaps forty feet across and two stories high, round or octagonal?

The next idea is that such a house would require a ball-room at least as large as the dining-room. Why not, then, take these two towers, make each of them octagonal, and fit the rest of the house to them? Something of this sort is what we first sketch (221).



221. First conception of a motive for a large county house.

Well enough, so far. Our two big rooms can be made very magnificent; and, in the link between, we can put all the libraries, breakfast rooms, drawing-rooms, and, in the second story, bedrooms, dressing-rooms, boudoirs and suites, that we may need.

Still it looks crude and unfinished. Stiff, too, those great, square-shouldered masses; yet they are too good in themselves to give up just yet.

So we add, on each side, a very much smaller mass, keeping the oblongs of both roofs and walls of about the same character as those of the main building. One of the appendages must be appropriated to the kitchens, and the other we may use for the more retired parlors and music-room of the ladies of the family.

Then, coming diagonally out into the foreground, another appendage for the billiard-room, smoking-room, and gun-room of the men, and our design is much improved (222).

It is really nothing but two very large, equal masses; so large that

almost any number of smaller things can be placed around them; and, indeed, requiring irregularity in the setting to counteract the excessively formal character of the motive.

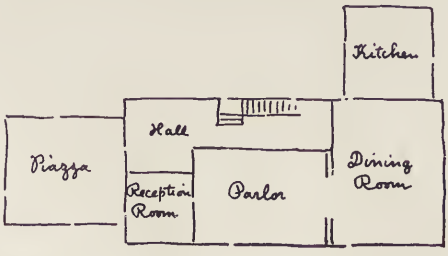
Therefore we deliberately put the entrance porch on one side of the centre, and a big dormer not quite the same distance the other side of the centre. The openings in the central link we dispose in a continuous row, entirely avoiding any break in the connecting lines. We expect to have some trouble with the chimneys, as they must

222. Completed Design of Country House Sketched at 221.

be kept as low as we dare to make them; the design would be better with none at all.

Let us take another house, of quite an opposite character.

The cost is limited to four thousand dollars. The lot is irregular, and shaped so that we must place the broadest side toward the street. The special requirements are that there shall be a small reception room on the first story, and that one of the bedrooms shall have a small room attached to it, as a study. The piazza must be at the side, as the house fronts north, and the summer breeze is from the south; and something of this kind, in plan, is the first result (223).

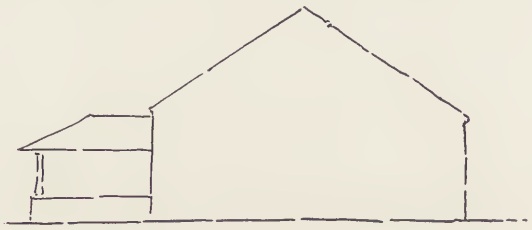


223. Conditions of plan for a small country house.

As for the exterior, we are quite at sea. Either a gabled roof, or a hipped roof it must be; it is too narrow for a gable at the side; a hipped roof will leave no space for a servant's room; there is noth-

ing for it but a gable facing the front, not at all a bad motive to begin with; but not very beautiful yet (224).

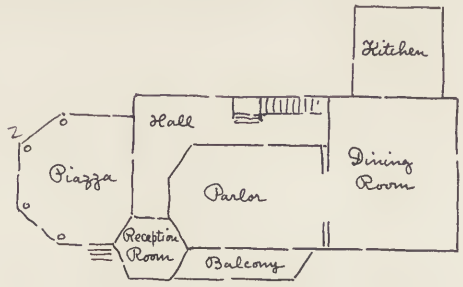
As we cast about for an idea, it occurs to us that the reception-room is far from satisfactory. Could we not put it, we ask ourselves,



224. Conditions of elevation resulting.

outside the rectangle of the plan, and make a single feature of it, which, as we have said, may be placed upon any part of a mass, and make a harmony.

Accordingly, we overhaul our plans thus (225), put our reception-room, and it just strikes us, the study in the second story over it, in an octagonal turret, attached to the main gable.



225. The same plan as 224, so modified as to obtain a single subordinate mass in elevation.

The result is good, as long as the large gable is higher than the turret (226). To raise the latter would make a group of two equal and unlike objects; to add a smaller gable, as shown in 227, would make a group of two subordinate unlike objects; either of which combinations does not look well. If we wanted to add another turret we might do

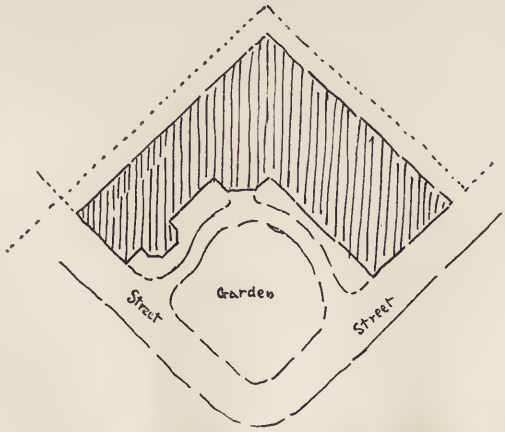
226. Elevation resulting from 226. The balconies are details, serving to connect the subordinate tower mass with the chief mass.

227. Unfortunate effect of a second and different subordinate mass.

228. Small country house, a single mass, with one subordinate mass and one appendage.

so; but it is better to preserve the original motive, a single mass, with one subordinate mass, the tower, and one appendage, the piazza. 228 is a photograph of the building as completed.

The next example we take may be that of a school in a rural town. The plan, after much study, we conclude to make two sides of a quadrangle, on the inner sides of our corner lot (229).



229. Block plan of school building.

230. Design for Country School.

A single mass with a subordinate mass—the turret—and an appendage, the wing on the left. This appendage itself has a subordinate mass, resembling the turret in its octagonal plan.

One of these parts is naturally larger than the other; and it remains only for us to join them by a low turret, in the angle, to obtain a most effective arrangement (230).

At the same moment, it occurs to us that this turret will be just the place for the main entrance; and that over it, on the second story, will be a convenient situation for the principal's room, commanding outside a full view of the garden, and inside of both corridors.

The motive is a single mass, the larger block, with a subordinate mass, the turret, and an appendage, the smaller mass; the same grouping, in fact, as the small country house just described. This use of towers and turrets in re-entrant angles is always capable of being made effective. The essential point to be observed is that the tower must be lower and smaller—much smaller—than the chief mass.

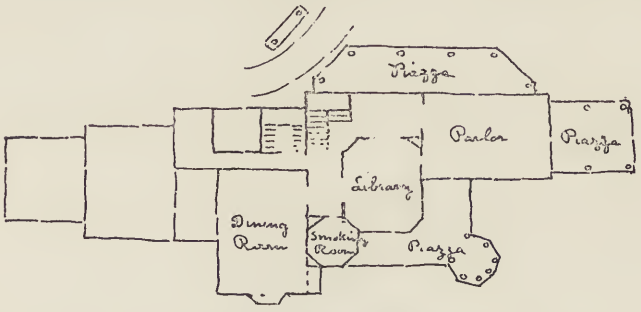
Let us take another example of a house of moderate size, since such constitute so large a part of a modern architect's field.

The problem, in this case, is complex. The site is the top of an open hill, with a fine mountain view on the south and west, which the owner wishes to command from as many of the rooms as possible. On the east are woods and rocks, and on the north a potato patch, belonging to somebody else. This last is, by all means, the place for the kitchens; all of the three remaining sides should be available frontage for family rooms.

The requirement that most of the rooms should command the view, leads us, finally, to a plan of rooms, en echelon, as it were, thus, (231), the long side being the principal front, and the entrance being on the opposite front.

The plan does not look promising for a design. Moreover, it is a most unscholarly plan, having no axes to speak of; yet there are some good diagonal vistas inside, and everywhere a glimpse of the beautiful out-of-doors.

As for treatment, we recur to the useful double group (232). making one large gable, and one somewhat smaller, the larger with a low turret, as a subordinate mass, very much as in the school design: except that here the individuality of the gables forbids us to regard one as the appendage of the other, and causes us to class them as two unequal members. On each side, however, we have a compound



231. Plan of house arranged to command double view from every room.

232. Design for Country House.

Two unequal masses—the main gables, with two unequal compound appendages. The turret is a subordinate mass upon the main gable.

233. Design for Small Library.

A single mass, the gable, with a subordinate mass, the turret, and an appendage—the whole portion to the left.

234. A City Building.

The fronts are subdivided into three parts longitudinally, and the openings in general dimensions are similar to the façade.

appendage, which, with a little, anomalous, octagonal pavilion in the foreground, complete the design. The two gables are, of course, similar; and all the rectangles, in both stories, have some relation of approximate similarity.

Let us now try our hand at a small library, belonging to a modest educational institution.

It is the wish of the management that class-rooms, in two stories, and two in each story, shall be attached to the library; and that the latter shall be somewhat monumental in character, directly communicating with the class-rooms, and also provided with an entrance for outsiders from the street.

The parts are as shown (233) almost similar, and the composition, as a whole, is a main mass—the gable—with an appendage, the library, and a turret again as a subordinate mass. The appendage is larger than is desirable, but this seems unavoidable. Notice the suggestion of the outline of the turret in each window of the appendage.

The next problem is a block of city stores, with apartments above, quite the usual thing in cities (234).

Our plan is unimportant; being determined by light courts, sizes of rooms, spacing of iron columns, and such considerations. The important thing is that the whole lot must be covered, the building must be eight stories high, and the top story is to be used for studios.

This last condition gives us a clew to the treatment.

We divide our fronts, for it is on a corner, into three parts horizontally. The lower one comprises the stores, and the story over them; the upper one is the studio story. Both we arrange with columns, the lower stout and plain, determined more by constructive than æsthetic propriety; the upper, slim and rich, and crowned with a moderate, terra-cotta cornice. In between, we keep it all plain; carry up the piers unbroken; an intermediate horizontal line would be fatal here; we venture only to hang a few garlands, like a fringe, below the upper story, making them, in effect, a part of it; and to put a few light, iron balconies, taking care that they shall not form a marked horizontal line.

This is all that we can do. The heights of stories determine our subdivisions for us; and no thoughts of similar or dissimilar rectangles may be entertained. Only, we have been able to group the windows in triplets, each group approximating the squareness of the façade in its general dimensions.

John Beverley Robinson.

PALLADIO.*

PALLADIO was, then, both a literary man and an architect, and that can be accounted for either by studying the times in which he lived or the scenes amid which he received his education and his art.

The sixteenth century in Italy is the century of erudition. Renouncing the Middle Ages, the epoch of the humanists was devoted to the literary and artistic monuments of Greece and Rome, and Jeangeorge Trissino, the patron of Palladio, contributed to the appreciation of the Greek and Roman masterpieces, both as poet and lover of architecture.

An historian of authority remarked on this point that Trissino occupied himself in writing one of his most famous poems, "Italia Liberata," to demonstrate at one and the same time not only his familiarity with the military art of the ancients, but his knowledge of building as well.

Having said this much, it is evident the influence of Trissino upon Palladio must have been both profound and continuous. Author and architect was Trissino. Author and architect was Palladio. Besides, during the sixteenth century it was almost impossible for an artist to be ignorant of the literature of his time. During the Renaissance, Italy had a school of accomplished artists who could handle the pen as well as the tools of their craft, and who were sometimes authors of technical and historical works. These literary artists appeared before Palladio's time and occupied themselves with the same themes and ideas as did those of whom we are now speaking. Didactic works at this time were invariably compiled by artists: Ghiberti, Alberti, the Filarete, Pietro della Francesca, Leonardo, Cesare Cesariano. The exceptions are only seeming, and at this time when literature was servile, architecture followed in its wake, in such a manner that in our art, inspiration was replaced by erudition, and every architect became what many artists at this time were, viz.: writers as well as architects, and this Palladio was in an eminent degree.

Thus, in the time to which we refer, it was indispensable for everyone, i. e., for those who were interested in letters, to understand Latin, and as Latin architecture (or as some called it Greco-Latin) was the architecture that one had to study, the language became the principal vulgariser of this very architecture.

I have mentioned Vitruvius, and since Palladio speaks of him as

*See Vol. VII., No. 3, Architectural Record, for Part I. of this article.

ANTICA PORTA, VICENZA.

"our great Vitruvius," one can easily understand why he made him his favorite author. Thus arose the necessity of understanding the language, and even the Vitruvian text, which contained in the translations many paraphrases more or less free before Palladio interested himself therein. Examples are to be found in Fra Giocondo (1511), Cesare Cesariano (1521), Caporali (1536), and in fanatics such as Fra Pacioli, in whom the Vitruvian enthusiasm reached its utmost limits. This fanatical priest thundered against those who called themselves architects without having seen the binding, even, of a copy of that great theorist, "delo excellentissimo volume del nostro degnissimo Architecto e gran Mathematico, Vitruvio."

Thus Palladio chose Vitruvius for his guide (see the preface to the first book of "Architectura"), but he manifested nothing of the intolerance of Pacioli. On the contrary, upon the study of monuments he modified the Vitruvian precepts, here and there, whenever he considered it advantageous. Like his eminent predecessors of the Renaissance, Alberti and Filarete, Palladio wrote a treatise on architecture, which, as a matter of fact, was nothing but a paraphrase of that of Vitruvius. One can quite understand that in those days it was the fashion for a celebrated architect to keep himself before the public by writing a book containing his ideas upon architecture and on the great Roman theory, and Palladio, like his countryman, Scamozzi, later made use of this opportunity and custom.

The architectural writings of Palladio were divided into two parts, the first of which bore the title, "I due Libri d'Architettura d'Andrea Palladio," and was printed at Venice in 1570 by Domenico Francesca; and the second, "I due primi Libri delle Antichita di Andrea Palladio." They were afterward united in a new edition, and a large number printed, and even to-day we find them sought after as curiosities by literary people. Palladio, dedicated the two works, one to Jacques Angaran, and the other to Emanuel Philibert, Duke of Savoy. He repeated the two dedications in the united edition, addressing the first and second books to Angaran, and the third and fourth to the Duke of Savoy.

A passage in the dedication to Angaran is particularly interesting from the psychological point of view, revealing to us the confidence which Palladio had in his own proper merit. In effect he said he had "thrown so much light on architectural matters that those who will follow after will, with these examples, be able while exercising their powers and talents to restrain with ease the magnificence of their buildings to the true beauty and elegance of the ancients."

These words, which to-day we would call superb, need not surprise us. The ancients said loyally what they felt, and Palladio was not different from those artists who in memorable inscriptions have confided to us the most curious personal praises.

PALAZZO COLLEONI-PORTO, VICENZA.

In the first book Palladio described the five orders—Tuscan, Doric, Ionic, Corinthian and Composite—our author having considered, as did Vignola that the Composite was itself an order. In the second book he treated of private architecture, and gave very interesting hints and information for the times in which he wrote. The third book deals with streets, places, bridges; the fourth describes several ancient monuments, and embraced the opportunity to show in what scholarly manner he had studied them, and how perfectly he understood them. It is worth while here to show in what liberal fashion Palladio studied Vitruvius, the more so as one believes too often in the absolute impersonality of our architect, who,

LOGGIA BERNANDA (PALAZZO COMMUNALE), VICENZA.

on the contrary (and the facts bear witness in his favor), never accepted with closed eyes the judgments of others. He showed more than once a firmness of character which might be mistaken for unreasonable obstinacy. Already Trissano had exhibited reserve on some of the opinions of Vitruvius. He understood that his time was not that of the eminent theorist; and, consequently, that one could not follow on all points the text of Vitruvius. Besides, he had added (rogue that he was) that Vitruvius understood many things but taught very little. Perhaps the opinion of Palladio was not in the end very different from Trissino's. In fact, where he speaks of the

Ionian base Palladio abandons his beloved author in a trenchant manner. Vitruvius gave as the model of the Ionic base (see chap. III, of book III), a base resting on a square footing and composed of two Scotia mouldings, separated by two Astragals, with their filets. The principal Scotia, is surmounted by a large torus (round member in the base of a pillar) in such a manner that by reversing the principle that the strong should carry the weak, here it is the weak which carries the strong. Palladio dispensed with the Ionic base and preferred the Attic, because that, he remarked, please me more. Here it is a matter of detail, but it is precisely in details that the critic shows his bent. Always in spite of the note of independence which distinguishes Palladio the Vicenzan architect never ceased to make known his veneration for Vitruvius, and never refused his co-operation toward the researches which his contempories made among the Vitruvian texts. We find the proof of what I have just said in certain words of Daniele Barbaro, famous for the skill he acquired in the interpretation of Vitruvius and another of the "Comments" which had their moments of celebrity.

From the strict point of view the architectural works of Palladio were his best literary productions, but they were preceded by a small "brochure," little like his books, but which has an interest on the question of Palladio's first studies of Roman antiquities. The "Antichita di Roma raccolte brevemente dagli autori antichi e moderni," which appeared the first time in 1554, was subsequently published twenty times, as late even as 1711, which is the date of the last edition.

One easily sees that this work is of the historic order, and Palladio shows in it a large acquaintance with Roman history in a profound and careful lecture on monuments. It is curious that Palladio's "brochure" became in his time what the "Itinerary of Rome," of Nibby, was afterward, a kind of manual for visitors to the Eternal City, and even at present it is interesting and amusing reading. The "Antichita di Roma" was Palladio's book of introduction to his historical work, in which we witness more than in his other publications the solid, logical knowledge of our architect. It places him at once in a very favorable light.

I would like to refer to the "Commentari di Cesare," which appeared for the first time in 1575, where Palladio was assisted at the commencement by his two sons, Leonide and Orace, two young men endowed with high literary attainments, who in the brief space of two months were doomed both to die, and to thus cause Palladio the most poignant affliction. He refers to it in the preface to his "Commentaries." The publication of Cæsar's "Commentaries" appears like an academical production to those who do not know the time in which it appeared, and that the times encouraged this sort

of research. Gunpowder no doubt had substantially modified the military tactics of the ancients, still many scholars at that time studied Roman strategy to find out how modern captains could make use of it, and some tried to prove that even in military art the Romans offered a remarkable source of theoretical study and practical illustration. Palladio never disguised from himself the opposition which would be raised to his opinions; on the contrary, he set to work to defend them in a close and vigorous polemic. It is not necessary for me to point out here how far (according to my ideas) Palladio was right or wrong. It will be sufficient if I maintain that when he

MUSEO CIVICO, VICENZA.

published his "Commentaries" he produced a work of undoubted merit. Dedicated to Giacomo Buoncompagni, a general of the Holy Church, the "Commentaries" ran through several editions, as was the case with the other works of Palladio. The last was issued in Milan in 1829.

The edition of 1575, the first of which bore the following title: "I Commentari di C Giulio Cesare con le figure in rame de gli alloggiamenti de fatti d'arme delle circonvallationi delle citta et di molte altre cose notabili descritte in essi. Fatté da Andrea Palladio, per facilitare a chi legge la cognition della historia—Con privilegi," printed at Venice by P. da Francesca in 1575, is also remarkable as a typographical work—counting 39 plates, a topographical map

PALAZZO LOSCHI, ZILARI, VICENZA.

of Spain, another of France, and one designed as a preface, in all 42 plates. The first part of the work deals with the "Gothic War," divided into three books. The second treats of the "Civil War," in three books, and the third of the "Alexandrian War," of Aulo Hircio. Another book is taken up with the "African War," and the "War in Spain," with which the work ends.

With this the literary works of Palladio which have come down to us end, but there is another which is not always quoted, and to which I must also recall the attention of the reader. I refer to the work in which Palladio describes his studies on the Greek historian, Polybius, who lived from 220 to 146 B. C., and of which, unfortunately, there exists but one letter (dedication) of 1569, addressed to Come, Grand Duke of Tuscany. It is supposed that the Vicenzan architect took up these studies in order to aid Count Marius Savorgnan, related by blood to the Porto family, who lived from time to time at Vincenza, and who was well versed in the military art of the ancients.

I have spoken of the "Theorist" and "Savant," but as yet have said nothing about the Man of Letters; that is to say, the Stylist. It is because (as Baudelaire remarks) they correspond to and complete each other—a saying here very much to the point, for the architect was the "litterateur" and "savant" combined. As a matter of fact, Palladio wrote as he designed; his style has the same clearness as his constructions. Palladio, the author, knew nothing of either literary artifice or the effect of colored style, both of which he willingly sacrificed to simplicity of diction, which, sometimes, to tell the truth, glides into the cold and formal. In short, the lyric strain is absent from Palladio's prose, notwithstanding one often finds there religious expression.

Allow me to give you in the original language one of the most poetical pages from the pen of the architect-author. I have found it in the midst of the flat sea of his writings on architecture:

"E veramente considerando noi questa bella macchina del mondo di quanti maravigliosi ornamenti ella sia piena. * * * Non possiamo dubitare che dovendo essere simili i piccoli templi che noi facciamo a questo grandissimo, non siamo tenuti a fare in modo che tutte le parti insieme una soave armonia oppertino agli occhi dei riguardanti."

The example is not sufficient to give a complete idea of Palladio's style, nevertheless it shows both the poetical note and a correct picture of Palladian phrase and period.

I find in the following a remarkably religious note from the standpoint of Palladio's love of classical antiquities, which I would like thus to translate:

"It is bad (said our architect) and worthy of condemnation that

we who have the true worship may be beaten by those who are without a glimmer of the truth."

The author refers to the pagan temples, and following the usage of the time he ignored the Byzantine and Gothic churches, the Middle Ages being the time of the most profound architectural decadence, according to the ideas of the Renaissance.

The hope that Palladio as a writer would be more highly esteemed in future has often been expressed, but although in the Italian antologies we find passages by literary artists, both ancient and modern, such as Vasari, Cellini and Dupré, the name of Palladio never appears there.

That is an injustice which will be righted, let us hope, as soon as the renown of Palladio for his literary style shall become better known.

And what was the influence that Palladio as an architect exercised on his own and modern times? It is fair to say that it has been enormous. It is sufficient to make an excursion particularly in and around Vicenza to be convinced of this. This influence touched his contemporaries and later those who tired of the extravagances of the Baroque. It may be affirmed on this point that Palladian architecture and the theories of the Vicenzan architect are, in Italy, even more vigorous among moderns than they were among his contemporaries. Nevertheless, it cannot be said that Palladio has a disciple who continued, with any fame, his architectural traditions. Perhaps if his sons, whom he had taught to study ancient authors, had not died so young, he might have had truly glorious successors. But Heaven willed otherwise, and when the brilliant sun of Palladio set it left us nothing but pale satellites, and his voice but its echoes from afar. As Palladio has spoken the first word of his art, so even he said the last, and nothing resulted from his work, but sterile copies of what was already written down to the very last word.

We have the example of Vincenzo Scamozzi, who was the rival of Palladio, and who left Palladianism at its most successful moment. Among the contemporaries and followers of Palladio we find everywhere demi-shadowy figures: a Francesca and Giovanni Battista Albanese; a Camillo Mariani, a Natal Baragia, a Giovanni Grazioli. One might make some exception in favor of Marco Thiene, who was bound to Palladio by a cordial friendship, but whose title to celebrity rests more on his poetry and patriotism than on his architecture. He was also a "savant," and on this ground the name of Thiene is coupled with Palladio, with Trissino and with Maganza apropos of a memorable journey to Rome and so far as the façade of the Barbaran Palace at Vicenza is concerned. But there still remains to be solved the question of the paternity of this building. The façade

PALAZZO BARBARAN, VICENZA.

of the Barbaran Palace is very well proportioned, and has an exquisite ingenuity and taste, which is not without interest for the modern architect who wishes to arrive at artistic effects with the least resources possible. This façade, so to speak, has an air of relationship with the famous Casa del Palladio, devised with taste by its author, who up to the present moment is unknown. There does not exist an architectural building in the Palladian manner more original than this one. Contrary to general opinion, I affirm that the admirer of Palladio has no occasion to blush for this little house where Palladio certainly did not live, as has been already shown several years ago by a document which admits of no discussion.

PALAZZO PORTO BARBARAN, VICENZA.

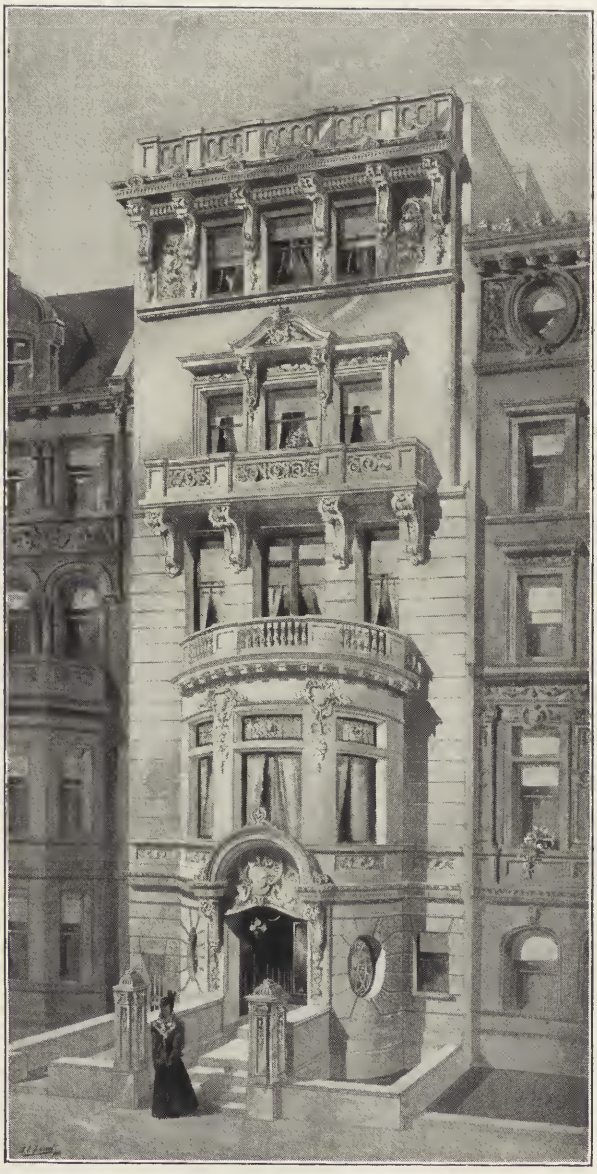
CASA DEL PALLADIO, VICENZA.

As I have already said, Palladio's architecture received more attention and honor after the 18th century, or, at least, it was studied more then than during the 16th century. To obtain a new and richer blossoming it was necessary that Palladian architecture should suffer the fantastic reaction of the Bernini, the Borromini, the Vittoria and of the Longhena. Then after the epoch of architectural neurosis the calm and solemn lines of Palladio again inspired Italian architecture, which once more returned to the severe imitation of the ancients and their most faithful followers. This is the most curious point, perhaps, in the history of architecture since the Renaissance, the return to Palladian architecture after it was forgotten for a century—or worse still—after it was condemned for its servility, its platitude and its uniformity.

The return to the ancients was the return to Palladio, i. e., to the source Vitruvian, and Vitruvius, especially in Venice, was again preferred, whilst Palladio being an architect, as well as a theorist, became the inspirer par excellence of the professional architect.

The return, then, was hailed with enthusiasm, for the public was tired of this Baroque architecture and demanded repose. People's taste was strengthened by the discovery of Herculaneum and Pompeii, and by the new publications on classic art, so many of which Piranesi provided. Who does not recall Piranesi's eaux fortes of Rome—that artist whose work has remained without equal? In addition to the architectural treatises which appeared during the Renaissance, was added the new Studies upon the Vitruvian text, and it was the Marquis Poleni who in Venice, the fortress of Palladism, sought to throw new light on this same text, with his "Esercitationes Vitruvianæ," which was studied both by scholars and by architects, because Poleni was truly an authority in mathematics and architecture. But as I have just said, Vitruvius having adhered to pure theory, while Palladio, on the contrary, had added to the written word the actual work of building, it follows that Palladio was the inseparable guide of architecture which after the neurosis of the 17th century developed in Italy up to the first half of this century.

Alfredo Melani.



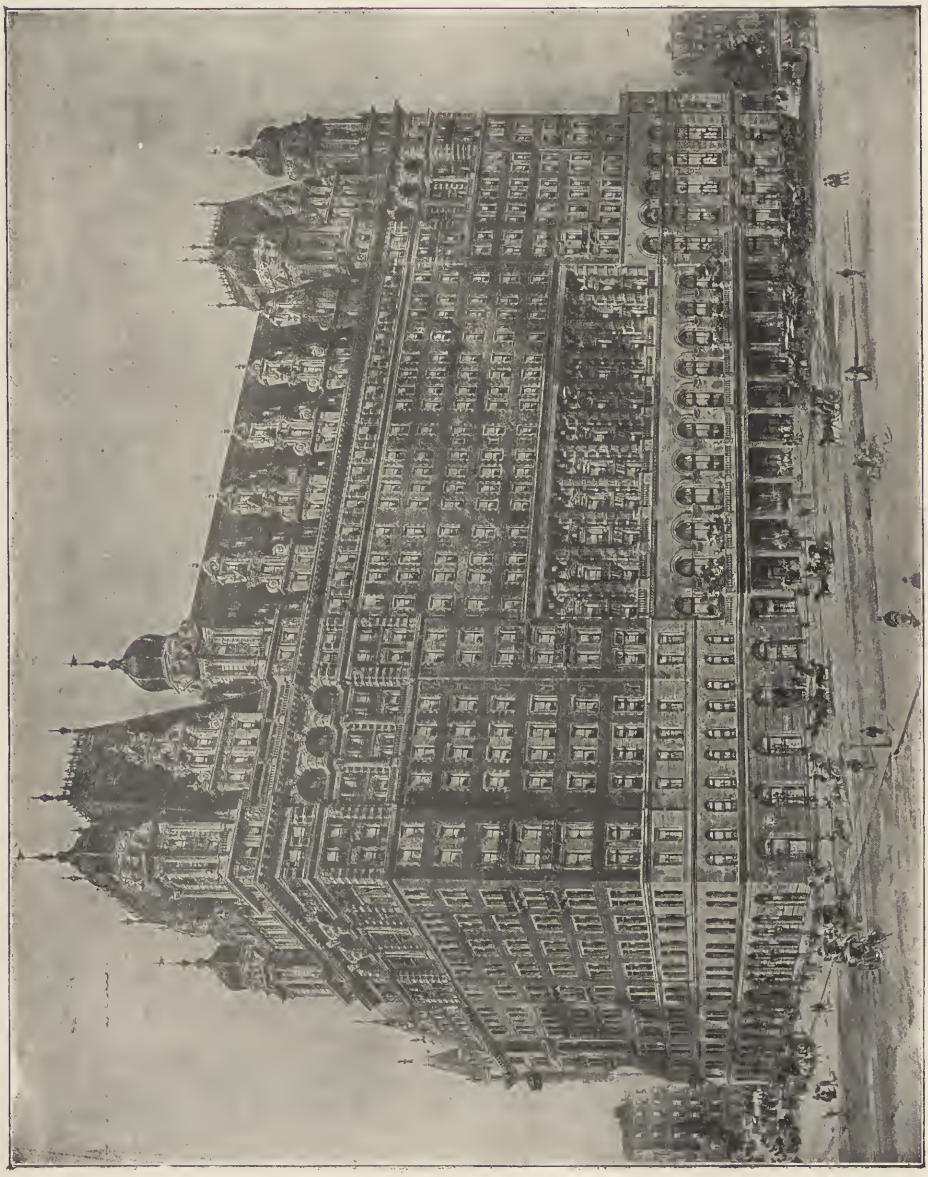
RESIDENCE.

West 72d Street, N. Y. City. A. B. Kight, Architect.

THE PARK ROW BUILDING.
The largest office building in the world.
Nos. 13 to 21 Park Row, New York City. R. H. Robertson, Architect.

ST. PAUL BUILDING,	GEORGE B. POST, Architect
HAVEMEYER STORES,	GEORGE B. POST, Architect
EQUITABLE BUILDING,	GEORGE B. POST, Architect
WELD ESTATE BUILDING,	GEORGE B. POST, Architect
COE ESTATE BUILDING,	GEORGE B. POST, Architect
THE PARK BUILDING,	GEORGE B. POST, Architect
EMPIRE BUILDING,	KIMBALL & THOMPSON, Architects
STANDARD OIL BUILDING,	KIMBALL & THOMPSON, Architects
SHERRY BUILDING,	McKIM, MEAD & WHITE, Architects
NEW YORK LIFE INS. BUILDING,	McKIM, MEAD & WHITE, Architects
UNIVERSITY CLUB,	McKIM, MEAD & WHITE, Architects
EXCHANGE COURT BUILDING,	CLINTON & RUSSELL, Architects
METROPOLITAN LIFE INS. BUILDING,	N. LE BRUN & SON, Architects

SINGER BUILDING,	ERNEST FLAGG, Architect
MILLS' HOTELS, Nos. 1 and 2,	ERNEST FLAGG, Architect
SCRIBNER BUILDING,	ERNEST FLAGG, Architect
JOHNSTON BUILDING,	J. B. BAKER, Architect
PRESBYTERIAN BUILDING,	J. B. BAKER, Architect
BANK OF COMMERCE,	J. B. BAKER, Architect
AMERICAN SURETY BUILDING,	BRUCE PRICE, Architect
GILLENDER BUILDING,	BERG & CLARK, Architects
HARTFORD FIRE INS. BUILDING,	CADY, BERG & SEE, Architects
TOWNSEND BUILDING,	CYRUS L. W. EIDLITZ, Architect
FIDELITY AND CASUALTY BUILDING,	CYRUS L. W. EIDLITZ, Architect
WASHINGTON LIFE BUILDING,	CYRUS L. W. EIDLITZ, Architect



THE ASTORIA HOTEL.

THE BROOKLYN BRIDGE BRAND OF ROSENDALE HYDRAULIC CEMENT WAS USED IN THE CONSTRUCTION OF THE ABOVE BUILDING.

OLD COLONIAL DOORWAY,

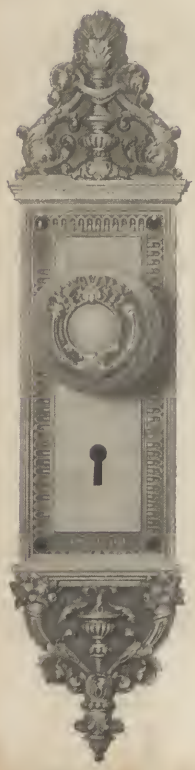
14 Middle Street, Portsmouth, N. H.

RUSSELL & ERWIN MANUFACTURING COMPANY.

BUILDERS AND OTHER HARDWARE.

New Britain, Connecticut.

New York, 43, 45, 47 Chambers Street.



Hotel Astoria.

BUILDING.	ARCHITECT.
VINCENT BUILDING,	George B. Post
MANHATTAN HOTEL,	Henry J. Hardenburgh
HARMONIE CLUB,	Herts & Tallant
PONCE DE LEON HOTEL,	Carrere & Hastings
CHESEBROUGH BUILDING,	Clinton & Russell
ARBUCKLE BUILDING,	Frank Freeman
ONONDAGA SAVINGS BANK BUILDING,	R. W. Gibson
CUSHMAN APARTMENTS,	C. P. H. Gilbert
NEW YORK PUBLIC SCHOOLS,	C. B. J. Snyder
RESIDENCE FREDERICK POTTER, ESQ.,	Renwick, Aspinwall & Owen

Harmonie Club.

MALL CITY HOUSE IN NEW YORK.

III. No. 4. *For Quarter ending June 30, 1899.* Whole No. 32.

THE ARCHITECTU. AL RECORD.

CONTENTS

100 ILLUSTRATIONS.

THE ARCHITECTURAL RECORD CO. 14-18 VESEY STREET, N. Y.

ST. PAUL BUILDING,	Geo. B. Post, Architect
STANDARD OIL BUILDING,	Kimball & Thompson, Architects
HARTFORD FIRE INS. BUILDING,	Cady, Berg & See, Architects
NEW YORK LIFE BUILDING,	McKim, Mead & White, Architects
SEIGEL-COOPER BUILDING,	DeLemos & Cordes, Architects

CENTRAL NATIONAL BANK BUILDING,	J. T. Williams, Architect
SPINGLER BUILDING,	W. H. Hume & Son, Architects
GILLENDER BUILDING,	Berg & Clark, Architects
COLUMBIA COLLEGE BUILDINGS,	McKim, Mead & White, Architects
NEW YORK ATHLETIC CLUB,	W. A. Cable, Architect

THE RESIDENCE OF ELBRIDGE T. GERRY, ESQ.
5th Avenue and 61st Street, New York City. Richard Morris Hunt, Architect.

Please notice what Commodore ELBRIDGE T. GERRY says regarding the heating of his large new residence, No. 2 East 61st St., City. House is 100x110.

NEW YORK, March 14, 1895.

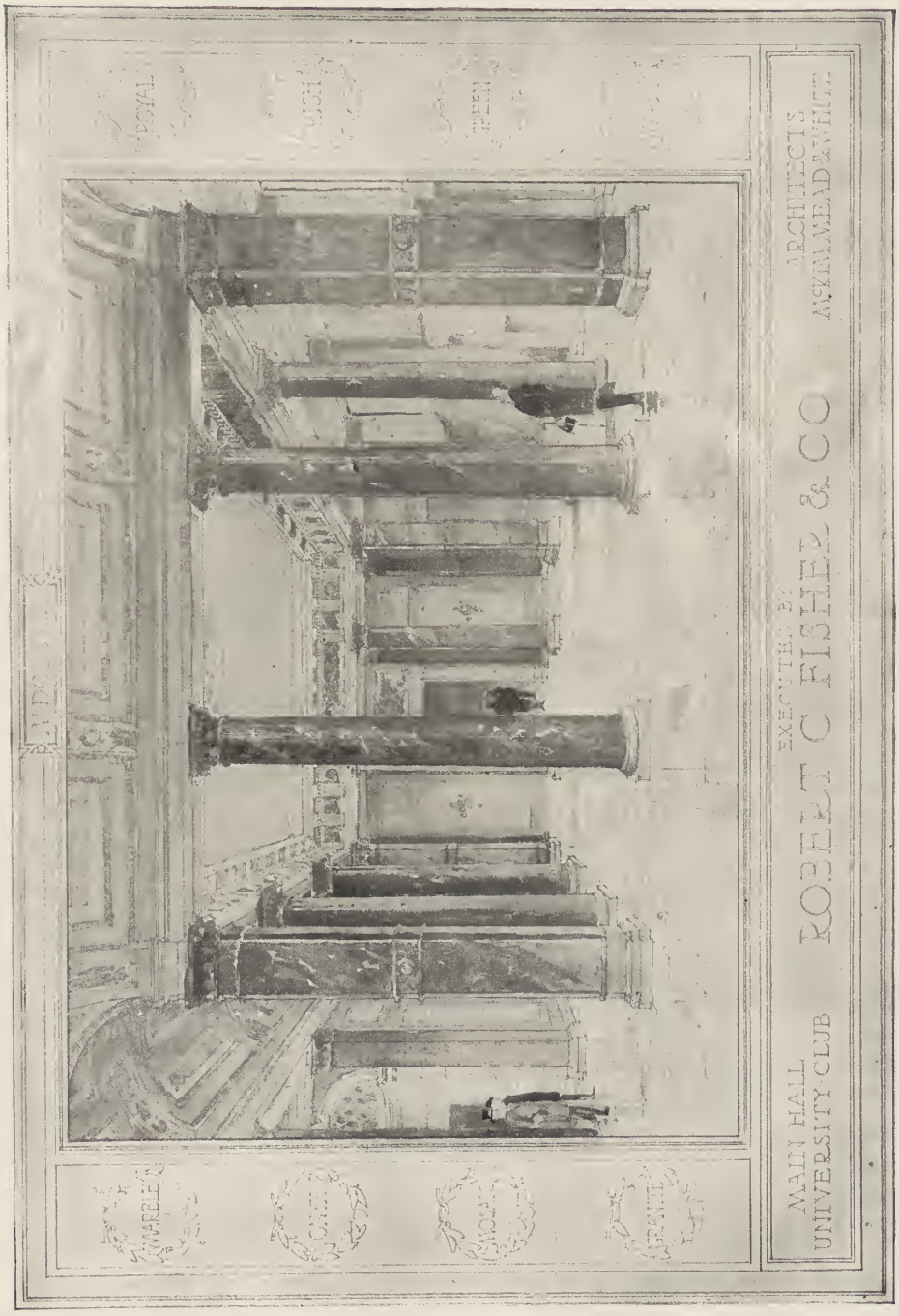
Richardson & Boynton Co.,

Gentlemen :—I write to express my great satisfaction with your admirable system of Perfect warm air furnaces recently placed in my house, No. 2 East 61st Street, in this city. They possess the advantage, as to the character of the warm air, that it is neither the disgusting steam heat which dries up the skin and affects the head, nor, on the other hand, is it the almost equally dry hot water heat, as it is called ; but during the entire cold weather of the late winter, even during the blizzard, my house has been thoroughly heated. The heat is uniform and the ventilation perfect.

Very truly yours,

ELBRIDGE T. GERRY.

ASTORIA HOTEL.


MAIN HALL
UNIVERSITY CLUB
EXECUTED BY
ROBERT C FISHER & CO
ARCHITECTS
MCKIM MEAD & WHITE

(WHOLE No. 32.)

Vol. VIII. ONE DOLLAR A YEAR. No. 4.

The Architectural Record

April-June, 1899.

25¢

25¢

CONTENTS

100 Illustrations.

Illustrated

Published Quarterly

ADVERTISERS' DIRECTORY.

ADVERTISERS' DIRECTORY.—*Continued.*

The
Architectural Record.

VOL. VIII. APRIL-JUNE, 1899. No. 4.

THE SMALL CITY HOUSE IN NEW YORK.

FENIMORE COOPER had a great interest in architecture, which he exhibits here and there in his novels, and especially in the "Notions of the Americans" which he wrote in 1825, in the character of a European traveler, to enlighten the Old World about the New. In the course of his account of New York in this work he says: "There is a species of second-rate, genteel houses, that abound in New York into which I have looked when passing with the utmost pleasure. They have, as usual, a story that is half sunk in the earth, receiving light from the area, and two floors above. The tenants of these are chiefly merchants, or professional men, in moderate circumstances, who pay rents of from $300 to $500 a year. You know that no American who is at all comfortable in life will share his dwelling with another. Each has his own roof and his own little yard. These buildings are finished, and exceedingly well finished, too, to the attics, containing on an average six rooms, besides offices and servants' apartments. The furniture of these houses is often elegant, and always neat. Mahogany abounds here, and is commonly used for all the principal articles, and very frequently for doors, railings of stairs, etc., etc. Indeed, the whole world seems to contribute to their luxury."

The passage seems worth quoting, for the vivid contrast it brings out between the New York of to-day and the New York of three-quarters of a century ago. The "second-rate genteel house" described by Cooper was not the first type, of course, of the small city house on Manhattan Island. There were in Cooper's time, as he explains, still some examples left of the earlier type. In his words: "A few old Dutch dwellings yet remain, and can easily be distinguished by their little bricks, their gables to the street, and those steps in their battlement walls which are said to have been invented in order to ascend to regulate the iron weathercocks at every variation of the fickle winds." The description shows that Cooper was unaware that the real purpose of the crow-step gable was to enable the wall to be

easily and securely coped, though not all the Dutch gables were so treated, the brick wall having been in some examples made to provide its own coping by an ingenious arrangement of the brick work. This was the case with the latest survivor of the Dutch houses of Albany, which was demolished only three or four years ago.

But although the small house of Cooper's time was not the first, it was undoubtedly the most eligible type that had up to its advent appeared, or that has appeared yet, upon Manhattan Island. If it be no longer eligible, that is because the price of land over all the surface of Manhattan Island, if not throughout the

NOS. 45 TO 53 CHARLTON STREET.

whole city of New York, has so appreciated that to make a comfortable house within the limits of a basement, two stories and an attic would be a piece of extravagance.

Of these houses we have to say, as Cooper of their Dutch predecessors, that "a few yet remain," and these in the lower part of the town, though the type was so completely established half a century ago that it even extended itself into the suburbs in the form of detached houses, for which it is by no means so well fitted as to be built in rows, and a sporadic specimen may be seen in what was known when it was erected as the village of Yorkville, and is now East Eighty-sixth street. A quarter of a century ago these houses were to be seen by whole blocks. Now the march of improvement has pretty

well obliterated them. They are gone like the North American bison, of which, however, one "herd" is said still to precariously exist on the border of Canada. The nearest approach that remains to a "herd" of the second-class genteel houses of 1825 may be found upon the Trinity property above Canal street and near the North River, and survives as precariously as the bison, seeing that the houses are built upon a ground rent, and are waiting for their doom until the leases fall in and the corporation covers their sites with towering warehouses. Meanwhile it seems to be a pious as well as an interesting task to commemorate what is left of them, and the best examples for our purpose are two rows, one in Vandam street and one in Charlton, between Macdougal and Varick, in blocks which not so very long ago were lined with like houses from end to end and gave an impression of decorum and refinement for which one would search any more modern quarter entirely in vain. We are not speaking now of the mansions that surround Washington Square, or the scattered reminders of the old glories of St. John's Park and Second avenue, or of what little is left to recall what Bond street used to be, or of the mild protest of faded gentility that is still entered by an occasional house front in East Broadway against the screeching vulgarity by which it is surrounded. For these relics are of more ambitious abodes. They have three full stories besides the basement and the attic, and their frontage, never less than twenty-five feet, extends on occasion to thirty and thirty-five. They are mansions, not "second-rate genteel houses." We have nothing to do with them, except to remark that the type is the same, and that the mansion was for half a century and more merely a more expensive expansion and elaboration of the small house.

At every turn, when one is looking backwards through the architectural history of New York, he finds fresh occasion to execrate the authors of the street system of 1807. The deep lot was one of the dire inventions of those unconscious vandals. In that part of the town that was built as it was wanted, and built in time to escape their ravages, there can scarcely be said to be an average depth of block, but 150 feet is not an unusual depth. With this decrease of depth, the small owner can command more frontage, and the large owner can "buy through" and establish his stable at the rear of his house without great extravagance. With this depth also one can still build forty feet deep and occupy only a little more than half his lot, retaining as much space for light and air in the rear as the street affords him in front. Forty feet, too, is about the extreme depth at which a house, with a moderate height of ceiling, can be thoroughly lighted from the ends. Forty feet is accordingly the standard depth, which was scarcely ever exceeded, though often come short of, in the houses in question.

The plan of these houses was simplicity itself. One enters the door at one side. Before him is a vestibule, beyond at one side the parlor door. This gives access to two rooms equal in size, except when the second is extended across the whole width of the lot. Between them is a pair of double doors, often of the mahogany of which Cooper speaks, and the passage is narrowed to the width of the doorway, gaining an ample china-closet on each side, on one side surrounding the ample chimney-breast. The two rooms together give a decent, almost a liberal space for social gatherings, even in a house twenty by forty. What is still better, the whole space is perfectly lighted by day. One advantage which the house had over its brownstone front successor was that in general the stairs also were well lighted. Instead of rising from the front door straight into vacancy and darkness, they start considerably further back, and rise to a landing at the rear, lighted with its own special window between the stories, from which another flight goes backward to the second floor. In the brownstone pattern the space at the rear is occupied by the bath-room. That Persian apparatus, the fixed bath-tub, did not come in until after the period of which we are speaking, and the pioneers before the days of the Croton aqueduct had their compensation in the light and cheerful landing, which could be made gay with flowering plants if the exposure were suitable. The second floor contained sometimes two chambers, the one taking up the whole width of the house, and sometimes three, the hall bedroom taking the width of the staircase. The attic contained three or four chambers in addition to the store-room. Cooper's "six rooms" probably excluded these and included only the two parlors, the three chambers of the second floor, and the front basement, which was almost always the dining-room. The service-door was of course under the main entrance, in the "high-stoop" arrangement, which is the one architectural bequest of the Dutch that has survived. But where the house was of more than twenty feet an alley was arranged at the side for service, and the space accruing over it became on the parlor floor a practicable "den." Sometimes the service alley was enlarged into a driveway, and the stable relegated to the rear of the lot.

The house thus compendiously described was an eminently decent and livable human habitation. The frontage, if it only exceptionally rose above twenty feet, almost never fell below it, and in that space the accommodations for a small house can be arranged with liberality, even with dignity; that is, five small houses can be built on four full city lots. But when the value of land narrows the frontage of the small house successively to four houses to three lots, the "18.9" front, three houses to two lots, the 16.8 front, five houses to three lots, liberality and dignity are put out of the question. The

plan of the old houses could not be bettered, and the more recent "saloon parlor" and square dining-room are a distinct retrogression from it. If there were a courageous speculative builder who should repeat, on ground suburban enough to be available for the purpose, the "second-rate, genteel house" of the twenties, it would be interesting to note the result of his experiment.

The old streets were more like the Bloomsbury quarter of London than like any of the recent residential quarters of New York, so far as the habitableness of the houses were concerned. But in point of

NOS. 16 TO 20 VANDAM STREET.

appearance, the advantage was immensely in favor of the New York Bloomsbury. The "House in the dark, unlovely street," celebrated in "In Memoriam," was a Bloomsbury house, situated, as a matter of fact, in Gower street, and nobody who has ever visited that thoroughfare will question the accuracy of the description. But the old New York streets were neither dark nor unlovely. They were gay and positively attractive, by reason of the architectural tradition that had grown up among the mechanics. The houses were more than decent; they were "elegant." That adjective cannot be applied to the contemporary small houses of Philadelphia or of Boston. They

were decent, in the one case with a Quakerish simplicity, in the other with a Puritanic bleakness, but they were decidedly not elegant. The New York small house owed its elegance to the ornament which was applied to it, very modestly and very sparingly, but none the less effectively. In the first place, the area was protected by a well designed railing of wrought iron, continued or varied as the hand rail of the stoop, and the posts, if hollow cages can be called so, in which these handrails terminated, were elaborated in various degrees of ornateness. These were true examples of artistic handicraft, which do great credit to their artificers. Elsewhere the ornament was convestional and discreet. Here there were no manuals or precedents. Originality was compelled and fantasy was permitted. The moderation and discretion which were enforced upon the joiner by his book of patterns the iron workers had to impose upon themselves. It was what would now be called the result of "artistic training," and so it was then, but the training was that of the workshop only. Of the many patterns of railing none is repulsive and many are attractive. And the same thing is equally true of the effloresences in which the ironwork was permitted to pullulate in the hollow posts. The domestic ironwork of three-quarters of a century ago was, in its modest way, a triumph of "industrial art."

Elsewhere the ornament is that of the joiner. There were very few skilled stone-cutters in New York in those days. One suspects that the carvers of the City Hall, fifteen or twenty years earlier, must have been specially imported, for there does not seem to have been enough work found for them elsewhere to keep them busy. The doorway was the one feature of the house front upon which ornament was lavished. Of the half dozen or so patterns which it followed only two or three were executed in stone. There was the plainly moulded or unmoulded arch with a projecting keystone, sometimes single, sometimes triple, sometimes plain, sometimes rather richly wrought. There was the more ambitious arch in which the courses were alternately plain projecting blocks and sheaves of mouldings, a form that has been imitated in a modern house in Madison avenue. There is the Doric order in stone, with half columns and a complete entablature sometimes with a wreath at each end of the frieze and guttae under it. The ornamental stonework was always confined to the opening of the doorway, and this was filled with the joiner's work in wood and glass. And most commonly, in the second-rate genteel house, the opening of the doorway, like that of the windows, was a pair of plain brick jambs covered with a lintel, sometimes a plain slab, sometimes with a moulding around its edge, and a panel at the center rising above the line. The basement wall, plain but for its sharply bevelled joints, the doorway and the lintels comprised the stonework. This was commonly in brown stone, but often in

marble, and the more costly material has now paid for itself in its better preservation, and in its appearance. For the New York householder, even when he has taken the best care of his habitation, has never been possessed by that fury of cleanliness which has prevailed

NO. 34 VARICK STREET.

in Philadelphia and induced the Philadelphians to keep their marble as glaringly white and their brickwork as glaringly red as scrubbing and paint would do it. The New Yorker has let his marble take on a dingy and mellow tone.

The joiner's work in the doorway is the most elaborately ornamental part of the old New York house, and the most attractive. It is almost always an order, oftenest Ionic, sometimes Doric, never, I think, Corinthian, unless of that embryonic Corinthian in which the leaves are incised upon the bell of the capital and not projected. A Corinthian capital is indeed so refractory to the woodworker that

there is hardly an example of it in our Old Colonial, and the earliest example of it in stonework in New York, the portico of St. John's Chapel, was probably the first attempt to exhibit the order, and, if the columns had been fluted, it would still remain as about the most impressive. The Ionic order, as it was treated in the doorways of the old houses, was unfailingly effective, even when the columns were plain, in which case they showed a slight and not a dropsical entasis, or fluted, in which case they were apt to be straight-sided. The detached columns were counterparted by half columns against the jambs, and between these was the sash frame of small panes, for it was before the period of plate glass, with a wooden leading, so to speak, of almost unfailingly graceful shape and arrangement. A like sash frame filled the door head above the entablature of the order. When moulded uprights took the places of the columns this disposition was maintained. But the most elaborate treatment of the sash-frame occurred, as might be expected, when the doorway was arched and the upper sash became a fan-light, and this was often as pretty as it was elaborate. The doorway is worth describing in this detail, because it was the feature which most definitely put the stamp of elegance on a building which otherwise would have been merely decent, like the houses of Bloomsbury, or old Philadelphia, or old Boston. But it was by no means the joiner's only opportunity. The others were the detailing of the cornice and of the dormers. The former was simply a casing of the gutter, with a board underneath against the wall. It was, of course, not monumental, though it seems in many instances as well preserved as the more durable material. But it was never offensive. It cannot fairly be said to be an imitation of a stone cornice except in the simple mouldings of the projecting member. The board, the frieze of the cornice, is generally quite plain, sometimes with a simple bead near the bottom, sometimes with an egg-and-dart and a row of dentils, at least, in one remaining instance with two rows of leafage very well designed and well cut, and giving as much evidence of enjoyed handicraft as the order of the front door, or the iron posts of the stoop. Sometimes the projection is at a right angle and in this case the soffit may have projecting panels studded with guttae.

The dormers, two in number, are aligned over the piers of the wall, and in the treatment of them the joiner took rather more liberties than he indulged himself in elsewhere. They were gabled into pediments, triangular or round, and the opening itself, usually square-headed, was sometimes round-arched and sometimes segment-headed. In the latter case the center of the arch is apt to be marked by a harmless, unnecessary keywood—harmless because the workman was so habituated to discreet moderation in form and scale that even his meaningless additions lost their offensiveness. Behind the

dormers rose the roof against which they were relieved at a moderate slope which, however, with the moderate height of the house, left it visible to the gaze from the opposite sidewalk. How much the visibility of the roof added to the distinction that the old houses derived from their careful detail would scarcely be believed if it were

NO. 24 ST. MARK'S PLACE.

not so completely in evidence. In every remaining row of the old houses, or adjoining it, there is apt to be one of which the owner has converted the attic into a flat roof. Even when the detail, including that of the cornice, has been accurately reproduced from the original, the front loses all distinction and is descredited in comparison with its modester neighbors.

While the old house, small and large, was the most respectable and artistic pattern of habitation New York has ever known, it must be remembered that it was a pattern arrived at by general consent, and that its builders did not do so well when they were put upon their own resources. They never arrived, for example at a satisfac-

tory treatment of the end, or flank, of a row of houses abutting upon the street. While the pattern of the "inside" house was the most eligible that perhaps could have been devised, neither in place nor in design was it the most eligible for a corner house. Where three sides are free a more commodious and impressive interior and a more expressive exterior may be attained by a different arrangement, by putting the entrance, for example, at the center of the longer front. But this the old builders never took thought to do but repeated the pattern, leaving the flanking wall quite blank, at

NO. 113 EAST BROADWAY.

least below the gable. For this they had some variety of pattern. Sometimes the roof is crowned with a simple gable, sometimes it is a gambril, which, with a depth even of forty feet, is more effective, as well as more economical. In either case there was commonly one window, sometimes flanked by quadrants. But the favorite arrangement, where there were two chimneys in the wall, was to mask the roofs altogether by building a parapet between them at the height of the ridge. None of these modes, however, is quite satisfactory. In this particular the builders comparatively failed who had oth-

erwise arrived at so attractive and successful a solution of the problem, as it was presented, in the New York of their day, of the small city house.

The house which succeeded this was much like it in plan, but showed a distinct falling off in architecture. The carefully and prettily wrought bits of decoration were omitted from the front. This was the period of the Greek revival, of which, in house-building, the north side of Washington square offers the most conspicuous example. In the second-rate house a pair of pilasters and a lintel in brown stone framed the doorway in place of the Doric order in white mar-

NOS. 27 AND 29 EAST 4TH STREET.

ble of the mansions. The lintels were left plain, worst of all, the roof was dropped into invisibility, and the dormers which gave so much of their charm to the old houses replaced by a half story of square or oblong openings. The house was as habitable as its predecessor, or nearly so. It had simply ceased to be an object of architecture. It was decent, but it was bald and dull and absolutely without interest. Nobody in passing could have looked into it "with the utmost pleasure," or with any pleasure at all. These houses at one time filled a great part of the residential quarter, and many more of them than of their predecessors remain. They, too, are going, but not to anybody's regret.

But these were honest structures of brick and stone, and if they were not attractive they were not offensive. Would that we could

say as much or as little of their successor, which was the brownstone front. Who was the malefactor who first discovered the practicability of that scandalous edifice? Brown stone and brick had been used together before, and though most of the brown stone used in New York was not a very durable or eligible building material, by reason of its tendency to scale off, it was a very available material, by reason of its abundance and of the ease with which it could be wrought. It had been employed in the small houses from the first, though perhaps no building had been completely built of it. Everybody knows that the City Hall, faced and flanked with marble, was backed with brown stone, upon the ground that the northern aspect of it was unimportant, since it was at the upper end of the town, and that paint now brings the rear into conformity with the rest. Cooper, in the same chapter from which we have quoted, demands to know why no churches have been built of brownstone, and points out its special appropriateness to the Gothic style, but his aspiration was not fulfilled for twenty years after he wrote, and then in the building of Trinity Church, where the stone, by the way, was very carefully and successfully selected. It had been used in sills and lintels and doorways in the earlier houses, and it might have been used more extensively by way of bondstones, and more elaborately by a greater profusion of carving, without doing architectural harm. The architectural harm was done by the malefactor who discovered that a house of brick and brown stone could be constructed, by using the stone not legitimately to bind the brickwork and span its openings, but to conceal the brickwork altogether by plastering a veneer of brown stone four inches deep upon a brick wall, leaving the actual material to expose itself at the rear. Of course it is not practically a good construction. So far from adding to the strength and carrying capacity of the wall, the facing was a burden to it, and to maintain the assumption that the facing was the wall required the omission of the bondstones that would have incorporated it with the wall. Architecturally the whole thing was a false pretence that the material was more costly and the house more valuable than in fact it was. It was not nor it could not come to good. It was this nefarious structure which speedily became epidemic over nearly the whole residential quarter of Manhattan Island, which was built up between 1850 and 1870. For nearly half the width of the island from Fourteenth street to Fifty-ninth it raged and prevailed. It became a much less habitable house than its predecessor. Its disadvantages we all know, for we have all lived in it. Most of them proceeded from the fact that with the increasing price of land, the frontage was gradually reduced below the twenty feet which is the absolute minimum where a passage and stairway are to be deducted from the width. I have already noted the compensation which the pre-Crotonean had for the want of the bathroom that darkens the stairs and the hallways. There was

another compensation in the fact that when the stairs extended to a landing at the back of the house, even if but forty feet deep, they could be set back so as to gain a spacious and dignified vestibule, whereas in a brown-stone front the visitor finds himself confronted with the stairs as soon as he has passed the double doors. In order to make up for the reduced width of the house, its depth was increased, and indeed the depth of a dwelling of much pretension occupying a full inside lot became three rooms instead of two, thus render-

NO. 109 EAST BROADWAY.

ing the middle third of the house a gloomy cavern. The "high stoop" was retained in these brown-stone fronts, without any reason. When the house became three rooms deep, and often when it was but two, the rear room on the parlor floor became the dining room. The "front basement," which had almost invariably been the dining-room of the earlier house, thus lost its function. Cooper complains of having to climb the outside steps of the high stoop in a New York house much more pretentious than that of which we have quoted his description. When the basement dining-room was abolished this trouble ceased to have any compensation. But the speculative builder who did practically all the brown-stone fronts continued the old arrangement under the new conditions without taking any more thought than the lilies of the field. It was not until after planning was taken

out of his hands and put into those of architects that it was discovered that with the narrowing and deepening of the house the dark middle was the most available place for the stairs, or that it was discovered that the high stoop lost its meaning and use when the front basement was no longer the dining-room. One may see the fruit of these discoveries in almost every block of the brown-stone district in a house which has been converted within the last few years from a high stoop to a basement, in which the whole width of the first

NO. 29 ST. MARK'S PLACE.

floor is regained for the parlor, and in which the front basement, which had become a mere "survival," has been converted into an ample and dignified entrance hall.

It was not to be expected that the builder who was quite thoughtless when the question was of practical convenience would be any more thoughtful when the question was of architectural expression. The whole scheme, as we have seen, was a false pretence, and the architecture consisted in additions which had no relation to the fact.

The decoration of the old house had consisted in the adornment of necessary members. The decoration of the new consisted in the addition of unnecessary members. The entrance was, as before, the ornate feature. The actual entrance speedily came to consist of two pairs of doors enclosing a nearly square vestibule. The outer arch was not generally itself modeled, but had mouldings applied to the jambs, while it was furnished with a keystone and crowned with a pedimen either triangular or curved, sometimes carried upon a pair of columns, sometimes upon a pair of consoles. In the more pretentious houses, the Corinthian order came to be employed, but wrought out in brown stone the fragility of the leafage and its provision of perches for birds became objectionable, and it became customary to surround and protect the capitals with a wire cage. This absurd device of course spoiled whatever effect the order otherwise might have had on so reduced a scale, but it continued to be employed until the end of the brown-stone front period, instead of being taken to indicate, as it did indicate, the unsuitableness of the Corinthian capital for the purpose. The windows were often pedimented, and always in houses of any pretensions the lintels and sills were moulded and projected and the jambs of the windows also covered with projecting mouldings which of course were absolutely meaningless. Between the openings the walls were faced with as large slabs as could be procured, and the joints narrowed till they were as nearly as possible imperceptible, the assumption of the builder apparently being that the whole brown-stone veneer should seem to be a single sheet. In the later works of the brown-stone period, this assumption comes so near being made good that in the first floor there are no joints visible, great slabs of veneer stretching from opening to opening and one or two joints that could not be obviated being concealed by mouldings tacked on, so to speak, as in unconstructural woodwork. There is really no intimation of a masonic structure allowed to escape. Evidently this is the negation of architecture as an expression of construction. On the one hand the facts of the case are carefully concealed. On the other the supposed ornaments have nothing to do with the facts.

But this is not all, nor perhaps the worst. With the disappearance of the roof and the backward slope of the flat roof to a gutter at the rear, the gutter at the front disappeared and with it the necessity for a cornice either to constitute or to enclose and support the gutter. It became merely a coping. But the necessity for a cornice as "finish" remained, at least in the mind of the speculative builder. A real stone cornice costs money, and was out of the question, except in the costliest houses. An imitation in wood was troublesome and perishable. It was at this juncture that it occurred to the diabolical ingenuity of somebody that sheet iron could be pounded into the

similitude of a moulded stone cornice, supported upon brackets and consoles, and could be tacked across a front all in one piece. Whoever this miscreant may have been, he produced his nefarious invention early in the brown-stone period, and he is almost as deserving of execration as the original malefactor who produced the brown-stone front itself. The projection of a stone cornice is limited by mechanical as well as by pecuniary considerations. The projection of a sheet-metal cornice painted and sanded to imitate stone is not so limited. Accordingly the sheet-metal cornice took on extravagant dimensions soon after its introduction. It did not, it is true, go to those outrageous and umbrageous lengths to which it has since been car-

NO. 238 EAST 51ST STREET.

ried in the erections over tenement houses and cheap apartment houses. It constitutes the greatest architectural scandal of New York, in so much as nothing could so tend to bring the aspect of the town back to decency as the appointment of a judicious iconoclast with power to tear off all the tin cornices. But it was excessive from the first, and its extravagance reacted upon the stone work and was probably the origin of the excess in scale which gives the detail of the brownstone fronts that bloated look which is their chief offensiveness.

What happened at the top happened at the bottom. The ironwork

of the earlier houses, as we have seen, was one of the chief causes of their attractiveness. It was really artistic and enjoyed handicraft. In the early mansions of the brown-stone period, there were substituted for the open posts and the carefully-wrought iron railing, heavy posts and balustrades of cut stone. In the "second-rate" houses, no longer "genteel," the speculative builder substituted huge cylinders or polygons of cast iron and hand rails and balusters of the same material, all painted and sanded to resemble stone—

> As if his whole vocation
> Were endless imitation.

The ordinary brown-stone front was thus a series of pretentious shams, and with these shams miles of the streets of New York were and are composed. To live in and among them, to become inured to them, was to suffer a depravation of taste the more pitiable for being unconscious. The brown-stone front was enough to vulgarize a whole population, and in our case it came near succeeding.

One merit, or, if one cannot ascribe merit to the result of a refusal to think, one advantage the brown-stone front had, and that was its conformity, its virtual uniformity. True, it was this repetition which made and makes a mile of it so dismal. But to a single block it gives a unity and keeping which its predecessor attained by more rational and artistic means, but which its successors have not attained at all. When the fashion, which is not yet twenty years old, came in of employing architects to design private houses, each for its owner, the architect was commonly content to make his own work effective by contrast with, and at the expense of, its neighbors. His work had to be very good indeed to reconcile the spectator to the interruption it gave to a row of houses which would otherwise have been at least a series and had the magnifying and satisfying aspect which a long enough series of similar buildings always wears, until one comes to look at them in detail. The thing for an artistic architect to do who had to fill a gap in a row of brown-stone fronts would have been, one would say, to see what could be done with the brown-stone front, to insert a front which did not contradict its surroundings nor assert itself at their expense, but deferred to them and conformed to them as far as it could do without stultifying itself. I know of but one architect in New York who has had so much grace given to him, and who has exercised the supervision of an aedile over himself and set an example of civism and good neighborhood. That is the architect, whoever he may be, of No. 25 East 74th street, to whom I accordingly beg to present my respectful compliments. He has inserted a studied and refined brown-stone front in a row of unstudied and coarse brown-stone fronts, but without putting any unnecessary indignities upon them. In material and in the main lines of the cornice line and the stoop line he carefully conforms to them. He substitutes

NO. 25 EAST 74TH STREET.

a substantial and convenient flight of stone steps for the straight flight garnished with imitations in cast iron of an ugly construction in stone. He reduces his cornice to the dimensions proper to the stone of which it is composed and he scales down the detail elsewhere from the coarse excess to which it had been carried to live up to a swollen tin cornice. He adds in the bay a feature which gives interest to his front. But all this he does while still conforming to the "block," and showing that something can be done with the brown-stone front. It is a very exemplary performance, a public service, and our gratitude

for it makes us willing to overlook the unreasonableness and weakness of the Italian arched canopy over the entrance standing free on its pair of columns and without any abutment, an unconstructural construction of which he is so enamored that he has repeated it in the story above with even less excuse. Nobody can look at this front, one would say, without acknowledging how very much better it is in its place and for its purpose than as good a front, or even a better one, in which the architect had ignored his surroundings. It is a very good object-lesson in the advantages of conformity.

These advantages by no means impressed themselves upon the pioneers in the building of the belated West Side. Here for the first time in nearly half a century there seemed to be offered an opportunity for a quarter of small houses. So much land was at once thrown open to settlement by the completion of the elevated railroad that its price was low enough to encourage speculative builders to provide for the wants of people of moderate means, people who could not pay more than twice the "$300 or $500" rent which their predecessors paid in Cooper's time, nor more than $15,000, let us put it, for the fee simple of a house. For these people no provision at all had been made during the brown-stone period. It then became true, as a recent British visitor has said, that "if you are going to live in New York, it is well first to take the precaution of being a millionaire." People who could not pay a minimum of a thousand a year were driven to New Jersey, to the uttermost parts of Brooklyn, and toward the close of the brownstone period began to take refuge in flats. The social philosopher and the Philadelphian agree that it is good for a citizen to live in his own house, and the West Side seemed to offer the small New Yorker his chance. Speculative builders presently offered him some miles of houses suited to his means, and it seemed that he could afford at last to inhabit an undivided house on Manhattan Island. If he had only been an "artisan," probably more pains would have been taken in the planning of his house. Being left to supply and demand, he fell among the speculative builder, who, not being trained to take thought, but only to do what he was used to doing, and not choosing to go to the expense of a trained architect, undertook to supply the demand by imposing his own "ideas" on his own cheap draughtsmen. The front was narrowed from twenty feet to seventeen, or even less, and the depth somewhat increased, the house still consisting of four flours. It could not have been made so convenient as the old "second-rate, genteel house," but it could have been made much more convenient than in the first essays it was, as has since been shown when architects came to be employed to design the small houses. In architecture these first essays were frightful. They were particularly frightful because the speculative builder took it into his head that whereas what he was accustomed to do

was monotony, what the public now demanded was variety. His own incapacity for design remaining the same, his effort after variety produced the wildest of wild work. Thence came those rows of variegated and individualized sixteen-foot fronts of which an eminent architect declared that "they made him sea-sick." They had all the shams and vices of the brown-stone rows, the bloated tin cornice and the rest, and their "variety" gave them a clamoring restlessness all their own. Our street architecture nowhere presents a worse aspect than in these productions of an incompetent designer working under the purpose of a real or imagined demand for novelty and variety. Perhaps in no other is it so bad. Such a block-front as the south side of West Seventy-fifth street, from West End avenue to the Boulevard, is an atrocity compared to which a row of merely dull and dismal brown-stone fronts takes on repose and dignity. Not that the features of this bad architecture are necessarily bad in themselves. Some of them, such as the archway spanning the whole front, and the loggia, were crude suggestions of good things. But in the hands of the speculative builder's draughtsman, they remained hopelessly crude and unstudied. It was only when the speculative builder found himself forced to employ real architects that they were studied and became really decorative appendages, or rather organic parts of the house. But unfortunately when that time arrived, ground, even upon the West Side, had become too valuable to be devoted to small houses. The small four-story houses with which the improvement of the West Side began were about the equivalents in accommodation of the old small house of a sunk basement, two stories, and an attic in the roof, though the accommodations could not be so conveniently arranged when the house became narrower and deeper. To make a liberal and dignified entrance required the sacrifice of one of the best rooms. The houses that now characterize the West Side are without doubt the most interesting examples of domestic architecture that New York has to show. A few of them are worth illustration here for the sake of their architectural merit, though they do not really belong to our subject, being evidently the abodes of people more than fairly well to do, even when they stop short of the palatial point. The expression of "a comfortable bourgeoisie" which nearly all of them have is often heightened into the expression of something more artistic. The designers have aimed to make a house that at once satisfies and expresses the needs and habits of their occupants. They have done this without much thought for purity of style, and indeed the best of the houses are apt to be the hardest to classify. The group of three houses at Seventy-seventh street and Riverside Drive, the single house with the rectangular projecting bay in West Seventy-third street near the drive, and the detached house in West Seventy-sixth street near the one with the steeply hooded loggia, are

equally unaffected and straightforward expressions of the conditions of New York life, whether or not they wear the badges of some historical style. They mark as distinct an advance from the brownstone front as that marked a distinct retrogression from the still "Colonial" house of the second decade. The features which are repulsive as they were crudely sketched by the speculative builder's assistant have been studied and overruled into decorum and sometimes into beauty. And the designers have had a very gratifying measure

NOS. 327 AND 329 WEST 76TH STREET.

of success with the difficult problem of individualizing the houses in a row without too much sacrifice of the uniformity of the row. In this respect Nos. 323-331 West Seventy-sixth are particularly interesting. Too strong a differentiation is made by using red brick entirely for the central house, while the flanking houses are of brown stone with some admixture of brickwork. But the differentiation is mainly managed by the difference in the position and treatment of the loggia. Perhaps the loggia is more theoretically than practically a desirable adjunct of a city house. For while it would be as useful

as it is agreeable in a house that was lived in all the year, it is evident that the inhabitants of houses of this class abandon them at the season when the loggia would be a pleasant resort. But of the utility of it as an architectural device, as it is used here, there can be no manner of question.

But by no means all the careful design in the newer quarters is lavished upon houses too costly to come within our scope, nor are artistic small houses confined to the West Side. In East Eighty-seventh street beyond Second avenue there is a row of unpretending small

NOS. 323 TO 331 WEST 76TH STREET.

houses, nay, there are two rows confronting each other across the street which are in no danger of vitiating the taste of those who live in them by inducing tolerance of what ought to be intolerable. There are other rows in the upper sixties, extending from Third avenue to Second. One of the most interesting essays in the individualizing of small houses while maintaining a certain unity for the collection has been made in a group of eleven houses at the corner of Lexington avenue and Eighty-ninth street, upon a plot 140x100 or thereabouts. And luckily, upon the West Side itself, builders were compelled to invoke the aid of competent architects before they had

NOS. 219 AND 221 WEST 138TH STREET.

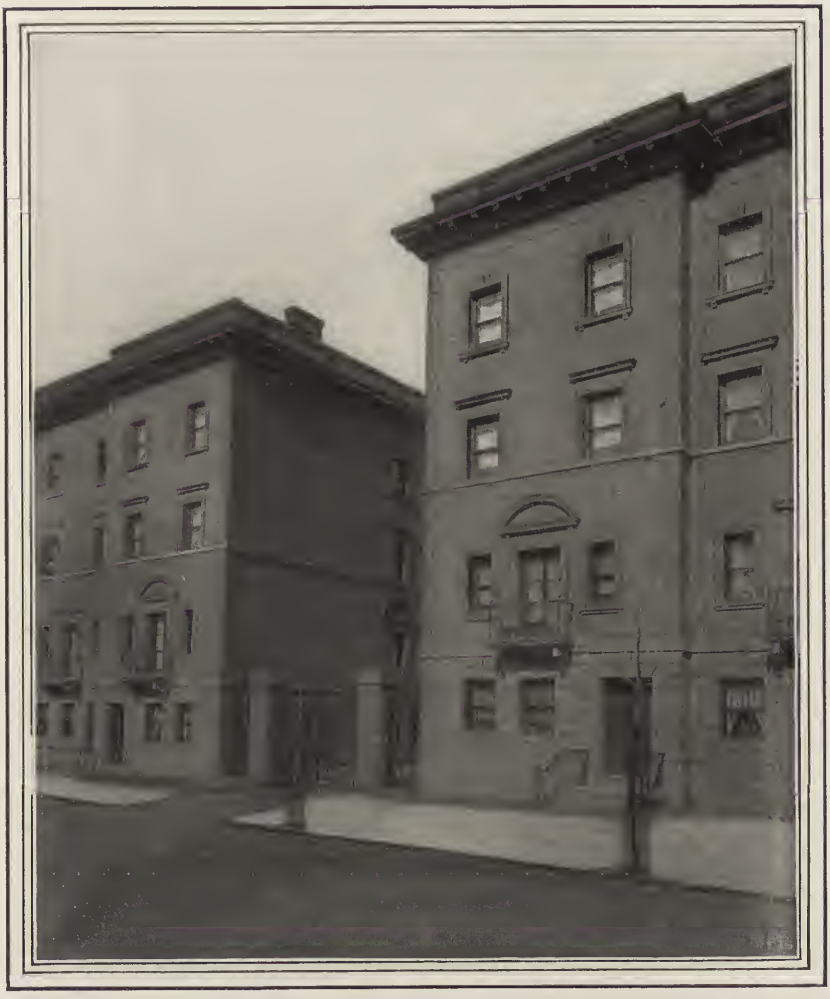
all determined that the land was too valuable for small houses. The most extensive building operation that has been carried out upon the West Side is the construction of the "King houses," that occupy 138th and 139th streets from Seventh to Eighth avenues, and these come strictly within our scope. The undertaking was on a scale which of course was the more economical by reason of its hugeness, and evidently a builder who can finance a project of this magnitude can afford easier terms to buyers and tenants than a builder whose resources are limited to half a dozen dwellings at a time. One of the exhibitions of intelligence in the construction of these houses was the employment of three architects of the first rank to compete with each other, not on paper, but in actual brick and mortar. The experiment is so successful that one would like to have it again and again repeated, not merely for the sake of having something entertaining to

look at, which it must be owned one finds on the West Side in as full a measure as in any other American city, perhaps in a measure even fuller, but as a friend of humanity. Indeed it is so successful that one wishes for a benevolent aedile who should ordain that all the houses of a block front must make up one design and come from one designer. In this way the one partly redeeming feature of the brownstone period, the uniformity of a single block front, would be retained and the additional advantage gained of detail that was interesting as well as of an ensemble that was impressive, while the different views

NOS. 214 AND 216 WEST 138TH STREET.

that different architects took of their problems would ensure them against monotony.

The works of the three architects employed in this case show quite sufficient variety. The south side of 138th street is lined with houses in pressed red brick and brown stone, treated with a studied plainness with little more decoration than the flat arches of the openings. The north side of 139th street is lined with houses in brown stone and mottled brown brick, with cornices of metal imitating modillioned cornices in stone. The intervening block is built in buff brick and



NOS. 217 AND 219 WEST 139TH STREET.

white terra cotta. The houses are all, one hears, eminently livable, and whatever the differences of architectural treatment, they all look so. These differences are considerable. It may be said in general that the authors of the southernmost and northernmost rows have apparently built for tenants who, Quaker like, were

Content to dwell in decencies forever.

Decorum they have in fact and without question attained. These are "second-rate, genteel houses," in which nobody will be ashamed to be caught dwelling. Mere decorum is a considerable achievement, as our street architecture goes. And indeed, if one misses the prim, grave ornament sparingly bestowed upon the old houses, he finds compensation in the composition of a row of houses into an archi-

tectural unity at which the old builders never aimed, and which is here attempted with success. It has attained especial success in the row on 139th street, in spite of the fact that the dark brown stone and the dark mottled brick and the black cornices have a somewhat lugubrious aspect. But the features, the plain round pediments, the open vestibules that punctuate the row at judicious intervals, and the arrangement of the windows, all these things have been so managed and treated as to make of the block front an architectural unity, while the individual houses are yet quite clearly enough distinguishable.

The third designer, who had, in the treatment of a whole block, an

NO. 233 WEST 139TH STREET.

ampler opportunity even than that of a block front, has availed himself of it very judiciously in respect of planning, has cut the Gordian knot of house service by reverting to an alley through the block, with transverse alleys, and has contrived an agreeable feature at the intersection of the alleys. But he has not been as content as his colleagues that his tenants should dwell in mere decencies, and has striven to mingle some "dulce" with "decorum." The most conspicuous of the features with which he has endeavored to dulcify his exteriors is the Renaissance triple window, in which an arch is turned over the central opening. This is always an effective feature, when it is well done, and here it is very well done in detail, with Doric col-

umns and much enrichment of the entablature. The arch, however, is here left a blind tympanum filled with ornament, and is neither so intelligible nor so effective as when it is opened and glazed. Nevertheless the feature is effective and decorative when it occurs in the center of the side wall. When the central opening is set alone in a wall, with its tympanum crowning it by way of an evidently constructed ornament, the effect is by no means so good. Though the detail is all good in itself, and adds a grace to the points to which it is applied, it leaves the question open whether this ornate treatment is more eligible than that of the block front to the north, in which ornament is almost entirely renounced. But all these essays are successful in producing decorous and attractive houses. Numerous as they are, however, they have supplied but a small fraction of the demand that exists for such dwellings. The projector was a public benefactor, and if he had seen his way to covering the whole flat from Morningside to the Harlem River with like houses, he would have been a public benefactor of the very first order.

At about the same time when these houses were erected there were also erected the row of small houses at the corner of West End avenue and Eighty-third street, which are really models of the "second-rate, genteel houses" of the end of the century, as those that are so rapidly undergoing extinction on the domain of Trinity are of its first quarter. These revert to a tradition even earlier that that of the old New York house, being no less than the Dutch house of New Amsterdam, of which the gable was furnished with the crow-steps that Cooper so widely misunderstood. It is, in fact, only in the crow-stepped gables that these houses recall the first permanent abodes of white men on Manhattan Island, but the gables and the crow-steps give a very familiar and attractive touch to the architecture. One wishes that the author of them might have had a whole block front to himself, since he has contrived to gain so much of effect with a row of only five houses of twenty feet frontage, or less, and of four stories including the roof. The general composition and the detail of these houses are almost equally successful. It was a happy thought that alternated the gables of the longer front with the houses that exhibit the roof to the ridge line, converting the upper story into an open loggia of which the roof is carried upon two unmistakably wooden posts, even though the corbels that seem to relieve the bearing of the beams upon these posts are devices that, as they are here introduced, belong distinctly to stonework and are irrelevant to the timber of which they are in fact composed. It was a still happier thought to terminate the longitudinal ridge against a crow-stepped gable which is not at the end, but emerges from the roof of the end house at some distance short of the end wall. The manner in which this gable is made to emerge from the open loggia at the end, and in which that

loggia, crowned at the angle with its own steep and separate hood, is yet incorporated in the design is an admirable and exemplary piece of carefully studied composition. Nor is the detail upon the whole less admirable. The main story with its arches, extravagantly deep, it is true, is very effective throughout, but especially at the end, where the terminal windows effectively balance each other, and where the two central openings of which one is a doorway and the other a window, are so happily united by the one column of polished marble which would anywhere else be a "purple patch," an extravagance incongruous with the general treatment, but which is here prettily and

SOUTHWEST CORNER OF WEST END AVENUE AND 83D STREET.

even exquisitely in place and keeping. It is true that the flat arches of the story above are shallowed to the point of weakness. You really cannot bridge a three-foot opening with a flat arch one-half a brick deep, and one notes, not without satisfaction, that the laws of mechanics have already imposed the penalty for this infraction of them, that the whirligig of a single decade or so has brought in its revenges, and that the arches have visibly failed under the impossible task imposed upon them. The extreme shallowness of the flat arches looks all the weaker by reason of the extravagant depth allowed to the Florentine arches of the floor below, which would evidently be

excessive if the flat arches of the second story were sufficient, as they evidently are not. This is a fault in architecture as well as in construction, but it would be unjust to make much of it in a design generally so successful, and carried into detail with such affectionate care. One of the best points of these excellent houses is the introduction of two tints and surfaces of brickwork, the contrast of the smooth red pressed brick of the jambs and quoins and the alternate bunches

NOS. 314 TO 322 WEST 76TH STREET.

of brick in the windows with the dark and rough surface of the wall. The contrast just suffices to give animation to the buildings without interfering with their repose. This row is one of the recent erections that can sustain a comparison, in point of simplicity and straightforwardness, with the old small houses, which are virtually of the same dimensions. If it lacks their elegance in detail, it has the compensation that what ornament it does show is much more accurately "founded on fact," and it shows a power of composition, and of uniting the members of a "row" into an architectural unity which was so far beyond the mechanics of 1820 that they never even made any attempts in that direction.

There is another row of five small houses on the south side of West Seventy-sixth street (Nos. 314-322) which seems to me especially

exemplary. These are really small houses, of only seventeen feet frontage each, and consisting of a basement, a parlor floor, and two subordinate stories above. The row shows the same effort to obtain variety in unity which we were remarking in the row nearly opposite (Nos. 323-31) of taller and more pretentious houses, where it was attained by making the loggias to differ among themselves in position and treatment. In the present case, the attainment of unity was especially difficult by reason of the rather sharp slope of the street. This makes an awkward break in the cornice which one wishes might have been avoided. A visible roof would have made the row in this respect much more attractive. And the attainment of unity is obstructed by the real or fancied necessity, when the houses were built, of giving the purchaser a choice of "basement" or "high stoop." But this difference has enabled the designer to vary his fronts effectively without giving the fatal suspicion of a disposition enforced for the mere sake of variety. The feature of each front is a triple opening marked by columns. In the central house this is a three-sided oriel. In each end house it is a rounded oriel, while in the intermediate houses there is no projection but the columns are ranged against the wall. The difference in the levels of the floors, according to the arrangement of basement, brings the little colonnades also on different levels. The basements themselves are of brown stone, left much too rude for the real elegance of the wall above, and indeed showing so little design in detail that one suspects that the designer of the terra cotta was the real artist concerned in the transaction. However that may be, the work in baked clay is highly artistic, well designed in form and projection, well adjusted in scale, and it has a singular charm of color almost unequaled elsewhere. The brickwork is in different tones of rich yellow, while the terra cotta varies from tawny red to golden. The result is a delightful expanse of studied form and playing color, as superior to our old friends of 1825 as they are superior to the tame work of the builders of the brown-stone fronts or to the wild work of the speculative builder's draughtsman. Above, the feature of the front is in each case a series of flat arches in terra cotta shouldered on corbels of the same material, all equally successful in design and equally lucky in color. So much cannot be said of the copper cornice above, any more than of the stonework below. Copper cornices are very frequent on the West Side. Unlike the sheet-metal cornices of the brown-stone fronts, the material is not disguised, but is left to attain its patina of a green old age. Unfortunately, however, its form is still that of stonework, a modillioned cornice, as in the present case, or a machicolation, as in some other cases. Neither of these designs could have been evolved from the material, and neither is expressive of it or suitable to it. Indeed, I know of but one metal cornice in New York

which is idiomatically designed for its material, and that surmounts the front of a fire engine house in Third street.

So the fault is not in our stars, but in ourselves, that we are underlings. It is not that our architects cannot make as attractive small houses as were made by the mechanics of two generations ago. In fact, they can make more attractive small houses. The examples we have just been citing prove that conclusively enough to anybody who will disinterestedly compare the two. But the old small house was the common typical New York house of its kind. The new house, in so far as it is artistic and attractive, is exceptional. Although the old houses are so rapidly going, there are probably as many of them still standing, perhaps more, than there are of modern small houses which are better or as good in point of sound construction, thoughtful planning and artistic design. If the common small householder had demanded an artistic house, he would have got it. In so far as he demanded it one may say that he did get it. The speculative builder used cheap and untutored draughtsmen only so long as his client would stand their output. When his client declined to stand it any longer the speculative builder resorted to designers who thought about what they were doing and who had to be supported while they were thinking about it. And observe that the public, the promiscuous public, never demands better than that with which it is supplied, because its taste is formed only on what it sees. The first builder who employed an artistic architect to do him small houses on the West Side put a pressure upon all other builders to go and do likewise. The block front upon Seventy-fifth street which we have exhibited as the nadir of the small house in New York is not worse than some other block fronts. But it was made impossible as soon as a block front of a distinctly higher order was built. In these things it is the supply which creates the demand. That is why the wayfaring investor has got a perception of domestic architecture, from what has been done on the West Side, which makes very crude and very reckless work an offense to him, and that the West Side has come to be a quarter full of entertainment to noticing people.

Unfortunately this quarter, which, when it was first opened to settlement, seemed to offer to our friend the small householder the opportunity he long had sought, seems now to be closed against him, like all the other quarters. It is a real grievance. An American of decent education and of average "earning capacity" deems it part of his birthright to look forward to owning as good a house as he deserves. Mr. Kipling says, in one of his American letters: "Every good American wants a home, a pretty house and a little piece of land of his very own; and every other good American seems to get it." He can get it, that is to say, in any other American city than New York. But it seems that on Manhattan Island he can no more

get it than he could get it thirty years ago. If he cannot afford to pay a minimum of $1,000 for rent, there is nothing for him but a flat. When scanty and partial provision is made for his needs, he takes such eager advantage of it as shows the strength and urgency of the demand. When artistic houses are supplied to him he promptly shows his appreciation of them. Surely there is land enough within the present municipal limits upon which builders can afford to meet this constant and unfailing demand. The enlightened builder who undertakes it may derive from this review suggestions which will help him to be a benefactor of the species, and in that hope it is to him that it is respectfully dedicated.

Montgomery Schuyler.

ARCHITECTURE AT SOUTH KENSINGTON MUSEUM.*

POSSIBLY at no other museum in the world is there so large a collection of architectural examples, originals and casts, as at the South Kensington, and at the same time there are probably few which are more unscientifically arranged; where it is more difficult for the student to seize upon the salient points of any special exhibit, to grasp its effect in its original position and its true place in the sequence of styles. In the arrangement everything is sacrificed to the making of an artistic show; to elevate the public, as it is pretended; to please and amuse in fact. Two large courts, known as the Architectural Courts, and another, known as the Italian Court, are full of beautiful architectural examples, while others are scattered here and there over the whole of the rambling ground floor of the building. Where there are many examples they are utterly overcrowded, and the others are difficult to find, while such arrangement as there is, besides that which produces pleasing combinations of form and color, is that of division into the countries in which the objects have been found. There is no attempt at chronological sequence, either as a main idea or as a subdivision within that of the countries. To add to the confusion there is no proper guide-book published, so that it has become a necessity, both for the use of the architectural student and for the casual visitor besides, that a short account of the architectural exhibits should be written, treating them in their proper chronological sequence, and drawing from them some of those lessons which they are able to teach; and if such an account is to appear first in an American journal it has to be written not only to assist those who will eventually visit the museum, but also to inform those others who are prevented from so doing by the long distance which they are away, of what, of an architectural nature, our great English Art Museum consists.

Of examples of Egyptian and Grecian art there are none accessible to the general public save a series of casts and a model of the Parthenon at Athens, completed according to the supposition of the great English archaeologist, Fergusson. It is to the British Museum that one must go for these—to that most wonderful and well-displayed collection where the student revels and the casual visitor yawns. For the use of the students of the South Kensington Art School, however, there is an almost complete series of casts from

* It is, perhaps, necessary in fairness to Mr. Middleton to say that this article was written for the Architectural Record some time ago, but publication was unavoidably delayed. In the meantime some changes may have been made in the Museum.—Editor Architectural Record.

originals in the British Museum, tantalizingly placed in a high gallery, within the sight of, but inaccessible to, those who have not the full privileges of students. As casts, these are good, but it is wonderful to one who knows the originals well how greatly their value has decreased in the process of reproduction. Everything is there, certainly, but the extreme subtlety upon which the beauty of Grecian work so largely depends has been lost. What is left is the form, of great refinement still, but yet with the full soul of the artist lacking.

Roman Column with Renaissance Pilasters Behind It.

It would scarcely be necessary to mention this, these casts of Grecian architectural fragments thus rather forming a private than a public collection, were it not that in considering the many other plaster casts in the public Museum itself it might otherwise be forgotten that something of the spirit of the original designer is necessarily absent—less or more according as the work has depended upon

force or upon subtlety for its charm—the general massing of heavily contrasting light and shade being affected to a much smaller extent than delicate curves and highly finished outlines.

Of actual Roman work there is one example—it is a notable thing that there is so much. It is a marble column, kept in a glass case, and prominently placed facing the passageway through the Italian Court. It stands about 6 feet high, and has been placed upon a pedestal. Rising from a base of acanthus leaves, it spreads outwards as it rises, thus tapering the reverse way to that which is usual, and so giving no impression of having been used constructionally for weight carrying. The shaft is sculptured, first with a deep band of ivy leaves, treated in a natural manner, then with a narrow band of what is called by architects the "honeysuckle" ornament (in reality a development of the palm tree of Assyria), this being treated alternately with its leaves upwards and downwards, then with a broad band representing closely-folded cloth or linen, and then with ivy leaves again, this time conventionally treated, and with berries introduced.

From this description it will be understood that it is much more elaborate than would be anything of the same character in Grecian or even in the earlier and more austere Roman times, and, although its date is unknown, it may safely be ascribed to the later, degraded days of the Empire, when all the desire of the wealthy classes—it might almost be said of all classes—of the people was for richness and magnificence, their sense of the beauty of simplicity being dulled if not obliterated. This supposition is still further borne out by consideration of the form of the ornamentation. In the place of the crisp outline and clean cutting of Grecian ornament, often as precise in the hardest marble as if it had been executed in soap or cheese, there is a general roundness; the outlines are curved and the surfaces are wavy.

The same characteristics are to be seen in some casts in the Architectural Court, of a candelabrum, of which the original is in the Louvre, and of a curious jumble of odd fragments pieced together by a French architect, and also in the Louvre. In the Great Roman cast, however, they are less noticeable, for Trajan's Column consists almost entirely of a corkscrew continuous band of sculpture from base to summit, representing scenes in Trajan's life. The full-sized cast of this huge column, being too high to be put up in one piece within the building, has been erected in two halves, side by side; and then it is only just got in. The sculptures have many times been compared, and favorably, with those upon the frieze of the Parthenon at Athens, and certainly the best of these are excellent and equal to some of those at Athens which are of inferior workmanship. More than this, however, cannot properly be said, for the best work of the Pan-Athenian frieze is simply beyond competition with anything of the kind elsewhere.

In the other Architectural Court, hung in a small glass case against the wall, and in a position where it is rarely noticed, is one of the very few records which remain to us of that Etruscan architecture which preceded the Roman, dating back to the third or second century B. C. to a time when the true spirit of Grecian art was

Cast of Roman Candelabrum (from the Louvre). The Three Graces, Renaissance, in the Foreground.

yet alive in that neighboring country. It is only an antefix—an ornament erected on the eaves of a building for the roof tiles to butt up against, and this is a casting only from a matrix found near Orvietto; but it may be considered as being an original for all art purposes, the matrix having been made for the purpose of having the antefix cast from it, as this has

been after a lapse of two thousand years or more. It consists of a life-size and beautiful female head, in which the classic and the Northern types of features are combined, set in a high and almost a full relief in a deep circular recess, with an aureole of simple thistle leaves, which, suggested rather than modelled in full detail, set off the beautiful outline and perfect finish of the head to absolute perfection.

Etruscan Antefix. Cast in Unbroken Clay from a Terra-Cotta Mould found near Orvietto, Italy. Date, 2d or 3d Century B. C.

If, however, the Museum contains but few examples of the purely classic work of Greece and Rome, it is still worse off with respect to the Romanesque—that style which arose out of the Roman after the seat of the Empire was changed from Rome to Constantinople. There is, in fact, nothing Byzantine at all in the Museum, in the true sense of the word—nothing, that is, from the extreme southeast of Europe or from Asia Minor, dating to the early centuries of the

Christian era, nor even from the earliest and purest examples of the style in Italy, the Church of St. Vitale, at Ravenna. Of St. Mark's, at Venice, there is a tiny fragment, a portion of a twisted column, less than a foot in length and a few inches in diameter, inlaid with gold and glass mosaic in small triangular blocks; while close to this, in one corner of the Italian Court, are several small samples of similar mosaic work, inlaid in stone pavements and steps, all of about the thirteenth century, and all geometric in design—of that class of work which is known as Opus Alexandrinum.

More truly Byzantine in character are four wooden columns hidden away in an exceedingly dark annex to the Italian Court. They originally stood upon the backs of coarsely carved lions as bases, two of which still remain, but the caps are strictly Byzantine in having four plane inclined faces, on which the ornamentation is incised, this ornament being composed partly of debased acanthus foliage and honeysuckle ornament—relics of the classic art from which they were devised—and partly of archaic figures and natural leaves and foliage. They are described as being South Italian, probably of the thirteenth century, and originally formed the supports of an organ.

A small timber altar front, of the same district and date, shows octagonal columns, having simple leaf capitals and bases which certainly suggest the fifteenth rather than the thirteenth century; while a pair of lion bases, in marble, flank the entrance to the Italian Court —coarsely modelled, ugly things—which are dated back as far as the eleventh century.

The consideration of these lions, used as bases, leads one naturally to the Moorish work of Spain, which, with all its eccentricities, can still trace its origin to Byzantium, and, through Byzantium, to Rome and Greece. Constructionally weak, artistically perfect in color and in form, and in suitability to the climate of the country where it flourished, there are many examples of it at South Kensington, one of which clearly tells of its classic origin. It is a complete arch with wall over, from the nave arcade of the Jewish Synagogue at Toledo, known as Sta. Maria de la Blanca, which was erected in the fourteenth century, and consecrated as a Christian Church a hundred years later. The columns are octagonal, but the capitals, while ornamented with incised carving of Byzantine character, have projecting voluted (or curled) leaves, reminding one much of the acanthus leaves and white scrolls of the Corinthian order of Ancient Rome. The arches are horseshoe—that form which, especially in an interior where bright light is sparsely admitted, is so exceedingly voluptuous in its expression—and above them is a deep wall-surface, ornamented with a geometric pattern of straight lines in various directions, slightly raised, in the true Moorish fashion; while above, again, is a blind arcade with horseshoe and much-cusped arches, as

if the designers had seen the cusp in use in neighboring lands where the Gothic influence was then in the ascendant, and had adopted it, and exaggerated it, to suit their own requirements.

This stands against the wall in the Architectural Court, and close to it is a cupboard in age-colored wood from a house at Toledo, called the Botica de los Templarios, also of the fourteenth century, and showing all the elaboration of Moorish detail when translated into wood, all just incised below the general surface of the timber, yet with a bold scroll-work design set off by a tiny pattern acting as filling in behind, to form a background.

Along the adjoining wall, too, are hung a large number of casts of ornament from the Alhambra at Grenada, but these, elaborate and beautiful as they are, lack the rich coloring of the original to bring out the difference between the plane surface and the incised parts, and to give them the full educational value which they should possess.

In quite a different part of the Museum is found another collection of the work of Mohammedan artificers—in the collection of Assyrian and Persian art near the secondary entrance. Here, of a much later date (seventeenth and eighteenth centuries, and even of the present time), you find all the same characteristics as in the work of the Moors of Spain, executed several hundred years before. Here, at first sight, appears to be the same incised wood-carving, and here certainly is the same stalactitic vaulting, corbelling and cusped arching; but on closer inspection it is found that what appears to be wood-carving is mere fretwork, the pierced layer of wood being glued upon the face of another which is unpierced, while in the Cairene work the texture of the surface is rendered still more rich by the employment of windows filled with numberless small turnings of wood pieced together, instead of glass, known as "Mushrabiyeh," or turned lattice-work. This is replaced at Damascus by large trellis work, still of turned wood, but now so large that the interior of the room can be seen through it, which is by no means the case with the closely worked Mushrabiyeh.

Here, in this little visited corner, a few years ago were two rooms, completely furnished and decorated, as they have been brought from Damascus, making up with the rich collection of Moslem woodwork near, a most fascinating spot where many people love to linger; but "improvements" have been effected recently, and these rooms are no longer to be found.

Of the great Romanesque style which spread through Western Europe during the ninth, tenth and eleventh centuries, the Museum is again most unaccountably wanting in examples. From the Great Rhine churches—from those at Aix-la-Chapelle, Cologne, Andernach, Mayence, Worms, Spires and Trèves—there is absolutely

nothing; and it is the same both with the French and English so-called Norman architecture; that architecture which, founded upon Roman round-arched construction, led the way to the rise of the great Gothic style. Most nearly approaching to this is the large cast of the west doorway of the Cathedral of Santiago de Compostella; but this takes us back to Spain again, where consequently the Moorish, and through it the Byzantine, influence is felt, though it is to a part of Spain which the Moors never reached themselves. This huge cast occupies one entire end of the Architectural Court, and is exceedingly difficult to describe, being formed of three semi-circular arches, each enriched with numerous figures in bold relief and of less clumsy workmanship than would be expected at the end of the twelfth century. The supports are grouped columns, with tortuously carved capitals representing, some of them trees and human figures, and some of them the acanthus leaves again; while there is a solid base, moulded in simple and effective outline, which itself rests upon the heads of animals whose zoological name has yet to be discovered, but who all look to be suffering considerably from having to carry so heavy a weight as that brought upon them.

To the Englishman it is natural, but to the foreigner it must be astonishing, that at South Kensington there should be so very little relating to English architecture. We have preserved, well-cared for, and forming integral parts of many noble buildings, specimens which are beyond rival of all the various styles of the Middle Ages, as adopted and used by our own forefathers. It is our pride that in our cathedrals, our churches and our castles are exemplified a truly insular and national phase of that great Gothic architecture in which all mediaeval works of Western Europe were executed; and there is no necessity to place occasional fragments of these great erections in our museums, when the actual monuments themselves, in all their grandeur, are available to those who care to visit them. Thus it happens that permanent English architecture is only represented by a few casts in an obscure corner, and these, too, not very good. An exception is, to a certain extent, made with the English timber-work, it having been possible to collect a little piece here, and a little piece there, which would otherwise have been destroyed. A most English and characteristic specimen of this class of work is a richly traceried carved oak corner-post, from an old house of the fifteenth century, now pulled down, but which once stood at Bury St. Edmunds in Suffolk. It is carved out of one huge piece of oak, with the richly cusped sunk panels of its time; a grand piece, illustrating a grand period, when the middle class was rising, during the wars of the Roses, upon the ruins of the old feudal nobility.

For other examples, it is necessary to wander into the same dark passage as that in which the specimens of Mushrabiyeh are stored.

Here is a screen and door from a former Palace of the Bishops of Exeter, in that type of fifteenth century woodwork which is peculiar to the Western countries—open tracery, the arch equilateral or nearly so (not four-centred, as is usual in other parts of England at that time), and with bold and simple mouldings. Here, also, are a few minor details of wood tracery and panelling, all of about the same date, and several magnificent chimney-pieces of the Elizabethan period, when the Gothic and the Renaissance were fighting for supremacy, and when all the national characteristics and all the artistic spirit of every European country seem to have been most pronounced. The four most marked specimens are all boldly conceived and executed stone chimney-pieces, with oaken overmantels, from a house in Lime street, London, presented by the Fishmongers' Company, and dated about 1620.

Two distinct curiosities, close by, a little while since were an oak desk and an organ-bellows lever. The former was only temporarily lent to the Museum, and is just an ordinary small desk of the sixteenth century, with sloping top, hinged to form a box lid in a very usual way, but so covered with iron bands as to have been useless for writing at; while the latter is a most elaborately carved arrangement from the destroyed church of St. Mary Somerset, Thames street, London, built by Wren, and forms no mean specimen of the class of work which was executed under that great master.

Returning to the Architectural room, one finds there, of late Elizabethan or Jacobean character, one of the finest architectural relics in the Museum, in the entire oak front of Sir Paul Pinder's house, erected by him in the year 1600, which was presented to the nation by the chairman and directors of the Great Eastern Railway Company, when its site was required for modern utilitarian purposes. It is of most picturesque and broken outline, story projecting above story, with panels and pilasters richly carved in the grotesque manner then in vogue, and with almost the whole front of each story given up to window space, the glass, of many quiet colors, being arranged in little panes within lead framing. Here we have a phase of English architecture, of which, owing to fire, and the "improvement" of our streets, there are but few remains extant amongst us, and it is, therefore, fitting that this, the most perfect and the most beautiful, should find a resting place in a great museum.

Continental Gothic work, unlike the English, is very fairly represented, and though almost entirely so by casts, these are sufficient to give a student who really looks about him and compares intelligently, a very fair idea of the different characteristics which mark the buildings of France, of Germany, of Belgium and of Italy. Of the early French of the thirteenth century, for instance, the whole portion of the

Portal of the North Transept of Bordeaux Cathedral, and the centre pillar of the Porch of Amiens Cathedral, are well-known and magnificent examples, bold and rich, yet with the richness subordinated to the general lines. The former depends for its effect upon its graceful vertical and curved lines, obtained by carefully devised and well-moulded members, broken by comparatively small statuary niches, while the latter is stronger in character, with the horizontal line more

Upper Portion of Sir Paul Pindar's House, Bishopsgate Without, London. Built 1600 A. D.

marked, and the statuary bolder, much plain surface, just enriched with slightly sunk panels, being allowed; yet both evince a subtle spirit of enthusiasm and of brilliancy such as seems to have been characteristic of our Gallic neighbors at all periods of their history.

These may well be compared with the two pulpits in the other Architectural Court, one from the Baptistery and the other from the

Cathedral at Pisa. Almost identical in date with the French examples just cited, they not only have the horizontal feeling of Classic or Byzantine times, but their details are so much so also as to lead one to question whether there ever was a true Gothic period in Italy at all —whether, in fact, these works and all others like them should not rather be classed as late Byzantine, with a Gothic admixture. In both there are several columns which rest upon lions' backs; in both there are capitals of acanthus character; in both the mouldings are of debased classic rather than of Gothic form, and are ornamented with debased leaf and dart and other classic enrichments; and in both there are square panels filled with small high-relief sculpture, in which the arrangement and the modelling alike tell of the classic predilections of the artists who were employed. Even later, and yet before the opening of the Renaissance, the same spirit is in distinct evidence in the cast of the Shrine of St. Peter the Martyr, in the Church of St. Eustorgio at Milan, which is dated 1339—a date at which a Gothic style was in undisputed sway in all Northwestern Europe; and, in fact, in this example the Classic is so strongly suggested that a perfect entablature is found to the main cornice, while all that is Gothic at all is a little crocketting and tabernacle work, and the small crowning canopy.

Returning to the French Gothic school, there are to be found plenty of good examples showing its later characteristics, the most prominent being a large cast of the main Western Portal of the Cathedral of St. Sauveur, at Aix in Provence. The bases of the door jambs and centre post show the curious continental feature of the base mouldings being proportioned and designed to suit each individual member separately, and not the mass as a whole—a feature which often results in great complexity, and which lacks the sturdiness and repose of the English method of treatment. The flat head to the doorways, with the angles rounded off, is also noticeable in contradistinction to the low four-centred arch which would have been used in England at that date (1477-1504). The doors themselves are richly carved, pure Gothic being mingled with pure Renaissance details, as this latter style was now creeping northwards. Unfortunately, in this and other casts, the portions representing stone and wood have alike been left white in the plaster representations, giving quite a false idea of the color values of the originals.

Close by are representations of a brass font and a stone shrine from the church of Notre Dame, at Hal, in Belgium, both of a slightly earlier and more purely Gothic period, and both more delicate in execution—as such gems ought to be—evidencing, too, that wonderful power of figure carving which the Flemings have always possessed, and do possess to the present day, especially marked where the figures are but statuettes.

French again, transitional between the Gothic and the Renaissance, is the Rood Loft of Limoges Cathedral, in which the lines are horizontal and almost all is Renaissance in form, being Gothic in spirit only—and it forms as good an example as could well have been chosen to place in a museum of that most beautiful and delicate transition style, which has all the artistic instinct of the work of the same time in England and in Germany, but is delicate and most refined where the latter is sturdy and even occasionally coarse. In this particular example, erected in 1533, the detail is so small and yet so boldly cut as to give the appearance, at a little distance, of elaborate knotted lace-work; but in this it is peculiar to itself, though the feeling is much the same as that which produced the beautiful chateaux of the Loire valley—such as those at Blois, Azey-le-Rideau, and Chénonceaux.

Comparable with these great French examples are those from Germany. The plaster cast of part of the oak choir stalls in the Cathedral of Ulm is typical of all such work to be found in the districts of the Black Forest and Bavaria—with bold lines and yet much flimsy tracery, mouldings rarely more than rounds and shallow hollows, and yet all treated in a masterful and most peculiarly masculine way, the curves in the intertwined foliage carving being particularly strong. Is there not something here, in the contrast between this and the extreme fineness of the Limoges detail, of the character of the two nations?

Nuremberg, the centre of the artistic life of Bavaria, second, even now that it is a great commercial city, only to its little neighbor Rothenburg in charm, is represented by two casts, both from the Sebaldkirche. One is from Adam Kraft's Shreyer Monument, in one of the bays outside the church, between two of the apse buttresses, and much better seen here in plaster, in its vigor and its overdone complexity, than in the original, which is dark, dust covered, and surrounded with close wirework. Architecturally a little stump tracery at the side of the return is most noticeable, showing the debasement of the Gothic in the fifteenth century, as it was marked in mid-Germany. The other cast is of the bronze shrine of St. Sebaldus which stands inside the church, and is the work of Peter Vischer. Of noble Gothic outline, yet the fact of its standing upon the backs of snails, and of there being much that is Renaissance in detail, if examined closely, all tell of the influence which his long visit to Italy had upon this craftsman, while the nobility and graceful pose of the many figures which enrich it speak both of this influence and of his own artistic power.

Unquestionally, however, from an architectural point of view, the Italian Renaissance is the period best represented at South Kensington, both the Italian Court and one of the Architectural Courts con-

taining a large number of well-selected examples, mostly in original. The fifteenth century which, in Northern Europe, saw the decay or elaboration of the Gothic style, was witness, in Italy, of a wonderful revival of the pure classic feeling, the architectural work being based upon that of the Romans during the Empire, but evincing a more free and yet a more refined spirit. This revival took place first at Florence, and though it has, of course, been impossible to trans-

Florentine Lavabo.

port to London huge gloomy palaces and gorgeous churches, yet a considerable number of beautiful little bits of detail have been acquired. One of these is from Florence, and of the very best period (A. D. 1490), when the workers had overcome the stiffness which is almost inseparable from first attempts upon new lines. It is a "Lav-

abo," or Fountain, of the black stone, known as Pietra Lerena, and consists of a bowl standing on a pedestal, and set in a recess domed with the shell ornament. It is flanked with pilasters carrying entablature and cornice over the whole, and all is enriched with carving in low relief, of vases and scrolls, acanthus leaves, scallop shells, and masks of human faces, all conventionally treated in a way which reminds one of, though it does not copy, the carving of the older Roman days.

Then there are several marble doorways, some bold, some quiet in design, but all good specimens and noble entrances to noble build-

Stone Chimney-Piece from a Palace near Como. A. D. 1520.

ings. One is from a palace in Genoa, made in 1519, rich with carving in bold relief; three others are from the palace at Gubbio, erected by Frederico, Duke of Urbino, about 1475 or 1480, and are carved in low relief with well-conceived acanthus scrolls; two others belonged to private chapels in a Church at Genoa, built by Lazaro Doria and Givigo Spinola in 1472 and 1480, and are of an absolutely black, hard stone, carved in very low relief; while yet the most important is the large gateway, said to have been brought from Ghedi, near Breschia, where it formed part of a palace erected by Nicola Orsini.

built in 1575, and for which the Museum authorities gave no less a sum than £602.

Then, too, there are some magnificent stone chimney-pieces, with the mantel projecting to form a hood for gathering the smoke up to the flue, and generally supported by trusses formed of male human figures, and all of about the same date—early in the sixteenth century. One of these is different, though. It is from the neighborhood of Milan, and is formed of one plane surface of green and white marble inlaid with grotesques, with shields of arms, and with the representation of an open temple, beneath which stands a globe—

Tomb of Filippo Decio.

all in colored marbles. It is curious rather than handsome, but rich in color and attractive by its gorgeousness and brilliancy.

The most prominent object in the Italian Court is the sanctuary, with its arch and dome complete, together with the high altar, which originally formed part of the Conventual Church of Santa Chiara, at Florence, built in 1493, by one of the pupils of Brunelleschi. More simple and severe than most of the other objects exhibited here it forms an excellent example of the earlier Italian style, of the period of its earlier Florentine exponents.

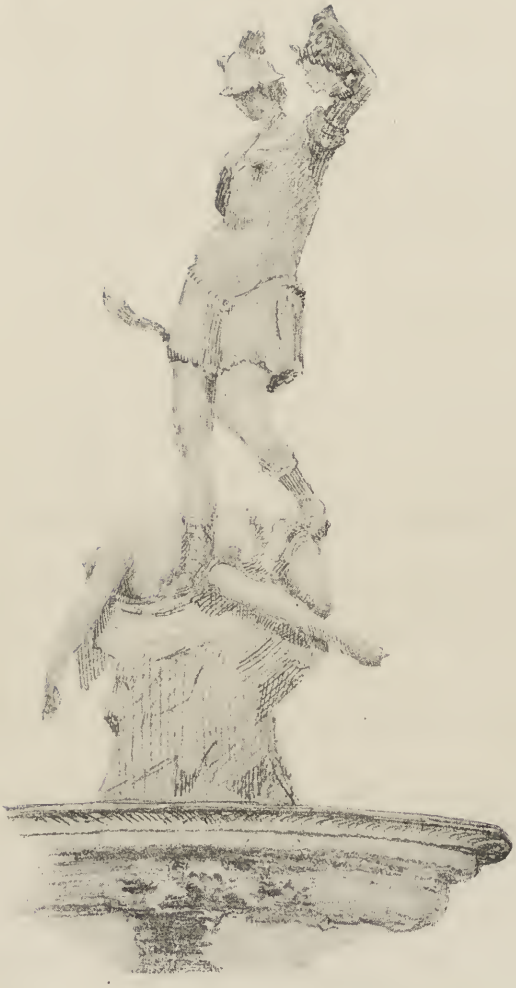
Well-heads, capitals, corbels, portions of columns, and numerous other minor details are arranged about the court, in such positions as to be readily available to the many students who come here to sketch and measure—making this one of the best spots in Europe for the study of Italian ornament.

These are all originals; but in the Architectural Court are many more Italian examples—casts, it is true, but good representations—including many details from the famous Certosa, near Pavia, the elaborate marble window of the fifteenth century, and two large panels from the altar-piece. More beautiful still is the tomb of Filippo Decio, in the Campo Santo of Pisa, and dated 1530—the figure lying upon an

Rood Loft, Church of St. John, Bois-le-Duc. Dated 1625 A. D.

urn or bed, which itself rests upon a well-proportioned and elaborate pedestal. It is a good example of what the tomb of a wealthy man should be—not ostentatious, but refined and elegant, yet rich with a large amount of carving, and so designed that, were this carving omitted, it would still be beautiful and noticeable.

Of the Renaissance of other lands, the best examples are from Belgium, and they are in the Architectural Courts. First, in point of its resemblance to Gothic work, comes the Tabernacle (cast) in the Church of St. Léonard at Léau, erected in 1552, aspiring in form



Fountain in the Courtyard of the Old Palace at Munich.

and so calling to mind the more beautiful and purely Gothic one in the Laurenzkirche at Nuremberg, but of bold Renaissance detail, the angles at the base being carried by six strong male figures, or Atlantes, taking the place of columns. Two other exhibits are, however, of earlier date. The great chimney-piece from the Palais de Justice at Bruges, the cast of which occupies almost all one end of one of the Architectural Courts, was erected in 1529, and is one mass of complicated carving, rousing wonder more than admiration after examination of the finer work of Italy—while its boldness of conception is well set off by its being flanked by a representation of the equally well-known, and more justly praised, door to the Council Chamber of the Hotel de Ville at Audenarde, made by Paul Van der Schelden, in 1534, with its many deeply recessed and elaborately carved panels—shown to better advantage here than in the Council Chamber itself.

Last of all, forming the exit from the Museum, is the Rood Loft from the Church of St. John, at Bois-le-Duc, dated 1625—a magnificently bold conception in dark colored marbles, but with the many figures in the niches and the carving of the friezes done in white. Seen here, in a suitable position, its full nobility can be understood. Belgium is full of such things—screens and altars—but they are there in churches of the Gothic period; they are incongruous and out of place, and it is impossible to appreciate them properly. If they could all be purchased as this was, even at so high a price as £900, and placed amidst suitable surroundings in new Renaissance churches or in great museums, they would be seen to better advantage themselves, and it would be better also for the churches which they now disfigure.

The German Renaissance is not well represented. There is nothing, not even the cast of a single figure, from Heidelberg, nor is there any representation of the quaint painted houses to be seen in so many of the larger German towns. In fact, most of the German examples of this period in South Kensington Museum are in the collection of iron work, which is so good and so large as to demand an article entirely to itself to do it even most scanty justice. There is, however, one cast—that of the Medusa Fountain in the courtyard of the Old Palace at Munich, which is admirable as showing the life-like pose and delicacy of treatment which generally characterises the sculpture of Renaissance times in Germany, and particularly in Bavaria, making it a meet subsidiary to beautiful architectural works.

G. A. T. Middleton.

THE SANITATION OF DWELLINGS IN ENGLAND.

Preliminary Chapter on Site and General Sanitary Conditions of the House.

SANITARY science is the determination of the architectural conditions favorable to health, and in this respect differs from hygiene, which determines the food, dress and exercise, etc., desirable in order to keep the body in a healthy condition.

Now it is not intended here to go deeply into the question of selecting a site for a building for the simple reason that other and larger works have already touched on this point; but a word or two on soil and aspect may be advisable. In examining a site for a proposed house, visit it under circumstances when damp will be most likely to be there, that is to say in the evening or during a fall of temperature when what are called radiation fogs are about. Soils are roughly divided into two kinds, viz., impervious and pervious. Of the former, stiff clay soils are bad from a sanitary point of view, because damp and water accumulate, and make the air cold. When it is necessary to build a house on a clay soil, therefore, greater care should be taken in its construction, viz., by building dry areas to the walls, by the more careful application of damp courses, by the sloping of the ground from the houses, by making sure of obtaining the greatest possible amount of sun into the living rooms, and by the proper heating and ventilating of the house generally.

Of the latter class, viz., pervious soils, may be reckoned chalk, sand and gravel, all of which are warmer and drier, and therefore preferable, as the water does not accumulate, but passes quickly away.

As regards the general position of a house, hollows should be avoided, as here water accumulates, and there is a general inclination to dampness. For the same reason the bottom of a hill is bad, and special precautions must be taken to prevent the entry of damp into the house, when it is necessary to build a house in such a position.

The position of chimneys also in external walls is a point which should be well considered; they should not, if possible, face those points of the compass whence come cold and dampness.

Dry air and equable temperature are points necessary to be observed in the construction of a building, and for this reason, water tight roofs and non-porous walls are necessary, as well as the effective exclusion of ground water. Damp air is bad because it reduces the temperature, favors decomposition of organic matters and the growth of disease germs.

Water-tight roofs are also absolutely necessary to the proper sanitary condition of a building, these depending on the quality and pitch of roofing materials, and the security of their joints and connections.

Non-porous walls depend on the quality of bricks, mortar and their thickness. To test the porosity of bricks, weigh them when dry and after soaking in water, and compare the differences. The following is a list of different materials with their absorption per cent. of their weight.

Granite	½ to 1	per cent. of its weight.
Malm bricks	20 to 22	" " "
Gray stocks	10	" " "
Hard stocks	7½	" " "
Blue Staffordshire	6	" " "
Good sandstones	8 to 10	" " "
Portland stone	14	" " "
Bath stone	17	" " "
Kentish rag	1½	" " "

An ordinary hard stock only absorbs about 1-10th of its weight. A brick backing should be placed to a stone-faced wall, as it prevents the entry of water by capillary attraction.

Damp ascends the building by two ways, either through the walls or by the action of the ground water; now, as will be pointed out, the vertical action may be prevented by means of a horizontal damp cause, whereas the lateral action may be prevented by means of what is known as a dry area placed outside the wall and well ventilated.

The action of the ground water is met by a bed of concrete being placed over the whole surface of the site. Moreover the level of the ground water should be ascertained, and if within six feet of surface of the ground it should be specially drained away from the site.

Equable temperature is most important in a really healthful dwelling, and this is brought about by a proper construction of roof or walls; with a due regard to insulation, which is the important factor, and in which respect wood is particularly good, whereas metals are bad.

Taking the rate of conductivity of wood as equal to 1, we have: Wood equals 1; plaster equals 3; brick equals 4; glass equals 5; freestone equals 10; slate equals 14; marble equals 18; lead equals 80; zinc equals 140; iron equals 150; copper equals 300.

Anti-pyœmian conditions are to be obtained by non-absorbent walls, ceilings and floors, and although much attention has been given to this subject of late, one cannot be too particular. A wall finished in Keen's cement and distempered is as non-absorbent as it is possible to conceive, and therefore absolutely healthy. Wall papers are bad because they are absorbent, and the paste employed to stick them to the wall necessarily decomposes.

Floors are rendered satisfactory by the use of parquet or close laid boarding or blocks paraffined or waxed.

Basements should be avoided wherever possible, as they are in general very unhealthy and liable to be damp however carefully planned. Where there is not sufficient room on the ground floor, the wine cellar and coal cellar may be placed in a basement where also the heating apparatus should be fitted up.

Attics.—Those with sloping ceilings are bad from a sanitary point of view, as they are extremely cold in winter and sultry in summer; care must be taken, therefore, to keep an air space between the inner and outer covering so as to counteract their defects.

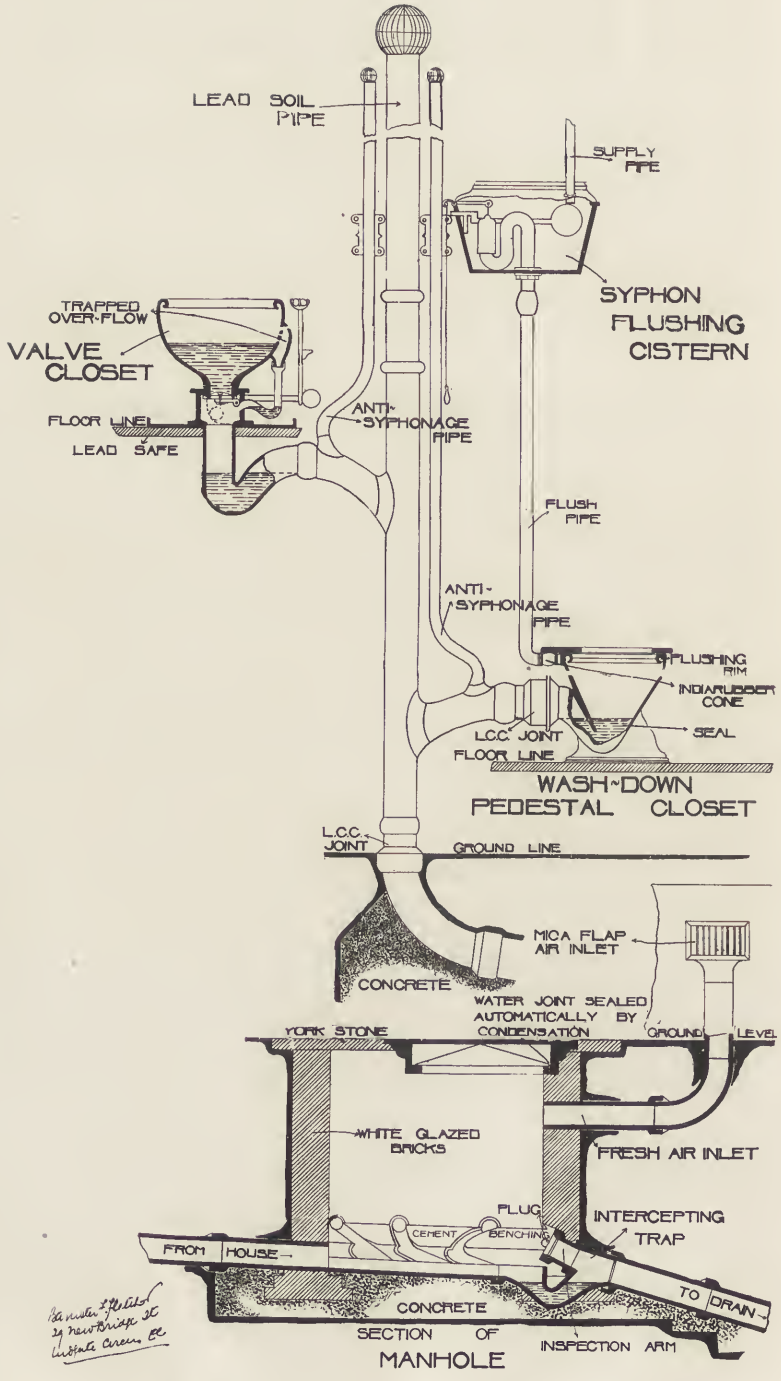
Trees.—Before closing this chapter one other point occurs, and that is the question of trees. Trees may be, and are, very useful as a means of sheltering the house on the more exposed parts, for instance on the north and northeast sides, but if placed too near a house they may be a nuisance, as the dead leaves will block up the gutters and the tree itself will shut out light and air from the house. A good plan is then that a tree should not be nearer to the house than its own height.

Drainage.

Introductory.—Of all the subjects connected with building there is no one which has received, and rightly more attention of late years than the sanitary condition of the houses in which we live. No one nowadays, at least with respect for his life, ever takes a house without a report from a competent architect as to the condition of the drains, and the general condition of the house in respect to dampness, etc., and its general sanitary condition. It behooves us therefore to be more than usually careful and precise in dealing with this subject. We have prepared a special plate of sketches showing the proper method of treating the various appliances of drainage, which will be found in this article.

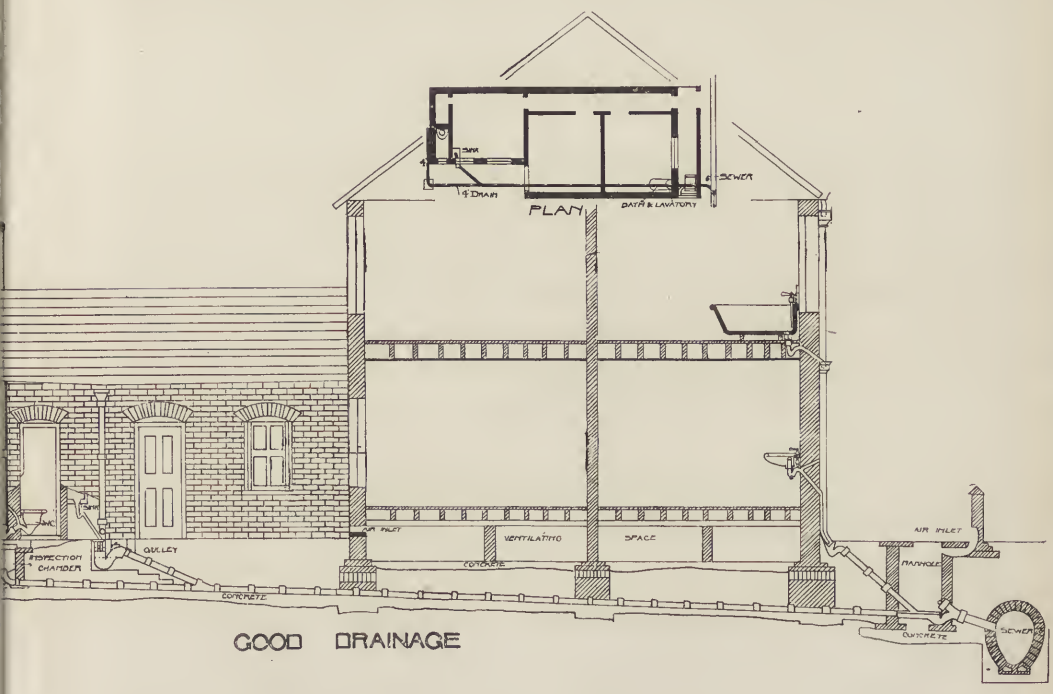
Drainage.—The underground drains should be constructed of glazed stoneware, the pipes should be truly laid and securely jointed, and should have a fall of at least 3 inches in 10 feet. Probably the best form of joints is that known as Stanford's, which is made by Messrs. Doulton; it is comprised of a durable material, consisting of coal tar, sulphur and ground pottery. The composition is laid on the spigot end of one pipe, and in the flange of the next, and being made of a convex form when pushed home makes a perfectly water tight joint. More usually and perhaps as effectually a plain cement joint is made. It is scarcely necessary to mention that such a thing as a clay joint should not be permitted.

Size of Drains.—Not less than 6 inches is laid down as necessary for a drainage taking a discharge for a water-closet, and four inches


LEAD SOIL PIPE
SUPPLY PIPE
SYPHON FLUSHING CISTERN
TRAPPED OVER-FLOW
VALVE CLOSET
FLOOR LINE
LEAD SAFE
ANTI-SYPHONAGE PIPE
FLUSH PIPE
ANTI-SYPHONAGE PIPE
FLUSHING RIM
INDIARUBBER CONE
SEAL
L.C.C. JOINT
FLOOR LINE
WASH-DOWN PEDESTAL CLOSET
L.C.C. JOINT
GROUND LINE
MICA FLAP AIR INLET
CONCRETE
WATER JOINT SEALED AUTOMATICALLY BY CONDENSATION
YORK STONE
GROUND LEVEL
WHITE GLAZED BRICKS
FRESH AIR INLET
FLUG
CEMENT
BENCHING
INTERCEPTING TRAP
FROM HOUSE
TO DRAIN
CONCRETE
SECTION OF MANHOLE
INSPECTION ARM

is considered sufficient for rain water drains and for taking the wastes from baths, sinks, lavatories, etc.

All drains should be easy to get at, as straight as possible and should be well ventilated by air pipes, with proper air inlets, and in all cases be taken up outside the house. The fall of drains should not be less than 3 inches in 10 feet. It is advisable that, with few exceptions, the pipes should be laid on a bed of concrete formed to the required fall, care being taken that the whole of the pipe should rest on the concrete, and not only the flanges which is liable to cause fracture. If by any chance a soil drain has to be taken under a house it should be entirely cased in concrete so as to prevent any possibility



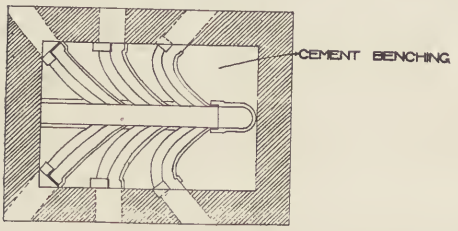
GOOD DRAINAGE

of the escape of bad air. While on the subject of drainage it may be mentioned that there is some diversity of opinion as to whether or no iron pipes should be used. Some engineers have expressed their opinion that they were as durable as stoneware, when treated with special solutions, but we are strongly in favor of galvanized earthenware, and should recommend its adoption everywhere. On the other hand, iron pipes are preferred by many, especially under houses, as there are fewer joints and less likelihood of leakage.

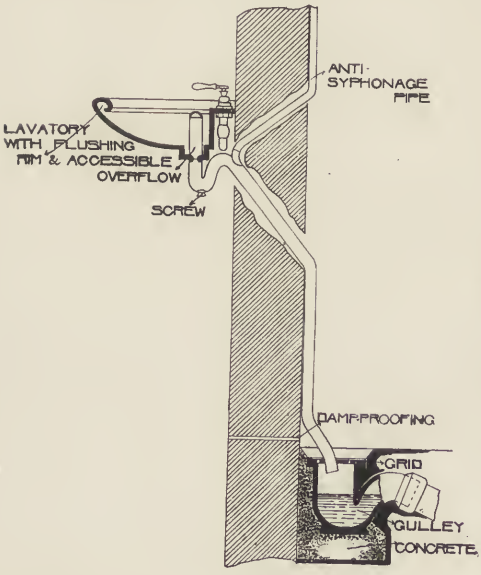
Water-closets must be placed where they can be thoroughly ventilated directly from the external air with top of windows level with ceilings, and if possible they should be shut off from the house by a well ventilated ante-room to prevent communication with other parts

of the house. In some house plans it will be noticed that the lavatory take the place of the passage recommended above.

Soil Pipes.—Soil pipes are usually made of 8 lb. lead, and 4 inch in diameter, though some consider 3 inches sufficient. They, as well as ventilating pipes from drains, should be carried up above the roof and terminate sufficiently high to be clear of all windows. All the house drains must be entirely cut off from the sewer (or cesspool where there is no other system of sewage), and a through current of air be taken through the drains. This is done by means of an "inspection chamber" or manhole in which the pipes and junctions are continued through in special half section pipes to the syphon trap which is placed on the side nearest the sewer. This inspection chamber should be built in white glazed bricks in cement and should have an inlet of fresh air through a 4-inch galvanized iron pipe fitted with a mica flap, the outlet air shaft at the head of the drain, which is often the soil pipe carried up, may be fitted with an extractor, but many architects prefer to keep it quite open at the top or just fitted with an ordinary woven iron wire cover.



PLAN OF MANHOLE



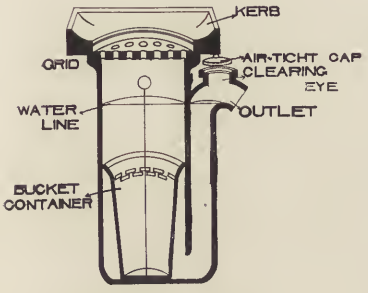
LAVATORY WASTE

Rain Water Pipes.—Rain water pipes should not be allowed to act as ventilators, but should discharge over an open gully at the foot of down pipe. The inspection chamber should be fitted with a patent wrought iron air-tight frame and cover.

Lavatory Wastes, etc.—Waste from baths, lavatories, etc., should discharge over an open trapped gully so as to effectually cut off all connection with the soil drains. If from baths on the first floor these wastes should discharge into an open head.

Kitchen Sinks.—Wastes from kitchen and scullery sinks should be taken into a grease trap, so as to intercept the rush of grease to the

drains, where it might help to form an obstruction. There are numerous forms of combined grease and gulley traps, the object being to give time for the grease to cool and form a cake there upon the surface which can be lifted out. One form is designed in connection with an automatic syphon flushing tank, by which the grease, when congealed, is broken up in the strong current of water and driven in a solid state through the drain; but I cannot impress too strongly on the reader the fact that a grease trap is worse than useless unless periodically cleaned out, and that the mistress herself must in many cases see that this is done.



GREASE TRAP

Flushing Tank.—House drains, even if they have sufficient fall, should be supplied with a flushing tank provided with clean water at the highest point of the drain. Another method is to plan the house so that the bath is at the head of the drainage system; this, especially when the English system of cold morning baths by several members of the family is indulged in, is a capital way of cleansing the drains and keeping them in good condition.

Water Supply.—This is a most important point in the construction of a house, and one that cannot receive too much attention. Even where a constant supply is obtained it is better to have a small supply cistern in case the company may at any time shut off the supply for repairs, etc. Water for drinking, and in fact any purposes should be stored remote from all places where bad air or noxious gases are likely to occur, and it should therefore be well away from all outlets to ventilating pipes, soil pipes, wastes or drains. Water absorbs air just as a sponge does water, and when any impure air is near the water will soon be impregnated with it. You have only to place a pail of water in a newly painted room to obtain a good proof of this. A small room should therefore be provided, and should be well lighted and ventilated, and the cistern should not, as is frequently the case, be allowed to be put in any odd dark corner in the roof where it cannot be got at to be thoroughly cleaned at frequent intervals. All water used for sanitary purposes should be effectively cut off from the cistern; this is commonly done by taking the supply to each water-closet through a water waste preventer.

The best material for cisterns is galvanized iron, and a cistern should have a lead safe under it with outlet for same, so that in case of overflow the ceiling of the floor below would not be damaged. A stop-cock should be placed in the supply pipe from the cistern

(and close to it) to enable the water to be shut off and minimize the damage in case of a burst or broken pipe.

Amount of Water to be Allowed per Person.—In ordinary families in the country the usual consumption for all household purposes is from 18 to 25 gallons per head a day, but the amount is regulated by various circumstances, as the number of baths, etc., used. In or near London, where a constant supply can be obtained only a supply cistern is necessary as mentioned above, but in the country a cistern sufficiently large for the day's consumption must be provided.

Rain Water.—The rain-water in town houses and houses near London is generally run into the drains, and assists in cleansing them, but it is a good thing to have a fair-sized rain-water cistern, taking the water from part of the house, as rain or soft water is preferred by some for washing purposes, and a supply pipe may be led from this cistern to the housemaid's sink.

Slop Sinks.—These should be provided, as well as housemaid's sinks, and should be of such a form as to provide no place of lodgment in any part which would cause it to become unwholesome. The slop sink should have a lead 3 inch waste pipe from it, and a lead trap thereunder, with a brass screw plug in the underside for easy examination, if by any chance it gets stopped. These sinks are usually made in cast iron enamelled over on the inside with white porcelain enamel. The housemaid's sink, which is generally placed over the slop sink, may be in white enamelled iron, or it may be made of a wooden framing and lined with lead; in the latter case 8 lb., or better still, 10 lb. lead should be used, as the initial cost is not much more, and the endurance is much greater.

COMBINATION PANTRY SINK

Before passing on it may be as well to mention that in the opinion of many sanitarians a slop sink is superfluous, and especially when the housemaid's sink is near the water-closet, which is generally the case. In this case, and when the water-closet apparatus is of the ordinary syphon or wash-down kind (see illustration), all wooden casings, which only harbor dust and favor disease are done away with, and the wooden seat is simply hinged at the back, so that the closet can be used as a slop sink and urinal as well.

It is a great thing to have as few appliances to get out of order as possible, and on this point only, it seems desirable if possible to do without the slop sink.

Baths.—Baths are made of various materials, and the usual method of finishing is by placing a wooden enclosure around the bath, and

thus providing a dark place for the harboring of dust and vermin. My advice is here the same as in regard to water closets, and that is to do away with these objectionable "casings" and let your bath be open all round, so that there may be no lodgment for dirt.

Of course the old baths which were made to be cased round do not look well when they are used without the casing, but baths of a fairly good design and perfectly presentable are now made by the best makers in either enamelled iron or porcelain. These latter are clean and durable, their only objection, which is a slight one, is that they are somewhat heavy; marble baths are also used.

Bath Fittings.—There is such a variety of bath valves and bath cocks that it will not be worth while to examine the merits of each. Let it suffice to say that valves of whatever description are always easier to open and shut than screw down cocks. The screw down and diaphragm taps take so many turns of the handle to open or shut, the water during this screwing is so obstructed that they are never likely to be extensively used. The quarter turn roundway valve gives a quicker water way and has this additional advantage that it opens and shuts at a quarter turn of the circle. The waste pipe and valve should not be less than 1½ inches. The service and waste pipes with their valves should always be considered so as to provide for a quick supply and discharge. The service water should never be brought into the bath through the waste pipe or the dregs of the previous bath will get washed back again. According to the Metropolis Water Act the supply pipes must come into the bath above the water line, but this is too high for the hot water service, and when a hot bath is needed the room would be filled with steam. Every bath should be fitted with an overflow pipe near the top which should discharge in the open and be fitted with a hinged flap.

The hot water inlet to the bath should therefore be a few inches above the bottom.

Bath Safes.—They are necessary in a properly constructed bath-room, and should be constructed of 6 lb. lead and turned up 2½ inches at edges, and should be sloped so as to cause the water to flow towards the outlet. But a better plan, especially when no casings are used for the bath as I have advised, is to have the floor of the part of the bathroom (or the whole may be done) laid with tiles in cement on concrete and give a fall of the floor towards a point in the outer wall when by means of a pipe with a flap on its outer extremity, any surplus water or overflow may be led into the open head which also receives the waste water. A cement skirting 6 inches high should be placed round the room.

It is advisable to put a fireplace wherever possible in a bathroom for ventilating purposes, and by using a special ventilating flue pipe, such as is made by Messrs. Doulton, the hot air and steam can be

withdrawn at the ceiling level, and so keep the bathroom in a healthy condition.

Lavatories.—These may be fitted up in a variety of ways from the simple plug basin upwards, but in all alike it should be remembered that the overflow pipes should be large enough to take away the water should the service pipe be left open, also that all the waste pipes from all lavatories should be trapped with a patent cast lead anti-D trap with a cleansing cap and screw at bottom. Waste pipes are usually 1½ inches diameter. "Tip up" lavatories are much used and are preferred by many, they have the advantage of emptying the basin quickly, but care should be taken that the receiver into which the dirty water is thrown is cleaned periodically as the smell from soap suds is most unpleasant and unsanitary. The suddenness of the discharge into the waste pipe is likely to unsyphon the trap, unless the special anti-D form is used, which has been designed to resist this action, when however two or more of these traps are fixed on one stack of soil pipe or waste pipe, their branches should be ventilated to avoid syphonage. The waste pipe should always be made to discharge into an open head or open gulley.

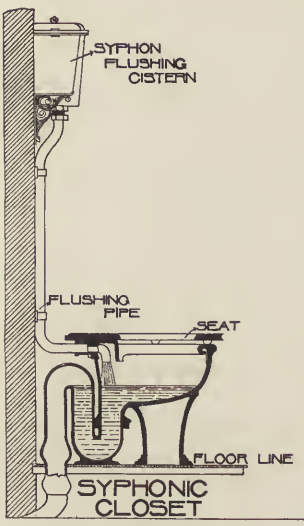
In several cases I have fitted up lavatories in the principal bedrooms and dressing rooms, and there is no doubt that much labor is saved to the servants by so doing, as well as the convenience of always having a supply of hot or cold water ready for use. There is no doubt that in these days there is a great tendency to save unnecessary trouble and labor in all classes, and it is possible that the introduction of the lavatory into the best bedrooms will soon be looked on as a necessity.

Urinals.—Urinals may be looked upon as not necessary in a private house. The syphon closet with lift-up hinged seat which should be placed in the ground floor water closet answers the purpose of a urinal. These hinged seats are also advisable where no slop sinks are provided.

Water Closet Apparatus.— These may be roughly divided into two sorts, for thanks to the progress of sanitary science the old pan closet with its pestilential D trap is, we hope, a thing of the past. The first is the "valve closet" and this sort, if of the very best manufacture, is undoubtedly the best. A valve closet, however, is expensive, and it is clear, therefore, it cannot be used in many places on account of the cost; it is generally used in the better class of house. This form is practically a double trap, the upper body of water being retained by a flap either ground to its seat or else fitted with India rubber, which makes it water-tight, the lower trap being simply an S trap.

The second kind is what is known as the wash-down closet; these are made by various makers under different names. In this class

the wooden casings which are so objectionable and so unsanitary can be entirely cleared away and the china basin itself exposed to view. It consists simply of a basin at the bottom of which is a syphon trap all formed in one piece. In some of these the lead soil pipe is joined at the floor level with the glazed earthenware apparatus, but though great care may be taken by performing the joint in tow and red lead, it is a difficult thing to make a good joint between metal and earthenware, and a better plan is to have the trap made of stout lead, which enables a thoroughly sound joint to be made with the soil pipe, the joint between metal and earthenware being above the trap, and therefore the danger of sewer gas entering the house can be entirely done away with. The trap in every case should be ventilated by a special pipe taken above the roof; this pipe also prevents the unsealing of the water trap, which is likely to occur when two closets, one above the other, discharge into the same soil pipe. (That form of closet known as the washout is bad in principle, and in many respects as bad as the old pan closet, and should not be used.)



SYPHONIC CLOSET

Water Supply to Closets.—The best method is undoubtedly what is known as a "Water Waste Preventor" placed at the ceiling level in the water closet, and which, when pulled, discharges a two or three gallon flush as the case may be. A supply pipe, which should not be less than $1\frac{1}{4}$ inches, is led from this cistern to the flushing rim of the pan. An overflow pipe should be taken from these cisterns to discharge through the wall in the open, and this overflow should be at least twice the size of the service.

Heating, Lighting and Ventilation.

We propose offering a few remarks on the above subjects in so far as they refer to the subject in hand. The fuller details as to the subject generally about which whole volumes have been written, we must refer to work specially bearing on these subjects.

Heating Fireplaces.—In a climate like ours, it goes without saying that to properly warm our houses in the most efficient way, without being injurious to health, is one of the most important problems which we have to solve. We all know that the old-fashioned fireplaces, while being the most wasteful, are at the same time the most cheerful means of heating our rooms, and this being so, we must en-

deavor to keep the open fireplace, while at the same time mitigating the evils for which they were noted. These are:

1. Waste of fuel and loss of heat.

2. Excessive production of soot and smoke.

3. Large addition to ash-pit refuse by cinders which are really unburnt, and therefore waste fuel.

One of the great drawbacks is undoubtedly the large supply of air which was necessary in order to keep the fire going, and which is the great cause of draughts in rooms, without which the fire has a tendency to smoke. There are two ways of diminishing this tendency to draughts and great waste of fuel. One is the introduction of fresh air direct to the fire by air-ducts from without, and the other by the adoption of what are known as slow-combustion methods, and the adoption of a form of grate which shall thoroughly burn the coal, cinders and all, and not leave these to be thrown away, which is a most wasteful method. Mr. Pridgin Teale, F. R. S., was the first in later years to draw public attention to the extravagant waste of the ordinary open fireplace, and to propose in its stead a fireplace constructed on scientific principles. The special features of these fireplaces may be enumerated as follows: 1. As little iron as possible is used in their construction, iron being a conductor of heat. 2. Fire lump back and sides to fire. 3. The sides set at an angle of 60°. 4. The upper part of the back projecting over the fire 1½ inches, and from there leaning over the fire at an angle of 70°. 5. The fire of considerable depth from front to back. 6. The openings in the bottom grating of the fire not more than ¼ inch wide, to prevent any ashes passing out of the fire unconsumed. 7. The front bars vertical, made of steel ¼ inch thick and ¾ inch apart, so as not to obstruct the radiated heat, and to prevent the coal falling on the hearth. 8. A plate below the bars called the "economizer" to prevent the air entering the fire below the bars with ash pan to catch the dust, and, finally, 9, a narrow opening into the chimney, which, while ample for the escape of smoke and ventilation, yet prevents any unnecessary escape of heated air from the room and so keeps the room much warmer. This narrow opening to the chimney also tends to prevent smoky chimneys.

The advantages claimed are saving of coal, dust, and labor, increase of warmth, little need of attention (with the aid of a damper the fire being kept alight for about 10 hours), reduction of soot and smoke.

It is claimed that a fire 13 inches wide will heat a room containing 2,000 cubic feet, 15 inches wide will heat a room containing 3,000 cubic feet, 17 inches wide will heat a room containing 4,000 cubic feet.

We well remember attending the lecture by Mr. Pridgin Teale at

the Architectural Association when he advocated this system when he produced some coal which had been burnt at the Leeds Infirmary, which was reduced to a fine powder, thus showing the absolute combustion which takes place. It was claimed that the saving in coal at that institution was reduced nearly one half by the use of these grates.

So much for the improved method of treating the open fireplace which from the cheerfulness it always possesses must commend itself to us in, at any rate, the use of all sitting rooms in preference to hot water and hot air generated from a furnace.

Hot Water Heating is useful and most necessary for the passages and halls of larger houses, and is most important for the prevention of draught from doors, etc. It is also necessary that the passage should be thoroughly and efficiently warmed, and perhaps this is best done by hot water pipes and coils heated from a central position in the basement. That known as the high pressure system is one of the methods adapted for the ordinary house, and consists of a closed system of small pipes built with a furnace, the pipe being continued from the upper part of the coil and passes round the building proposed to be warmed, forming a continuous circuit when again joined at the bottom of the coil. A large pipe called the expansion pipe about 2½ inches diameter is placed at the highest point of the apparatus, and from which the cistern is filled with water, the cistern being afterwards hermetically sealed. This expansion pipe is calculated to hold 1-12th as much water as the whole of the system, this being necessary in order to allow for the expansion that takes place in the volume of the water when heated, and which, otherwise, would inevitably burst the pipes, however strong they may be; water possessing but a small degree of elasticity. The advantages of the high pressure system are:

(1). That the pipes do not require filling, and water practically lasts for an unlimited period.

(2). The water is very easily raised to a high temperature.

(3). Small pipes less unsightly than large pipes.

(4). Cheaper in first cost, but more expensive in maintenance.

The disadvantages are:

(1). The high temperature of pipe and the consequent liability, without precaution, of setting fire to buildings and the scorching of dust which settles on the pipes.

(2). Possibility of explosion (which of course with proper treatment is reduced to a mimimum).

(3). Temperature, although quickly raised, as quickly falls unless attention is paid to the heating apparatus.

The Low Pressure or Open System is an open system of large pipes, generally 1, 2, 3 or 4 inches in diameter, placed in a continuous

circuit and warmed by a saddle back boiler. From the upper part is taken an open expansion pipe. The low pressure system may be fitted up in connection with the kitchen boiler, and thus the heat of the kitchen fire utilized for heating the house, as well as supplying hot water for domestic purposes.

The advantages of this system are:

(1). Cheaper in maintenance.

(2). Retains heat for a longer period.

The disadvantages are:

(1). Unsightliness of large pipes.

(2). Difficulty of application to complicated buildings.

(3). The heat requires a longer time to generate.

Steam, at high or low pressure, is also used for heating purposes, but not in general for the class of house we are referring to in England, but it is largely used in the United States, where great care has been expended on the appliances necessary for its production and circulation.

The hot air system consists in having a stove in a chamber in the basement, to which fresh air is admitted and warmed and passed by ducts or hot air pipes direct to the rooms themselves. It has often been attempted to heat the house entirely by this method, placing inlets and outlets in each room and thus avoiding fireplaces entirely, but it has not been found an acceptable method for heating a house. If it is adopted for heating the halls and passages care should be taken that cellar or ground air is not distributed throughout the house, but the air to be heated should be taken 6 feet from the ground by specially constructed air ducts from opposite sides of the house. The air chamber itself should be quite impervious to ground air and provided with a smooth cement floor and walls. An evaporating pan should be kept full of water in order to keep the air sufficiently moist and an air filter should be in use where the air is liable to be charged with impurities as in London or large towns. In my opinion, already expressed, none of these systems should supersede the open fire for sitting-rooms, but it should be used for warming the house generally in conjunction with the open fireplace.

Gas fires are often used, and in the case of bedrooms or in rooms likely to be used for a short time only they have been found useful. They should of course always have a flue, as in a coal fire, to take off the fumes of combustion, as these are most injurious to health. In addition a tray of water which need not necessarily be of an ugly description should be placed in front of the fire in order to keep the air of the room sufficiently moist.

The matter of gas cooking it is hardly our province to touch upon, but if gas is burnt in properly constructed ranges in which the

air can get to the articles to be roasted, there is no doubt it is equally efficacious as an open fire, and when we remember that you have your fire at once by turning on a tap, without smoke or soot or a large amount of coal wasted, and that you can as easily turn if off there is a great deal to be said for it on economic grounds.

Ventilation.—The object of ventilation is, shortly, to remove the foul air in a room or building and to provide fresh air to take its place.

The principles to be remembered are:

(1). That air when heated expands and rises.

(2). That fresh air is lighter than foul air of the same temperature.

(3). That warm air is lighter than cold air of the same density.

Ventilation may be divided into natural and artificial. The latter being further subdivided into plenum and vacuum. In general the fireplace is the ventilating agent by which our rooms are kept habitable. Artificial ventilation is costly and difficult to manage, and is always liable to get out of order, and is not used for the class of buildings about which we are writing. For their purpose we must provide inlets which should be placed near the warmest parts of the room, and not on an outside wall (which is usually made use of), and thus the incoming cold air will tend to equalize the temperature of the room. The inlet should be placed about the levels of the heads of the occupant so as not to cause draughts, i. e., about 6 feet high. The form of inlet, so long known as a Tobin's Tube, is an admirable plan for the admission of air, and by means of a butterfly valve is under the control of the occupant. In very cold weather, in order to avoid cooling the room too much, half the fresh air admitted should be warmed up to 60°. The outlet for the foul air is in the majority of dwelling-rooms the fireplace, but special flues are sometimes built with extracts at the ceiling level. We have used with success for this purpose the combined flue pipe and ventilating pipe, made by Messrs. Doulton, in which by the side of the flue pipe, but distinct from it is the space for carrying off the vitiated air which is of course helped in its upward tendency by the heat of the chimney connected with it. A jet of gas kept burning at the top end of the vent pipe will also help to keep a continuous motion up the pipe. The subject of ventilation is so vast and so many complications are likely to arise that of course we do not pretend to deal with it in this small space, but the above hints may be found useful.

Lighting.—Either oil, gas or electricity is used. Gas, as is well known, vitiates the air of the apartment and renders it unfit for occupation unless the room is properly supplied with outlets, and in dealing with these we must remember that one jet of gas vitiates as much air as two grown-up men, and ventilation must be allowed for accordingly. In a small-sized room, the well-known central gasalier

is, we think, a mistake as it apparently decreases the size of the room, and is not in that position to my mind in harmony with the adjuncts of a small room. If gas is used a couple of brackets on the chimney piece is a better position, but personally for sitting-rooms, at any rate, we are not in favor of gas as an illuminant because of the unhealthy atmosphere it creates. It has also a destructive effect on pictures, wall paper and ceiling alike, and for the centre of the table at dinner or for reading a well shaded and well trimmed oil lamp is much to be preferred, and preferably one of the Defries' pattern, which are what is known as safety lamps, and which go out if by any means they are knocked over.

Nothing could be better than the electric light, and it is no doubt coming to the front at last, and is to be had even now in many of the suburbs of London, and we may look forward to its general use in the near future when it will be as natural to lay it on to a house as it is now with gas. In the meantime our advice is use oil in preference to gas for your sitting-rooms.

In drawing our necessarily brief and condensed notes to a conclusion, we may remind our readers that we have touched upon the three main points of sanitation in connection with the house, the site, the drainage, and the heating, lighting and ventilation. In the two former articles of this series upon the smaller houses of our provinces and suburbs, we treated in No. 1 of plan and design, in No. 2 of construction, while in a future article No. 4 we shall deal with interiors and decoration, giving special photographic illustrations of the best modern work.

Banister F. Fletcher.

Examples of Recent Architecture

McCORMICK BUILDING.
130 Michigan Avenue, Chicago, Ill. Louis H. Sullivan, Architect.

DRY GOODS STORE.

State and Madison Streets, Chicago, Ill. Louis H. Sullivan, Architect.

OFFICES OF MESSRS. ISMAY, IMRIE & CO.
Liverpool, Eng. Messrs. R. Norman Shaw, R. A. and J. Francis Doyle, Architects.
(From "The Architect," London.)

THE NEW OPERA COMIQUE.

Paris, France. M. Bernier, Architect.

(From "The Builder," London.)

HAYDEN HALL LODGE.

Pinner, England.

Ernest George & Yeates, Architects.

(From "The Architect," London.)

NEW OFFICE BUILDING.

84 Broadway, and 3 and 5 Wall St., New York City. W. Wheeler Smith, Architect.

Newport, R. I. "CROSS WAYS." Dudley Newton, Architect.

HALL IN "CROSS WAYS."

LIBRARY IN "CROSS WAYS."

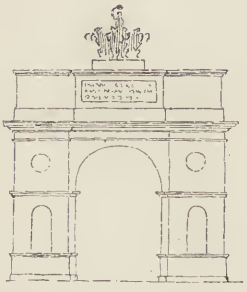
DRAWING ROOM IN "CROSS WAYS."

XI.

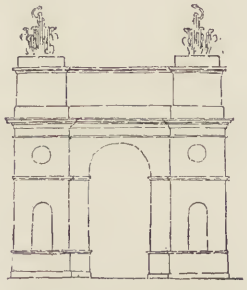
Theoretical Basis.

IT may seem to some that in the foregoing pages an undue stress has been placed upon the number three. Our insistence upon it has not been a reminiscence of the superstitious reverence that has in the past attached to the number, but is based upon certain qualities therein inherent and easily explicable.

As used in composition, the only mystical property assignable to the sacred number is the fact that two and one are three. That is to say, that, by a slight difference in accentuation of parts, a single group becomes a double one, and a double becomes a triple; it is in the power of the designer to pass from one to the other often without destroying, or even injuring the design for practical use or in constructive facility.



235. A single arched opening. The niches in the piers count merely as details in their treatment.



236. By an increase in relative size the piers count as the elements of a double group; the arch is reduced to a link between them. The arch should be still smaller than here shown, for due subordination.

237. The niches in the piers are here increased until they count as members in a triple group of arches

At 235 we have the outline of the ordinary triumphal arch. It is clearly a single arch; the abutments, although there are two of them, are quite subordinate, nothing more than the support of it. But, should we need to change the scheme, we may, at any moment, shrink the arch, and magnify the abutment masses into a group of two—towers, or something of the sort—with a moderate gateway to connect them. The sides have become the leading motive; the central part subordinate, 236.

Or we may do still a different thing by increasing the side parts, leaving the central undiminished, 237, the niches growing into

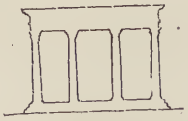
archways, comparable, though not equal, to the central, the whole constituting a triple group of arches.

In the desire to maintain the identity of the object through the different variations, regard for the proportions of the parts has been relaxed, leaving the sketches rather crude, but sufficient to illustrate the point in question.

These transformations shed light upon the just-mentioned mystical property of the number three. Every architectural object consists of a central part and two sides, the central usually a void, the lateral solids. Architecture is, indeed, in its essence, the surrounding or limiting of voids with solids. The building itself is a part of space, surrounded by walls and topped by a roof; while the most important architectural objects are the holes made in the walls—windows, or doors, or intercolumniations—each of which is a void flanked by pier or column and topped by lintel or architrave.

Thus it is that three leading parts, one centre and two sides, become a definite category of architectural thought, to which the mind intuitively reverts, even though the central object cease to be a void and become a mass, or the laterals cease to be solids and become openings; and even though the sides, in the case of double grouping, become more important than the central part.

So again a group of three intercolumniations, as at 238, by the shifting of the intermediate columns toward the sides, becomes a single opening between coupled columns, 239; shifting them toward the centre gives double openings with a double column in the middle and single at the sides, 240, not a very satisfactory arrangement, certainly, but perhaps as much so as that with three single columns, 241. But if we double the columns at the sides, as at 242, a perfectly satisfactory result is obtained.



238

238. Triple openings.

239

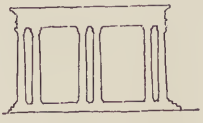
239. The same, with intermediate columns moved so as to leave a single opening.

240

240. The same, with intermediate columns moved toward the centre, leaving double openings.

241

241. The same as 240, with exterior tral column.



242

242. The same as 240, with exterior-coupled columns.

In passing we may glance at 243, a Greek example, in which the designer seems to have hit off precisely the amount of widening that the central opening will bear, with the corresponding reduction of the side openings, without reducing the latter to spaces between coupled columns and with distinct preservation of a sense of three openings.

243. Gate of the Agora at Athens.
The middle opening is widened as much as possible without losing the identity of the lateral as members in a triple group of openings.

Through all the different stages of composition we have it in our power to pass from one accentuation to another, to express the centre and subordinate the sides, to make the sides the most important and to suppress the centre, or finally to give full force to all three, either equally or with the middle predominating.

This seems to be the real reason why three leading masses is the largest number that can be coherently united. This reasoning applies to unsymmetrical groups as well as to symmetrical, for in the former as well as in the latter it is essential that the objects should be nearly the same size and nearly of the same general appearance. The double unequal group at 244 depends for its proper expression upon the approach to equality of the unequal members, as well as upon their general similarity of appearance. This studied difference in size was a favorite device of the mediæval designers to add interest and poetry to their creations. At 245 is a modern instance of the same sort of thing, although upon a much humbler scale. Here the general similarity of each mass—house and barn—is very marked. Each has a hipped roof, of equal pitch, with an appendage similarly attached to each, and with a small dormer upon each. Each

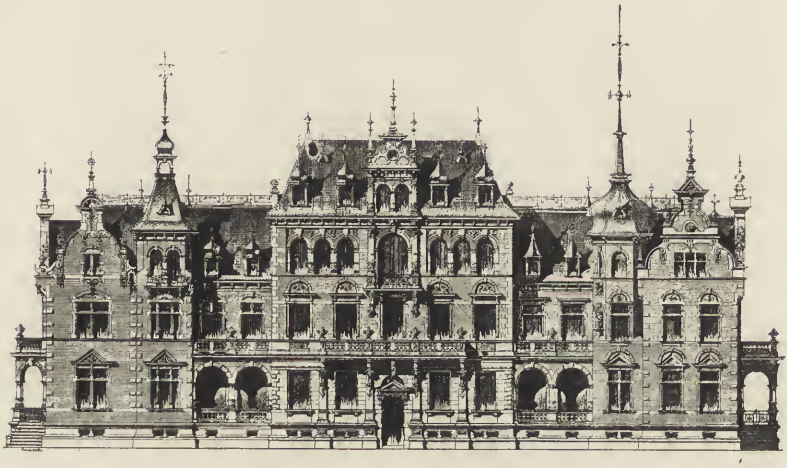
244. St. Jean des Vignes, Soissons.

Group of two unequals. Such a group must have the members approximately equal and nearly similar in treatment. In this case each feature above the upper string-course is repeated and shortened in the smaller tower. The lateral buttresses are so arranged as to give the effect of greater width to the higher tower.

also has a single subordinate mass, with a difference; that upon the house being a round tower, carefully subordinated in height, while that upon the barn is a ventilator on top. This example carries the subordination of the central part to an extreme point, nothing being left of it but a fence, yet from a pictorial point of view the result is quite satisfactory.

An unsymmetrical triple group is shown at 246, where again in spite of the lack of symmetry the sense of centre and sides is very marked. Another example is at 247, although in this the central gable has a subordinate tower grouped with it. The wings are very different from each other, yet the sense of one being on each side is distinct.

245. House and Stable at Bethlehem, Pa.
As in 244, the treatment of both members is very nearly alike.



246. A Double Private House in Heidelberg.
The entire lack of symmetry in the lateral members does not in the least detract from the sense of triplicity in the group.

247. Union Passenger Station at Ogden, Utah.
The sense of triplicity in the grouping of the gables is not diminished by the asymmetry of the terminal gables.

Incidentally, it might be desired that the tower should either be a little smaller and stand on the same plane as the middle gable, and a little closer to it; or else should be much larger, large enough to dominate the whole group, and stand somewhere back, allowing the central gable to be completed.

Such a group as 248, although it exhibits three objects, is not properly a triple group; the unlikeness of the members renders such a conclusion antagonistic to sense. It is a single object of predom-

248. Entrance to the Antwerp Exposition of 1885. Although there are three objects, their dissimilarity in size and shape forbids classing it as a triple group.

inating size, with a subordinate double group, corresponding with a single opening flanked by coupled columns; the spaces between the columns do not count at all as openings, on account of their lesser size and different proportions. Each of these groups passes into another with perfect flexibility in the hands of the designer, and to make such transitions he must always hold himself ready.

XII.

Transformation of Motives.

The classification of a composition depends upon the predominant group, and this is often determined by a very small difference. A very frequent motive for small houses is shown in 249, in which the main body of the house is a single object, the front gable a single subordinate object upon it.

249. Motive for a small house. A single front gable as a subordinate mass.

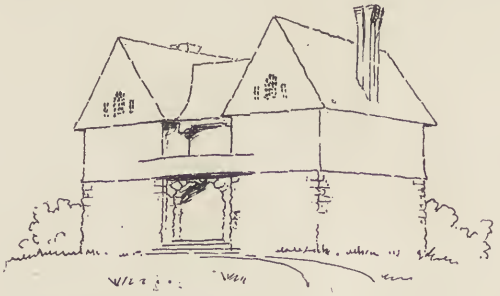
250. Same as 249. Ridge of subordinate gable raised to level of main ridge. A faulty composition.

If the ridge of the latter be raised to the same height as that of the former, 250, we have the elements of a bad composition. There is no telling, as we look at it, which is the leading part. Many carpenters' houses that might otherwise be fairly satisfactory are spoiled by this very fault.

But as soon as the ridge of the front gable overtops that of the house behind, 251, we have a new and excellent group, the front gable becomes the dominant single mass; the rest of the house is reduced to two appendages.

251. Same as 249. Ridge of front gable raised still more, until it has become the principal mass.

So, again, in the case of a double group, as 252. It is necessary for a satisfactory result that the ridge of the link should be lower than those of the two masses. If the need for garret room, or other exigency, require the ridge of the link to be higher than this limit



252. The ridge of the link must be lower than those of the members of the group.

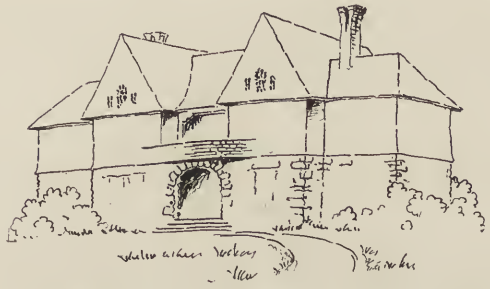
it is hardly permissible to raise it to the same height as those of the members of the group. Under certain circumstances, as where there is sufficient relief of the masses in plan, it may be raised to an equal height; but if the conditions demand a still greater elevation we may raise it higher only by changing the motive, prolonging the building until the ridge of the link becomes the main ridge, 253, and the two gables are reduced to subordinate masses upon it.

Or, if we need added length, without any more height, we may leave the link as it was, and put the additional length in the form of appendages, taking care to keep the ridges of these even lower than that of the link for proper effect, 254.

253. Ridge of link raised above those of members; the latter becoming subordinate masses upon a single main mass.

In each case it is the predominance of the ridges that determines the group, and it is essential that one arrangement or the other should be defined unmistakably as the principal motive of the composition.

In this way the designer who understands, or feels without understanding, the rules of combination by which he must be guided, holds his problem fluent in his hand; adding here, to accommodate



254. Ridge of link not raised. Building extended by appendages, whose ridges are yet lower than that of the link.

any unprovided-for room by an unsymmetrical appendage, or a subordinate mass projecting boldly forward; but always maintaining a proper dominance of the motive which he has adopted, or, if occasion require a change of motive, insisting as clearly upon the new one.

Not for a moment must it be supposed that anything like the inflexible stiffness of the last half-dozen sketches is the ideal of the designer. In elucidating the principles, simplicity of grouping must be the first thought, and stiffness is the inevitable accompaniment.

But in practice it is quite a different matter. As long as the leading motive is explained and not obscured by them, uncatalogued

and uncataloguable variations are not merely permissible, but add grace and charm to what might be without them prosaic and cold.

The house shown at 255, for instance, is, in its leading motive, a single mass, with two unequal gables as subordinate masses. There is, however, another almost symmetrical subordinate group of two turrets, set quite unsymmetrically with reference to the gables.

255. Double unsymmetrical group of gables, with an additional double symmetrical group of turrets.

One of the gables, too, runs down on one side, quite regardless of anything else, yet notwithstanding all these irregularities, the main motive of the two gables is not in the least obscured.

256. The smaller gable, upon the right-hand appendage, suggests a double group in connection with the gable of the principal mass.

In 256 the primary group is the large single gable, with the rest of the house attached on each side as appendages. The addition of the smaller gable, giving in connection with the main gable a faint suggestion of a double unequal group, adds interest to the whole composition.

Another complex group is at 257. It is a group of two unequal masses, differing from each other in elevation and even more in plan. The largest mass is at the left, and it is composed itself of two unequal masses, the gables, also irregular in plan, and a subordinate mass, the octagonal turret. The smaller of the leading masses is a

257. Denby Hall, Bryn Mawr College.

A complex double group; the larger member is itself a double group with a subordinate turret.

simple gable, elaborated by a single gable placed on the return as a subordinate mass. Although so irregular, the group is as articulate and coherent as the most absolutely symmetrical combination could be.

On the other hand, a symmetrical grouping is shown at 258, in which each of two equal masses is combined with a tower as a sub-

258. Another complex double group. Each member has a tower attached as a subordinate mass.

ordinate mass. Incidentally it may be remarked that the slight variation in detail in the disposition of the openings, upon the fronts of both the wings and the attached towers, does not at all detract from the symmetry of the whole composition. Again, at 259, is another compound symmetrical group. The principal mass is a group of two gables and there are two appendages; the more distant scarcely distinguishable, except to permit us to say that it is quite different, in plan as well as in elevation, from the nearer. The latter, the appendage on the left, is compounded with another appendage, marked by a break in the roof line, and by a subordinate

mass, which is a double gable like the principal mass. The roof of the appendage is rather muddled with three detailed gables, all different: it would have been better if the smallest might have been

259. Piggot's Manor, Hertfordshire.
A complex group of single principal mass with two appendages, all parts asymmetrical and compound.

thriee repeated. The distant appendage also seems to have the ridge a little too high, although it is too much obscured by the principal mass to speak positively. The whole is a coherent and pleasing composition.

260. House at Chestnut Hill, Mass.
The main gable and those of the dormers are alike in treatment.

261. House at Chestnut Hill, Mass.
Here again the hipped dormers correspond to the hipped main roof.

In the disposition of details upon the principal and subordinate masses, the most general caution to be observed is that the same general character should mark both the details and the masses. Thus, in 260, the gablets of the dormers repeat the gable of the building; in 261 both mass and dormers are covered with hipped

262. Buchan Hall, Sussex.
The treatment of all the gables of main roof and dormers is as much alike as possible.

roofs. In 262, which, by the way, is another admirable example of a coherent, although unsymmetrical group, all the gables, both of masses and details are treated as nearly alike as the difference in size will permit. Every one is crowned with a small pediment, flanked by two pinnacles, divided horizontally by mouldings and perpendicularly by colonnettes.

263. House at East Orange.
Another example of the happy effect of similar treatment of parts varying in size and importance.

A more simple, and as marked, example is at 263, where the similarity and the excellence of effect thereby produced are conspicuous.

For certain definite purposes, however, precisely the opposite course must be pursued, and treatment must be used, varying according to the circumstances of the case.

At 264 is a composition of a double group, the two large gables, united by a link. To this is added an appendage, the lower wing at the right, and a single subordinate mass,the tower. The dormers upon

264. Passenger Station at Cheyenne, Wyo.
In this case the dormers of the appendage are suppressed as much as possible, to mark it as an appendage.

the link are treated with hipped roofs, and not with gablets, in order to more clearly limit the height of the wall of the link to one story, thereby distinguishing masses from link as perfectly as possible. Upon the appendage, the dormers are kept low, flat and inconspicuous, to aid in asserting the subordination of this part of the building.

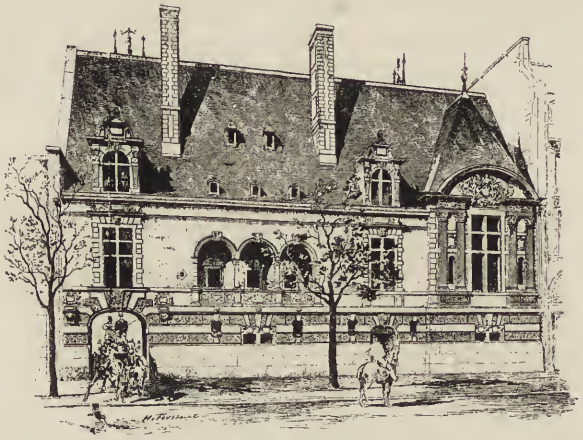
Sometimes, too, details are grouped upon the background which the building itself affords, very much as if they were an independent composition. In this case, again, they must be of such a character as will make clear the grouping that is intended.

Such a treatment is at 265, the datum given being an unmanageable second story projecting through a gambrel roof, presenting a continuous vertical wall, of the height of the second story windows,

265. House at Little Harbor, N. H. The dormers are arranged as an unsymmetrical triple group.

or a little more, which must be gracefully roofed. It has been skilfully done. The character of all the dormer roofs, as usually befits a minor composition upon a larger mass, is different from that of the main roof. That is a gambrel gable; these are hipped, square or octagonal, and they form a group of three members, the central octagonal, the side square, connected by a low, straight line produced by

bringing the main roof down at a lower pitch. The same sort of thing might have been done in several different ways. Two octagons might have been formed, the present and another on the left, in place of one



266. Private House, Paris.
The pavilion is a single subordinate mass; the dormers and other details are separately composed in a double grouping.

267. House at Hampstead, England.
An interesting parallel to 266. Here, however, the details are a triple group.

of the square dormers. Or the present octagon dormer might have been enlarged, which would not have looked well, and so on, but a more pleasing result it would have been hard to reach.

266 and 267 are a pair of rather curious examples of parallel motives in quite different styles, one modern French and one modern

English, both good of their kind and both quite characteristic. Both are single masses, with straight front walls and high pitched straight roofs, ending at gable walls, actual or potential. Each is provided with a single subordinate mass; that in 266 being at the extreme right hand of the façade, a graceful French Renaissance pavilion with hipped roof; the other at the extreme left hand, an unpretending English bay, also with hipped roof.

The rest of the detail in both examples is treated as a separate composition, in the English specimen, a group of three equal members, in the French, a composition of two members joined by a link, the openings in the first story and the dormers on the roof being suitably modified to carry out this impression.

Such examples as these, in which designers of schools so opposite as to be almost antagonistic, have arrived at so nearly the same solution of a problem, indicate how closely such schools are really connected, notwithstanding superficial separation. They show, too, how necessary it is in laying down the law in such matters to avoid dogmatism, as a skilful designer will always be ready to avail himself of new and untried combinations.

But where no special difficulty is to be overcome, the handling of the masses of a design, with the aid of the rules that have been elucidated, becomes almost a mechanical matter.

Each group that we have indicated becomes clearly fixed in the mind, with its variations and modifications; one gliding into the other by such easy changes, and the limits of possible changes being definitely fixed, that we are restrained from false steps, and soon learn to instinctively assign to each new plan its appropriate treatment.

Each arrangement, too, we learn to think of as independent of "style"; as indeed, practicable in any style, although some may lend themselves more readily to one sort of treatment than another.

Thus the three designs shown on page 449 are all of the same motive, adapted in treatment to different styles. The motive of each is a single mass, with one subordinate mass placed unsymmetrically, and with two appendages, one of which also has a subordinate mass, placed also unsymmetrically.

The first, 268, shows the motive treated in modern rural style, a design suited, perhaps, for a country hotel. In this case one of the appendages is placed diagonally in plan, without influencing the motive. All of the three roofs of main mass and of both appendages are made with gables and long ridges. Hipped roofs for all might have been adopted just as well, as far as the unity of the design is concerned, or the main roof might have been gabled, and the appendage roofs hipped. The single subordinate mass is applied in the form of an oriel turret. This turret is not started from the ground, because

such treatment would destroy its proportion to the masses. These latter are all open rectangles, rather "chunky" in build, and the chunkiness of the turret which is obtained by shortening it is quite

268. A composition of a single mass with one subordinate mass and two appendages.

in keeping. Moreover, keeping it up from the ground accentuates the line above the first story, which runs through mass and appendages, subdividing the design horizontally into two parts, an effect

269. The same composition as 268, in an entirely different style.

which would be antagonized and spoiled if the tower were carried to the ground.

The next, 269, is an application of a horizontal Italian style, to the same motive. Deference to precedent urges us to straighten out, in

270. The same composition as 268 and 269, but differing in style from both of them.

plan, the appendage that was before diagonal. The treatment of all the roofs is low and flat, scarcely showing above the cornices; and the projection of the latter is somewhat more than in proportion to the dimensions of the separate members, rather to those of the group as

a whole. It would be fatal to allow this to be cut into by a turret: the subordinate mass accordingly is chopped off at the top as well as the bottom, and the roof of it flattened to match the other roofs. At 270 is the same motive again in Gothic treatment.

The detail appropriate to that style cuts the masses up into narrow vertical slices, quite subordinating the horizontal lines. In harmony with this the turret is prolonged both downward to the ground and upward above the main roof. All the roofs are of steep pitch, and the subordinate oriel window which adorned one of the appendages in the two preceding examples is omitted, as more in keeping with Gothic work.

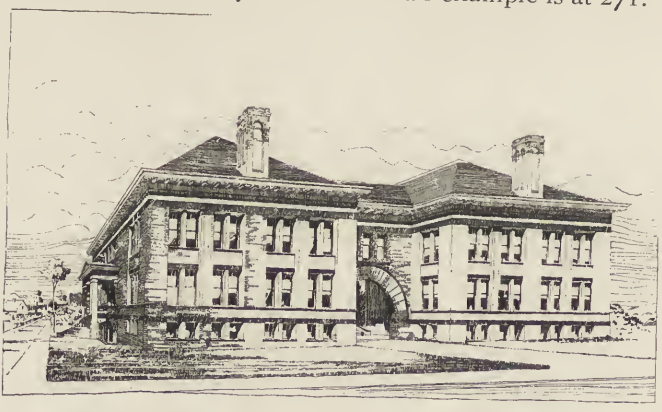
XIV.

Double Composition.

A few words of further explanation upon the question of "double composition," once before referred to, may be in place.

It is well known that two like objects set side by side, unless the junction is properly managed, look exceedingly ill. This fault is called "double composition," and is so well recognized that it is not easy to find very good examples.

The chief cause of error in this respect is the failure to make the connecting link sufficiently evident. A fair example is at 271. From



271. The too great retreat of the link renders this almost a case of "double composition."

the point of view of the picture the link is quite visible, and the "doubleness" not so striking, but if the spectator should stand a little further on one side the link would pass out of sight and the "doubleness" become manifest.

A similar fault often occurs in New York apartment houses, where two houses standing back to back occupy the whole frontage at the end of a block. Sometimes the defect is partly remedied by the addition of a colonnade to connect the two buildings.

So in 272 the two parts of the building would not look well were they not connected by the porch, which the architect has, very judiciously, carried through two stories.

272. This design is rescued from the charge of "double composition" by the prominence of the projecting porch.

These two are examples of principal masses, with reference to the defect in question. As for subordinate masses and details it is much

273. Hotel de Ville, Ambroise. The double treatment is united by the high roof of the building.

easier to avoid "double composition"; because they are so well united by the background of the mass upon which they occur, that often

no other connection is needed. At 273 is a pair of dormers, which would certainly fall under condemnation were it not for the large roof behind them, which ties them together; as it is they barely escape it. Another instance, which is scarcely redeemed by the pres-

274. Parish School, Charleton, Devon.
The main mass behind is barely large enough to properly unite the two gables.

ence of the principal mass behind, is at 274, the two gabled masses not looking so well as if they were connected by something flush, or nearly flush, with the face of them.

Sometimes the welding is done by the addition of a subordinate object, of which a particularly fine instance is at 275; the two gables

275. Church of English Martyrs, York.
The two gables, which without it would be a flagrant case of "double composition," are admirably united by the central tourelle.

276. Postoffice, Surbiton, England. The central doorway serves to unite the double treatment.

277. Private House, New York.
The wreath in the fourth story unites the double treatment of third and fourth stories.

would look badly without the clever turret between, which "pulls them together."

Very often the addition of a central detail of this kind will have the desired unifying effect. 276 is a case in point, where the central doorway is so used, also the window above it has some effect of connecting the double motive, although this effect would be greater if the window were oval, or circular, or a cartouche, or something differing more from the windows on each side. 277 is another case, in which the wreath between the two fourth story windows has a wonderful effect in connecting the two windows of third as well as those of the fourth story; and again, at 278, the canopied balcony connects

278. Rathhaus, Ratisbon. Double treat ment united by central balcony.

the double motive of the front. There are other ways of uniting two objects that are not sufficiently well connected. Two gables standing side by side are apt to fall under the charge of "double composi-

279. Llewellyn Almshouses.
Double gabled treatment united by heavy overhang of gables.

tion" unless measures are taken to join them. Usually a heavy projection is managed, either just below them, as is seen in the double gables in 279; or a series of marked horizontal lines in the mass below, as at 280, forms an adequate bond. Sometimes they are

280. Double gables united by marked horizontal lines.

laid together bodily, as at 281, 282, a part of each being chopped off in order to unite the two into a whole.

In one frequently recurring requirement of design "double composition" is imminent. In every couplet window, with a central

281. Private house at Detroit, Mich. Double gables united by juxtaposition and merging together

282. House at Interlaken, Fla. Same as 281.

mullion, the tendency to double is felt. If in any way the individuality of the mullion is too marked, as by making it a column, it is almost sure to involve "double composition."

Accordingly in almost all arched couplets we find three columns or columns are used, and in the rare cases in which a colonnette is used for a mullion in a square-headed opening, the situation is often

rescued by putting a row of such openings together, and overcoming the effect of individuality, that with one column would detract from the desired effect of a duplex opening, by the appearance of continuity in the succession of both columns and openings.

XV.

Criticisms.

When such a design as 283 is presented for our opinion as to its merits, it is easy to speak the word of condemnation without hesitation; not so easy to name and classify our objections, and show how

283. A design for critical analysis.

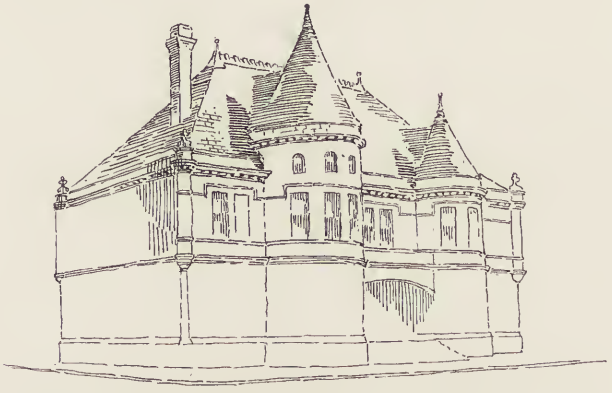
the faults discovered may be removed. By the aid of what we have learned, however, we may hope to succeed in the attempt.

The first really critical thought is that the mass of the building predominates; all of the towers and other projections, whatever their merits or defects, are subordinate to the building itself.

Our next thought is that the arrangement of octagon tower roof, dormer and circular bay upon the front is hardly clear; there seems some intention of uniting the tower and bay in a group of two by the balcony at the second story, but the dormer is so large and self-assertive that, above, it looks more like a group of three. Do away with the dormer entirely, let the attic go without light if need be—light has nothing to do with appearance—and it is at once much improved.

The tower and bay are still at variance, and they must be made of similar character before they can be united. The conception of the

designer seems to have been that of a group of two unequals, and this is quite practicable. In order to make such a group we must widen the large tower in order to make its dimensions proportionate to those of the bay, and we must also make both bay and tower either circular or octagonal in plan, thus, 284.



284. The same as 283, with the large front dormer removed, and the towers made similar in treatment, although of different sizes.

Incidentally, we abolish the octagonal bay on the side of the building. It is rarely advisable to use anything like the same treatment on the side and front of a building. One or the other should receive the principal treatment, not both the same. So if we must have a bay at the side we should take off the roof and terminate it with a balcony only; or, better still, stop it at the second story.

Even as we have made it the design is not yet satisfactory. The reason is that, in making the larger tower proportionate to the

285. The same as 284, but the towers reduced to a group of double equal subordinate masses.

smaller, we have made it too large to appear quite as a subordinate mass. We must give up the idea of a double unequal group and make a double group of equals as at 285. The composition now is

much improved, although the details of windows, corner tourellettes, and others are yet susceptible of improvement.

As for lighting our attic, it must go unlighted, or at the most receive a glimmer through the smallest possible roof slits, none at all would look best. If a brilliant light is indispensable we must put three large dormers on the front slope of the roof and take away our bays entirely. The two treatments cannot be combined, 286.

A very fine example of hesitation in subordinating the members of a group is shown at 287. Here are three objects—a tower, a gable, and a pavilion, all of about equal size, none of the three pre-

286. The original design of 283 modified in an opposite direction, the towers omitted and triple dormers developed.

dominating sufficiently to enable us to say whether it is a group of one, two or three parts. Nor is any of them large enough to be regarded as subordinating the main bulk of the building to a mere ap-

287. Another example for critical analysis.

pendage; nor small enough to reduce itself to a subordinate mass upon the building.

So that we must first make up our minds as to this latter point, whether the objects are to be principal or subordinate masses—whether the composition is to be one large thing, with several small things upon it; or whether it is to be a group of things of varying sizes, each properly related to the other.

Beginning with the former arrangement we have as a foundation a perfectly straightforward, square building—very safe and satisfactory as a motive at all times, 288. It has a mansard roof, somewhat

288. The base upon which 287 is composed.

difficult to treat—more difficult upon an isolated building, such as this is, than upon a façade. Moreover, the proportions of the stories and of the roof are unsatisfactory.

Leaving these for the moment, for we must not lose sight entirely of the building that we are analyzing, we endeavor to restore some

289. An attempt to recompose design of 283. Round tower omitted and replaced by a symmetrical pavilion.

of the objects, as in 289, wherein we have changed the round tower into a pavilion, knowing well that three unlike and equal objects cannot be united in a group. We hope by doing this to obtain a

290. The same, with the central gable abandoned and a pavilion like the sides substituted.

group of three, the central unlike the sides, and predominating over them. Our hope fails us. The central mass is not big enough to dominate the group; besides, there is a painful lack of similarity be-

tween its slope and that of the side pavilions: we must assimilate it to the others, and make a group of three like masses, 290, which is fairly practicable, although the details and proportions need much further study.

As to faults of proportion, one thing especially comes to our attention—the narrowness of the link walls, and the lack of similarity between their dimensions and those of the pavilions. The windows, too, seem to be crowded in, but the idea of being crowded is an intellectual and not an æsthetic one; the real æsthetic defect is the comparative broadness of the pavilions contrasted with the narrowness of the curtain walls between them.

With the view of obtaining a broader link space we determine to try a double grouping as at 291. This promises better results. The

291. Central pavilion omitted and composition changed to double motive.

effect of the pavilion at the nearest angle, however, is unfortunate: it is not clear whether the pavilions are subordinate or principal masses. We therefore relinquish the motive that we have hitherto pursued and determine to make them definitely the latter by raising their ridges as in 292.

292. The same as 291, with the members increased and the link subordinated.

Not one of the motives that we have thus obtained is satisfactory until much more study has been given to it than we can afford to give here. Enough has been said to indicate the methods by which our efforts at improving the design should proceed.

293. Another example for critical analysis. Masses not properly subordinated.

In 293, apart from the lack of grace which occurs in all parts, the fundamental error is the same as in 287; the pavilions and other parts that are upon both front and side are either too large for the building or the building is too large for them, They must all be very much lessened and properly disposed upon the building as subordinate masses; or else very much increased; and, in this latter case the number of them must be diminished. Besides this the treatment of the side must be less individualized: it is almost impossible to treat successfully both a front and an adjacent side with important central masses.

So frequent and so fatal is this last error that one or two added examples may well be examined. An excellent illustration is shown in 294. Although there are other points that might be criticized, by far the most interesting is the ill effect of the exactly similar treatment of front and side. The reason is that the whole art of obtaining unity in a design is the observance of a due subordination in the various parts. One side or the other, either front or return, must in some way predominate in treatment. If our design is a simple pedimented or gabled mass, the pediment or gable is sufficient to give predominance to the side on which it occurs: if, on the other hand, one side is distinguished by a certain grouping of subordinate

294. Illustrating the unfortunate effect of treating both front and side alike.

masses, some entirely different treatment is needed for the adjacent side.

There are innumerable houses of the most modest dimensions and extremely bad design, that are erected every year by builders who regard themselves as architects, but lack the chief requisite to justify such a view—the power to make an agreeable composition. At 295 is an instance of which the faults may at once be pointed out;

295. Design for critical analysis. The front dormer is excessive, if it is meant to be a subordinate feature.

296. The same as 295 with the excessive dormer reduced.

the most serious is the excessive size of the front gable. This is clearly meant to be a subordinate mass, as indicated by its bracketed support; its excess in height above the main ridge, however, quite contradicts this assumption.

In order to make it tenable we must lower the front gable as in 296. This is an improvement, but it still leaves us in trouble with

our piazza. Any marked horizontal line which stops short as this does of the horizontal lines of the principal mass, is difficult to manage. It is almost as bad if it is returned at one end and not at the other. Perhaps as good a solution as can be reached without an entire restudy of the plan is that shown in 297, where the piazza is carried across the entrance front, the roof of portion on the return being omitted. The flat-roofed one-story part must be treated as an appendage, and the back wing separated from the main house by a break in plan, which will make it compose as an appendage from a side view.

297. The same as 296 with dormer and main roof united by similar treatment.

298. Design for critical analysis, Almost incorrigible.

299. An attempt to improve upon 298.

300. The same as 299, farther modified, but not yet successful.

A still finer specimen of a bad composition is at 298—so bad indeed that it is scarcely possible to suggest improvements without beginning with total erasure of all that has been done. The main building appears to be meant for a hipped roof, but the various subordinate parts are so disposed that the outline of the roof is barely discernible. This is the most serious fault: we proceed to radically

extirpate it in 299, where we have restored the main roof, leaving the lower part much as it was. The single subordinate hipped part that remains is very unmanageable, because it is at variance with the heavy horizontal line of the overhanging eaves. Moreover, on so small a building, it should be in the centre or else still more to one side. Besides this the unsymmetrically placed piazza will not do without further study. We make an attempt at 300 to right these matters, by putting both piazza and upper projection on the corner of the building, making them octagonal to excuse the asymmetry. The result is not happy, the vertical lines of the turret are still at variance with the eaves, and its proportions fail to harmonize with those of the piazza.

301. Example for critical analysis. Faulty composition of details.

Further study would give us a new and satisfactory motive, but not without losing the identity of the design that we are criticising.

At 300 we have a specimen of faulty arrangement of details, less offensive, indeed, than some of the foregoing faulty examples, as a façade is hardly capable of being either as beautiful or as ugly as an isolated building.

Such a spacing of windows, with an excessively narrow pier on one boundary, as occurs in the basement and first story, is not to be excused on any grounds of convenience of internal arrangement.

Not because a narrow pier suggests constructive weakness: this may be true, but it is not with such criticisms that we now busy ourselves: simply because of its entire dissimilarity with any other part of the building, especially with any other pier, such a narrow pier as this the eye cannot tolerate.

If the conditions are inflexible, we must seek a solution by making the other piers also narrow, which would look badly enough, but not so badly as at present, because one serious æsthetic objection would be removed, though new ones of lesser importance might be presented.

A still more serious error is in the grouping of the three dormers on the roof. In the first place the roof itself offered a suitable background, without cutting it up with hips apparently intended to suggest a pavilion, but having too little relief to look well. In the second place, if pavilion there must be, its sole function was to be a background to the three dormers, which is negatived by starting the hips from the top of the lower dormers, instead of from the main cornice.

In the third place the topmost dormer should be of the same character as the two below; or if it must be different, it should be very much more different than it is, and if possible, much larger.

In the fourth place the panel between the two lower dormers is most unfortunate; there should be no panel there, but only roof surface: if panel there must be it should have less individuality, so as to unite the dormers rather than assert itself.

John Beverley Robinson.

WASHINGTON LIFE BUILDING.

P. & F. CORBIN,

Art Workers in Metal,

AND MANUFACTURERS OF BUILDERS' HARDWARE.

Offices, 11, 13 & 15 Murray Street, New York.

Works, New Britain, Conn.

The following are among the many prominent and important buildings supplied with hardware by this firm :

WASHINGTON LIFE INSURANCE BUILDING,	CYRUS L. W. EIDLITZ, Architect
SINGER BUILDING,	ERNEST FLAGG, Architect
PARK ROW BUILDING,	R. H. ROBERTSON, Architect
EMPIRE BUILDING,	KIMBALL & THOMPSON, Architects
PARK BUILDING,	GEORGE B. POST, Architect
BOURNE OFFICE BUILDING,	ERNEST FLAGG, Architect
RESIDENCE OF F. G. BOURNE,	ERNEST FLAGG, Architect
FRANKLIN BUILDING,	CLINTON & RUSSELL, Architects
GRAND CENTRAL STATION,	BRADFORD L. GILBERT, Architect
STANDARD OIL BUILDING,	KIMBALL & THOMPSON, Architects
CHEMISTRY BUILDING, COLUMBIA COLLEGE,	McKIM, MEAD & WHITE, Architects
ENGINEERING BUILDING, " "	McKIM, MEAD & WHITE, Architects
THE UNIVERSITY OF NEW YORK,	McKIM, MEAD & WHITE, Architects

ST. PAUL BUILDING,	GEORGE B. POST, Architect
HAVEMEYER STORES,	GEORGE B. POST, Architect
EQUITABLE BUILDING,	GEORGE B. POST, Architect
WELD ESTATE BUILDING,	GEORGE B. POST, Architect
COE ESTATE BUILDING,	GEORGE B. POST, Architect
THE PARK BUILDING,	GEORGE B. POST, Architect
EMPIRE BUILDING,	KIMBALL & THOMPSON, Architects
STANDARD OIL BUILDING,	KIMBALL & THOMPSON, Architects
SHERRY BUILDING,	McKIM, MEAD & WHITE, Architects
NEW YORK LIFE INS. BUILDING,	McKIM, MEAD & WHITE, Architects
UNIVERSITY CLUB,	McKIM, MEAD & WHITE, Architects
EXCHANGE COURT BUILDING,	CLINTON & RUSSELL, Architects
METROPOLITAN LIFE INS. BUILDING,	N. LE BRUN & SON, Architects

SINGER BUILDING,	ERNEST FLAGG, Architect
MILLS' HOTELS, Nos. 1 and 2,	ERNEST FLAGG, Architect
SCRIBNER BUILDING,	ERNEST FLAGG, Architect
JOHNSTON BUILDING,	J. B. BAKER, Architect
PRESBYTERIAN BUILDING,	J. B. BAKER, Architect
BANK OF COMMERCE,	J. B. BAKER, Architect
AMERICAN SURETY BUILDING,	BRUCE PRICE, Architect
GILLENDER BUILDING,	BERG & CLARK, Architects
HARTFORD FIRE INS. BUILDING,	CADY, BERG & SEE, Architects
TOWNSEND BUILDING,	CYRUS L. W. EIDLITZ, Architect
FIDELITY AND CASUALTY BUILDING,	CYRUS L. W. EIDLITZ, Architect
WASHINGTON LIFE BUILDING,	CYRUS L. W. EIDLITZ, Architect

OTIS ELEVATOR COMPANY.

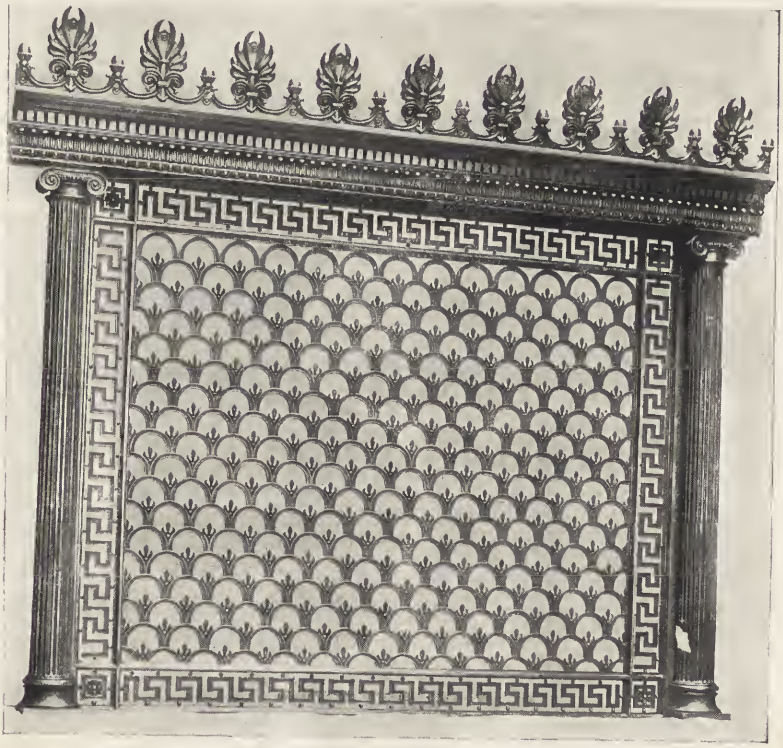
71 BROADWAY, NEW YORK.

THE OTIS ELEVATOR

PARTIAL LIST OF IMPORTANT BUILDINGS EQUIPPED WITH OTIS ELEVATORS.

Biltmore—Residence, Geo. W. Vanderbilt, Esq.	Richard M. Hunt, Architect
The Breakers—Residence, Cornelius Vanderbilt, Esq.	Richard M. Hunt, Architect
Residence, Elbridge T. Gerry, Esq.	Richard M. Hunt, Architect
St. Paul Building	George B. Post, Architect
Havemeyer Building	George B. Post, Architect
Union Trust Building	George B. Post, Architect
New York Life Insurance Building	McKim, Mead & White, Architects
Madison Square Garden	McKim, Mead & White, Architects
Metropolitan Club	McKim, Mead & White, Architects
Townsend Building	Cyrus L. W. Eidlitz, Architect
Washington Life Insurance Building	Cyrus L. W. Eidlitz, Architect
New York Bar Association	Cyrus L. W. Eidlitz, Architect
Mohawk Building	R. H. Robertson, Architect
McIntyre Building	R. H. Robertson, Architect
Van Ingen Building	R. H. Robertson, Architect
Schermerhorn Building (23d Street)	Henry J. Hardenbergh, Architect
Astor Building	Henry J. Hardenbergh, Architect
Martinique Hotel	Henry J. Hardenbergh, Architect
Metropolitan Opera House	Cady, Berg & See, Architects
National Shoe and Leather Bank	Cady, Berg & See, Architects
Hartford Fire Insurance Building	Cady, Berg & See, Architects
Varick Street Warehouses	Chas. C. Haight, Architect
Lawyers' Title Insurance Building	Chas. C. Haight, Architect
N. Y. Orthopaedic Hospital	Chas. C. Haight, Architect
Mutual Life Insurance Building	Clinton & Russell, Architects
Woodbridge Building	Clinton & Russell, Architects
Sampson Building	Clinton & Russell, Architects
Mail and Express Building	Carrere & Hastings, Architects
Pierce Building	Carrere & Hastings, Architects
Residence of H. T. Sloane, Esq.	Carrere & Hastings, Architects
Empire Building	Kimball & Thompson, Architects
Manhattan Life Insurance Building	Kimball & Thompson, Architects
Standard Oil Building	Kimball & Thompson, Architects
New Altman Stores	Kimball & Thompson, Architects
Mutual Reserve Fund Building	W. H. Hume & Son, Architects
Spingler Building	W. H. Hume & Son, Architects
Netherlands Hotel	W. H. Hume & Son, Architects
Scott & Bowne Building	Schickel & Ditmars, Architects
R. H. Macy & Co.	Schickel & Ditmars, Architects
Lakewood Hotel	Schickel & Ditmars, Architects
Presbyterian Building	James B. Baker, Architect
Johnston Building	James B. Baker, Architect
National Bank of Commerce	James B. Baker, Architect
United States Trust Co.	R. W. Gibson, Architect
New York Clearing House	R. W. Gibson, Architect
Onondaga County Savings Bank, Syracuse, N. Y.	R. W. Gibson, Architect
St. Luke's Hospital	Ernest Flagg, Architect
Singer Building	Ernest Flagg, Architect
D. O. Mills Model Hotel	Ernest Flagg, Architect
Post Graduate Medical School and Hospital	W. B. Tuthill, Architect
Carnegie Music Hall	W. B. Tuthill, Architect
Kuhn, Loeb & Co.	De Lemos & Cordes, Architects
Fulton Building	De Lemos & Cordes, Architects
Eagle Building	De Lemos & Cordes, Architects
Metropolitan Life Insurance Building	N. Le Brun & Son, Architects
Fire Department Headquarters	N. Le Brun & Son, Architects
New York Commercial Buildings	Robert Maynicke, Architect
John Wanamaker's	Robert Maynicke, Architect

Interior Bowery Savings Bank, Showing Brass Counter Screen



THE BROOKLYN BRIDGE BRAND OF ROSENDALE HYDRAULIC CEMENT WAS USED IN THE CONSTRUCTION OF THE ABOVE BUILDING.

THE ASTORIA HOTEL.

THE J. L. MOTT IRON WORKS,

84-90 BEEKMAN STREET, NEW YORK.

332-334 Boylston Street, Boston. 311-313 Wabash Avenue, Chicago.

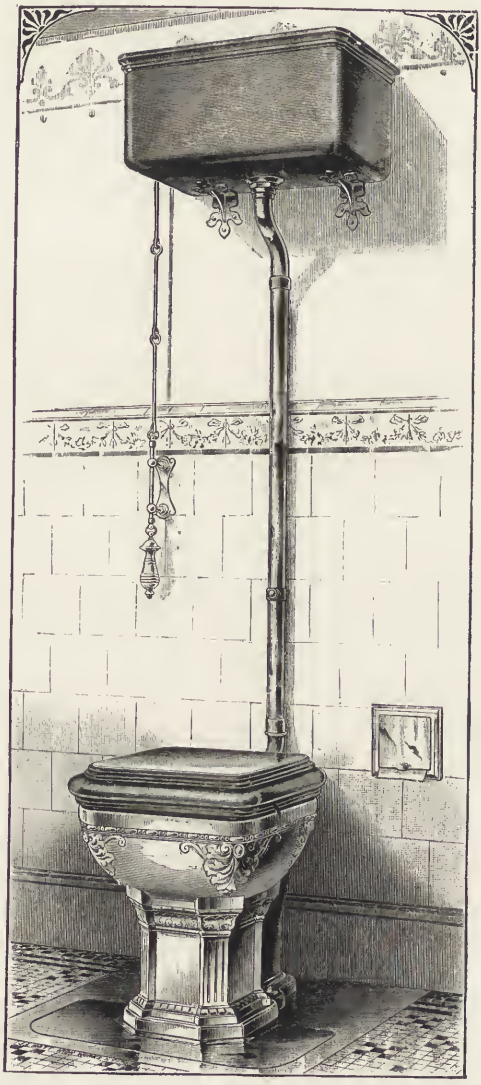


PLATE 5016-R.

The "Renaissance" Improved Syphon Jet Water Closet.

(PATENTED)

FOR FULL DESCRIPTION SEE CIRCULAR, WHICH MAY BE HAD ON APPLICATION.

The Boston Architectural Club

ARCHITECTURAL EXHIBITION

GALLERIES OF THE

ST. BOTOLPH CLUB

BOSTON.

May 15 to May 27, 1899.

EXHIBITION WILL CONSIST OF

Drawings, models, and photographs of Architectural and Landscape Design, drawings, models, photographs and examples of executed work in Mural Decorations, Mosaic, Stained Glass, Interior Decoration and Furniture, Wood and Stone Carving, Metal Work and the Applied Arts generally will be received, subject to the approval of the Jury of Admission.

An illustrated catalogue of the Exhibition will be published.

SPECIAL EXHIBITION COMMITTEE

Of the Boston Architectural Club.

GEORGE E. BARTON, *Chairman*. R. CLIPTSON STURGIS.
IRVING T. GUILD. ALBERT CHAPMAN FERNALD.
AND
J. RANDOLPH COOLIDGE, JR., of the Boston Society of Architects.
RICHARD HOWLAND HUNT, of New York.
WILSON EYRE, JR., of Philadelphia.

ADMISSION TO THE PUBLIC WILL BE FREE.

Circulars and detailed information can be had by addressing the

EXHIBITION COMMITTEE,

19 EXCHANGE PLACE, BOSTON, MASS.