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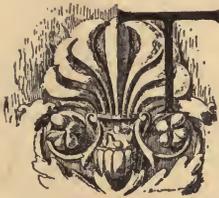
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THE MUSICAL IDEALS OF ARCHITECTURE.

Part II.

THE MEETING OF THE IDEALS.



THE aim of all art is to grasp and interpret beauty, and to impress upon its particular work certain human feelings, emotions and ideals. Sometimes the thought thus expressed may be of simple, hourly truths, sometimes of exalted imaginings. But that is according to place and circumstance and individuality of power.

Let us seek for a moment what are the relative positions of music and architecture in the pursuit of such visionary thought—visions though that are intensely real.

The æsthetic value of both melody and proportion arises from the harmonies which are produced under the influence of the emotions and the love of beautiful forms and ideas. The laws of rhythm and order are inherent in all natural organisms, and thus architecture and music are indirectly based upon nature, though their actual forms are creative or arrived at through instinctive feeling.

The life and harmony of nature are given definite and rhythmical shape and made ready for art in countless

ways: in air, in water, in every living thing. But this is material for the painter and sculptor to seek out and render, either very literally or with strong ideality, according to his temperament. There is a certain amount of musical impulse even in this. It is the record of what music the eye may discover.

But, beyond this, art discovers material fit to mould into languages. In them is expressed but dimly the life of nature, though vividly the mental and moral states of humanity; sensuous love of form if the work be Greek, craze for the mysterious be it Goth, craze for the insignificant be it modern. And this is done in forms that have no existence in nature, but stand for ideals, the expression of which she has left, as it were, to man; suggesting, perhaps, but not furnishing the model. The æsthetic nature, which, like, love, penetrates by a sort of instinct into the heart of nature and of life, discovers, selects and organizes upon the principles, as we have seen, of order and harmony; and then, out of nothing apparently, springs into life a human art. This art is *music*. Music of the eye as well as of the ear—speaking in design as well as in figure.

It is not, in my belief, simply and en-

tirely because of the mental satisfaction following the perception of parts aptly adjusted to the whole which renders certain works in building art, or in musical, valued of men.

With little plaster models of the Temples of the Acropolis at Athens, or the sumptuous monuments of ancient Rome, we may study and enjoy the grace of line and harmony of proportion which they possess. But the works themselves may yield us a higher pleasure—sublimity, poetry. In their presence we feel the power of human labor and imagination. They become a vision of life. The Greek himself is revealed to us in all his refinement, his natural purity, his love of light and of smooth, softly glowing form. Or the imperious Roman, glorying in his power, grandiose in all his work, yet betraying beneath a hard and cruel nature that prefers a vicious lavishness to any simplicity of beauty or desire. Were the histories of these races unknown their character would stand revealed upon the silent pages of their monuments.

Proportion, symmetry, fitness, are all essential elements of organic life, and so all works of art require them. Music or architecture without the power of harmonious construction could attain nothing higher. Yet these are comparatively but means. But to present these mere abstractions in such form as to convey what is lovely to the eye and precious to the soul—these, for each of them, are ends.

In the indefinite quality of their expression, as well as in their independence of nature, they are separated from the other arts. In painting or poetry may be accurately depicted the thoughts and actions and the heroic deeds of men. In music and architecture they are subtly hidden or symbolically told. This is at once a loss and a gain. For, with the diminution of the power of gaining precise thought, power to reveal the undimmed lustre of the imagination and the emotions increases. And the higher phases of painting and poetry depend upon the latter as much, if not more, than on the former.

Much that we are saying of the resemblance of architecture to music ap-

plies also to poetry, as far as the latter may be called literal music, adapted as a beautiful language to clothe natural imagery and imaginative thought; and exclusively of its literal descriptions of men and things.

It is, of course, chiefly in reflecting *man* that the powers of music and architecture are exercised. But, also, each of them reveals, by no means rarely, moods of nature to those whose sympathies and powers of association are keen enough to appreciate them. Plato remarks that music (he uses the word in a broad sense, as including all non-imitative art) "furnishes the most adequate imitation of nature," of the spirit, never the form. But before proceeding to notice further resemblance it may be well to examine some of the manners in which the ideals of music and design naturally differ.

The most marked divergence of form results, of course, from the fact that design must possess the feeling of repose and permanence, while the art of sound breathes the atmosphere of actual movement, flashes before you and is gone like a fire-fly. Yet what seems at first glance the most opposite conditions in the world prove, on closer scrutiny, to have an essential connection in laws and in ideals, though differently envired. This art of reposeful form is also, we should remember, one of *imaginative* form. It is not, to be sure, so purely and intensely a language of the feelings as is music. But the difference is rather in degree than kind. Form is highly essential in music itself. Any one studying these arts must have observed that in one as in the other harmony between *form* and *life* is ever necessary of achievement. Beauty is a many-sided thing. To unite the beauty natural to form—the beauty, that is, which the instinct or rhythmical sense of the artist discovers in his material—with the beauty of his ideal is the guiding light that gleams untiringly before him. What sets their aims at material variance is the difference of emphasis, natural to each, upon these elements

This must not be lost sight of. Thus, while music is by nature prone to impress one with sadness and pathos,

and readily expresses passionate love or hate and other sudden and swift emotions, architecture lends itself more naturally to the expression of vastness of mind and the multitude of material things, of quiet happiness and peaceful desire, of enduring power and law. But, at the same time, repose should not be taken for mere inertness; thought is change and movement. The transformation of mechanical to truly plastic and beautiful form is wrought by the presence of the spirit of life and harmonic organism. Rhythm, and what Professor Waldstein calls the "flow of form," are not the concerns of sculpture only, but of all abstract design.

It has been rightly said that those ideas which are best expressed by motion and time should be given exclusively to music and poetry, while those fitted to space and repose should take shape in architecture and other arts of space. But I think this axiom may, in confusion of the motives of form with its special laws, be taken to include more than is just. Forced imitations of effect that belong rightfully to another art are, of course, reprehensible. But all architecture is, in a degree, naturally emotional, and some, such as the Gothic, extremely so. Imagination is the word more usually and properly applied to form, and emotion to music. And while there is some difference in the meaning of the two they are also inseparable.

Architectural impressions are often made slowly. A great building grows upon one. It can seldom take the senses so by storm as a grand musical work so frequently does. But then it does not leave us with the suddenness of the conclusion of an opera or concert. We may return to it day by day. Patiently it awaits whoever will pause to learn and enjoy.

The voice of architecture is subjective, but it is a voice. Music itself is not concrete thought without poetry or words. To many the noblest works of music are so much meaningless sound, as in the loveliest buildings they see but piles of masonry. But no one who has any appreciation of the beauties of architectural forms will deny that

imagination and the more permanent elements of the emotional states of mind have found abundant expression and symbolism in formal and plastic design. The fervor and purity of faith, the power of intellect, the dignity of state, the vanity of wealth, the festive pleasure of a happy people, the monk's love of heaven, the pagan's love of earth!

Not that her only glory is in borrowed plumage, nor that the sole artistic element of the arts of form depends upon evidence of emotional thought. On the contrary, supposing we regard the intrinsic beauty, so to speak, of form as the most excellent quality, we are brought then to the most tangible point of union; for the paramount power of proportion and harmonious ordering which we here admire is musical form itself. As for the musical and poetic spirit, we think it is more intimately interwoven with the architectural than is often supposed. All three are wandering fauns in the same mystic wood, of whom we ask for stories of what they have there seen and heard, what fairy fancies caught, what softly whispered secrets from nature weaned. The tale of one of them, who has gazed with finely sympathetic eyes, is filled with peaceful charm, with the light of human power and the majesty of that which is immutable. The other two, with sweetly flowing words or deftly fingered lyre, speak of great actions, summon wind-tossed passions and awake the fire of inmost feeling. Thus much does the spirit of their interpreting differ. There is no such thing as making a comparison of their relative artistic merit or value, whether expression through musical movement or plastic repose be of the higher order. To observe their similarity and variance of aim does not infer any such attempt.

What Walter Crane says of pattern may be applied to all art of abstract design: that it is "the notation of silent music. * * * 'Here is sound,' says the musician, 'let us make music.' 'Here is surface,' says the designer, 'let us make pattern.'" We may add: here is space and structure, let us make architecture. Frederic Schegel called architecture "frozen music." It is

music in space, impressed therefore with the character of repose.

The designer has, like the musician, to create, to perceive the spirit of nature where she becomes silent. It is the same spirit that speaks in dome or in chant. Style in these arts is developed very gradually. Social forces beyond number influence their growth.

It goes without saying that these artistic forces of architecture must always act in concert with systems of construction and demands of utility, and is limited by them. The evolution of the latter has great influence in bringing out many characteristics, and when, therefore, we speak of the power of the æsthetic sense as creating architecture, we do not intend to infer that it may do so independently of the laws and developments of structure.

Yet, at the same time, any one may observe who will take the trouble to sift the question that in any style-producing race, the *motifs* of design, which, of course, proceed from the truly characteristic art ideals and mental tendencies of that race, are always in natural accord with the unavoidable suggestions and limitations of these same structural and practical forms and lines. Utilitarian experiment and discovery does not of and by itself produce styles in ornament and design, nor does the æsthetic invent structure. Those two distinct types, the Greek and the Mediæval, each display a smooth working together of the climatic and material conditions, with all that we may include under the term of the *mentality* distinctive of the epoch. The natural art impulses (only, we repeat, in style creating periods) find instruments as sympathetic as though they had been deliberately chosen, instead of thrust upon them. This being once recognized, the æsthetic side may, without objection, we think, be analyzed without pausing at every turn to see how it is especially influenced by structure and use.

One of the most valuable results that might follow a more general appreciation of the truth that the basis of architectural design is in an application, largely unconscious, of the laws of natural and musical harmony, of which

we dealt in the preceding chapter, would, I think, be to influence taste toward pure design and increase the knowledge of its power in times past and its possibilities in the future.

Modern art criticism, for reasons which it would be out of place to discuss, has been fond of asserting that architecture only rises to the beautiful and to mental expression through her use of imitative arts. And, on the other hand, her own professors, while insisting on grammatical correctness of form, have lost the vital fire of the days of creative style. In the continual repetition of the motives of the ancients, the value of academic perfection has been evident, but the intellectual expressiveness of the old harmonic lines and forms has been forgotten.

Now, as I believe that the study of architecture in this comparative light argues strongly for the truth that abstract design may be full of human and emotional or imaginative power, and also that at its best it is a lifelike art and not a formalism: a glance at these aspects of design will be necessary to determine upon which principle this true musical ideal chiefly depends.

Music has in this age attained greater power and brilliancy than ever heretofore. Its emotional range and profundity need no pointing out. But coming to architecture we strike those laws of proportion, symmetry, orders and the like, which are looked upon by many at the present day as rather vague in their æsthetic derivation and capabilities. Yet why should their precision seem any less promising than that of bars and notes, intervals and fugues? And a different face is put upon the matter if we acknowledge them to be a particular expression of universal laws of music and nature. In the thirteenth century our present question would have been reversed. It might then have asked: could arrangement of sounds be conceived ever to acquire the range, the freedom of fancy, the depth of thought that is distinctly possible to architecture. Not that architecture can enjoy her full nobility with-

out the adornment of imitative art—of sculptured freize and frescoed wall, just as the highest type of music is only reached through a union with poetry and dramatic action. Yet, it remains, that in forms which seem to have no model in nature are awakened sympathies of the imagination; and there is found a musical art, a basis of architectural virtue, as there is an organism in the twisted branches of the grape-vine hid beneath the soft luxuriance of broad leaf and luscious fruit.

When buildings have nothing to impart of the sympathies and emotions on which art depends, as Ruskin unjustly complains is the case with *all* building which is ungraced by lovely ornament, it is because of an artistic frigidity on the part of the designer and of the conditions of life around him, not because abstract architectural design offers no opportunities for the imprint of artistic thought, or is alive to no human sentiment.

To say that in the Parthenon, in Amiens cathedral, in Salisbury, there is no art but in the sculptures, is to show incapacity to appreciate one of the most far-reaching (though at times neglected) powers of art. A Doric temple with empty metopes, a stalwart chateau with towers and battlements, sternly bare of decoration, a cathedral, distant a mile or so, where its sculptures appear reduced to flecks of light—these still impart impressions of beauty, of human might or tenderness.

But, on the other hand, something more than the academical point of view of form is necessary to bring out the full musical scope of design. Rhythm and harmony are qualities of nature and life—mental as well as physical—perceived intuitively by artistic minds. But some of the formal and empirical methods of Palladio, Vignola, the architects of Louis XIV., and of some modern academies of art are not natural, unless it be nature petrified—and therefore appeal only to the grammarian and not to the artist.

We would not have it for a moment thought that we admire disdain or desertion of the canons of style. At present this could result in nothing

but discordant and bastard structures. And in the past tradition played no small part, nor was it ever wilfully disregarded with success. But the difference is in this: that the noble styles, whose smallest acts we now reverence as immutable law, grew into form in a series of typical monuments, as temple or church; and all motives of structure, design and decoration centred about the experimental development of a great constructive form, which has been either column and lintel, dome, or equilibrated arches and vaults.

This dual evolution brought out the creative qualities of design. Every building advanced and perfected the style of the period in some degree. Variation was continual, though gradual. Life was evident in every branch of design. Artists lived in the present, and until the fifteenth century little study was made of the work of any time or people save that which was growing up around them. So it will be seen that their work was *naturally* harmonious rather than *scholastically* so, and that they enjoyed a chance to throw true poetry and originality into their productions, such as is lost or but dimly seen in the most faithful "revival." Of course, no architectural system was ever the invention of a single man nor even of a handful; primary motives result from great intellectual movements and developments of social systems. Individualities of emotion are therefore more pronounced in music than design. Yet even the severe lines of Greek buildings, designed chiefly to convey the placid beauty of form, are not without imaginative and sympathetic power.

So, while in periods of academic rule, the precision of musical form is expressed it is only in more creative epochs that the complete musical ideal is found. For, as in the art of rhythmical sound we observe this power of harmonious order becoming the voice of the most varied emotional impressions; so the art of rhythmical shapes, notwithstanding its abstract and mechanical rudiments, its demands for stability and symmetry, becomes one of man's emotional languages.

Poetry and painting can, to be sure, bring before us the loveliness of nature as architecture or music alone are powerless to do; but, with things human, they are of a current as deep, if not to-day (with architecture at least) as strong.

In the buildings of many centuries we may see man at war, at peace, at work, at play. We may see him barbarous and superstitious, joyful and ideal, proud and luxurious, grotesque and spiritual, and finally democratic and prosaic. In short, while it is more the mind than the passions that we find recorded, the art of architecture is an exponent, as is every art in some measure, of the innumerable phases of *La Comédie Humaine*.

In other moods of music or architecture, the significance of their forms is of comparatively little importance beside to the sensuous delightfulness of harmonious lines, or sounds, or colors. The other arts are precious, too, in these different ways, but the two we are considering possess that severe and unimitative quality, which, by its very restrictions, opens the way for the most finely wrought idealism, to which more literally interpretive arts can less perfectly attain.

The summary of our conclusion thus far comes to something like this:

The musical faculty and the faculty of design are fundamentally the same artistic power. This declares itself in the fact that the structural systems which each has adopted to express art thought are distinctly parallel methods in all their most prominent significations. They carry out their æsthetic purposes in common through means of harmonious ordering of their constructional forms or units.

This law of harmony is not the chance property of a particular art but a natural one of universal extent. Beauty being in part dependent upon form and part upon expression, which latter is a very changeable element, the standards of taste are relative rather than absolute. But certain broad principles of the intrinsic value of form and the distinction of beautiful from ugly, harmony from discord, or consonance from dissonance, may be estab-

lished; and it is found that these principles are of greatly similar character in sound and in form, both upon physiological and physical grounds. And the artistic structures reared upon this foundation, respectively by music and architecture, show strong resemblance in their methods of composition or design; which methods may be summed up in rhythm and melody, proportion and outline. While music has its systems of tonic-key and tonality, architecture has stability and arrangements in different planes, grouping for structural unity, and study of color harmony. The musician has grades of intensity to aid him; the designer commands grades of light and shadow. Quality of sound is for one what texture of material is for the other.

The relation, however, is more than a likeness of the *materia* of their artistic structures; there is an emotional and creative affinity as well. The power of each art lies in something apart from imitation of nature, and there are many points of similarity to be observed in the manner in which each hews for itself fair forms out of the rough unsuggestive blocks with which it finds itself supplied.

Furthermore, these abstract motives and methods penetrate the imitative arts and all art whatever, and in reverse manner they themselves require considerable aid from mimetic and pictorial art.

The beauties of form in plastic repose and of form born upon the wings of sweeping sound are in a manner opposite, yet are in touch.

This element of design which we call the "musical ideal," is, then, primarily, the just and beautiful ordering of parts and forms: as the giving of certain proportions, well studied in the relations of lines, intervals, etc., to a treatment, say, of arches and pilasters or to the general outlines of a building; or the disposing the acanthus leaves of an arabesque or the blossoms of a wall paper upon certain general and symmetrical systems of graceful, that is, rhythmical lines, instead of carelessly hap-hazard or with all the unrestraint nature.

But the musical ideal does not cease

there. It has concern with the motive as well as the law of composition. The most musical architecture is not, as might appear from the above reasons, the most formal. For, as it is because of music being an emotional language, that melody is made of value; so it is that the formalism resulting from the conventionalism of nature, which takes place in design, is prevented from becoming a merely mechanical proceeding and an arbitrary copying *in toto* of already acknowledged forms of beauty, because it may be elevated to a language of mind and emotion, expressed with an infinite variation of existing standards of beauty so that every work is a vital outcome of the artistic temperaments and sympathies of its time and of climatic conditions. Spontaneity of style gives an equivalent to the life and movement which are so necessary to music.

For such reasons is it that the architectures of Greece, the Ile de France, and Italy of Renaissance give the fullest expression to the musical ideals, which are possible of interpretation into form, and, for the same reasons, is it that our feeble or accurate copies of the work of those ages, in this dark age of design, can never equal their originals.

Architectural design, being an art of form, is, in its actual and visible accomplishments, more closely connected with the other arts of form, as painting and sculpture, than with an art presided over by another organ. But the nature of this union is like the meeting of two individuals upon common ground, who work together for the accomplishment of one result.

Whereas the union with music is more fundamental, so much so that it is not exaggeration to speak of it as *musical art in space*, and to say that design in line and form, as architecture, considering it apart from other motives of necessity which may have influence, is the creation of pure music in space.

Motion is supreme in the one art, repose in the other. Yet, as we have pointed out, neither is entirely sustained by one only of these forces. Each is carried into fields never visited by the other; yet, these fields are

but on the opposite banks of a little stream. And, withal, the speech of music is unconsciously spoken by design; through means of line and mass, light, shade and color instead of through sound. And, in this too oft despised language did the Greeks and the Mediævalists and the Florentines and the Venetians, with blocks of stone and lumps of clay and beams of wood as instruments create poems. As Wordsworth has said:

While with an eye made quiet by the power
Of harmony, and the deep power of joy,
We see into the life of things.

III.

Historic Parallels and Reflections.

THE first indications of the art impulse in man may very probably have been in joyful or woeful acclamation—in rudimentary music. But, though possibly the first art to have an actual beginning, it was by no means the first to reach a high stage of development. It was a long time before any one sought to discover her æsthetic and technical laws with sufficient energy to produce anything worthy of being called musical art.

Architecture preceded all the arts in its growth, necessity urging it on. Many truths which each art has in turn expressed were first discovered and propounded by architecture. Music, being almost free from practical requirement, was the last to reach maturity.

Architecture retained this lead, and so the music of to-day is giving expression to conceptions which received form in architecture five hundred years ago.

The dawn of musical composition was probably in chants and war songs. In these a rudimentary idea of metre is developed. The construction is limited to an uncertain amount of division of the lines and words of the song into long and short intervals, and to accent or stress laid upon notes or syllables with more or less regularity.

The germ of architecture is in the feature analagous to the metre, the *line*, and in the discovery that useful

objects could be made pleasing by giving certain shapes and quantities to their component parts: *i. e.*, study in line. The first efforts in design were most likely in the shaping of pots and urns and handles of weapons. The first step in architecture is in juxtaposition of large and small forms, horizontal and perpendicular lines. Thus the Celts placed long, upright stones in the ground and balanced a large, flat stone upon a small one. Next, the savage arranges a succession of approximately equal uprights at fairly equal intervals. This same step is marked in music when the notes become divided into groups of equal duration. As yet, though, the complete idea of rhythm and proportion is, lacking. The principle of order is established but there is no organism. But when, together with accent and time, the idea of systematic grouping enters and the accents become grouped into musical phrases; and when a lintel is set across the top of the upright stones and, furthermore, in pursuance of structural suggestion, the shafts are given cap stones to receive their load and the entablature divided into parts, then the structure has become an organism, and proportion, in its elements, at least, has been thought of. The study of the relative dimensions of the parts and the beauties of curvature and shadow follow naturally: The history of primitive ornament is the record of the development of pattern (rhythmical arrangement) from a mixture of naturalism and rude convention in carvings and sketches of human heads and figures, sacred animals and plants.

We have little knowledge of the nature of music prior to the days of Greece, nor is very much known of it even then. The general character of the music of the pre-Grecian civilizations may, however, be safely judged from that of peoples in a primitive stage of civilization to-day. Of such, the recent tenants of our Midway Plaisance gave every one a splendid opportunity to judge. There are certain general characteristics noticeable in all this barbarous music. It is recitative and declamatory, filled with pur-

poseless sound, lacking in real rhythm and modulation, and possessing instead a wild sort of continuance and monotony of key; all of which speaks little of joy or the lighter emotions, but much of sadness, of savage war, and of the fear that disturbs the awakening mind as it feels the presence of the Unseen.

Such also is the character of primitive architecture, as the Egyptian. It is possessed of the same gloom and monotony. Vast, ponderous, and oppressive, lavish in its expenditure of force, but with the sense of proportion and delight in form undeveloped, barely existing.

The wearisome cadences of the child of the desert to-day, take one back at a leap to the monotonous stretches of columns and leveling entablatures of Karnak. The want of melody in the one corresponds to the lack of proportion in the other. The idea of harmonious ordering is weak in both.

Turning to Greece, we see on every hand the work of a finer, a more beautifully ordered mind. Here is design most lovely in conception, most pure in execution. An epitome of the progress of musical forms from barbarous to classic civilization is furnished in the transformation of the Egyptian colonnade wrought by the Greeks.

In the first place, the Egyptian extends over practically unlimited areas, whereas the Grecian is confined to a peristyle for the temple cella, and being surmounted by the gable roof is exactly defined and unified thereby. A Gregorian chant or the droning recital of the Oriental may extend over any length of time, but a true song has beginning, middle and end.

Furthermore, as to modulation, the Egyptian entablature and in fact all their work is flat. What projections there are, are abrupt, without gradation. The only curves used to any perceptible extent are the cavetto and torus of the cornice and the lotus form of the capitals. But in the Greek entablature the architrave is separated from the freize, the cornice breaks out boldly, but with solidifying members, from it. The pediment sets back again upon the freize line. The slanting

plane of the roof modifies the severity of the contrast between the series of columns and the horizontal entablature, as the mouldings of the capitals do between each individual shaft and the architrave. The cornice has a broken outline of gradated parts. Curved members, which become more numerous as the Doric is supplanted by the Ionic and Corinthian, carry out still more perfectly this gradation and modulation in the matter of shadows as well as of lines. In the exquisite ordering and modeling of detail, in which lay the artistic solution of the constructive problem of post and lintel and gable roof, something has dawned which did not come to music until centuries later. But these motives of complex harmony are held in strict restraint. The temple as a whole is a rhythmically proportioned unit. Its separate parts succeed each other and repeat horizontally without interference and singly rather than in group.

The Greeks insisted on predominate symmetry in architecture and rhythm in music. They developed rhythm on the same ideal as they did proportion. Their music was exceedingly simple as compared with ours, but they advanced a great step in developing melody as an accompaniment to the rhythmic dance. This is the most prominent motive of their musical work. Simple measures and melodies were created, but harmony, in its technical sense, though known in principle, was but little investigated. It was contrary to their ideas of the true path of music. Plato reveals one of the fundamental art ideals of his people when he says: "Simplicity as to music creates in the soul temperance." It is in natural accord with Greek taste to find them pre-eminent in the feeling for the mathematical relations of proportion—severe yet never obtrusive—of which we spoke in an early part of this essay.

In the scientific planning for acoustic effect, of their open-air theatres, including the placing of vases, so shaped as to sound, each of them, a note of the scale, and which acted as resonators, increasing the powers of the voice, all of which is described by Vitruvius, it may be seen that the Greeks had a

practical knowledge, whatever their theory, of a connection between the properties of sound and geometry.

The great dependence placed upon the intrinsic value of rhythmically disposed form is echoed by a kindred spirit in the classic modes of music. Form in either is at once grave and joyous. Always human, but never voluptuous or intense in emotion.

Greek design possesses symmetry but not accent or balance in the leading motives and masses of composition as does later art. Just such is the motive of rhythmical chant or dance chorale and simple melody. Their music was innocent of counterpoint; and, except for one important feature—the pediment—their architecture was equally simple. The Greek order is pure melody in space as the dance music was pure melody in time.

The end to which the architectural form, the ideas which it sought to express were the same as in the music of the day, viz.: an extremely pure, reposeful, yet sensuous form that would express the external beauty, the rhythmic motion of natural life, especially as revealed in nature's highest type: Man, in a state of free and healthy happiness.

Thus, then, are Greek architecture and music related both in spirit and form.

Rome was rather a borrowing than a creative period, artistically. But some of her decisive departures in constructive systems—the introduction of arches, vaults and domes in conjunction with the motive of the colonnade—opened the way for consistently expressive developments some centuries later, when the turmoil following the fall of the Empire had subsided.

Byzantine architecture was, at its birth at least, full of character, but the age produced no music sufficiently typical to furnish material for a comparison.

Passing them at once to the full-grown style of the middle ages, the thirteenth century Gothic, we find ourselves before a distinctly new system of structure and design.

We observe in architecture a loss of the breadth and tranquility of Greek

design. In place of the simple structural motive of column and entablature there appears a complex system of equilibrated forces. The section of any typical structure does not show one gable only, but a group of gables leading up finally into towers. Several systems of lines and planes, balanced and harmonized, confronts us in whatever direction we study the design.

The Greek pediment gave the first intimation of such motive. But the taste and temperament of the Dorians and Ionians prevented it from becoming very assertive. In Roman buildings, such as the triumphal arches, the *thermæ*, and the Pantheon type, the harmony of contrasting forms is more avowedly dealt with. The culmination is reached in the Gothic church where whole naves, apses, and towers are used as groups. The evolution of the ribbed and buttressed vault has resulted in the abolition of extensive wall surface and the long horizontal lines of cornice and entablature. But, though these necessities of the classic taste have been disregarded, the feeling for proportion and balance in Gothic design is extremely fine. Unity is attained, however, through a much greater perplexity of lines and surfaces. The flying buttresses lead the eye upwards and inwards from the protruding aisles and chapels through the clerestory to the soaring lanterns and spires. Inside the repeating vault cells are broken between nave and choir by the great arch of the transept, and the whole series of equal bays is brought into harmony as one mass with the opposing mass of the transept.

Rhythmical succession of forms has developed into the harmonizing of groups and masses.

Of such design is the harmony of many sounds and many voices, and such in fact was the character of mediæval music.

The height of the Gothic period saw music but little advanced from her classic simplicity. However, while all the various interactions of Teutonic and Frankish ideas with the Roman and Byzantine survival and with growing Christian ideals, were centering in the production of the consistent "Gothic"

architectural form, a similar, though less vigorous movement took place in musical composition. Harmony, fugue and counterpoint had then their beginnings, and their rise marks the division of modern harmonic principles from the single motive of classic rhythm and of Gregorian chant. Gradually these new principles worked a transformation of the plain chant, the chausan, the folk song; a change that resulted finally in the symphony, the oratorio, the opera, and the music drama. But the movement was slow. The music of the church did not culminate until the sixteenth century with Palestrina and his followers, three centuries later than mediæval architecture touched its zenith. By the twelfth century architecture, especially in the larger French cities, had freed itself from the domination of scholastic formalism and was left at liberty to express the symbolism and ideals of the church as artistic impulse led her to do. But music was still fettered by scholasticism, as architecture had been in her Byzantine and Romanesque periods and became again in the later Renaissance. The Italian Renaissance was, as regards church music, not a revival but a continuation of growth, a quickening of spirit and a deliverance from formalism such as had been accorded to architecture in the heyday of mediævalism.

The exclusively polyphonic character of music, which was scarcely broken until the appearance of the genius of Bach, is almost classic in its platonic "temperance," as compared with the profound instrumental compositions that have followed. However, the technical means of fugue and counterpoint are quite unclassic and are entirely similar to those qualities of design that pertain in the even more elaborate composition of the Gothic church of equilibrated forces and forms contrasted with one another and subordinated to large and simple motives. And, being practically limited to the writing of accompaniments for the voice, or rather voices, rhythmical division and repetition is kept in the foreground, and thus the relation to form is more distinctly held than it can be to purely instrumental work.

Still, not until the last century did music reach a point of development which seems to equal the variety and fullness of æsthetic expression of Gothic architecture. In short, the periods of "classic" and "romantic" ascendancy in the two arts have not entirely coincided.

The symbolism of the mediæval modes was, of course, largely the same as that which made possible the Gothic vault and spire. The chants and masses of Palestrina, sung in the Gothic church, so accord with the impression and complete it that it seems as though the stones had found a voice.

Italian church music is as spiritual and as replete in fine ideal as the monastic and cathedral architecture, except that the latter had attained a fuller command over its materials. Music has the advantage of being able to display particular moods, while architecture must be content to create a permanent and often more indefinite ideal. Now it is the *gloria in excelsis* which rises exulting; now the *popule meus* and the *miserere* that linger mournfully. But the Gothic fabric in stone breathes a spirit of harmony and soulful power, wrought out through such a complexity of means that it can only be compared as an art work to the modern symphony. It is barbarous, to be sure, and far more archaic than the Greek in matter of rhythmic finish and grace; yet it is a grand harmonic work, with all the soul of a Beethoven or a Wagner. There was something of the humanistic spirit, too, in the Gothic architecture which the other arts did not feel until the Renaissance.

The best of the eighteenth century church music, as the masses of Haydn, Mendelsohn and Beethoven, occupying as they do a sort of middle ground between the old mediæval polyphony and the extreme modernity of the symphonies, may also be compared in a measure to the spirit of Gothic building art. In the architecture of the early revival there was a great abundance of life and independent thought. Study of ancient monuments created a more refined knowledge of form.

Music pursued its way onward

through the Renaissance with steady pace; but architecture had already passed through a whole cycle and was declining. So this period came to her as one of revival and regeneration. The cinque cento was a time of brilliancy, of charming originality and graceful adoption—a time when the purity of plastic and graphic form was keenly and universally appreciated.

The sunny imagination that penetrated to every corner of Italy at that happy moment drew forth a profusion of charming and enviable designs in plaster, metal, stone and pigment. It is in this Renaissance architecture and ornament of Italy that we naturally seek the most perfect embodiment of the pure musical ideal—rhythm and melody, prized for their innate and inexplicable loveliness. Purity and beauty of form were esteemed above all else; and therefore all designs of this time display, in symmetry and matchless proportion, a rhythm at times little inferior to the Greek; and breadth, accuracy, well-studied repetitions, spacings and groupings reveal a melodious power unexcelled.

However, while the melting away of the haze of mysticism and the breaking of the hierarchal unity were attended by much that was beneficial, it lost to architecture the opportunity of creating such grand and soulful monuments. Throughout mediæval architecture runs the fire of the most emotional music, while with the Renaissance come the refinements of rhythm, the sweetness of melody, the dignity of drama and pageant; it is the spirit of ballad and the opera. It is a transition from organ and harp to flute and violin. The one is Dante, à Kempis; the other Spenser, Keats.

By the sixteenth century the bloom had faded. Expression becomes too much sacrificed to rule. The classic spirit is lost in formalism.

The graphic and plastic arts had by that time risen to such increased power of expression that they disdained the comparative obscurity and restraint of serving architecture as they had always done, yielding her their best thoughts in tributes of lovely decoration. This was a loss from which archi-

ture has most keenly suffered ever since.

While the Renaissance was a period of most marked musical motives, we cannot claim for the style as an objective whole any such clear and single type of musical form as for preceding styles. For one thing forces were becoming scattered and independent. Then, though the humanistic influence affected music as it did everything, it found a very young art instead of a mature one to work upon; and, as music was not in a state of decline as was later Gothic architecture, there was not the same force of pagan and classic revival. This was not entirely lacking, however, as the history of the birth of the oratorio and the opera evince.

Music did not find her full power until the eighteenth century, and by that time the actuating forces were quite different from those which had reigned in the days of the Medicis and the art-loving pontiffs. Music, therefore, took a different form than it would probably have done had it been ripe for a burst of genius then. The great features of the Renaissance movement are, of course, discernible in eighteenth century music; but these penetrate all branches of art and learning and are, therefore, more general than those we are seeking.

Then, too, neither the architectural nor the musical forms were longer confined to a few distinct types and systems of construction. Reverence for and imitation of the ancients made the expression of original types very vague. Personalities became more marked, though the individuality of the craftsman and artisan disappeared, and are much to be regretted; but the independence of the designer, notwithstanding his revival of details, was, for a while at least, very strong.

As the grasp of the academies became firmer and firmer upon architecture, music began to feel the strength of a divine power within her.

The works of the modern composers in independent instrumentality far surpasses the many-voiced harmony of the Italian church music in all but the fervent purity of faith. The noblest

phases of emotion find expression in the modern symphony and kindred work. The most subtle harmonies of color and atmosphere have been grasped by the modern landscape school which has grown up since the Renaissance. But architecture in the meantime has seemed content to become simply a formal profession and a commercial commodity. Why should the evolution of architectural form cease with Palladio or Bernini any more than painting with Le Bruu or music with Cherubini? Architecture was in advance of other art; but has Browning or Swinburne written the last true word of poetry, or Mouet or Vereschagin given the last touch to painting, or Wagner or Schuman brought musical invention to a close?

Architecture may never again, certainly will not for a long time to come, produce a radically distinct and thoroughly logical style: as distinct even, all things considered, as Italian Renaissance from the Roman Empire. Yet only in progress is there life. It must be acknowledged that under present conditions and environment it is a difficult task to design anything good which is not but a slight departure from some old time creation.

This is but natural, as styles can not be invented, but must grow: and architecture has grown but little, as regards development of style since the sixteenth century.

Splendid progress has been possible in music in this age, but architecture has felt more harshly the inartistic side of democracy and commercialism. The supremacy of utilitarian motives in modern affairs has had the unfortunate effect upon the noble art of architecture of robbing it of all freedom of production and progress, which would interfere with the practical business values of ground inclosed. No wonder that she has become superficial and eclectic in spirit. Building for the expressing of ideas and for the love of the beauty of form is a matter not one in a thousand outside the "profession" have any thought of. The creations of the Athenians, the Romans of Augustus' day, the Abbots and master-masons of the middle age, the Italian

artists of the Renaissance are repeated piecemeal in shop fronts, exchanges, and what not; but the fine knowledge of proportion, the instinctive power of design is only to be found occasionally and then it is comparatively feeble and uncertain. And where this light does burn there are many bushels ready for it to hide behind.

It is to be hoped that there will some day be room for the revival and practice of the old systems of proportion and design: that the spirits of Bramante, of Serlio, of Michael Angelo, and the rest, as well as superficial rules of tradition, may again be a strong force in art.

Tradition must be followed; but by keeping it alive, not by sterilizing it. Modern musical growth sets a splendid example of this spirit, and design has just shown a brilliant reawakening to it in the creation of the "White City:" since which it is clear that design is far from dead, though it is dormant and hampered by environment.

But what was possible in an ecstatic moment and with the unsubstantiality of a dream it would be quite hopeless to look for in permanent monuments, fulfilling the services of the day-to-day life of the present age. It is the character and impulses of this side of life which have always shaped the course of architecture. But, until a century or two ago, to whatever reasons we choose to attribute it, this did not prevent the art of design from freely developing upon its own artistic principle. So the Egyptians evolved a consistent, vital and monumental style, the Greeks another, and so on. In modern times, though, the only thoroughly novel types being those that have sprung from motives other than artistic, and even antagonistic, as our "skeleton" framing and proportion defying elevator systems of construction, it is useless to seek any particular points of union between the architecture of to-day and musical form.

However, looking from the other side, the higher developments of independent instrumental harmony, as in cantata or even symphony, which is distinctly a modern movement, may be

rightly said to have certain equivalents in the architectural form of other times. It is, though, as ideals of pure design throughout such work as the French cathedral Gothic, and such as produced the Court of Honor at the World's Fair, that brings modern music into relation with form and design.

To show a parallel of architecture as a concrete whole to a definite musical form, we must look to music as united to poetry or, at least, words rhythmically arranged, as in chant or to the dance. Such parallels we hope we have shown to exist between the Greek temple form and her melodious dance music, and between the mediæval form and the polyphonic chants and chorales of the church. Resemblances during the Renaissance and since, seem, for reasons given, to be less definite and contemporaneous, yet the oratorio and the opera have considerable constructive affinity to Renaissance design, as they, as well as the latter, began in attempts to restore classic principles and systems. The aria and musical accompaniment to dramatic action and dancing are returns to the ancient idea of music. Finally, in the lyric dramas of Wagner we may behold a return, not only to Greek ideals of the drama, as the composer sought, but also an unconscious revival of the motives which stirred in the brains of the great mediæval builders.

Much may be hoped for the future of design if the idea of the fundamental unity of the arts can be restored. Divided and specialized as to the extent they are at present they fly to extremes either of formalism or lamentable "originality." As Wagner said, thinking of his ideal lyric drama: "The separate branches of art could never aim to supply in any way the places of that all-powerful work of art which was only possible through a union of their forces."

Architecture has not been able to express the later day intellectuality, as has been the lot of music, if for no other reason, because of a more unkindly environment. Except as restricted by poetry and dramatic action, the musician may think in pure har-

mony, as it were, whereas, the architect may not build by simply conceiving lines and masses. Designers of other times were more fortunate in being able to turn to artistic account such novel constructive motives as time presented. In our time the suggestions to be derived from these sources are such that, handled with the logic and openness with which the Greek or the mediæval builder showed his construction, would annihilate all that is lovely in proportion, all that is melodic in form. So, shamming and masking real construction becomes the only reasonable course until some more malleable systems of structure are possible. Even this process demands a considerable amount of the faculty of design, though it is of a comparatively inferior order.

When, under a more favorable condition of civilization, architecture puts forth her strength and builds with some of the artistic spirit of Wagner, Gounod and the other great modern masters of music and music drama, who united lovely form and soulful ideas so intimately in their work; when one may find in her lines some echo of the culture of the age, and not merely the condition and ambitions of trade, then will she be instinct once more with the power of the music of form.

Not that salvation is to be gained

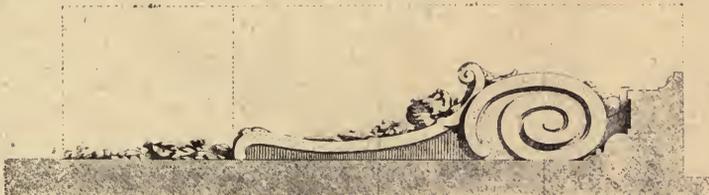
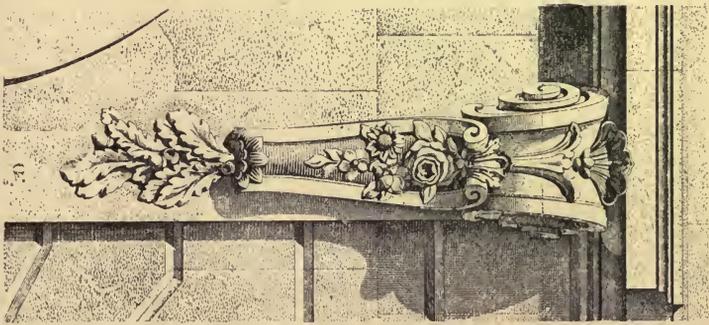
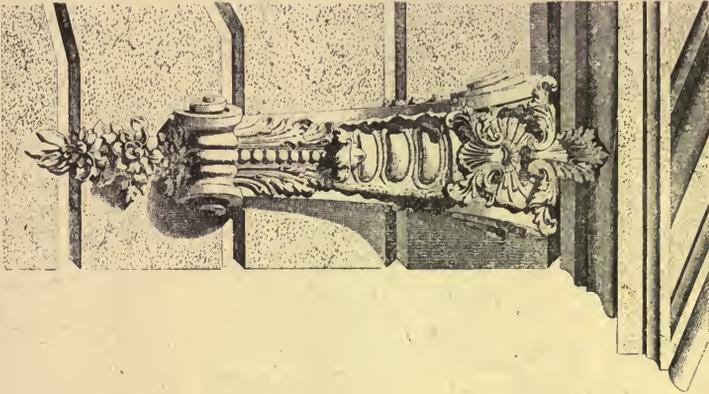
through wanton originality, innovation or disregard of our classic and academic standards. But, be we classic even in the extreme, we may rest assured that the more we seek sympathy and understanding in the soul as well as the exterior of the form we endeavor to perpetuate, the more truly and lucidly will we be enabled to use them, the more to fulfill the musical ideal, to which the architecture of other days gave natural and memorable expression.

With decorative art acting as formerly in concert with her purposes, and more desire evinced for monumental structures and more opportunities given to harmonize constructive and æsthetic motive, from which present styles have so far strayed, architecture would surely not neglect the power thus acquired through these dispositions, which are the marks of living style, but would again awake to a finer feeling of those profound harmonies whose concords her noble works in the past so unerringly struck, so beautifully fulfilled; and would infuse into the refined beauty of Renaissance traditional form, the active ideals of modern art thought, which now find expression chiefly through music and the "music of the future."

With this day may come another Golden Age to light this aged world upon its way.

H. Toler Booraem.





CONSOLS—STYLE LOUIS XV.

Paris, France.



KINMEL PARK, ABERGEELE.

The late W. Eden Nesfield, Architect.



THE EARLY CHRISTIAN ARCHITECTURE OF ROME.

IF we look back in the history of Rome to the accession of Constantine, at the beginning of the fourth century, we shall remember that, though her prestige remained, influence and energy were long gone out of her. The seat of influence was the seat of military power, that is, the army; and the army was kept busy on the frontiers, where the barbarians were always harrying the empire, and especially in the East. The army had for a long time made the emperors; some of the most noted of them were provincials, of barbarian stock. Septimius Severus was an African, Diocletian an Illyrian; Constantine, born in Moesia in Asia Minor, was made emperor at York. Rome had little to do with the empire except to live on it, and be its figure-head. The active emperors spent their time away from her, and some of them never saw her during their reigns; she lived in indolent tranquility, undisturbed except for occasional riots. Her population consisted of the old patrician families, who lived on their incomes, supported their troops of dependents, and gave the tone to the city; the tradesmen and work people, mostly slaves and freedmen; and the idle populace, who held themselves superior to the tradesmen and work people, and

lived on the largess of the empire. She had no stirring middle class; commerce was nothing to her. The city was finished, overbuilt indeed; no building of importance had been done in her for a century. Her art and literature, imported from Greece, were decadent, and given over to the lifeless imitation of old models. The Senate still sat and legislated perfunctorily; its only duty was to pass the edicts of the emperors. Rome was the stagnant home of old traditions, old customs, old ideas, and old superstitions. She was full of an overweening veneration for the traditions and memories of her old greatness, and closed to the ideas of progress with which the world outside was already fermenting. There was a considerable body of Christians among her people, chiefly among the slaves and freedmen, it would seem; some of them were prosperous and even wealthy, and beginning, in the cessation of persecution, to let their worship appear, and to build churches for it above ground, but outside the walls. Yet few persons of influence were among them, and they were looked down upon by both the patricians and the idle populace.

Rome was pagan, and pagan she remained even after Constantine, in her ruling spirit. The patricians were slow to accept the Christian religion at all, and clung to their old worship, at first

publicly, afterwards secretly, long after the official religion was established. Julian the Apostate, half a century after Constantine's conversion, only gave public expression to this smouldering paganism when he tried conscientiously to bring back the empire to the worship of its old gods. This was a part of the ineradicable conservatism of Rome, a conservatism which fairly matches that of her later years. Even among the lower classes, who formed the body of the faithful, the superstitions of the old worship lingered almost unimpaired for many generations; the worship of saints took the place of the cult of nymphs and fauns; the Christian festivals were set designedly on the days of heathen feasts, and it is curious to note how many popular superstitions which have survived in Italy to this day, and from her spread through Christendom, are clear survivals of the superstitions of pagan mythology, such as the evil eye, the sinister meaning of omens seen on the left, and a hundred common signs of good luck or ill.

As she was pagan, so she was classic. Her art was interwoven with her religion, interpenetrated by it, shaped by it and by the traditions which came down with it from her early history. That her conservatism should show itself especially in art was inevitable. For the gospel which was to work a radical change in the moral and social order of the world had no direct message whatever for art. The Church took her art where and as she found it. The only change she made in it was by the introduction of new symbolism, and even her characteristic symbols were in great part the symbols of the old worship invested with a new meaning, which may or may not have been discriminated by the multitude of believers. Thus the emblem of Bacchus became one of the cherished emblems of Christ, by his own authority, and the amorette which sported among the vines on the walls and vaults of the imperial palaces continued their gambols unrebuked in the name of cherubs on the vaults of Sta. Costanza and on the Christian sarcophagi of the fourth and fifth centuries.

This obstinate conservatism of classic art has not, I think, been sufficiently recognized. So long as the art of Italy lasted it was classic. It is common to assume that the new religion brought a new impulse to art, and began at once to develop a new system of forms which grew continuously into the art of the middle ages. But the new art did not germinate in the West till the old had expired; and before this the greater part of Italy had been reduced by violence, disorder, impoverishment, pestilence, famine and depopulation, to a condition in which art was the last thing to which her wretched inhabitants had attention to give. It was the destroyer himself who lifted her out of this condition, and when she rose again it was not only to a new social order and a new art, but practically with a new population. It was not to the new religion but to the new blood that art owed its regeneration.

It was in the East that the barbarians began to overrun the empire. There they did not annihilate the social and political order as in Italy, but rather were absorbed and transmuted by it, till in the end they may be said to have absorbed it. This process was going on before Christianity became the religion of the empire. As order and government did not perish in the East, but were gradually transmuted into new forms which suited a new people, so it was with art; and the art shaped by this process of transmutation retained in the end much more of classic character than in the new German kingdoms of Italy, where, when it grew again, it grew *de novo*.

To the East, there we naturally look for the connecting links that join classic art to Christian; but there these links are peculiarly difficult to trace, for they have been nearly obliterated by the later invasion of a later race, bringing a new and militant religion—a race which has not assimilated with the conquered people, and whose blood has rather curdled than clarified that of the countries which the Turk has overrun. But the great palace that Diocletian built at Spalato, the later churches at Constantinople, culminat-

ing in Sta. Sofia, the buildings of Theodoric at Ravenna, purely Eastern in style, and scattered survivals here and there, especially the singularly preserved series of stone buildings of Syria, give, when comparatively studied, a very convincing picture of the progressive changes of architecture in the East. It has been a habit to look on the East, including Greece after the loss of her independence, as the home of conservatism, given over to intellectual coma, and lost to progress. But though the later empire of the East stiffened into immobility and routine, and though after the Roman conquest Greece declined into artistic stagnation as well as political, yet in the brilliant days of the Roman dominion, through the reigns of the Antonines and down to the time of Justinian and later, the Eastern provinces were the focus of the energy and progress of the world. While Rome lived in idle indulgence on tributary wealth, the busy cities of the East created that wealth. The ruins of Asia and Syria show their astonishing prosperity and prove their continual progress. The exceeding refinement of form and fastidious adjustment of detail that belonged to the Greeks had been gradually lost, as was natural when the consecrated forms, refined by two or three centuries of consecutive study, came to be modified or supplanted; yet, if we may trust De Vogüé's plates, the detail of architectural work done in Syria from the second or third century to the seventh was as clear-cut and well-adjusted as any except that of the very best times—of the fifth and fourth centuries B. C. in Greece, the thirteenth in Western Europe, or the first two centuries of the Renaissance. It is not fair, I think, to speak of the first Christian centuries as a period of general decadence in architecture. In some respects a great change had come over architecture and the spirit in which it was designed. Though the exquisite sense of the Greek architects for proportion and for refinement in detail had decayed under the Romans, the period of Roman formalism was passed and a

decorative spirit had come in which, if it lacked the perfect grace of the old Greek and was over-exuberant, as some of us would say, was yet full of freshness, vigor and invention. It could not easily outdo, I suspect, the richness of pure Greek art, which was more sumptuous than we are apt to imagine; but it substituted an opulence of superb material, a wayward freedom and exuberance of form, and, especially with the development of mosaic, a profusion of colored surface-decoration that outshone the splendor of the earlier time. The technique of architecture, apart from the finish of its workmanship, had in some ways greatly advanced under the Romans, and it continued to advance. The squared masonry and simple lintel construction of the Greeks, unequaled in its kind, had been replaced by a complex system of arches, vaults and domes, with a carefully lavish use of rough material, cased in wrought stone or marble, carried to a gigantic scale, with unexampled grandeur of effect, and building structures of a complexity, size and audacious conception which even the nineteenth century shrinks from attempting. The technical advance by no means stopped as the splendor of the empire decayed after the period of the Antonines. The steps of the succeeding development are not clearly traced, owing to the disappearance of the buildings which should have shown them, but the monuments of Constantine and the more fully-developed architecture of Justinian show a transformation that could not have come of a sudden change—a thing which never happened in architecture till in modern days fashion got its hand upon it—but indicate clearly a continuous modification, some phases of which, at least, are still to be seen in the architecture of Central Syria and in scattered monuments that survive elsewhere.

So, while Rome was decadent, and art was decadent in her, architecture at least was not only alive but in some ways advancing in the East. Constantine's great predecessor, Diocletian, when he withdrew from empire retired—if it was retirement, to move nearer than his capital to the centre of all

activity—to his native Illyrium, and there built the great palace which is our record of the progress of architecture up to his day. I say up to his day, for the changes shown in it can hardly be the sudden efflorescence of that one building, but must be in the main examples of what was going on in the current of contemporary progress.

The palace, surviving in isolation, can not have been the only practising ground for such great innovations as it shows us. We find in it not only that direct imposition of the arch on the column for which it has been specially called into notice, but the continuous wall-arcade, the corbelled column, the razing of the entablature almost to a stilt-block, precursor of Ravenna and Thessalonica, the bending of the whole entablature about the arch, as in Syria, the plate-band, the arch carried over a lintel and cornice without impost or pilaster, all these are not signs of a sudden impulse due to a great opportunity, but rather, it would seem, are part and parcel of a consecutive development in the art of architecture. If we turn to Central Syria, we find in the early churches, as old as Constantine or older, the basilican form well established, the nave and aisles with bordering arcades, the round eastern apse flanked by two rooms like sacristies (the prothesis and diaconicon of the Byzantine churches), the clerestory, and the narthex across the front. In the great church, or rather quadruple group at Kalat-Siman, built, so far as we can make out, only about a century after Constantine's time, we see the clerestory beset by a range of corbelled columns carrying an upper range of corbels on which the roof-trusses rested, an apse surrounded without by ranges of like columns running up into the arcaded cornice, a projecting triple-arched porch with three gables crossing the front, and three eastern apses, as in a Western church of the twelfth century. The one feature wanting to the Syrian churches is the transept, as is natural in these small churches, intended either for monastic use, or for small congregations, and

for the celebration of the service by a small number of the clergy.

If we look at the architecture of the church in Italy in Constantine's reign, taking this as a conspicuous period rather than as the epoch of a great architectural transformation, we shall find architecture well advanced in the transition from classic forms to those of the Christian Church. We shall have reason to believe that the transition was accomplished in the East rather than in Italy, and that it was a deliberate, consecutive development of architecture apart from its special uses, whether secular or ecclesiastical, although certain definite forms of buildings had been evolved for the special use of the church. The indications are that the transformations were the work of the same Greek people who had invented or shaped the classic architecture itself. By this time, apparently, the colonnade and entablature had generally gone out of use in the East; and under the guidance probably of Greek artists the arch, which Greece had refused in the days of her first architectural glory, was taken where the Romans left it, and made the dominant and controlling element both in design and construction, lifted from servitude to a regal position which it kept through all the middle ages. It is likely that Constantine first brought the new architectural forms into Rome—perhaps they had as yet no place in Italy, for there is no indication that there had been any call for new architecture in Italy for some generations—and that it found there an uncongenial home.

The kind of church which Constantine built, and which his successors perpetuated, must have been developed in the East, though it differs from the smaller churches which we have just noticed in Syria. That which Paulinus, Bishop of Tyre, built, as Eusebius describes it, so far as we can understand his description, was substantially of the same type, and Eusebius does not stint his words in describing its splendor. Tyre was at this time the most prosperous city of Syria, and the church had been important there. In many cities of Asia Minor the

churches were prosperous from the first centuries, and as they gained in membership and wealth, where they were not under a ban as in Rome, there was every reason for providing them with buildings of size and importance. The prominence of the early churches, the complexity of organization which they soon developed, the growth of ceremonial and ritual, all testify not only to numbers but to position and wealth. There is a significant edict of Licinius, Constantine's rival in the East, which orders that men and women shall enter their churches through separate doors, and which, whether or not it testifies to their orderly ways, indicates considerable importance in the communities which were so disciplined by imperial edict. It probably points to an order of which the need had come to be well recognized, and which finds its recognition in the plans of the basilicas of that time, that is, the separation of the sexes among the worshipers.

I shall not go into the question of the origin of the Christian basilica: it is long, intricate and difficult. It is enough to recall that secular basilicas were common in Rome, that they existed and were probably abundant in provincial cities, and that there is no record of the conversion of any civic basilica to the use of the church; but that the ecclesiastical basilicas were developed from them is clear. Constantine built basilican churches both in the East and the West, and the type was naturally the same, though there are indications of certain significant differences. One of his first cares was to redeem and reconsecrate the Holy Sepulchre. There had been, we are told, a systematic attempt of the pagans to obliterate it by covering it up with earth and by building a temple of Venus over it. The temple must have perished, for it needed supernatural intervention to enable him to find the sepulchre. He restored it and built over or about it a splendid basilica. It is not easy to fully understand Eusebius' description of this, owing to our ignorance of the meaning of the Greek technical terms—an ignorance in which possibly the pious had a share—but it

shows plainly enough the principal points: first, toward the east was a great atrium apparently inclosing the sepulchre, with porticos on three sides; then, facing the east, a porch and three doors; then an inner vestibule; and, then the body of the church, "built up to infinite height, spread out to immensity in length and breath." The splendor-loving Constantine would have it as magnificent as became the place where the head of the church was laid, now that so much magnificence was gathered about the shrines of his followers. In his letter of instructions to Macrinus, Bishop of Jerusalem, he orders "that all the churches which in every State hold the first place, shall be far surpassed by the dignity of this:" "for this place, which is easily the first in all the world, must be worthily set off with every adornment." So the church was to be built outwardly of smooth-wrought stones and inwardly lined with varied marbles, divided lengthwise by colonnades or arcades, covered with fretted ceilings of wood, and partly with vaulting, and ended in a western apse, surrounded with twelve columns typifying the twelve apostles. I see no indication of a transept in this description, but in another great basilica, which Helena, his mother, and Constantine built at Bethlehem over the place of Christ's nativity, as he thought, and which survives to-day, the transept is conspicuous. The plan of this transept, to be sure, is so unusual for Constantine's time, having round apsidal ends, that some critics have concluded that it must date from Justinian's; but the structure of the building is said to be evidently of one date; its style is so clearly that of the fourth century, and so absolutely not that of the sixth, that in the lack of any trustworthy record that Justinian ever built at Bethlehem, and with the support of the history of the building, which is unusually continuous, I think we must conclude with De Vogüé that this is the original building. It is a five-aisled basilica, divided by rows of columns which carry wooden architraves supporting the clerestory walls and the ceilings of the aisles. The nave has now an open wooden

roof; probably it was at first a flat coffered ceiling. Nave and aisles reappear, as it were, beyond the transept, the choir ending like the transept arms in an apse, so that the east end is three arms of a Greek cross. This peculiarity does not appear in any of the churches built by Constantine in Rome, nor in any of those which were modeled on them. It is at least possible that the plan of this east end, which is essentially three apses looking toward a common centre, instead of the usual single apse, is due to the fact that here the focus of interest is in that centre, where is the crypt that contains the birthplace of Christ. It is a noteworthy peculiarity of its design that, although the arcade had become fully established in its independence of the entablature—the great arcaded hall, so called, of Diocletian's palace is a conspicuous example—and though we may reasonably suppose it to have mainly superseded the colonnade in the East, here it is refused, and the columns carry an architrave.

Constantine's Roman basilicas differed essentially from this at Bethlehem in the arrangement of the transept. The three great basilicas, nearly contemporaneous, of St Peter, St. John Lateran, and St. Paul outside the walls were of one type—five-aisled, with large transept, and single eastern apse opening from the middle of it. They had an open porch across the front, and before it an atrium surrounded by cloisters. These churches fixed what may be called the Latin type, peculiar to Rome and to the small number of cities which took their precedents directly from her—except for the double aisles, which were rare—and adhered to in Rome herself, with all that conservatism which I have ascribed to her, long after the progress of Romanesque architecture in Italy and elsewhere had altogether changed the type of churches outside of her. The type differs from that of the East, where the transept was not common and three apses were usual, where also the atrium was not so nearly universal as it seems to have been in the more important churches at Rome. The natural growth of the city has

obliterated it there in most cases; but indications of its existence are common. The transept was flush with the aisle walls, or nearly so. In the old St. Peter's, where by exception the ends projected considerably, they were cut off by screens of columns in line with the outer walls of the aisles, so that from within they did not seem to project. In some of the lesser churches the transept was omitted, as in S. Clemente, S. Maria in Cosmedin and S. Croce in Gerusalemme. The first of these three gives the best example that remains of the atrium of these primitive basilicas. Where that has disappeared, or was from the beginning omitted, we usually find a survival of it in the entrance porch opening with a colonnade or arcade in most cases, but sometimes overbuilt and closed, as in S. M. Maggiore and S. M. in Cosmedin, and serving as a narthex.

It is not worth while to dwell on the details of these churches, which are pretty well known to architects, but I wish to emphasize two points which seem to me most characteristic, and which illustrate more than others the pertinacity with which decadent Rome clung to her own ways, and let the progress of the world go by. The first of these is the adjustment of the transept to the body of the church, and is the thing which most characteristically distinguishes the Latin form of church or the Roman form. It is common to think and speak of all churches with transepts as cruciform, and to assume that the cruciform type prevailed wherever Christian churches were built. But the more precise and the better meaning of cruciform implies two members that mutually intersect, making four arms projecting from a centre which is common to both. In this sense the Latin churches are not cruciform at all; the cruciform church never prevailed in Rome till the Renaissance, and I have not been able to discover that it appeared there at all till the Gothic period. In the cruciform mediæval church the nave and transept penetrated each other, though by virtue of the predominating aspect of the nave and the uses of the choir, which occupied the eastern arm and the crossing

together, and often took in part of the nave, the crossing came to appear as part of the long aisle of the church, and the transept ends appeared like twin arms added to a continuous body. The plan of the Latin basilica was then not a cross, but a T, the apse being a mere excrescence on the transept. The relation of the two parts was very much like the head-house and train-house of a modern railway station. The transept did not consist of two arms fitted to a body that divided them but was the dominant member of the building, a continuous hall against which the nave and aisle abutted and stopped short, and which further asserted its dignity by lifting its whole floor above that of the others. The connection between these parts of the church was in Constantine's time not what the Germans call organic; there was not any articulated junction. It was as if the two members had been separate buildings; as if the nave and aisles had been moved up to the transept till their ends abutted against its side, and holes had been cut through for communication. I do not know that this architectural exaltation of the transept belonged to the Roman civic basilicas. Apparently the transept was not common in them, and where it existed it merely amplified the shape of the main hall. I suspect that its dominance was a characteristic of the Christian basilica, and it may well be that it belonged to great basilicas of the East, which have disappeared. The early Eastern churches of this form which remain to instruct us are for the most part without transept, but they are all comparatively small, and naturally would vary, like the smaller churches of Rome, from the plan of the great ones. The motive of the transept is obvious. It was to provide an ample and exalted position from which a great number of privileged persons, including the clergy, and doubtless the superior members of the imperial court, who could not be confounded with the mass of the faithful in the body of the church, might share or watch the services.

The architectural mediator between the transept and nave was the trium-

phal arch. It is best seen in St. Paul without the walls, where the primitive arch remains, spared by the fire which destroyed the nave early in this century. Here its impost is an entablature which is borne by two great columns, much higher than those of the nave, which stand out in the line of the transept wall. Occasionally its impost is continuous with the entablature or main string-course of the nave, as in S. M. Maggiore, but usually it asserts its superiority in an architecture on a larger scale than the rest, appearing only as a decorative feature of the transept, to enhance whose dignity is its chief office. This disposition of the church, while it served its purpose by exalting and in a way secluding that part which was reserved for the dignitaries, was an injury to the architectural composition. It is imperial in sentiment, and an echo of it still survives in the Greek church, where the priests do their office behind a screen, the Iconostasis, while the congregation waits in the nave. I say an injury to the architectural composition, for the nave, the original member, and far the more important in structure and effect, is degraded into a vestibule for the transept, which, for all its high function and the concentration of adornment about the centre, is in truth a mere cross-gallery. It is quite inferior in expression to the later form in which the nave is continued through to the apse, and the crossing appears as its natural climax, expanding upwards into a great central tower as in the fully developed cruciform church of the middle ages, or into a dome as in the Renaissance church.

But this was the type which Rome preferred, and to which she held with that conservatism on which I have dwelt before. From her example, apparently, it became the basis of that type which with more or less variation is often called the Italian type, in which the transept is still continuous, and bordered on its eastern side with chapels or apses, of which the middle one is simply a little more important than the rest. The type prevailed, I think, in provinces which were subject to the immediate influence of Rome, or were

more or less excluded from that of the German blood which was poured into Italy—in the states of the church, in Tuscany, and Campania, for instance. We find it in the great churches of Florence, where the Church of Sta. Croce is a conspicuous instance; in Naples, as in the Cathedral of St. Januarius, and in a hundred well-known instances throughout Italy; it held its own till the invasion of Pointed Gothic, and even reappears in some churches of the Renaissance. In those cities in which the German blood prevailed with its progressive instinct, or the Imperial power was dominant, the cruciform type seems to be preferred.

Rome held unswervingly to the Latin type until the time of the middle Renaissance, when under the rule of Julius II. and Leo X., and the artists whom they called about her, she suddenly flung away her conservatism, and became for the time the leader of progress, though it was progress in the revival of her own ancient forms of art and literature. I do not know of any acknowledgment in Rome of the cruciform type before this period, unless it be in her one Gothic church of S. M. Sopra Minerva. When in her lesser churches the transept was omitted she kept the form unimpaired in other respects. To be sure, in the small church of SS. Vicenzo ed Anastasio the nave is carried through the transept, and the apse attached to it, but even here the cruciform shape is not suggested, for the transept arms, lower than the nave, merely abut against it behind two larger arches in the continuous arcade. There is no thought of interpenetration; moreover the whole east end, including the transept, is an afterthought, added in the fourteenth century, and an anomaly which belongs to no type or series of buildings. It would be interesting to find out when and where the idea first occurred of pushing the nave through the transept, and joining it to the apse. The suggestion is apparently an obvious one, and the thing once done, it was natural to push both nave and apse beyond the farther transept wall, and make an eastern arm. When the triumphal arch at the entrance of the transept and that where the apse

had joined it were retained, and similar arches crossing the transept marked the continuation of the nave, the cruciform church was complete. The crossing became part of both nave and transept, but the need or the habit of extending the choir into and even beyond the crossing prevailed, the transept arms were soon disused in the celebration of the service, and became subordinate instead of principal, while the united nave and choir took their natural predominance, to the architectural benefit of the church. This arrangement was sufficiently foreshadowed in those smaller churches of Rome which had no transept, of which S. Clemente and S. M. Cosmedin are the best known examples. In the last the continuity of the longitudinal members is emphasized by the exceptional fact that the aisles as well as the nave end in apses. But Rome refused the cruciform plan.

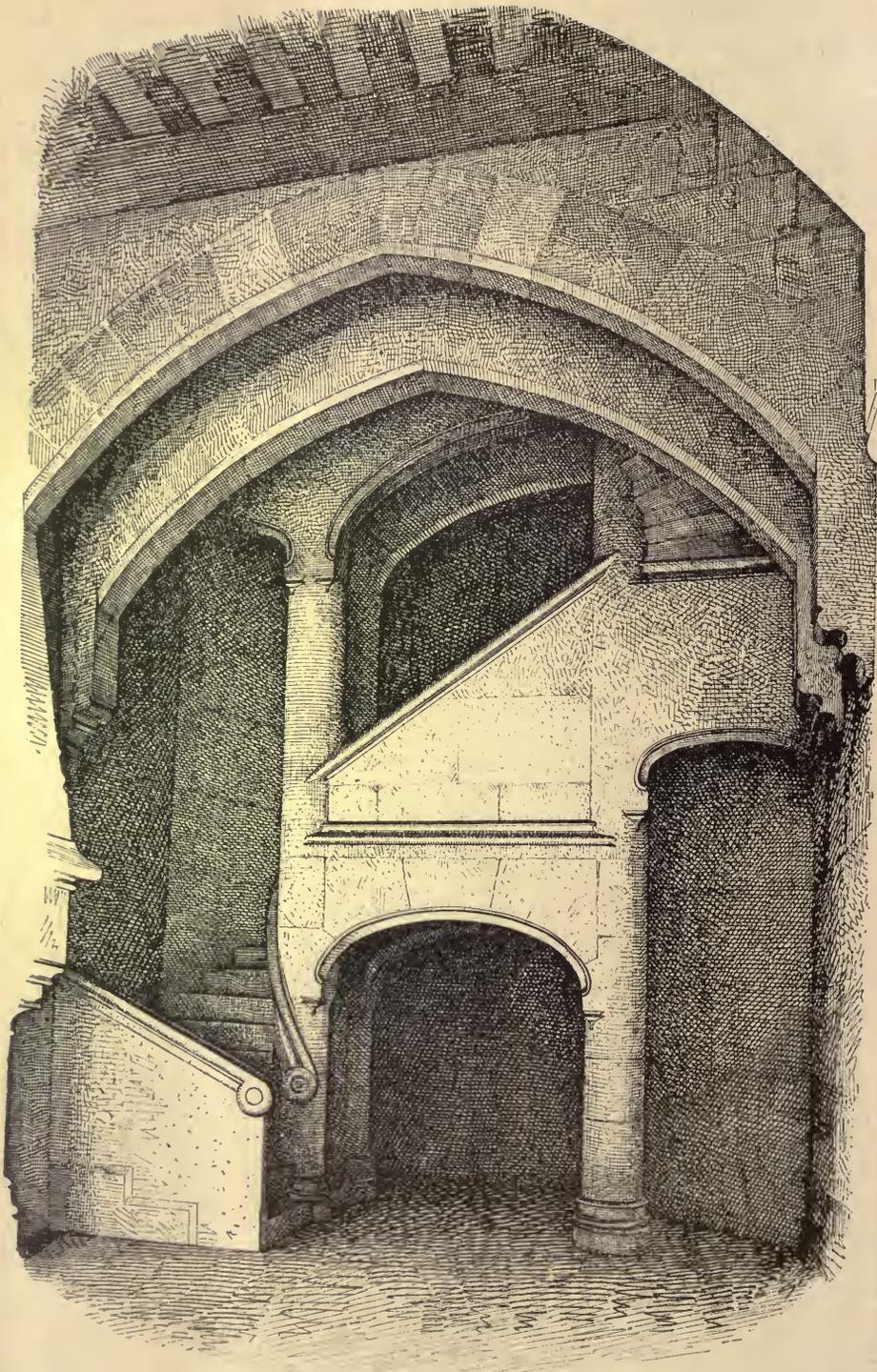
The second point which I wish to emphasize, wherein Rome clung to her classic precedents, is her favor for the entablature rather than the arch. We all know how the classic Romans subjugated the arch, which was their own property so far as they had any artistic property, to the order, which we are apt to speak of as borrowed from the Greeks. Borrowed it was in its more developed fashions, the Doric, the Ionic and even the Corinthian, but in its essentials it was the architecture of their own temples, inherited from the Etruscans, and possibly owed its honor as much to its religious associations as to their admiration of Greek art. It had been to them the representative of what was august and sacred, while the arch had been servant of all work. The Greeks themselves, as we have seen, had before Constantine's time rehabilitated the arch and given it the honor that suited its kingly qualities, but the Romans in their conservatism seemed to look upon it as an upstart, unworthy of the place it had won. The arcade was far cheaper than the colonnade, for it required fewer columns. It was easier to build, for it was built of much smaller stones. It was more serviceable, for it favored in the interior that openness which was one great advant-

age of the basilican form of church. Among the three great basilicas of the fourth century, in that which was the most august, if not the most venerable, that which Constantine built at the special intercession of Pope Sylvester, to Peter, the patron saint of Rome and head of the Universal Church, the nave was lined with a colonnade and the arcades were remanded to the divisions between the aisles. The other great basilica of Sta. M. Maggiore, built by Sylvester's successor, Liberius, owes its striking effect to the interminable colonnades with their continuous entablatures that border the nave, and tempt us to believe that the Romans were right if they ascribed a peculiar solemnity to the unbroken order. The colonnade appears even in the East in the church of Helena and Constantine at Bethlehem, as we have noticed; we find it once at Constantinople in the oldest church there, the St. John of Studios, built in the fourth century. In Rome it reappears at intervals in the more memorable churches all the way to the thirteenth century; in S. Lorenzo fuori le Mura, where it is pieced together out of fragments laboriously gathered from various buildings; in St. M. in Trastevere, in Sta. Prassede, S. Martino al Monte and others. In several of these churches, in St. M. in Trastevere and Sta. Prassede, for instance, relieving arches are built in the frieze to take the weight from the architrave, and hidden by the decoration rather than give the arch the place which its constructive importance deserves. While the entablature was banished from the rest of Europe in the centuries of her depopulation and poverty, when building had almost entirely stopped in Rome, her preference still shows itself in S. Lorenzo in the sixth century, in S. Prassede in the ninth, and when she began to revive in the twelfth, when the fully developed Romanesque was ready to break out

into Gothic outside her walls, with a new prosperity came a new reversion to her old love, and the Church of Sta. M. in Trastevere was built in the old way, and the porch added to the front of S. Giorgio in Velavro, and that built across the front of S. M. Maggiore and since covered up by Fernando Fuga, but shown in an illustration quoted in Letarouilly's book, eschewed the arch and went back to the entablatures. Even the sumptuous cloisters of S. Paolo Fuori and St. John Lateran show for their principal feature above their graceful arcades the revived entablature, not true to the old proportion, but faithful to the old idea.

As we look back over the history of Rome we see imaged in her architecture the same self-consistency, the same persistent individuality that marks her political endurance. All other cities whose architecture records their history show that they have been different cities at different times. In Rome alone that adherence to her old tradition which held her to a straight course in the time of Constantine is embodied in all her later aspects except for the vagaries of to-day. She is the one architecturally harmonious city in the world, as she is the oldest. She has clung to the forms of her architecture as she has to the traditions of her supremacy, and both are witnesses to the strange tenacity which enabled her to assert her primacy through all ages, in spite of poverty, neglect, humiliation and all that would degrade another city. She is to us a symbol of stability, a symbol perhaps of indifference to that progressiveness which the world loves, often to the things that mean real advance in the condition of men, but also of a noble endurance of time and disaster, of a steadfast dignity which makes the nobility of later ages seem petty, and which has held the garment of her majesty about her—at least till our day.

William P. P. Longfellow.



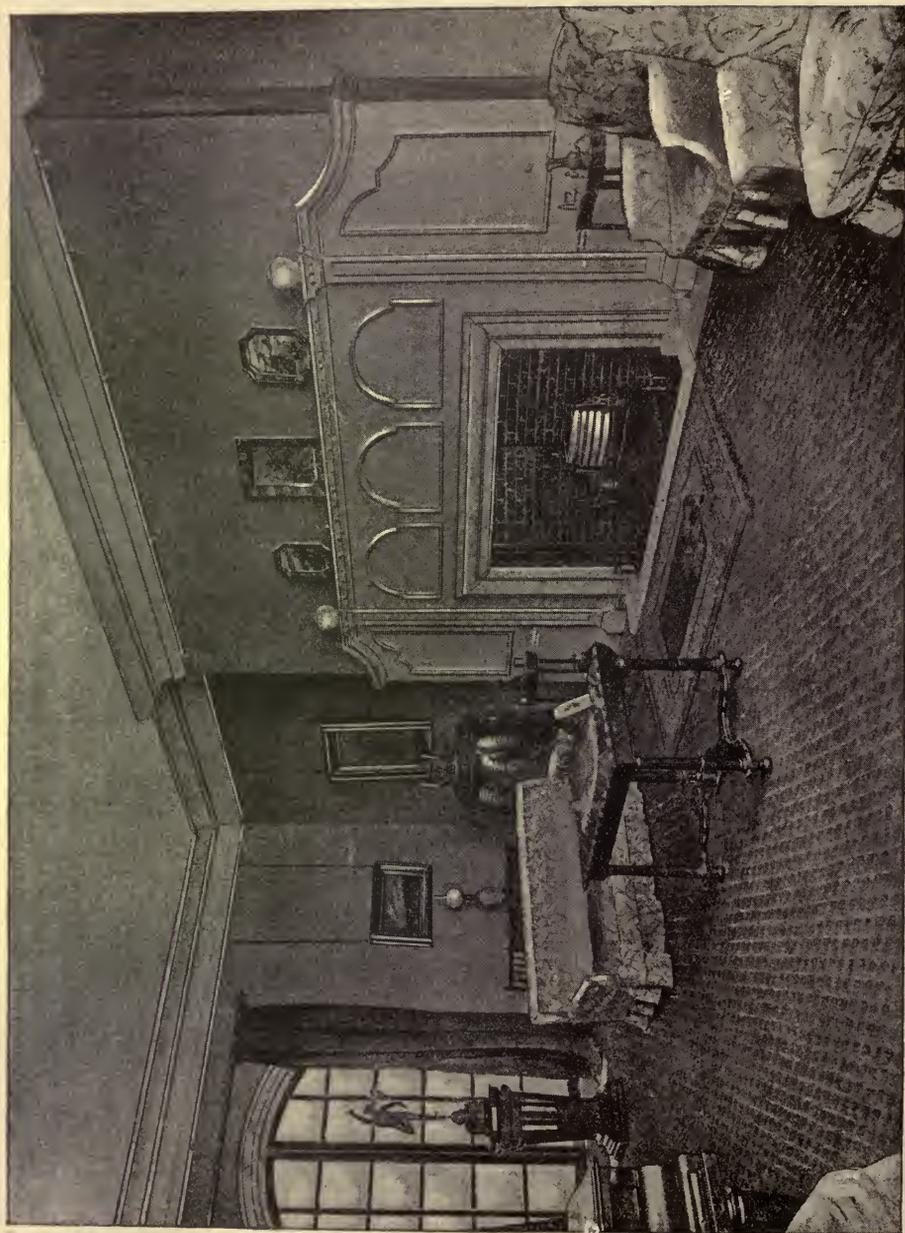
Pierrefond, France.

STAIRCASE IN THE CHATEAU.



Troy, France.

STAIRCASE.



185 Queen's Gate, London,

DRAWING-ROOM.

R. Norman Shaw, R. A. Architect.



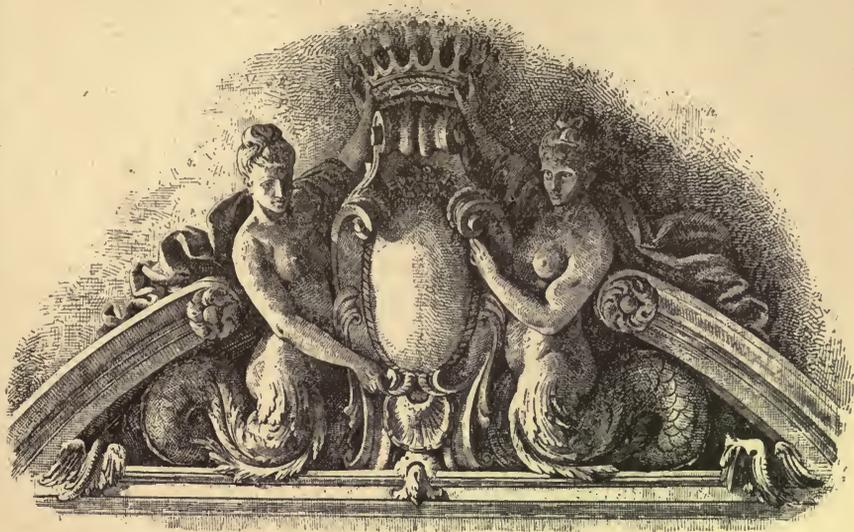
No. 185 Queen's Gate, London,

THE HALL,

R. Norman Shaw, R. A., Architect.



OLD BUILDING IN CHINON, FRANCE.



DECORATIVE ART.



WE are accustomed to thinking of decorative art simply as art which decorates, and which therefore must be secondary; and we are apt to confound it with art applied to manufactures, which is quite another thing. Decorative art means any form of art used in conjunction with architecture.

Ruskin says: "The only essential difference between decorative art and other art is, being fitted to a fixed place," and this one phrase, "being fitted to a fixed place," not only defines it perfectly, but separates it unmistakably from what he characterizes as "portable art," that is, individual and independent work of the sculptor or painter.

Architecture, supreme as it is among the arts, can never reach its highest perfection except in conjunction with its sister arts. It is like a stately tree, which, at its full completion, adds blossoms to its beauty, and glory, and color, and sweetness of fragrance, and so comes to its full perfection through these.

The phrase, "Art fitted to a fixed place," means much more than that, it

means a brotherhood and sisterhood of art. It means concert of gifts and of power.

All methods and all materials are open to it. It may model or carve or stain; or lay pigment upon pigment, or inlay metal upon metal, or fashion pictures in glass, or weave them into priceless tapestries; and each of these achievements will go hand in hand with others, and all finally stand together as one; as the unit of man's ability, the supreme perfection of his creative power.

The changed conditions of the world, during the later centuries, in which men have been growing in individuality, and the labor of the world growing to be voluntary instead of compulsory; and in consequence of this power of choice, choosing its own directions, and choosing them in lines which are in constant demand, and which supply the necessities of the world, have not been favorable centuries for the production of great examples of art in concert. These changed conditions have had a tendency to make art also, individual; and individual and applied art have flourished; because the first could be appropriated and monopolized by wealthy and success-

ful men, and the second—art applied to manufactures—has been so skillfully diffused as to have become the heritage of the million, of the indistinguishable individual instead of the favored few.

Of course, this condition of the world is far better for the happiness and well-being of mankind; but art, in its costlier and greater manifestations, has suffered from the change and is only now becoming adjusted to new conditions and requirements.

During intermediate centuries, architecture and art in their widest development have waited with idle hands for worthy occupation or, despairing of that, busied themselves with the smaller and more modest wants of the world.

Governments have occasionally called upon the arts to create costly buildings; and private or collective enterprise has furnished casual opportunities in this direction, but practically no great monuments of their united efforts have been created in modern times.

In France, it is true, opportunities have offered which have enabled at least one decorative painter to grow into greatness, and to illustrate modern ideas and methods on broad planes, while others have had a chance to show, by individual examples, what the modern painter believes to be the gospel of decoration. In Italy, Germany, Spain and England, combined art has waited in vain for its opportunities, and in America, so far from having only a suspended existence, it can hardly be said to have existed at all. And yet, during this time and under these conditions, architecture and sculpture and painting have each grown to a healthy maturity in separate lines; and these lines have naturally followed the changing wants of the centuries.

Architecture is not often in these days called upon to fashion a palace or temple or cathedral which will stand as a monument during all the ages to come; but it has learned to fit the needs of successful and luxurious family life as accurately as the cocoon fits the worm which spins it; and to erect halls through which the

business and commercial affairs of the world can march unhindered; as well as in naval architecture to build ships that can dominate the sea, and which would have been the wonder of the elder world. And, in a similar fashion, painting and sculpture have answered to the wants or wishes of man, wherever the demand has been made.

Sculpture has made solitary statues, because these were called for; and painting has made "portable" pictures, because men would fain have for their very own something which could go with them wherever the chances of the world might call them. But painting has not quite stopped at that; it has lent itself to the modern and more limited work of the architect as cheerfully as when its business was to record and portray history in living colors; and especially in America it has made itself felt in the development of color as an element of beauty; so that in private houses, wherever design or composition has an unimportant place, color establishes its court and beautifies the whole interior.

Few Americans who are not artists understand how thoroughly this color-gift belongs to us as a people. Few know that the interior of a model American house is the wonder and admiration of artists who come here from other countries. Comparatively few know that American stained glass leads the world, not only in color effects, but in adaptation of improved manufactures in glass.

Our decorative painters are sometimes happy enough to secure an order for a painted ceiling, but when they are not so fortunate they will work out a problem of color for walls and ceilings which requires quite as much of artistic knowledge, and they will light it with mosaic or painted windows, which make a oneness of beauty that satisfies the finest and most exacting of beauty-loving instincts.

This limited use of decorative art seemed, until very lately, the only theatre open to the decorative artist, and, indeed, it is presumably the most constant and permanent modern field; but it has been recently and greatly broadened by the wonderful effects of

the art, as shown to American people at the Columbian Fair.

The overwhelming value of the arts in sisterhood has probably never since the centuries of the antique world been so fully demonstrated. I think every one who saw the incomparable beauty of the Court of Honor, and after the first daze of effect, began to study the elements of their delight, will never forget that first sense of enjoyment of color as accessory to architecture. The first glimpse of the deepened rose color and ideal figures which posed behind the colonnades of the Agricultural Building, and yet projected a radiance of reflection over the lagoon; the gilding and color of the open domes of the Manufacturers' Building, which not only gave richness and gayety to the architecture but indicated and emphasized its purpose—these things were a joy and a delight.

Neither can one forget how the meaning of every building was deepened and illustrated by the groups of statues which supplemented the porticos or fringed the façades, or gave majesty to the spaces around them. And all this satisfaction of soul and sense was a lesson of the value which each art derives from association with others, and of the absolute preciousness of the tie between them.

As artists, as painters, as sculptors, and as lovers of the arts, we owe to that great enterprise, which was named "The Columbian Fair," that the field of artistic effort has been so greatly enlarged by examples of good painting and good sculpture as accessory to architecture. That it has also marked out a defined field for a certain class of effort, and that the lines of the painter and sculptor have been enlarged and made to embrace the highest and greatest work possible to mankind, even although it is limited, and marked as *accessory* and not independent.

We owe to the Columbian Fair that in the hitherto contracted field of art in America a seed of thought has been planted which is already working a revolution in the prospects and conditions of artistic production, and that

the tendency is toward less imitative and more distinctly national art, not only in our public buildings but in our homes.

The new Boston Library, which is evidently intended to be a step in advance of any instance of permanent public architecture in the country, is adding to its value the efforts of at least two of our prominent painters, and it is said that Purvis de Chavanner, the most, or the only distinctly decorative painter of the modern French school, has also been invited to contribute to its adornment. Other cities will follow this example and other painters will find their opportunities of public work and demonstrate their ability to execute it, for the power and faculty exist, although for the most part, in abeyance.

We see, then, that although decorative art at its highest point of development has been a waning instead of a growing need of the later world, on the other hand the growth of a luxurious type of domestic architecture has encouraged the exercise of a studied and artistic use of color and design, so that its effects, although in a modified form, have an almost universal inapplication.

Every successful modern house—and there are many of them—owes its beauty and harmony of interior to the decorative knowledge of some man who has been thoroughly educated as an artist, and can carry his work much farther than arranging valuable schemes of color, wherever he finds it necessary and appropriate. The very fact of his self-restraint in domestic interiors proves his ability to deal with larger problems; since *appropriateness* is the first and most important law of decoration, the very foundation-stone of all good art.

In one direction only, that of stained and decorative glass, the field of the decorative painter is enlarged rather than diminished. This medium of color can be both so splendid and so conservative, that it is easily made appropriate both to the most important public buildings and to the most modest and refined of private houses; consequently this enticing form of dec-

orative art has really advanced rather than retrograded.

The use of opalescent and semi-opaque glass gives a softness and mystery of effect which is impossible to transparent cathedral glass: and the mixture of stains, and the irregular thickness and uneven surface of much of the new glass give possibilities of subtle modulations of color which artists have been eager to take advantage of.

That painting of easel pictures has been effective training for the men who have brought decorative glass to its present pre-eminence in this country no one can doubt; since those who have been leading experimenters and most successful producers, are painters who had made reputations as "colorists" before becoming identified with this particular form of art.

The two most prominent leaders in its development, John Lafarge and Louis Tiffany, were in fact not only distinguished among painters as colorists, but were men possessing inventive faculty, and that sort of divine curiosity which leads and tempts the men of genius from one to another successive step, until he reaches some half-dreamed-of achievement. This faculty which is of such inestimable value in the mechanical arts, has rarely found so high and fascinating a field as in decorative glass. The reward of transcendent beauty which has followed every step of its progress has not only been an exceeding great reward in itself, but it has unquestionably affected the very marked color development of other forms of art. Reaching after the color effects possible only to stained or painted glass—the incomparable beauty of light strained through color—our painters have added strength and harmony to their tints. It has keyed up the color sense of art workers, not only in pigments, but in a marked degree in textiles and embroideries.

Curiously enough, the effect which the color of such a miracle-working medium as glass has had upon the textiles of America, has spread to other countries, and made a positive impression upon the art qualities of the weav-

ings first of England, and subsequently of France. It is interesting to trace this influence through all the hidden veins of commerce and note how the development of one art, or of one quality of a certain form of art, derived directly from qualities of mind of the artist, spreads and melts through other minds, working in other mediums, until widely different forms and substances are colored by it. It is like a ray of light at sunset, which sends its tints across the breadth of heaven and reflects upon the surface of every pool and thread of water which sleeps or flows upon the corresponding breadth of earth.

While the qualities of stained glass have undoubtedly influenced the color of the American painter, both in pictures and interiors, a counter-influence has been developed by the unmistakable bias of architects toward the cool light tints belonging naturally to the architectural styles of the French Renaissance. Fortunately for the development of the national instinct for color, this preference for the forms and belongings of that strongly-marked period of art has been half-unconsciously accepted by the public as only appropriate to the public and ceremonious apartments of the house, leaving the intimate and family apartments to the influence of the national instinct for color and decoration. It is a sort of compromise between the leading of the architect and the bias of the people.

As a rule, the architect is not particularly sensitive to color. To both architect and sculptor perfection and elevation of form satisfies the artistic sense and seems in fact to obliterate the color sense.

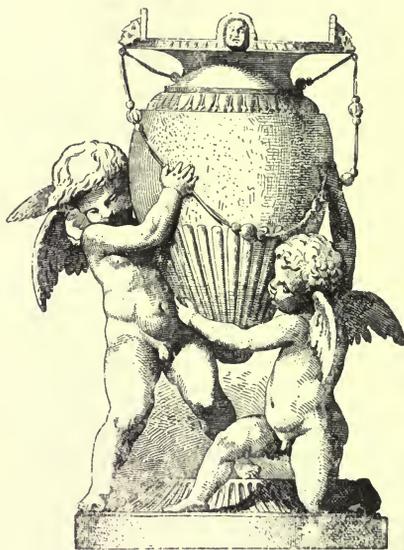
This makes a very curious situation as far as our domestic art is concerned, since the genius and sensitiveness of the people to color is not only instinctive, but highly cultivated. The result is that the drawing-rooms and halls of many of our important private houses might be palace interiors of the seventeenth century, while the dining and living rooms are a genuine product of American art—rich and skillful in color, thoughtful and original in treatment

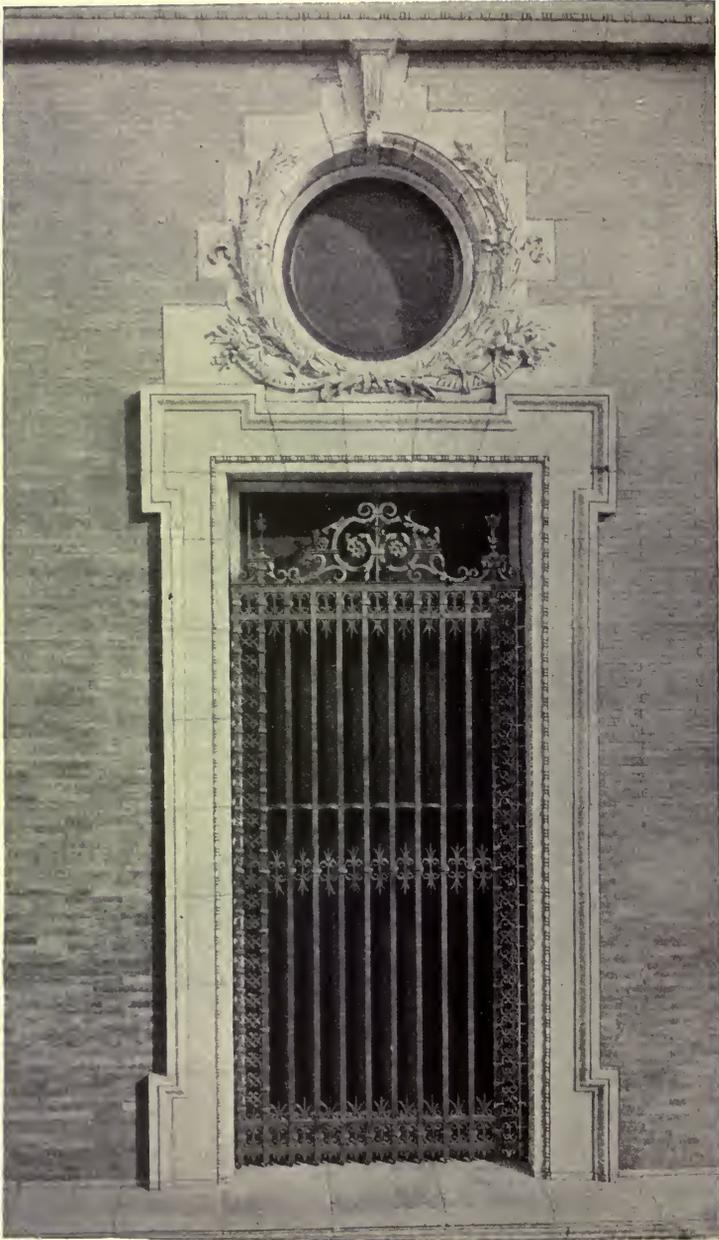
and perfectly appropriate to the life and moods of the century.

Of course, a style or development of art founded upon national gifts or preferences and instinct with living motives is more likely to become permanent and general than a more or

less accidental graft perfected by a different race under widely different conditions; but it may and probably will modify and give a certain purity and elegance to what in the future will harden into a characteristic American style of architecture and decoration.

Candace Wheeler.





WINDOW IN TRUST AND SAFE DEPOSIT CO.'S BUILDING.

Camden, N. J.

Frank Miles Day, Architect.



Entablature of a door in No. 25 Pearl Street, Albany.

THE COLONIAL BUILDINGS OF RENSSELAERWYCK.



HERE are in America but few localities where the buildings possess the element of historic interest, which gives to the architecture of

Europe its chief charm. This is so, not because we are essentially a new country, but because the restless spirit of progress, which delights fully as much in tearing down as in building up, ever demands that the crooked must be made straight and that the old must give place to the new.

It is not that we Americans live so wholly in the present and the future that we are careless of the past, but we have so long made it our boast that ours is a new country that we forget that it is no longer in its youth. It is from contempt, as well as from ignorance, that our own historic spots are neglected; for our historic buildings are for the most part isolated or surrounded by the busy traffic of a modern street. The interest which they inspire is, therefore, personal rather than local, and it is with difficulty that we can forget the present and think of them as they were rather than as they are.

We forget that there are many towns which have stood still, while the century which saw their birth has died and another is drawing to its close; that there are localities which have preserved the color and feeling of the past

as perfectly as have many of the quaint cities of the Old World. Such is many a New England town, where the stately houses of Colonial days stand half concealed among elms no younger than themselves. So also have the great mansions of the South something to tell us of a life now changed beyond recognition. Even the West, young as we are apt to think it, has its convent buildings to remind us that it too has had a past.

It was but a few years ago that Albany possessed a no less striking individuality. The architecture of the city was still distinctly Colonial, and many a Dutch building showed its gable to the street. During the last twenty years, these buildings have been for the most part removed, and there remain only a few of the more pretentious dwellings, which have opposed successfully the march of progress.

It is the purpose of the present article to describe a few of the many mansions for which that city was once noted; but if we would intelligently study the architecture of these buildings, we must consider the times in which they were built; we must forget the present and the immediate past and see the city of the early century, the point of distribution on the great high roads which poured the traffic of the valleys of the Hoosac, the Genesee and the Mohawk into the city's storehouses. New York was then the great wheat raising State

and much of the profits found their way to Albany. From this period date most of the handsome dwellings, which are remarkable for their beautiful Colonial details. The great mansions, the homes of the many well-known families of Colonial and Revolutionary fame, date from a few years earlier and were erected in the last half of the eighteenth century.

But we must follow the perspective still farther, to the days when Albany was an important trading post, and picture to ourselves the narrow, winding streets, widening in places to encircle the church, the fort, and the market; the temples of the three gods in whose honor this, as every other colony, was founded.

In the further distance we see the frontier village, whose very insignificance was a stronger defense than the stockades and the little fort around which the few rude huts clustered for protection; and yet this struggling hamlet is not so insignificant, for it is the most distant outpost of the greatest migration that the world has ever known.

But, for the fatherland of the settlers we must look far away from the colony itself, to the little republic, which was then the greatest naval power in the world, in whose honor the colony was named New Netherlands.

It is not within the province of the present article to describe the various attempts at colonization, which were made successively by the Dutch East India, the New Netherlands and the West India Companies.

Though a colony had been planted on the site of Albany as early as 1614 and again in 1623, when Fort Orange was erected by the West India Company, it was not until 1630 that the colony was placed upon a firm basis; for the settlers preferred to carry on a lucrative trade with the Indians rather than to establish permanent homes and cultivate the land.

The States-General soon saw what an unstable and unreliable people their colonists were, for in October, 1628, the reports say: "there are no families at Fort Orange; they keep five and twenty traders there;" and in the fol-

lowing year the Assembly reported to the States General: "The people conveyed by us thither have found but scanty means of livelihood and have not been a profit but a detriment to this (West India) company." A new scheme was therefore planned, with the object of colonizing artisans and farmers and to provide a field for the ambitious and the enterprising. Accordingly, in 1629, a charter was granted, which provided for the founding of a landed and baronial aristocracy in the New Netherlands. In the following year several Directors of the West India Company hastened to avail themselves of its privileges. Among these was Killian Van Rensselaer, a wealthy pearl merchant of Amsterdam, at a time when the merchants of Holland were, like those of Italy, princes in the land.

In 1629 Van Rensselaer and two of his associates sent agents to America to select suitable places for the establishment of colonies. Three sites were selected, one in Delaware, "Swaanendael," or "Valley of Swans;" one in New Jersey, "Pavonia," or "Land of Peacocks," and "Rensselaerwyck," named from the Manor of Rensselaer, the estate of the family near Nykerk, Holland.

Through his agent, Van Rensselaer purchased in 1629 a large tract of land from the Indian owners. These purchases were augmented until he found himself possessed of a tract of land twenty-four miles long and forty-eight miles wide, extending on both sides of the Hudson and containing 700,000 acres, in which are now comprised the counties of Rensselaer, Albany, and part of Columbia. The deeds signed by the Indian owners and a map made in 1630 by the agent who purchased the property are still preserved among the Van Rensselaer papers.

It was from Rome that the Dutch conceived the idea of governing a remote colony by committing it to the jurisdiction of a *Patroon* (Latin, *Patronus*). The power conferred upon the *Patroon* was analogous to that of the old feudal barons. He acknowledged only the States-General as his superiors and maintained a high military and judicial authority within his territorial

limits. He had his own fortresses planted with his own cannon,* manned with his own soldiers, who fought under his own flag. The Courts of the Colony were his and justice was administered in his name.

The Patroon's charter having provided that the "colonie" should contain within four years after its establishment at least fifty persons over fifteen years of age, Van Rensselaer lost no time in complying with the requirements. Early in 1630 he equipped a ship which carried to Fort Orange a large number of artisans with their families. These were soon provided with farms, live stock, buildings and implements at the expense of the Patroon. In return the tenants bound themselves to pay over a certain portion of the farm produce yearly, to grind their grain at the Patroon's mill and purchase their supplies at his store.

Killian Van Rensselaer, the first Patroon, never visited his possessions, which were managed by an agent. The first member of the family to visit America was his son, Jan Baptiste Van Rensselaer, who was appointed Director in 1652 and took up his residence on Castle Island under the protection of the guns of Fort Orange. Shortly afterwards he removed to the mainland and erected a rude dwelling with a thatch roof, which was destroyed by flood in 1665.

It was to replace this building that the first building known as the Manor House was erected by Jeremias, who had succeeded his brother as Director, in 1658. When Stuyvesant seized the lands around Fort Orange the tenants were compelled to procure "ground briefs" or deeds from the Director General, and it was to escape this indignity that Van Rensselaer moved his residence beyond the limits of Fort

Orange and erected the new building at Watervliet.

This was a long, low one-story dwelling, built of brick, which, it is said, were imported from the mother country. The windows were small and protected by stout shutters of wood, heavily barred. The front door was divided horizontally in halves and was reached by a "stoop" with seats on either side.

The house was planned as much for a place of defense as a dwelling, for several stone loop-holes, which are still preserved, pierced the thick walls. After the Manor House of 1765 had been erected this building was occupied by the Patroon's agent until 1840, when it was destroyed to permit a change in the "Troy road," when a more pretentious agent's house was erected immediately behind it. A small brick building, with immensely thick walls and vaulted roof is still standing. Here the rents were paid in through a heavily-barred window, and here the collection of Van Rensselaer papers, dating from 1630 and comprising several thousand documents are kept.

Among them is a letter written in 1666 by Richard Van Rensselaer, a younger son of the first Patroon, in which he describes a dwelling which he was building some four miles to the north of the fort. This was the famous "Flatts," which six years later passed into the hands of the Schuylers, in whose possession it has remained ever since.

It was here that Philip Schuyler, the founder of that family, lived. Here "Aunt Schuyler," the "American Lady" of Mrs. Grant's "Memoirs," famous for her breeding and hospitality, presided for thirty years after her husband's death. Here was born Colonel Peter Schuyler, the first Mayor of Albany (1686). Between the house and the river, along whose bank was the great turnpike, a party of Mohawks attacked the Mohegans in 1677 and took many prisoners. Here, in 1690, General Winthrop assembled the detachments of his army. From the "Flatts" two bands, under the command of John and Peter Schuyler,

* One of the cannon, shown in the illustration, is still in the possession of the Van Rensselaer family. The cannon is of bronze and is 3 feet 5 inches long. The bore measures 3 1-8 inches. Upon the base ring is cast this inscription: "Assuerus Koster Me fecit Amstelredam 1630" The base of the breach is covered with raised tracery, on which is shown a pattern of sea horses with widespread wings, surrounded with delicate arabesques. The cascabel is ornamented with fleur-de-lis and leaves. Tradition relates that the cannon was fired to announce the death of a Patroon and the birth of an heir.



The Homestead of the Schuylers.

THE "FLATTS"

Built 1666; Reconstructed 1756.

started on their expeditions against Canada, and assembled their Indian allies. Along the high road before the house for seventy years marched the several armies against the French. Under its roof the gallant Lord Howe, Abercrombie and other officers were entertained on their way to meet defeat at Ticonderoga, and here Lord Howe was carried to die.

Mrs. Grant's "Memoirs of an American Lady" (pages 110-114) thus describes the old house: "It was a large brick house of two or rather three stories (for there were excellent attics) besides a sunk story, finished with the exactest neatness. The house had two spacious floors; on the first there were three rooms, and in the upper one four. Through the middle of the house was a wide passage, with opposite front and back doors, which in summer admitted a stream of air peculiarly grateful to the languid senses. Here the family usually sat in hot weather, when there were no ceremonious strangers. At the back of the house was a smaller and lower one, so joined to it as to make

the form of a cross. There were one or two lower and smaller rooms below, and the same number above afforded a refuge to the family during the rigors of winter, when the spacious summer rooms would have been intolerably cold. Here, too, was a sunk story, while the kitchen was immediately below the eating parlor and increased the general warmth of the house."

The building was partly destroyed by fire in 1756. The front was injured the most, the upper story being completely destroyed. The walls were brought to a level, and the building is now but a story and a-half high. The new and the old can plainly be discerned by the difference in the sizes of the brick. The thick walls of the "winter house" withstood the fire and are still preserved.

The interior of the house is not especially remarkable. Some portions of the woodwork, noticeably the large "Dutch" door with its ponderous brass knocker, being from the original house, others being comparatively of modern date. The house is furnished with



Manor House of the Van Rensselaers.

THE "CRAILO."

(Said to have been erected in 1642, and supposed to be the oldest dwelling existing in the United States.)

beautifully carved mahogany furniture of Holland make and on the walls are many a portrait black with time.

The dwellings in the city proper, confined to more narrow limits, were higher and more regular in plan. Their high gable ends were toward the street and were "stepped" to the ridge, where they terminated in large chimneys, or the gables were plain and the "stepped" appearance was indicated by a pattern of bricks laid at an inclined angle. The abundant use of wrought iron was characteristic of this period. The walls were decorated with numerous ornamental iron anchors, with the dates of the erection of the building or the initials of the builders, the gables and chimneys were decorated with many and large weather-vanes and other ornamental work. The walls were thick and were pierced by small windows with heavy wooden shutters.

The door was invariably divided horizontally and every house was provided with its large "stoop" where the members of the family were wont to assemble to gossip, as they ate the evening meal in the open air. Several of these buildings were preserved until recent years—until within five years the house in which Gen. Philip Schuyler was born, erected in 1686 as a city residence by Peter Schuyler, when he became Albany's first Mayor, and the Lansing House, famous 175 years ago as the Exchange, where the Indian bartered his pelts for rum, tobacco and ammunition.

A few yards from the east bank of the Hudson stands the homestead of the younger and larger branch of the Van Rensselaer family, the "Crailo" Manor House. A bronzed tablet affixed to the walls declares it to have been erected in 1642, and that it is the old-

est dwelling in the United States. In the garden back of the house the Continental army, in June, 1775, held its cantonment on its way to Ticonderoga, and the house itself was occupied by Abercrombie as his headquarters. Here it was that Dr. Stackpole, a British surgeon, composed the song of "Yankee Doodle" in derision of the American troops who came straggling into camp in all kinds of clothes.

About few places has tradition weaved a greater mass of romantic stories, most of which are myths. According to common belief the building was erected by Killian Van Rensselaer for his son Johannes, between the years 1630 and 1642. The bricks and timbers are supposed to have been brought from Holland as ballast for the ships. The former, it is said, are stamped with the date 1629 or 1630—on this point tradition is undecided—and the latter are carved with the initials K. V. R. and the date 1642. In the cellar is a secret passage connecting with the well, and in the floor is a trap door designed like an oubliette to entrap the unwary enemy.

Unfortunately none of these corroborating facts will bear investigation. Neither Killian nor Johannes Van Rensselaer ever visited this country, and it is well known that the Patroon's agents, his sons, occupied dwellings but little better than mere huts, and that these successive houses were built on the other side of the river, where they were protected by the guns of the fort.

The bricks are not stamped with the date, and in point of size and form are between the very old Dutch brick and the later Colonial brick.*

* When the Van Rensselaer Manor House was demolished in 1893, I found beneath the basement floor and concealed by earth a vault 10 feet long, 6 feet wide and 5 feet high, with a vaulted ceiling. The vault was made of very rough, hand-made brick, which had evidently formed part of a previous structure, as many of them were blackened with smoke while others had been painted. It is probable that the vault was an outbuilding of the Manor House of 1666. The brick varied in size but averaged $6\frac{3}{4} \times 1\frac{1}{2}$ inches. They are doubtless as old as any in the colony. The Colonial brick of the later Manor House were $6\frac{1}{4} \times 2$ inches. I am inclined to doubt whether any brick was ever brought from the mother country in spite of the tradition which affirms it concerning nearly every old building. The earliest brick is of the most twisted and crude shape. Certainly better brick was made in Holland at this period and only the best would be exported from principles of economy. A description of Albany, written in 1656 by a French missionary, tells us

It is known that the Crailo estate on the east bank of the Hudson came into the possession of Hendrik Van Rensselaer in 1704 on the division of his father's estate, and that he erected shortly afterwards a "substantial brick house" for himself upon his property, which, it is evident from a map, occupied a position, approximately that of the house in question.

The building is a two-story and attic brick structure of most substantial construction. The walls are of great thickness, and are still pierced with two of the nine stone loopholes which once commanded the approaches. The beams of hewn pine are of unusual size, some of them being 16 inches square.

About the middle of the eighteenth century the rude fortress-like dwelling was transformed into a handsome residence and an addition was made in the rear (1740).

The main entrance is in the middle of the river front and gives access to a small hall, from which open doors, leading to the main rooms on either side. At the end of the hall springs an arch, the impost and soffits of which are ornamented with delicate garlands in low relief. Beyond is the staircase, which is rather insignificant.

A second and much larger paneled hall, giving upon the porch at the left, intersects this hall at the centre of the house. This house is most curiously planned; all the rooms connect with each other, usually by means of closets, but as there are several levels on the same story the doors in some cases open several feet above the floor of the lower room. There is no apparent reason for this difference of level unless it was purposely designed to increase the difficulty of capture, the house being taken by an enemy.

Two of the mantels, apparently of much later date, are of excellent design. The shelf of one is supported upon slender columns, of the other by gables. The panels have "egg-and-dart" mouldings and are decorated with wreaths and garlands in relief.

that there were at that time no buildings of masonry in the vicinity. If the first brick buildings were erected in 1656 it would be strange that the clay beds in the vicinity were not used, which after an occupation of twenty-five years must have been known to the settlers.

The building some years ago passed out of the hands of the Van Rensselaers, and the property is now in litigation. Pending the settlement, the house has been unoccupied for a year and has been the retreat of a band of young roughs, who have broken the windows, defaced the woodwork and demolished the mantels and balusters.

Not far from the Crailo Manor is Vlie House (the house by the marsh),

stones, Schuylers and Van Rensselaers of Revolutionary days. The hall, at the end of which is the staircase, runs the entire depth of the building and on either side open the two main parlors, back of which and also giving on the hall, are dining-room and library.

The woodwork of the house is especially noticeable. The doors are surmounted by broken pediments and the



Erected by Hendrik Cuyler, about 1773.

"VLIE HOUSE."

built by Hendrik Cuyler, about 1773. It is a large square brick building in the Colonial style, and stands in the midst of its gardens and orchards, which slope down to the river's bank.

The building is of a creamy tint, with cornice, porch and window frames in white. The large door, with its ponderous locks, opens upon a hall of no mean proportions, from whose walls look down the portraits of the Living-

wooden cornices are each of a different elaborate pattern. Some are carved with fret-work, others with dentils and others with small modillions. All the mantels are lined with Dutch tiles, representing biblical scenes or birds and animals. Above the mantel is the picture panel so familiar in English work of this period.

The design of much of the woodwork appears to have been borrowed from that of the Van Rensselaer Manor



Erected 1760.

THE SCHUYLER MANSION.

House, or else both were derived from a common source, for much is identical.

The second story is similar in plan to the first, the hall extending to the front, from which open the four large bedrooms.

The building has come down quite unchanged from the hands of the first occupant. The gardens are still filled with the same old-fashioned flowers—lilacs, syringas, Malta currants and hollyhocks. Still more remarkable, the interior is furnished in the same spirit which pervades the entire estate, for the furniture is much of it as old if not older than the building itself, and the abundance of black mahogany has left no room for our modern "antique" ash.

Very similar to Vlie House, both in exterior and in plan, is the Schuyler Mansion, built by the wife of Gen. Philip Schuyler while he was in England in 1760-1761.

A short flight of steps with wrought iron railing of graceful design leads to a small hexagonal vestibule, from which the large hall is reached. On either side are the principal rooms and in the rear, reached through a pair of large doors, is the staircase. Here is shown the famous tomahawk mark. In 1781 a plan was made to capture General Schuyler and take him to Canada. A party of Tories, Canadians and Indians, surrounded the house for several days and at length forced an entrance. The family took refuge in the upper story, leaving behind in their haste the youngest member of the family, Margaret Schuyler, afterward the wife of the Patroon. An elder sister going to rescue the infant was pursued by an Indian, who threw his tomahawk at her as she fled up the stairs. The weapon entered the handrail near the newel and the mark is still shown, which would be conclusive evidence if the



HALL OF SCHUYLER HOUSE.

same story were not told of the Glen house in Schenectady, the only house unburnt in the massacre of 1690. The tomahawk mark is shown here also. Thus history repeats itself.

The Schuyler staircase, aside from history, is well worth examining. The balusters are of three different designs, which are repeated in the same order at every step. All are carved by hand in a different rope pattern. This same design may be found in the staircase of the old Lee house at Marblehead, a house in Salem, Mass., and in one of the great mansions of the South. There are but two handsome mantels, one in the principal parlor, whose fretted picture panel serves as a rehedos for the altar of the chapel, for the house is now an orphan asylum of the St. Francis de Sales order, the other in the room directly above, in which Burgoyne was held as a prisoner after his surrender at Saratoga in 1777.

The woodwork, aside from the stair-

case, is not especially remarkable; the interior cornices have large and rather crudely-formed modillions, but the other mouldings are exceedingly well adapted. The rooms throughout the first story have the low white wainscot in two simple panels, which is everywhere found in houses of this period. The doors and windows of the vestibule, which is possibly an addition, are ornamented with gorgons' heads in relief, the other doors are not remarkable.

The house was for many years noted for the hospitality which was dispensed there. Tradition relates that Washington, Lafayette, Count de Rochambeau, Baron Steuben, Aaron Burr, Benjamin Franklin, Charles Carroll of Carrollton, and many other notable persons were entertained. Here Alexander Hamilton and Elizabeth Schuyler were married December 14, 1780. President Fillmore was also married here. It is sadly changed now, for

though the whole of the plateau on which it stands is still the garden, where some attempt has been made to keep up the flower beds surrounded by their box borders, the broad avenue shaded by great elms, which once led from the river directly to the house, is now lined with tenements, and the shady creek which once flowed by the house has for many years served as a sewer.

The house erected in 1798 for Gen.

show the abundant use of moulded decoration which was then coming into fashion. The exterior is ornamented with the anchors and other iron-work so popular with the Dutch; at one end is the date 1796, at the other the initials A. T. B., standing for Abraham Ten Broeck, the first owner.

The Van Rensselaer Manor House or the "Patroon's," as it was usually called, was, at the time of its erection, the handsomest residence in the col-



MANSION OF GENERAL TEN BROECK.

Ten Broeck by his ward, Stephen Van Rensselaer, bears a striking resemblance to the Schuyler Mansion both in exterior and in plan. Here the portico is open, instead of inclosed, but the door opens upon the same large hall, at the end of which, concealed by a partition, is the winding staircase.

The principal rooms open from the hall in the same manner. In the second story the wide hall extends from front to rear. The fireplaces are excellent examples of this period and

onies, and as such it exerted a wide influence over the architecture of the more ambitious dwellings in the neighborhood. The building was erected in 1765 by Stephen Van Rensselaer under the direction of his guardian, Gen. Ten Broeck. He brought his wife, Catharine, daughter of Philip Livingston, "the signer," from New York in a sloop to take possession of his new house. He was then only twenty-three and she a girl still in her teens. With them came their child, a baby in

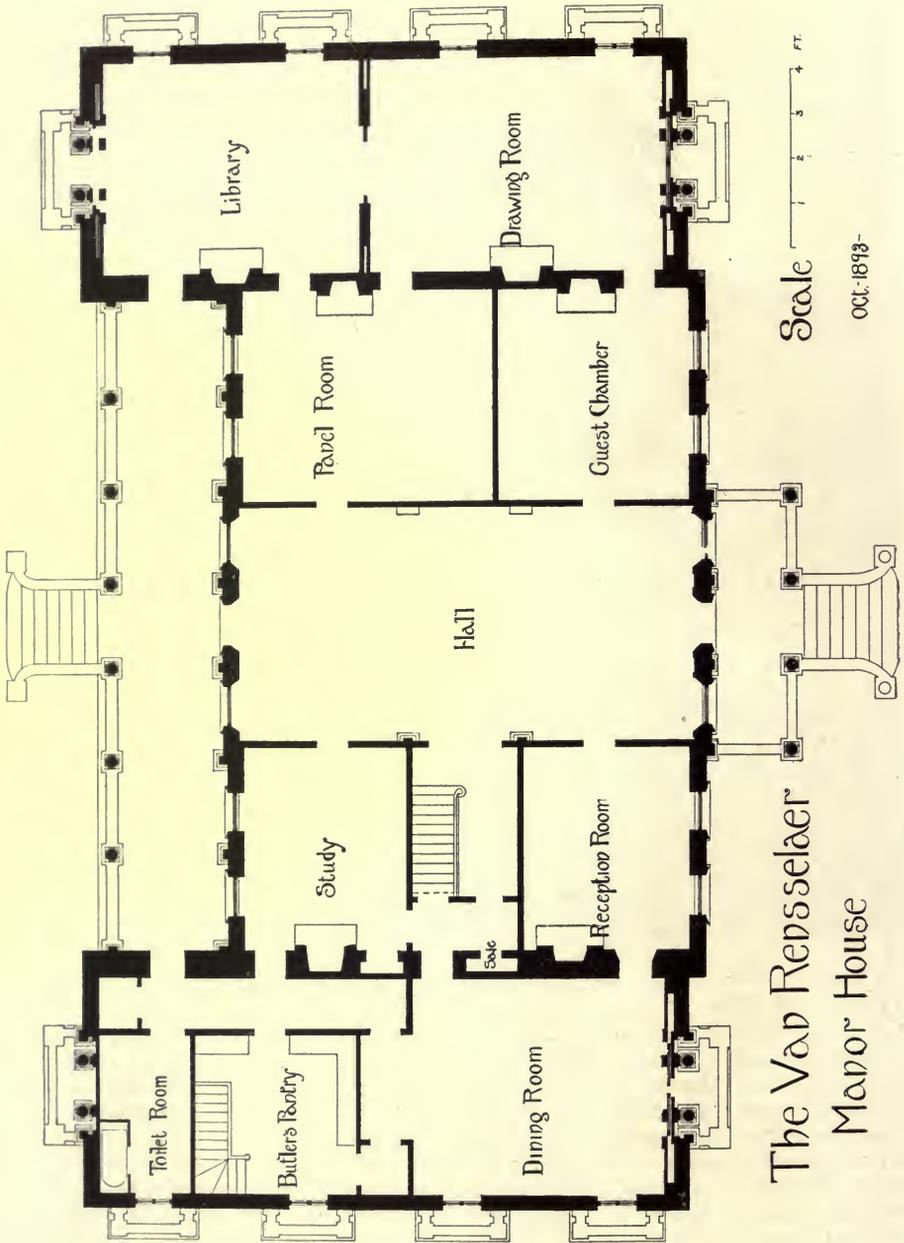


THE VAN RENSSELAER MANOR HOUSE.

arms, afterward Gen. Stephen Van Rensselaer, the most prominent man that the family produced.

The house was so completely remodeled in 1840-43, from designs by Upjohn, that but little resemblance to the old building was left. From an oil painting made before that date the character of the building can clearly be seen, while another painting shows the great gardens. The original house was built of brick of unusual size (9x 4¼x2 inches) and was painted in the Colonial colors, cream and white. A short flight of steps led up to the "stoop," a small porch whose roof was upheld by two Doric columns, above which, in the second story, was the great Palladian window. The house was flanked at either end with octagonal wings but one story in height. The construction of the house was of the heaviest. The walls were everywhere of unusual strength and the floor beams were of hewn pine, ranging in size from 3x12 to 9x11 inches.

On June 3, 1843, the building was opened after the extensive repairs had been completed. The wings had been torn down, some windows blocked up and others opened, the whitestone had been removed and replaced with brown New Jersey sandstone, and the great wings and the porch had been added. When the alterations had been completed the new building bore no resemblance to the old, even in architectural style, and indeed nothing of the old exterior was visible but the brick itself, and even this was half hidden behind a thin coating of sanded mastic. The new stone-work was for the most part of as strictly classical design as though it had been copied from "Rome Moderne," but in some places, noticeably in the gables and belt courses, a distinctly Gothic tendency is displayed. So also wherever the Corinthian order is used, as in the porch, the large pedimented windows or in the wings, the cornices are, in their upper portions, strictly Corinthian, but below the mo-



Scale 0 1 2 3 4 FT.

Oct. 1893-

The Vad Reddselæer
Manor House



FRONT DOOR OF VAN RENSSELAER MANOR HOUSE.
(Interior view.)



STAIRCASE DOOR IN THE HALL OF THE MANOR HOUSE.

dillion band the dentels are omitted and the cornice dies away in a few feeble mouldings, giving a decidedly top-heavy appearance. The two wings projected in the rear some 15 feet beyond the main building, and between them was a broad colonade, on which opened the rear door.

The building was rectangular in plan, with the great hall 24 feet broad, extending from the front to the rear of the house, some 46 feet. On either side of front and rear doors were two large windows with deep window seats. The walls were decorated with frescoes upon a yellow background, which in their day were the wonder of the country. These were painted upon large sheets of heavy paper, and were executed in Holland especially for the room and put on in 1768, the bill for which is still in the possession of the family.

The west wall of the hall was pierced in the centre by a large arched door-

way leading to the stairs, flanked by Ionic pilasters. To right and left were doors giving access in the front to the "green-room," used as a reception-room, and on the rear to the study or office-room of the Patroon. On the opposite wall were two similar doors, one of which gave entrance to the state bedroom in the front, the other to the paneled room in the rear.

There were four large frescoes which filled the wall surfaces on the side walls between the doors and the front and rear walls. A still larger one covered the wall opposite the large arched doorway; on either side of this were four smaller panels representing the four seasons. The pictures were surrounded by arabesques in the style of Louis XV. The woodwork in this hall was very elaborate; the door and window frames were crosseted, and above the doors were broken pediments. The cornice was of carved wood. As has been already said, both



HALL OF THE VAN RENSSELAER MANOR HOUSE.



DETAIL OF "PANEL" ROOM IN MANOR HOUSE.

cornice and doors served as models for those of many other houses of this period.

The state bedroom was a large square room on the first story. Here was the great mahogany bedstead, ornamented with dolphins and wreaths cast in brass. The mantel in this room was one of the few which were preserved when the house was remodeled. Two columns supported the panel bar, on which were carved a lion and a lioness.

Behind this room was the "panel" room, which before the alterations, was used as the family dining-room, the state dinners being given in the large hall. The walls of this room were of wood from floor to ceiling. A low paneled wainscot surrounded the room, whose baseboard and chair rail were elaborately carved with a running pattern. Above, large panels reached to the cornice, which was also of elaborately carved wood. The doors were the most beautiful in the building, the frames were decorated with carved egg-and-dart and waterlily mouldings, and the curved pediment above framed a bust of carved wood. The fireplace was the handsomest in the building. Two marble caryatides upholding the mantel shelf.

On the west of the main hall was the private study, a square room whose walls from floor to ceiling were lined with mahogany bookcases. The mantel was upheld by two small columns. Above it was the picture panel, which is almost universally found in houses of this period. The small reception-room had been so completely remodeled that only a fragment of wainscot, with a carved chair-rail, which had been concealed behind a pier glass, was left to show the style of the room in the original house.

The stairs opened off the hall and were lit by a small semicircular window of stained glass in the west wall, on which the family coat of arms was depicted. Tradition declares this to be the original window which was placed in the old Dutch church in 1656, in memory of John Baptist Van Rensselaer. Several others, which were placed in the church by the more im-

portant Dutch families, are of such a different shape, treatment and quality of glass, that it is very doubtful that this is the original window, in spite of its dedication to "Jan Baptist Van Renssilar." The stairs ascend on the right wall with broad treads to the wide landing, on which for many years stood the spinet. In the second story a wide hall, the full width of the stairs, occupied the middle of the house. From this opened through low pedimented doors, eight bedrooms, six of them large square rooms and two of them small dressing-rooms. This hall was used by the family in the evening as a sitting-room. The third or attic story had the same large hall. On this story were only four large bedrooms, the remaining space being occupied by spacious closets. The walls of the stairs and hall walls from the bottom of the house to the top were covered with a glazed paper, grained to imitate oak, divided into panels by egg-and-dart mouldings. The staircase well was lit by a skylight filled with stained glass, which was inserted in the attic floor and lighted by a skylight in the roof.

The east wing was occupied by two large rooms. That in the front was the main reception-room, that in the rear was the library.

The windows of these rooms extended to the floor and gave access to the two large balconies in front and rear and the four small balconies on the sides. The doors were pedimented and they, as well as the windows, had frames decorated with hand-carved egg-and-dart mouldings. These rooms were 16 feet in the clear, and when the great folding doors between them were opened they formed a magnificent room for entertainments.

The walls of the library were lined with beautifully carved mahogany book cases, above which were large plaster busts of the prominent men of those times.

In the west wing was the great dining-room. Here for thirty years a lavish hospitality was dispensed, which made the Manor House a noted place, not in this country alone, but abroad. Indeed the Manor had always been famous for

its hospitality. A noted Englishman who visited this country during the last years of the last century, was overwhelmed by the sumptuousness of the banquet, the magnificence of the family plate and the delicacy of the wines. At the old house at different times were entertained every man of distinction

which stands at the head of Market street." At that time the frescoes in the hall and the furniture of the various rooms were considered remarkable. In subsequent years the house was embellished with the spoils gathered in European travels. Added to the old furniture were cabinets and tables of



WINDOW IN LIBRARY OF VAN RENSSELAER MANOR HOUSE.

and every foreign "lion" from anti-Revolutionary days to the death of Gen. Van Rensselaer, the old Patroon. One of these guests, Timothy Dwight, has recorded his recollection of the house as it was in 1798, when he visited "the mansion of the Hon. Stephen Van Rensselaer, late Lieutenant-Governor,

more delicate workmanship. In the hall stood two Italian alabaster urns six feet high. These were carved with delicate acanthus leaves and the walls were reduced to a shell-like thinness, so that the lights which were placed within showed the delicate carving to great advantage. Here also

stood two large bronze groups; one of them, that of Chevalier Bayard on horseback, has but one duplicate. Two large Sevres vases of a peculiar blue had been made for Napoleon I. to be presented to the Czar of Russia; for some reason they subsequently came into the market and were purchased by William Bayard as a gift to his brother-in-law, Gen. Van Rensselaer. In the library a marble statue of Raphael stood beneath a magnificent chandelier of cut crystals. On the walls hung many pictures by well-known foreign artists and portraits of the family from Jan Van Rensselaer and his brother Jeremias, the first members of the family in this country, down to that of the last Patroon. An interesting collection, truly; some in court costume of scarlet cloth, with great sleeves and embroidered waistcoat, with laces at the throat and a great periwig of powdered hair flowing over the shoulders. Others in plainer costume with the natural hair tied in a queue behind; others in the uniform of Revolutionary generals; still others with great coats only relieved by the lace and frilled shirt fronts; still others in high collars encircled by uncompromising stocks.

As has been said Jeremias Van Rensselaer was forced to remove his residence outside the limit of Fort Orange because of the oppressions of Stuyvesant. About a mile to the north of the fort flowed a stream of the purest water. Here already had been established the several grist mills and saw mills belonging to the Patroon, and here it was that he built the long low house already described, doubtless because the creek which passed so near his house reminded the family of the homeland, indeed the early Dutch invariably selected a low valley for their dwellings and built as closely to the bank of a stream as possible. When in 1765 the new house was to be erected, Van Rensselaer, instead of seeking higher ground for his dwelling, selected a spot even lower and closer to the river. This was about 150 yards to the northeast of the old building. Save for the low ground a more charming spot could not have been found.

The land for several miles to the north was nearly level, to the south could be seen the spires of the city not quite a mile away, to the west rose the steep hills behind which lay the beautiful Tivoli lake, whose clear waters, after plunging down in a noisy waterfall, flowed through the Manor grounds not 100 yards from the house itself. To the east was the Hudson, to whose banks the gardens sloped gently away. Nor were those gardens the restricted gardens of to-day. The building stood in a vast park, which would have done credit to a great English estate. Immediately around the house were great elms, under whose shade the lawn, broken here and there by a piece of statuary or a fountain, looked like a piece of green velvet. To the east, within high box hedges were the gardens, which reached to the summer-house, which overlooked the river.

As for the character of the house itself, no better description can be found than that of Longfellow's.

"It was a pleasant mansion, an abode
Near and yet hidden from the great high-road,
Sequestered among trees, a noble pile,
Baronial and colonial in its style:
Gables and dormer windows everywhere,
And stacks of chimneys rising high in air,—
Pandaean pipes, on which all winds that blew
Made mournful music the whole winter through.
Within unwonted splendors met the eye,
Panels, and floors of oak, and tapestry:
Carved chimney-pieces, whereon brazen dogs
Revelled and roared the Christmas fires of logs."

Back of the house was a long low building whose overhanging eaves were green with moss, and against whose walls were trained peach trees. These were the stables, where still stands the family coach, the sleighs with the curved runners carved like swans' heads, and the other carriages of the style of fifty years ago.

The long expanse of unbroken wall surface which the building displays is most effective. Hidden behind the trees were smaller buildings where slept the servants. Before the house, directly at the head of the broad street which led to the city, was the porter's lodge and the gate which gave entrance to the estate. Here the clear stream, whose banks were shaded by willows

and elms, was crossed by a bridge, famous in the early days of the century as the "kissing bridge." To the west were the Patroon's mills, the overseer's house, a large building with a portico supported by brick piers, and the long low building where the tenants paid their rent.

Among the papers preserved in this old building is the account book of Gen. Ten Broeck, the guardian, during his minority, of Stephen, the old Patroon, as he had been of his father before him. Here under the entry of a "charge for beef and liquor consumed in a dinner to the tenantry on this your glorious twenty-first birthday" is a brief mention of a transaction which many years later took from the Van Rensselaers many of their acres. On that day, acting it is said upon the legal advice of his brother-in-law, Alexander Hamilton, the Patroon, sold in fee, with warranty of title, his farming lands in Albany and Rensselaer Counties. Nine hundred farms of 150 acres each or more than 207 square miles, were leased on that day. The feudal rights were still to be recognized in nominal rents to be paid at the storehouse at Watervliet, of a specified number of "bushels of good, clean merchantable winter wheat, four fat fowls and one day's service with carriage and horses." The old Patroon was a kind-hearted man and was never persistent in the matter of a delinquent tenant. If the full rent could not be paid he accepted what was offered. On his death in 1839, the property instead of being bequeathed to the eldest son, as had been the custom since 1685, when the estate was created an English Manor, was divided between his nine children, Stephen, called the fourth, succeeding to the Manor. The heirs demanded full returns and insisted that all back rents should be paid in full and threatened to prosecute every delinquent. The tenants who had at first complied with some grumbling, soon became restive, then defiant, and finally questioned the legality of the reservation. The legality of the rights of the landlord being once in question, an irreconcilable conflict the ("anti-rent war") was precipitated, during

which the sheriff and his posse were attacked and routed with some bloodshed, the troops were called out by the Governor and the matter was only finally settled by the Constitutional convention of 1846, which abolished all feudal tenures.

Although the property had been greatly decreased by division, Stephen Van Rensselaer, the fourth in direct descent of that name, was still a very wealthy man. Under him the wings and other improvements were added, and entertainments were for many years carried on in a lavish manner. In the early sixties the Patroon had become an old man; entertainments were given but seldom. He died May 25, 1868, and with him the old order of things passed away as completely as though he were the last of his race. His widow lived in the house until her death in 1876, when the family left it forever. The property was then divided among the heirs, and the house, stripped of its furniture, was left in the hands of caretakers.

The place had become undesirable as a residence. To the south, not far from the house, the New York Central tracks crossed the street, at whose head stood the Manor House, and wound to the left through the valley once occupied by the Patroon's creek and the little lake of Tivoli. Between the house and the river ran the Erie Canal, along which what was once the garden, had been divided by slips, and transformed into the great "Lumber District," for which Albany was noted. Through the narrow strip, between the house and the canal, the Delaware & Hudson Railroad laid its tracks and switches. It was evident that the doom of the old place was sealed.

A street was cut to the north to the rear of the stables, another to the south, within a few rods of the house. It was now in the midst of the manufacturing district, and noisy factories were on every side. The lodge was transposed into an office for a machine shop; between that and the house a large pattern maker's shop was erected.

The magnificent elms, which had been planted when the site of the



MANTEL IN DINING ROOM OF QUACKENBUSH HOUSE.

Manor was but the garden of a still older house, were one by one cut down, the beautiful shrubbery which had lined the many shady walks had gradually disappeared, and the turf and gardens over which the tenderest care had been lavished for over a century were obliterated. The stables and outhouses were falling to pieces, and the house itself, standing bare and desolate against the background of lumber piles, was rapidly falling to decay.

In the fall of 1893 a spur of the Central Railroad was laid directly in front of the house, and another was to pass close to the west wall. The old house had at last outlived its usefulness, and its destruction was determined on. Accordingly the building, which for more than a hundred years had represented the social side of the city life, was demolished.

The stone and timbers were transported to Williamstown, Mass., where

they have been used in the construction of the new chapter house of the Sigma Phi Society, a building which in many ways resembles the Manor House.

While it is sad to think that the building which had for so many years excited the pride and admiration of the city has been destroyed, it is far better that it should be removed while the recollection of the estate as it was in its perfection is still fresh in mind, than that it should remain to drag on a few more years of a neglected and dishonored old age.

This has been the fate of the Beverwyck Manor House, the residence of Wm. P. Van Rensselaer, the younger son of the "old Patroon." On the division of his father's estate, he became possessed of that portion of the property which lay on the east bank of the Hudson. He at once began the erection of a "Manor House," which

in many ways was handsomer than the Watervliet Manor. The building stands on the level summit of a high hill, or rather upon the edge of a great plateau, which descends at a steep grade to the waters of the Hudson. The hill is completely covered by a dense growth of sturdy trees, through which the road winds for more than a mile before the plateau is reached, at some distance from the house. Here and there are a few great elms, but this great park is for the most part open, being skirted on either side by the forest which covers the hillsides which slope rapidly down to the two ravines which bound the estate to north and south. At the end stands the house, which is still, even in its decay, impressive. In style it is a good example of the many English manors built in the Greek style so popular in England during the first quarter of this century. In front of the building, which faces the plateau, is the porch, supported by four Ionic columns of brownstone. At the right is a broad elevated porch, to the left were the conservatories.

The rooms are of truly magnificent proportions, and the interior very successfully carried out the spirit of the great English manors, which the long approach and great park so well suggested. The entrance door, flanked by two great windows, gave upon a large, square hall paved with marble. The walls were of a hard and polished plaster, and a full entablature surrounded the upper portions. Two columns and pilasters of colored Italian marble with white Ionic capitals carried the entablature and separated the square hall from a larger and rectangular hall. This also was paved with marble and finished in the same style. At the left was the marble staircase, with wrought iron rail, which was too small to harmonize with a hall of such monumental proportions.

Opening off the hall by doors of polished mahogany, set in classic frames of carved wood, were the principal rooms of the first story. Occupying the central portion of the house and immediately back of the hall was the library, a large rectangular room, whose walls were covered to the ceiling with

mahogany bookcases. Two columns and pilasters of colored marble separated the great bay which formed the main feature on the river side. Here windows opening to the ground gave access to the balcony, from which a fine view of the river and the city on the opposite shore could be obtained.

The ceiling of the library is frescoed with many converging lines, which gives the effect of a high dome. As the first story is 18 feet high the effect is very deceptive, but startling when the observer changes his position.

At the left were the dining-room and reception-room, from which doors opened upon the conservatory; to the right or north, were a large billiard hall opening on to the porch and a smaller reception-room. A smaller staircase ascended at this end of the hall also, and gave access to the room in a mezzanine story. The second story was occupied by a wide hall, from which opened the many large bedrooms with the connecting dressing-rooms. In the attic story were the rooms for the servants.

The fireplaces throughout the first story were imported from Italy, where the white marble was carved with the greatest delicacy. On one is depicted the "Chariot of the Sun," by Raphael, on another Pan is playing on his pipes to a group of listening satyrs, on a third is Bacchus with his attendant nymphs. There also may be seen Orpheus charming the dolphins with his lyre, and Paris awarding the golden apple.

The walls of some of the rooms are frescoed with Cupids, and on the ceiling of the reception-room is the Van Rensselaer coat of arms.

Within a few years after its erection the estate was sold. Its new owners occupied it for a short time, but finally abandoned it, and the rooms still filled with their wealth of furniture were for years without an occupant. Recently the furniture has been removed, and the building is now fast falling to decay. The mastic is falling from the walls, the windows have been boarded up to keep the rain from beating through the broken panes. The conservatory has entirely disappeared, much of the cop-



DOOR IN DRAWING ROOM OF BRADFORD WOOD HOUSE.

per roof has been stolen, the stone balustrade which once surrounded the terrace on the river front is battered and broken. The once beautiful gardens have for years run riot, the well-kept lawns have been used for pasture, and trees now obstruct the vistas through which the river and surrounding valleys were once seen. On the marble pavement of the hall, with a background of marble pillars and mahogany doors, two ragged Irishwomen were washing clothes. On the marble staircase ragged, bare-legged children were romping with their dogs, and the mingled smell of onions and soap-suds filled the rooms whose proportions and finish would not shame a palace.

Better, indeed, is it to destroy a house than to leave it to fall into ruin and decay.

While this Beverwyck Manor does not fall strictly within the scope of this article, for not in age or style is it Colonial, yet it is closely allied in spirit with the other great manors for which the city was remarkable.

The other residences in the city proper were small in comparison with these great houses, and were for the most part a development of the modest brick dwellings in the Dutch style already described.

The "Stevenson House," erected in 1780 by a rich fur trader, is said to have been the first private dwelling erected in Albany in the Colonial style. It was considered as a new departure, and known as "the rich man's house." The Colonial features were confined to the doorway, the Palladian window and the cornice. The new style grew in favor, and the new houses were erected on a similar plan. The exteriors were, for the most part, of great simplicity; the main entrance was, perhaps, arched and filled with glass in Colonial patterns; the cornices were often elaborate, and the roof was pierced with arched and paneled dormer windows. Occasionally a Palladian window in the centre of the second story marked the wide transverse hall which was used as a family sitting-room.

It was on the interior woodwork that the greatest care and the most money was lavished. The mantels of even the

most unpretentious houses were very elaborate and were usually of very elegant design.

The mantel shelves are supported by two columns or a group of clustered columns, and the panels decorated with wreaths, festoons, or with classical scenes depicted in moulded putty.

The doors are often surmounted with classical pediments, or the more Rococo broken and curved pediments; the jambs are gables or paneled pilasters, which support a full entablature, the frieze of which is decorated with wreaths and panels or medallions containing various designs in high relief such as dolphins or gorgon's heads.

A later and more classical doorway, very popular about 1810, is flanked by two Ionic pilasters or engaged columns which support a classical entablature, the cornice of which is of reduced proportions. Great attention was given to the stairs. The spandrills were usually decorated with a scroll or anthemium pattern in high relief, and the mahogany rail and newel were inlaid with lighter woods. The interior cornices were treated with great elaboration, though not with the refinement that the earlier mansions exhibit; indeed, the whole interior treatment is in a different style, for lavishness and richness take the place of simplicity and refinement. In no other detail is this so clearly exhibited as in the fire-places. Those of the earlier period are severe, the plain surfaces are never decorated, and the ornament is confined to the mouldings of the shelves and to the frames of the picture panels, which almost invariably reached from shelf to ceiling. The owners of the less pretentious dwellings on the other hand, concentrated their expenditures upon certain details, chief of which were the mantels, where they decorated every available moulding and filled every plain surface with ornament in relief.

The unusual number and renown of the Manor houses and mansions of Albany were due to the fact that the city was the home of many influential families, who attained the greater prominence by contrast with the people of less importance, who were crowded to the background.

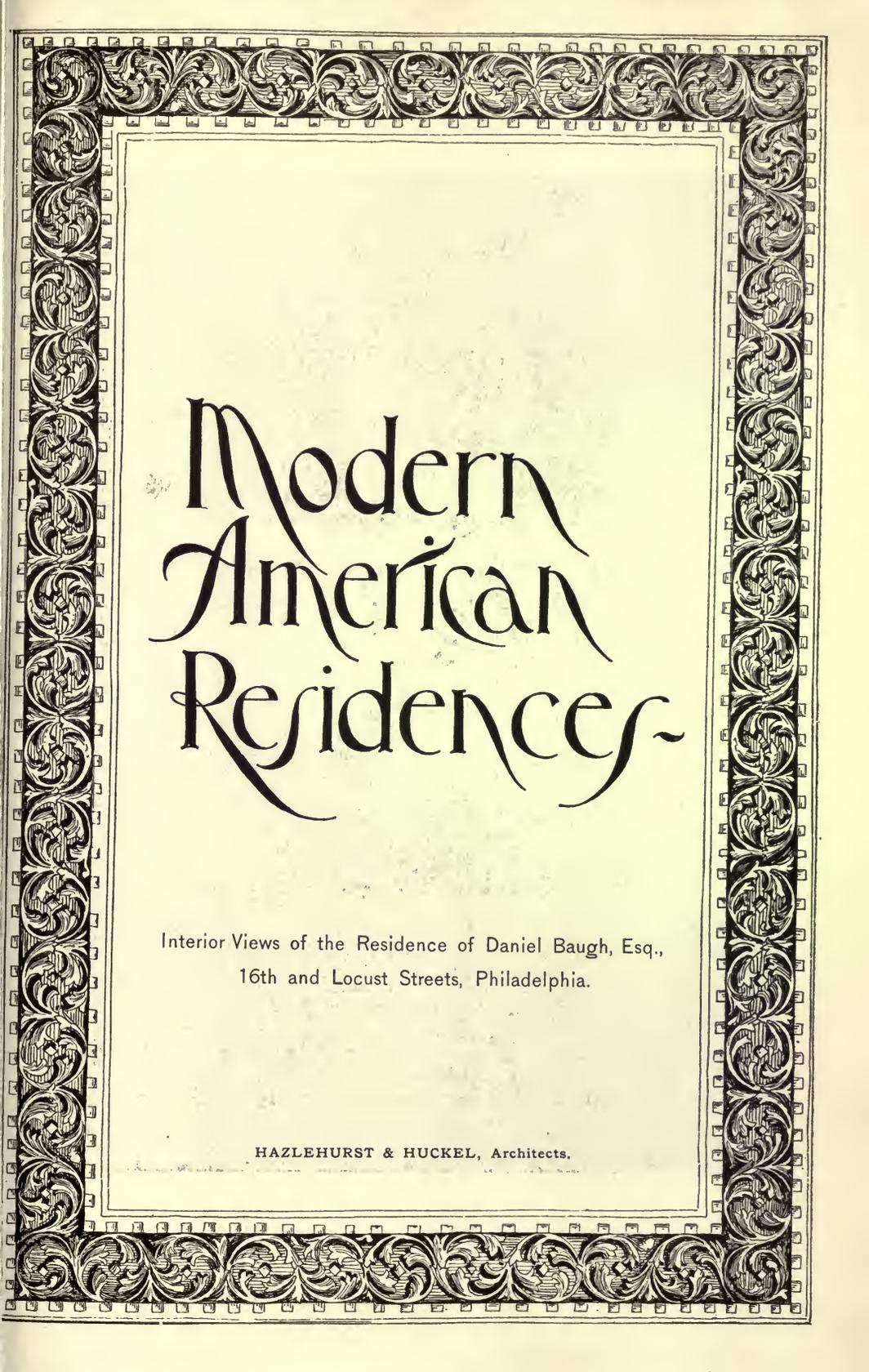
The entire country had been purchased and colonized by one man and remained almost unimpaired in the hands of his descendants for more than two centuries. The title and authority of the original Patroon and his descendants in the male line were unquestioned and to them were paid the honor and deference due to a manorial lord. The people had been originally his colonists and remained his tenants, which added to his wealth while it increased his importance.

At that time all the great families made a feature of intermarriage. the Van Rensselaers, the Schuylers, the Jays, Livingstons and Bayards were all connected by repeated intermarriage and wielded a political power unknown

in these degenerate days. Thus the prominent families of Albany were all connected by marriage and formed an oligarchical aristocracy none the less powerful because untitled. With these conditions it was but natural that during the Colonial days there were erected the many famous mansions for which the city was celebrated, while the great mass of the people occupied comfortable but inconspicuous dwellings. When feudalism had at last given way to democracy and there were more rich if fewer wealthy citizens, the great mansions were no longer built, but the average was more than maintained by the increase in the number of handsome dwellings.

Marcus T. Reynolds.





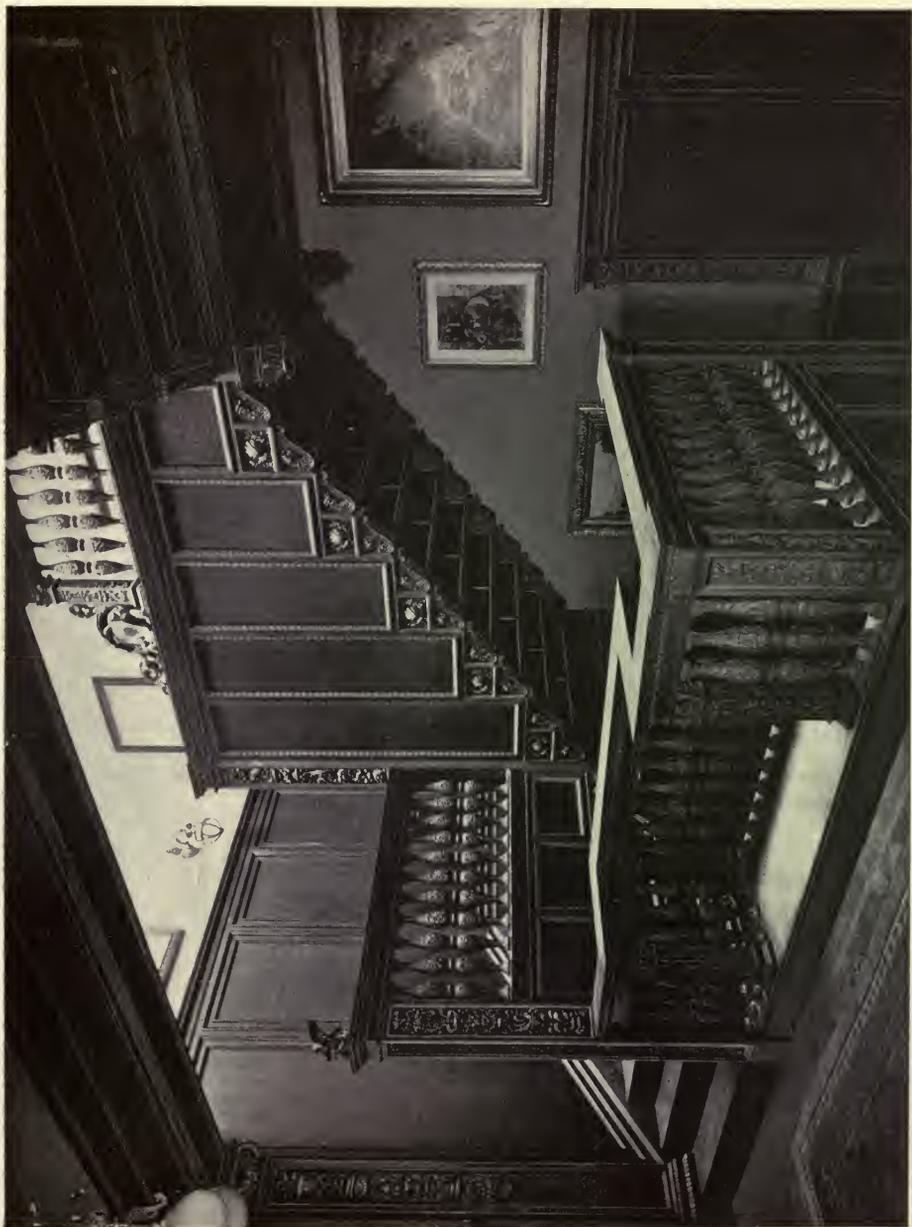
Modern American Residences

Interior Views of the Residence of Daniel Baugh, Esq.,
16th and Locust Streets, Philadelphia.

HAZLEHURST & HUCKEL, Architects.

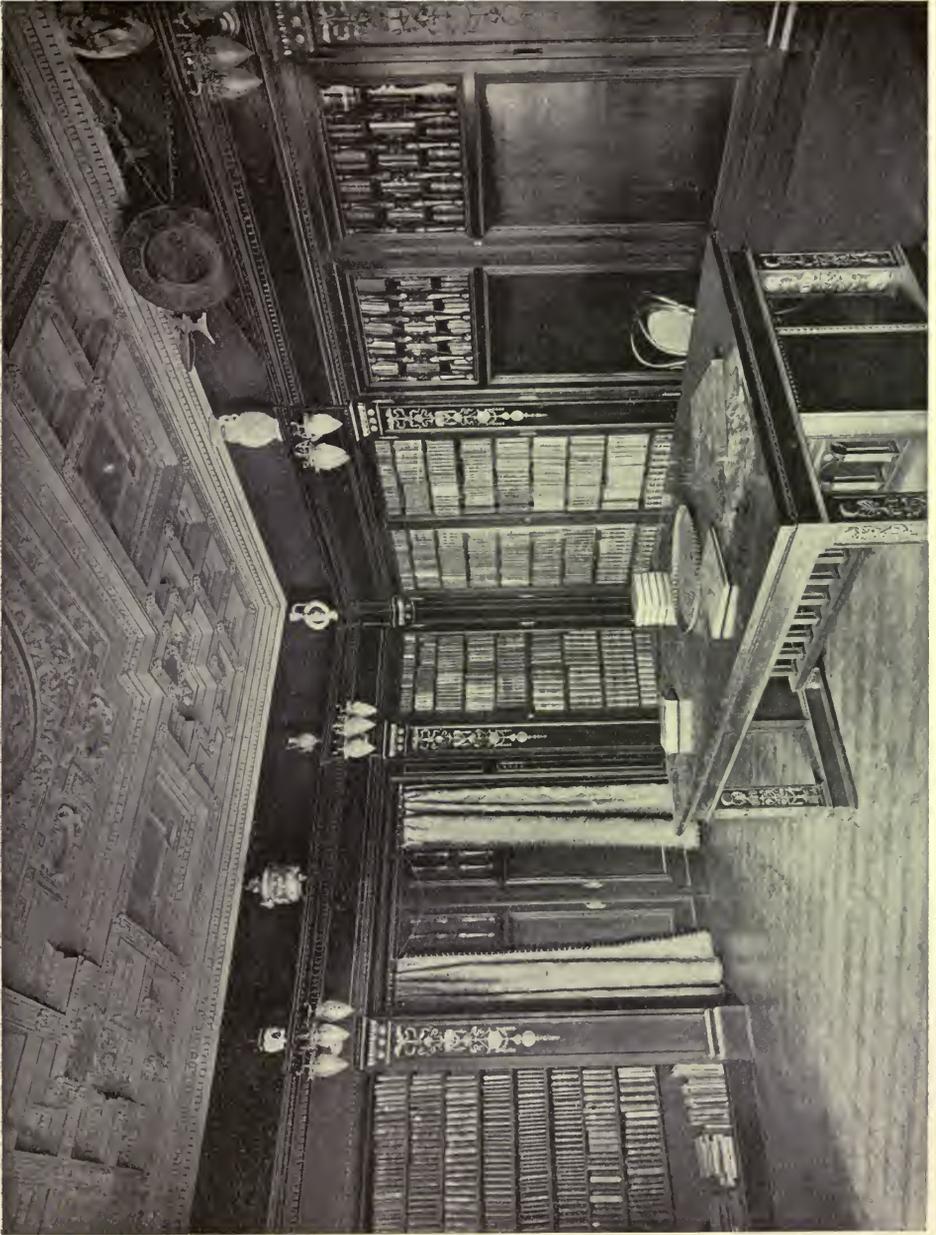


STAIRWAY.



STAIRWAY WELL—THIRD STORY.





LIBRARY.





PARLORS.



The inner temple court at Medinet Habou. From the drawing by Mr. John Pennethorne.
(See page 453.)

A DISCOVERY OF GREEK HORIZONTAL CURVES IN THE MAISON CARRÉE AT NIMES.



FOURTY-FOUR years have passed away since Francis Cranmer Penrose, then an architect just beginning life, published, with the aid and co-operation of the Dilettanti Society of London, his epoch-making work on the "Principles of Athenian Architecture." It was, therefore, in 1851 that the world of science was first advised of a series of facts regarding the construction of the Parthenon and other temples of the Greeks which are still a perpetual source of wonder and of speculation to the specialist—to whose knowledge even the existence of these facts is still very closely confined.

The observations and measurements of Penrose were undertaken in 1845, and were completed in 1846 and 1847. Up to those years the Greek temple was supposed to be, what to the superficial observer it appears to be. Its horizontal lines were supposed to be

level and were consequently supposed to be straight. Its vertical lines were supposed to be perpendicular. Its corresponding and apparently equal dimensions were supposed to be equal, and its corresponding spaces and distances were supposed to be commensurate. To discover an exact mathematical ratio in its main proportions was the constant effort of the archæologist. The mathematical ratios had *not* been discovered *exactly*, but this was thought to be the fault of the modern and not the fault of the Greek.

On a sudden the measuring rod of Penrose revealed that not two neighboring capitals or *abaci* of the Parthenon are of corresponding size, that the diameters of the columns are unequal, that the inter-columnar spacings are irregular, and that the metope spaces are of irregular width. His plumb line showed that none of the apparently vertical lines are really perpendicular. The columns all lean toward the centre of the building. The side

walls also lean to the centre. The pilasters or *antæ* at the angles of the building lean forward. The architrave and frieze lean backward and away from the imaginary perpendicular. The cornice and the fillet between the frieze and architrave, as well as the acroteria and antefixæ, have their faces inclined forward of the imaginary perpendicular. Finally the main horizontal lines of the building are constructed in curves which rise in vertical planes

larities as are easily detected, or as are obtrusively conspicuous to the eye.

As regards the curves they are inconspicuous to the eye unless sighted for, from some one angle of the building and along the line of the steps, or of the exterior line of the stylobate (the platform on which the temple rests). As viewed even from such an angle they are so delicate as not to be obtrusively conspicuous. As seen from other points of view, especially oppo-



Temple of Theseus at Athens.

to the centre of each side, but these curves do not form parallels.

Three main facts appear throughout all these various phenomena; first, an unquestionable purpose and intention, whatever the purpose and intention may have been; second, an avoidance of all exact ratios in proportions, of all exact correspondences in the presumably equal objects, sizes, and spaces—and of all mathematically straight, mathematically perpendicular, and mathematically parallel lines; third, an avoidance of all such irregu-

site the centre of the ends or sides of the building, they may be detected by close observation, but there is no point of view from which the eye is not naturally disposed to discount the effect as one of perspective. As there are no straight lines, but only delicate curves when straight lines are viewed in perspective, it is natural for the eye to discount the effect of a delicate curve; for this is what the eye constantly does when the actually straight line is curved by natural perspective. As regards the *appearance* of inclina-



Greek temple at Egesta, Sicily. From a photograph showing the curves of the entablature.

tion in the columns we have the testimony of Mr. Penrose that he was months in Athens before he could determine by the eye without plumbing which way a given column leans, and this fact will describe the delicacy of other deviations from the perpendicular. As regards the variations in size of presumably equal objects, or of spacing in presumably equal distances, it may be said that none of them can be definitely asserted to exist on purely ocular testimony, and that the surveyor's work is necessary not only to determine their amount, but even to determine their existence. Here again the difficulty in definite ocular detection depends on the fact that all objects of exactly corresponding size vary in apparent size according to the point of sight. Hence when an element of delicate irregularity of size or

spacing is artificially produced, it is impossible for the eye to avoid discounting this irregularity into perspective effect. Let it be noted here that I do not use the words perspective effect as necessarily implying an increase in effect of magnitude. If a Parthenon capital nearer to the eye be smaller than one next to it, and farther away from the eye, the effect in so far would be to diminish apparent distance between the two capitals, but this would still be an illusive effect of perspective appearance, because the ordinary effects of perspective would prevent the eye from appreciating an exact equality of size if it had existed. Then again, if a spectator be facing two unequal adjacent capitals at exactly equal distances from each, in which case they would naturally appear equal, the difference of size indicates to the eye a

deflection in the line of the building; or, in other words, the spectator appears, in so far, to be nearer to the large capital than he is to the smaller one.

We will now specify some of the maximum cases of irregularity according to the measurements of Penrose, which are given in feet and decimals of a foot. The curve of the Parthenon entablature on the flanks, about 228 feet in length, is .307 (decimals of a foot). At the sides of the building it is .171 in something over a hundred feet. (The flattest curve in Greek art is the entasis of the Erechtheum columns, which is .0195 in 21 feet.)



Illustration showing the curves of the Stylobate of the Parthenon. (From a photograph.)

The Parthenon columns lean .228 in 30 feet, an inclination of one unit in 150 units. In other words, as the columns lean to the centre of the building they would, if sufficiently prolonged in height, meet at a height of 5,856 feet above the level of the pavement. The *antæ* have a forward lean of one unit in 82, and the acroteria and the *antefixæ* have a forward lean of one in 25. A maximum deviation in spacings of the metopes is .325; the measurements of these spaces being four feet and over. The maximum deviation in intercolumnar spacings is over two feet, but this amount of deviation is only found at the angles where the columns next the corner are that much nearer the corner. At these points the spacings narrow from eight feet and a decimal to six feet and a decimal. Aside

from the angle columns the maximum intercolumnar deviation on the north flank is .136, in measurements which are all over eight feet with decimal variations. A maximum deviation in the diameters of columns (of corresponding lines and sizes), is .23 in measurements giving diameters of five feet and a decimal. A maximum deviation in size of the capitals is .312 in measurements of six feet and a decimal.

These instances will give an idea of the amount of actual irregularities according to actual measurement, and we will add that instances of two *adjacent* measurements being equal are almost absolutely unknown. We can occasionally trace some scheme in the variations by comparing two halves of one end, or one side of the building, but when such a scheme appears it does not repeat itself in any two different series of measurements on one side or one end of the building. For instance, in the metopes of the east front the spaces widen from the angles toward the centre, but this does not hold of the intercolumnar spacings, where the only perceptible scheme is that which makes the corner intercolumniations narrower by two feet and a fraction.

That all these remarkable deflections and irregularities were intended has been proven by masonry measurements and masonry observations. Penrose places the maximum deviation due to error or carelessness in the Parthenon masonry, at *one-fiftieth* of an inch. The two ends of the building are of equal width within that fraction. The difference of .02 (inch decimal) in 101 feet, points out "the degree of error which may have arisen from inaccuracy of workmanship in the Parthenon." To quote his own words again: "In the measurement of modern or even Roman buildings, an attempt to obtain the original measurements of considerable distances to the thousandth part of a foot would be fallacious, but in a building of the best Greek workmanship it can be done satisfactorily, if proper care be taken to select such measurements as have been least exposed to the action of the weather; for, owing to the perfect

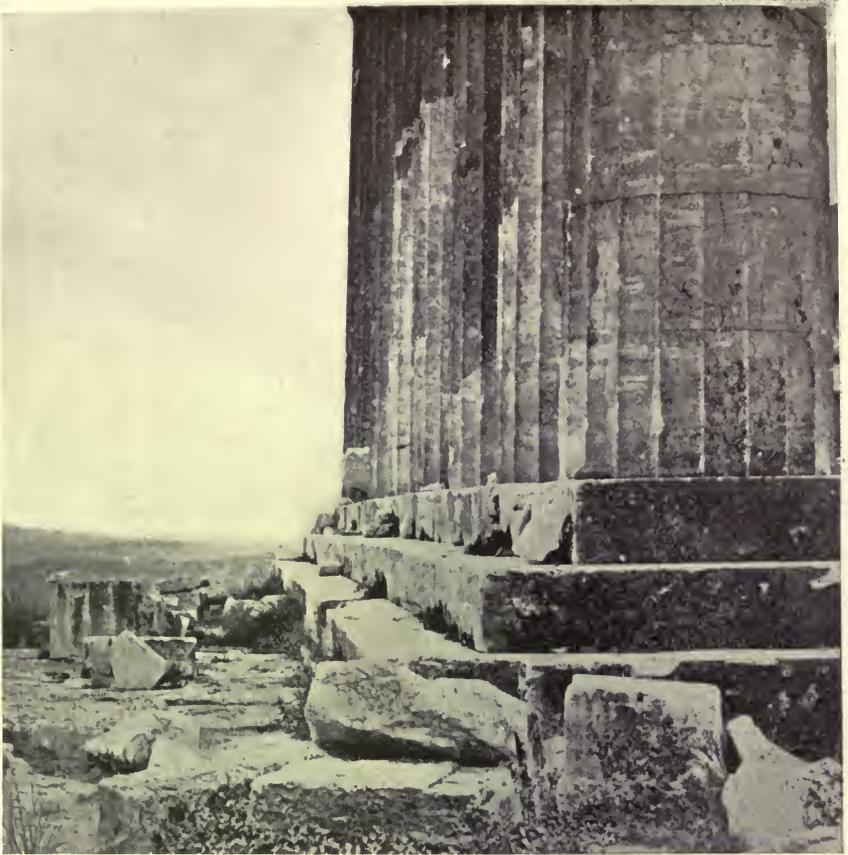


Illustration showing the curves of the Stylobate of the Parthenon. (From a photograph)

jointing of the stones the errors occasioned by any small shifts, which may have arisen from earthquakes or the violence of human agency, can be corrected most satisfactorily." To illustrate the refinement of masonry jointing, he mentions the observation of Stuart that the stones of the steps under the columns of the Parthenon have actually grown together. "On breaking off parts of two stones at the joint he found them as firmly united as though they had never been separate." This is explained as due to molecular attraction of two surfaces ground together to a very smooth finish, on the principle which explains why two panes of glass may adhere to one another. For an account of the methods by which this wonderfully fine fitting and

jointing were obtained, the work I am quoting must be consulted.

II.

Although the ultimate topic of this Paper is the discovery of Greek horizontal curves in the *Maison Carrée*, at Nîmes, which I made in 1891, I have considered it necessary not only to include an account of the existence of the Greek curves themselves, but also a rather explicit mention of all the irregularities connected with them; not only because incommensurate inter-columnar spacings and leaning faces and members are included in my observations at Nîmes, but also because the existence of the Greek horizontal curves is one of a series of facts whose

startling significance and importance cannot be wholly grasped until all of them are made known. This point again reacts on the importance of all observations which tend to supplement or accent certain explanations of any one set of these phenomena as against some certain other explanation. It will presently appear that my discovery at Nîmes has the result of agitating the still undetermined purpose or purposes of the Greek optical refinements in masonry, and that it tends to minimize the importance of the explanations offered by Penrose in favor of those which have been offered by certain other students. It also, as we shall see, throws a strong side light on the probably Egyptian origin of the Greek curves, and thereby again tends to throw new light on their purpose, on account of certain peculiar features of the Egyptian examples.

We will, therefore, draw nearer to my ultimate aim by degrees, and by considering in the next place the history of the discovery of the Greek horizontal curves, whose confirmation and detailed demonstration it was the great mission of Penrose to accomplish.

The *measurement* of the horizontal curves was the greatest achievement of Penrose, but their *existence* was not his discovery; as many of the facts were which I have just enumerated. In all cases it is the measurements of Penrose which have *established* the facts as not being accidental and as being in masonry construction, but the observation which discovered the curves was made in 1837 by Mr. John Pennethorne, and in the same year and about the same time the curves of the Parthenon were noticed by two German architects, Hofer and Schaubert. These gentlemen were the first to publish the discovery in 1838. This publication appeared in a Viennese architectural journal, the *Weiner Bauzeitung*.

What is the peculiar constitution of the modern eye which had overlooked the existence of these curves till 1837? What is the peculiar constitution of the modern reader who had anxiously been conning his Vitruvius since 1500, without considering the passage in which this Roman author directs the

construction of these curves? Why is it that when Wilkins made his excellent translation of Vitruvius in 1812 he added a foot note to the passage on the curves, to say that "this great refinement suggested by physical knowledge does not appear to have entered into the execution of the works of the ancients." Why is it that Wilkins did not do in 1812 what Pennethorne did in 1837—that is, *test the author by the buildings?*

Here at least are the facts. It is forty-four years only that the world of science has had the proper measurements of the Greek temples. Stuart and Revett had measured the whole Parthenon as far back as 1756. Lord Elgin and his workmen had had their scaffolds on it in the early nineteenth century, and yet the curves had not been seen. It was not even known until 1810 that the Greek columns had an entasis. This was the discovery of Cokerell, but he did not notice that all lines of the entire building exhibited a similar refinement. Donaldson discovered in 1829 the lean of the columns, but it was left for Penrose to discover the inward lean of the door-jamb and forward lean of the *antæ*, and the inclined faces of the entablature.

Let us then emphasize for a moment the discovery of Pennethorne as leading to all the later ones, and crowning all the earlier ones, and let us relate the way in which he made it. Mr. John Pennethorne, who was then a young architect, had first visited Athens in 1832, and he did not then make this discovery. In 1833 he made a trip to Egypt and was astounded to find in the Theban temple of Medinet Habou a series of convex curves in the architraves of the second court. On his return from Egypt he visited Athens a second time in 1835, again without observing the existence of the curves in Athens. It appears that after his second return to England the passage in Vitruvius attracted his attention. He says that he saw no reason to doubt the implications of the passage in Vitruvius and thus was led to make a third visit to Athens and re-examine the Parthenon. Thus was the discovery made.

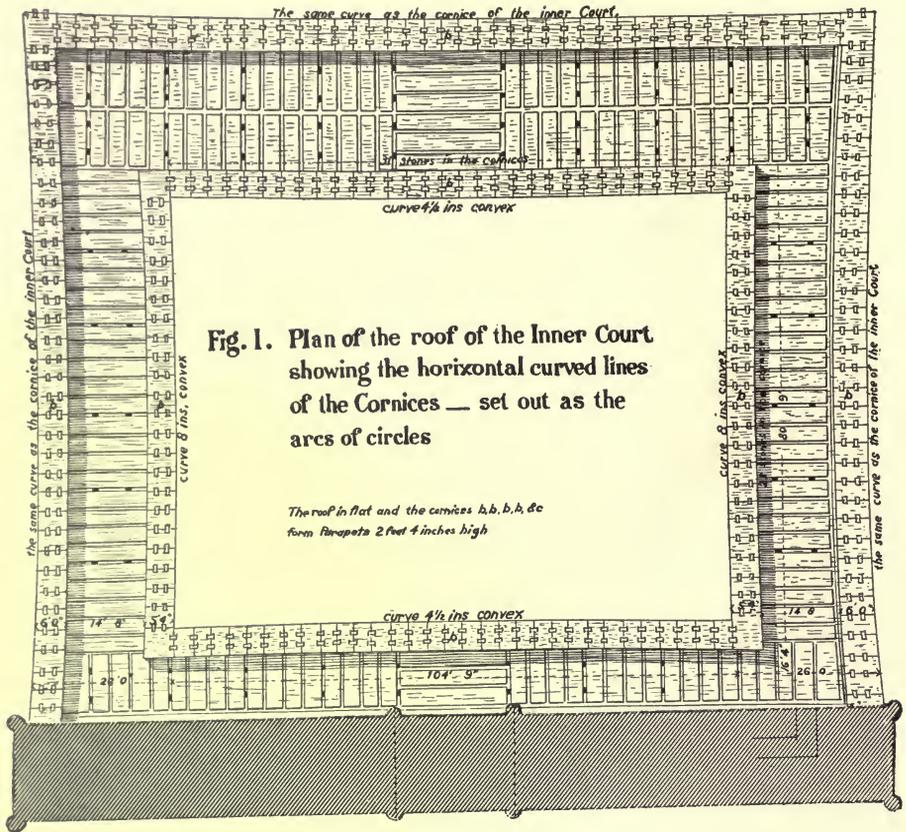


Fig. 1. Plan of the roof of the Inner Court showing the horizontal curved lines of the Cornices — set out as the arcs of circles

Plan of the roof of the inner court at Medinet Habou. From the survey of Mr. John Pennethorne.

It should no doubt be added that the long sides of the Parthenon have lost the main central portions of their entablatures by the gunpowder explosion of the seventeenth century, and that consequently the curves cannot be studied here. At the ends of the building, which are shorter, it is not so easy to notice the curve of the entablature. The most favorable location for the observation is on the long sides of the stylobate. Here then is the place to point out that this platform of the temple and also the temple steps had been covered by rubbish down to 1837. and that observations of the curves on their lines had been previously impossible in the Parthenon. But we may also point out that the Theseum at Athens has its long sides and upper entablatures intact. Here at least the curves might have been noticed before

1837. The curves have since been noticed in a number of other ruins which had been visited by students and measured before 1837. The laying bare of the stylobate of the Parthenon in 1837 assisted the discovery of Pennethorne, but it does not explain why some other student had not previously made the observation for the Theseum and for numerous other temples.

The reader will notice that I am working gradually toward an explanation of the fact that the curves of the *Maison Carrée*, in Southern France, were not noticed *as being in construction* until 1891. We have a parallel fact for the Athenian temples. Those buildings had been studied and carefully measured *for a period of over eighty years* before their curves were noticed. In 1756 were begun the measurements of Stuart and Revett; in

1837 were made the observations of Pennethorne and Hofer.

What then is the explanation for the oversight of these phenomena in either case. Clearly there are two. The modern eye is dull and blunted as compared with the eye of the Greek. People *look*, but they do not *see*. But above all the effect is discounted by the eye. Whatever may have been the *purpose* of the Greek curves there are only two possible *effects*. From certain points of view (it may be from all points of view) a perspective enlargement—from other points of view an optical mystification if not a perspective enlargement.

We will illustrate the direct perspective effect of enlargement, by assuming a point of view opposite the centre of one of the sides or of one of the ends of the building. From such a point of view the lines will fall in perspective on either side, and as their change of direction is purely an optical effect, in which each point of the line changes position according to its distance from the eye, it follows that this line must be a curve downward in each direction away from the centre. On this head we can have only one opinion from all experts in curvilinear perspective.

We will illustrate the optical mystification by assuming a standpoint opposite one of the angles of the building. I will not assert absolutely that there is a perspective increment from this position. It is my opinion that the already recognized principles of curvilinear perspective may involve this position, but it would be a position so far not familiar to experts, and I prefer not to debate it here. I will, however, most positively assert that from the given point of view one of two results must follow, either a direct perspective increment, or else an optical mystification owing to the contradictory optical effects of two sets of phenomena—one of which effects is artificial, while the other effect is natural.

For our present purpose it makes no difference whether optical mystification or perspective increment, or both, are the results of the Greek horizontal curves. My present argument is simply to the end that in either case the

effect is discounted by the eye. The cause is therefore not perceived.

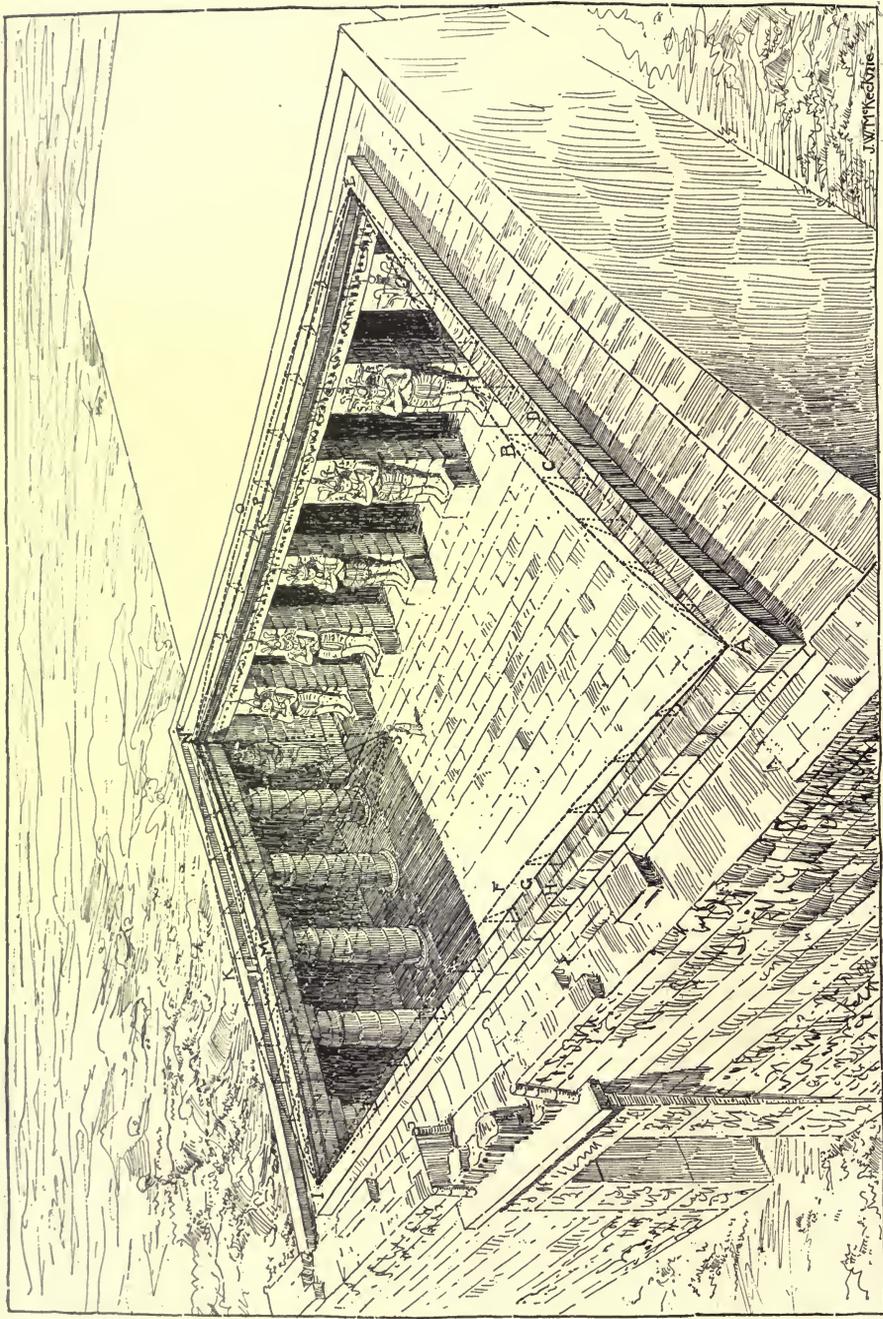
We may, therefore, assign three causes for the long failure of the modern eye to detect the Greek horizontal curves: First, inferior sharpness of vision and inattention to art forms. It is admitted that Greek art and Greek taste were superior to our own. This amounts to admitting that the Greek eye was more acute and more highly trained. Second, the effects of the curves, whether they be perspective effects or simply mystifications, or both, tend to prevent the detection of the underlying facts and causes. Third, the curves are so delicate as not to be obtrusive to the eye under any circumstances.

We are prepared therefore to understand why the curves of the *Maison Carrée* have not been noticed sooner.

I have so far carefully avoided making any reference to the *purpose* of the Greek curves. I have only asserted that they have certain *results*, without debating the question whether these results were intended. It will now bring us nearer to our ultimate topic and aim, if I announce my own observations for horizontal curves in Egyptian temples and connect them with those of Mr. Pennethorne, which I have mentioned for the Theban temple of Medinet Habou.

III.

It is then a fact to be once more noted that the discovery of curves in Greek temple construction was preceded by a discovery of curves in Egyptian temple construction, and that the same person made both discoveries. It is also a fact to be noted that the curves of the Greek temples (as so far discussed), are curves in elevation, curves in the direction of the altitude, while the curves at Medinet Habou are curves in plan, convex to the line of vision. They are curves lying in horizontal planes as distinct from curves lying in vertical planes. It would appear reasonable, considering the growing conviction of scholars that Egyptian art and culture had in many important ways influenced the Greeks



Bird's-eye view of the inner temple court at Medinet Habou. The lines A, F, I, K, N, O, E, and A, B, E, show the optical effects of the cornice curves from various points of sight. Drawn by John W. McKecknie.

that any theory as to the purpose of the Greek curves should be a theory which would also include Egyptian curves in its explanation, but this has not been the case, strange to say. The reasons for this are not only curious, but they are also important to our argument.

Mr. Pennethorne's discovery of the curves at Athens was not immediately published by him, aside from a pamphlet printed for private distribution, nor was it published by him for many years. His own publication was delayed until 1878, twenty-seven years after the publication of Penrose, and forty-one years after his own discovery. This delay appears to have been owing to lack of encouragement, in his special studies, and to the abandonment for many years of his chosen career. He tells us that he took up the pursuit of agriculture soon after his return to England. Most curious of all, he did not know until 1860 that the curves which he first discovered had been measured by Penrose in 1846. It was not till 1860 that the work of Penrose published in 1851 came to his knowledge. It was not until 1878 that he announced the curves at Medinet Habou, and meantime all the theories so far made known as to the curves of the Parthenon had made their appearance and had been advanced without this important knowledge. Not only that; when Mr. Pennethorne did publish, it was in a book on "The Optics and Geometry of Ancient Architecture," which costs a large sum (thirty-five dollars), and which, being a specialist book devoted to Greek architecture, has apparently so far not come to the notice of one single Egyptologist. There is not a single book, guide-book or any book otherwise known to me, which relates to Egypt, which mentions the curves at Medinet Habou. I have never met an Egyptologist who knew of their existence, and it appears to have been reserved for me to make the first observations and measurements for curves in three courts at Luxor, in the great court at Karnak and in the court at Edfou.

Mr. Pennethorne tells us in 1878 that he did not, when in Egypt, give the

further attention to the subject and attach the importance to it which it deserved, but the temple at Edfou where I have observed the curves was not cleared out till twenty-seven years after Pennethorne was in Egypt. Down to 1860 this temple was covered by an Egyptian village. The courts of Luxor were not cleared out till 1891, the year when I was in Egypt, and no one could have previously made measurements there. As for the court of Karnak, it is still buried in rubbish and observations can only be made in an imperfect, but I think convincing, way on the lines of the architrave.

It is, however, a most significant thing that the curves at Medinet Habou are generally unknown, in 1895, to the world of science and of travel. They amount, on the short side of the court, to 8 inches deflection in the architrave in a length of 80 feet 9 inches and, on the long side, to 4½ inches in a length of 104 feet 9 inches. They can be sighted on the roofs of the portico with the greatest ease and are most positively wholly constructive and not accidental, as already shown by Pennethorne. And yet I am acquainted with at least one very sharp-sighted architectural expert, who has been in this court without noting the curves and I am acquainted with many travelers who have not noticed them. Is it not then clear that all these persons have discounted the effect of the curve? What this effect is for standpoints nearly opposite the centre of any one side for that given side is indicated by one of Mr. John W. McKecknie's drawings herewith. This gentleman is an expert and instructor in perspective and the reader may be assured that there are no uncertain theories whatever involved in this picture. Remember, we are not debating whether the Egyptian architect intended this effect. We are not even debating, at this moment, whether the construction is accidental. We are concerned with the actual optical effect of the given phenomenon. All architectural lines which are curved in horizontal planes, convex to the position of the spectators, produce the effect of curves in elevation, as shown by the diagram. At an angle of 45 degrees,

8 inches curve in plan gives an effect of 8 inches curve in elevation. Inside the angle of 45 degrees, the apparent height increases rapidly and is something enormous on near approach, according to the dictum of another expert in perspective. In order to relate our text to the diagram, we are speaking of points of vision opposite or nearly opposite the centre of any one side of the court. In such a position, the natural downward direction of the architrave in perspective is exaggerated by two causes—first, there is the exaggeration in height at the centre; second, the receding line of the convex curve gives the effect of an extra downward bend to the line, as shown by the bird's-eye view.

There is a similar result from other points of view, possibly complicated by optical mystifications due to the contradiction between effects of natural perspective and the effects of artificial arrangement. The grand fact remains that a convex curve of 8 inches in 84 feet in the architraves at Medinet Habou has passed wholly unnoticed by an enormous number of modern travelers and that it is wholly unknown to Egyptologists as far as I am aware. I should be able to name several such, and the absence of literary mention in books on Egypt, which are generally so quick to point to connections with Greece where they are obvious, is something phenomenal. I will not say at present that the Egyptian builder intended an optical illusion but I will definitely say that he did produce one. Certainly not one man can gainsay me who has been in this court without perceiving the curves and among those men is the leading perspective expert of this country.

IV.

All these explanations seem to me of value as helping us to understand why the convex curves in the architraves of the *Maison Carrée* at Nîmes were not measured or noticed as in construction till the year 1891, when I had the pleasure of making this discovery. We understand, for instance, that scholars had studied and measured the Parthenon for all the years between 1756 and

1837 before its curves were noticed, and we understand that the existence of curves in plan in ancient architecture had been wholly overlooked, as distinct from the existence of curves in elevation.

No doubt an occasional student or observer has noticed these curves in the *Maison Carrée* and set them down to the score of masonry displacement, a fact so common in old buildings that the first thought of every architect and builder would naturally be that the timbers of the roof had thrust out the cornice and that the curve was not in the original construction. This is why I took pains to arm myself, when at Nîmes, with certificates from the official architect of the city and from his predecessor in office; the latter being especially familiar with the roof and upper masonry of the *Maison Carrée*; to the effect that these curves are in the masonry construction, although these gentlemen had not previously observed the fact.

Herewith are the certificates:

"The undersigned, Eugene Chambaud, architect of the City of Nîmes, after examining the curved lines of the *Maison Carrée* with Mr. Goodyear, has verified the existence of these curves as being in the said construction: with the proviso that the curve on the east flank has been exaggerated by a thrust of the roof timbers; but also verifying the fact that there has also been a curve on this side in the original construction—considering that the line of bases in the engaged columns is curved on this side as it is on the other, and that there has been no thrust here; considering also that the movement (owing to thrust) is far from having been sufficiently great to produce the curve of the cornice. He considers the theories of Mr. Goodyear regarding the perspective effects of the curves as a reasonable one, and remarks that the theory regarding the perspective effect of a convex curve is new but possible. He has observed with him that the variations of intercolumnar spacing on three sides of the monument would undoubtedly have a perspective effect, according to Mr. Goodyear's ideas. The joints of the cornice on the west side where there is a curve of 11½ centimetres, as measured by Mr. Goodyear, are intact, with one exception which is not important for the question of the curve.

NIMES, FEB. 23, 1891. E. CHAMBAUD."

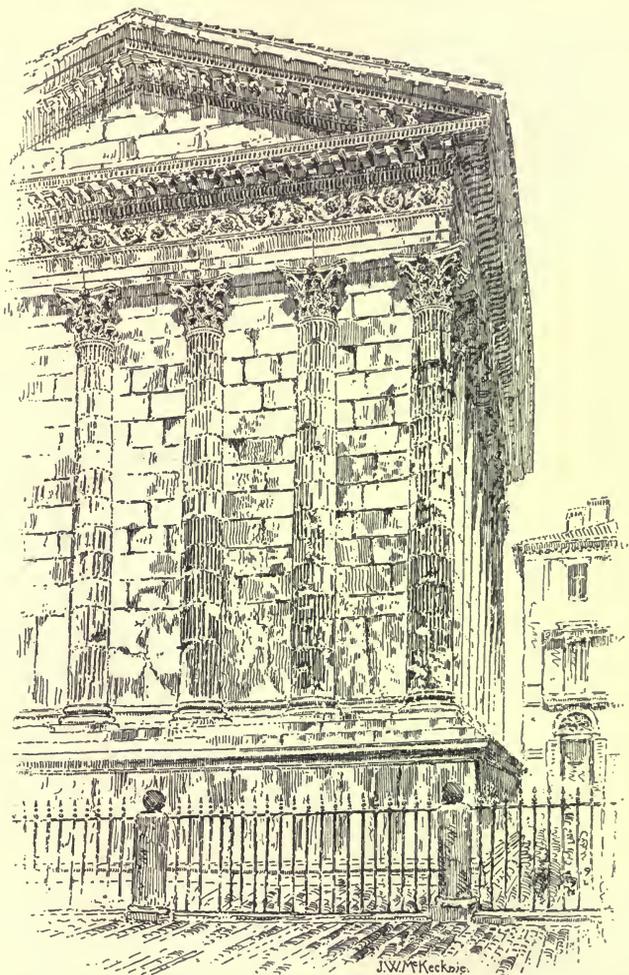
"FEB. 20, 1891.

"The measures herewith have been taken with the assistance of Mr. Augière, architect of the City of Nîmes. He witnesses to having observed the curves with Mr. Goodyear, and he verifies the fact that there has been no thrust in the cornice of

the west flank. As Professor of Perspective he wishes to say that he considers the theory of Mr. Goodyear regarding the perspective effect of a convex curve in plan new but reasonable. As to the effect of a concave curve in plan it is familiar to experts in perspective.

A. AUGIÈRE,"

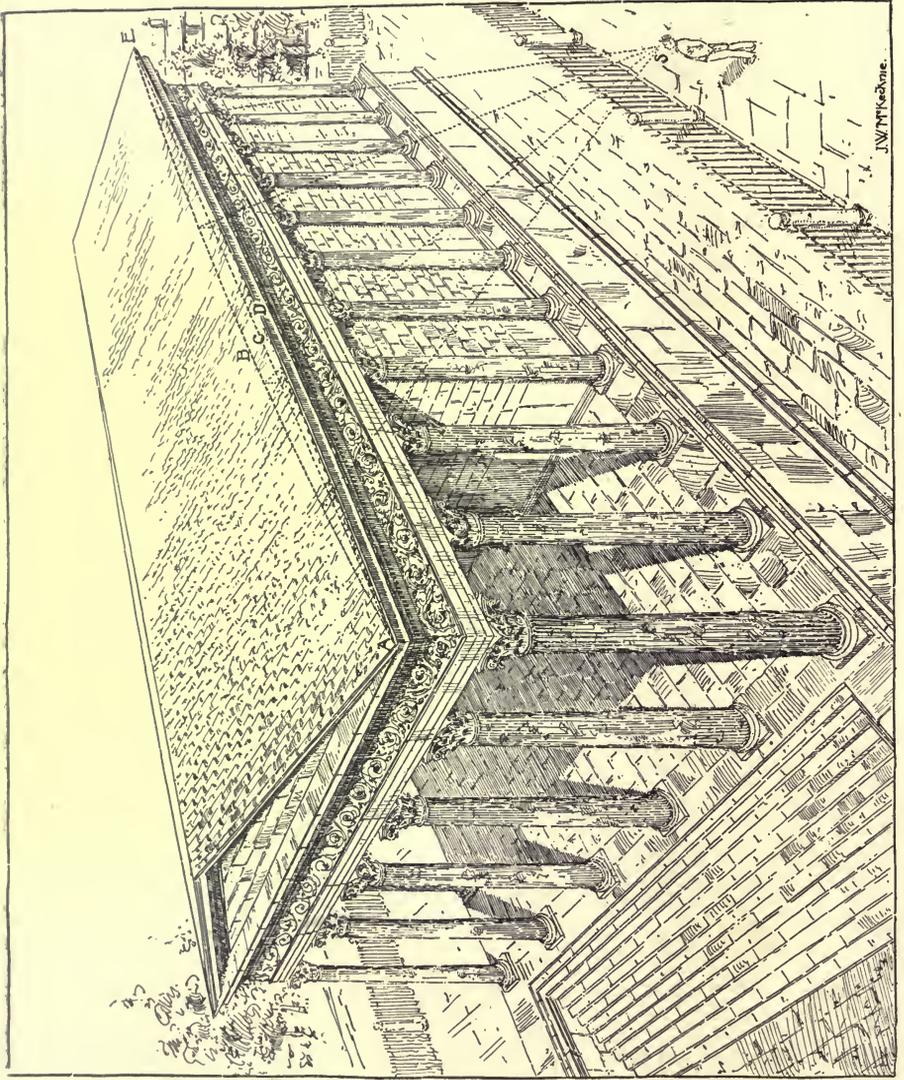
dropped a plumb line to the pavement below. The curves of the cornice, wholly due to masonry construction, are in horizontal planes convex to the position of the spectator, and measure about five inches.



View of the *Maison Carrée* at Nîmes. From a photograph taken for the author to show the curve of the cornice.

I must add that on one side of the *Maison Carrée* the curve has been exaggerated by a subsequent movement of the masonry, and that on this account I confined myself in measurements for the cornice to that side where the masonry is in thoroughly good condition. For measuring the cornice curve I employed tin-roofers, who scaled the building by ropes and

I also made measurements on the line of the stylobate which show slight corresponding curves in the line of the temple wall, and of its engaged columns along the plinth line. I have no hesitation in saying that even on the line of bases of the engaged columns resting on the stylobate there are slight convex curves in both temple walls on the long sides. It is also cer-



Bird's-eye view of the *Maison Carrée*, showing the optical effect of the cornice curve—A, D, E, the actual curve; A, B, E, the optical effect, from standpoint S. Drawn by John W. McKean.

tain that the great increase of the curve above was obtained by leaning out the walls and engaged columns at the centre.

It now remains to say what is the importance of this observation on the *Maison Carrée*. First, it overthrows the presumption of scholars that the Greek curves were unknown to the time of the Roman Empire, whose taste has been so far considered too coarse for this refinement. This observation, therefore, carries the history of the Greek curves from the time of the fifth century before Christ, down to the time of the second century after Christ. It extends the life of this

exaggerate the effects of curvilinear perspective and thus give increased dimensions to the building when seen from a point of view facing the centre of either side, but he also considered them as giving life and beauty to the building, and as superior to the more monotonous and colder effects of mathematically straight lines. This latter view is the one which has mainly figured in the standard compendiums of the Germans; for instance, in those of Kugler, of Schnaase, and of Jacob Burckhardt. It has not been abandoned by the publication of Thiersch,* whose essay is the only contribution to the optical and mathematical questions in-



The *Maison Carrée* at Nîmes.

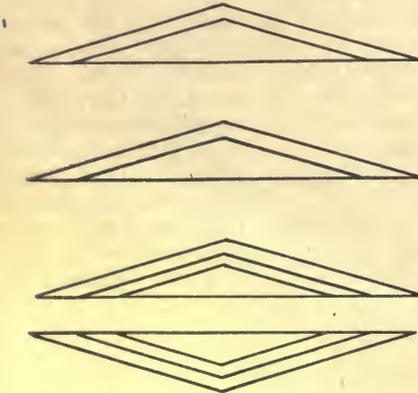
Greek refinement seven centuries later than as previously known. Second, it reopens the question as to the purpose of the Greek curves. The explanations which have been previously offered must be revised or supplemented to some extent, because the explanations previously offered have referred to curves in elevation and not to curves in plan.

This brings us back to the explanations so far offered for the Greek curves. We have seen that the German architect Hoffer was the first to announce the Parthenon curves in publication. This was in 1838. Hoffer's explanation was that the curves of the upper lines were intended to accent and

involved, aside from those of Penrose and Pennethorne. Thiersch, however, in the main, accents and develops the point of view of Penrose. The views of the latter as to the theory of the curves have naturally been most familiar to English and American students and as his measurements are our only authority for the facts, his theories have naturally been generally accepted by his English and American readers. The explanation of Penrose moves from the accepted fact that there is a tendency to optical downward deflection in the straight line of an entablature below the angle of

**Optische Täuschungen auf dem Gebiete der Architectur.*

a gable or pediment. It is his theory that these lines of the entablature were accordingly curved upward in order to counteract this defection. As to the curves of the flanks Penrose regards



From Thiersch, *Optische Täuschungen auf dem Gebiete der Architectur*. Diagrams illustrating the optical deflection of straight lines below the angle of a gable. The upper line appears to be curved downward and is really straight. The line next below appears to be straight, but is, in fact, curved upward. In the two lowest diagrams the lines which appear to curve away from one another are, in fact, straight and parallel.

them as a consequence incident originally on the methods pursued for the entablatures under the pediments and then adds :

"We may attribute the use of this refinement to the feeling of a greater appearance of strength imparted by it, to the appreciation of beauty inherent in a curved line and to the experience of a want of harmony between the convex stylobates and architraves of the front and the straight lines used in the flanks of the earliest temples. And farther, if we may suppose the first examples of

its application on the flanks to have occurred in situations like those in which the two temples above mentioned (viz. the Parthenon and Olympian Jupiter Temple) are built, the presence of a delicate, but not inappreciable curve in what may be considered as Nature's great and only horizontal line may possibly have combined with other causes to have suggested its use."*

Although Penrose is distinctly of the view that the hardness and dryness of modern copies of Greek architecture are due to the absence of these refinements, his effort is in each case of the various refinements quoted at the opening of this paper, to look for an optical correction as distinct from an optical illusion; and yet for the most important curves of all, viz. : those of the long sides of the temple, he does not even suggest that an optical correction was needed.

We come finally to the views of Boutmy, *Philosophie de l'Architecture en Grèce*, 1870, who returns to and revives the idea of Hoffer of a perspective illusion, but still confining his explanation to an effect from one point of view, viz. : that opposite to the centre of the sides or ends of a temple.

Now, the importance of the observation of curves in the *Maison Carrée* is that they were not applied to the pediments at all, but exclusively to the sides. The theory of an optical correction is therefore insufficient, and the theory of a perspective illusion appears

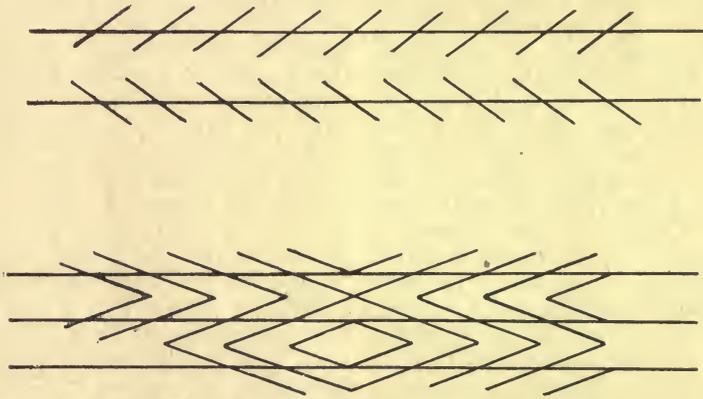
* The line referred to is that of the sea along the horizon.



Diagram showing an optical effect of inequality in straight lines which are in fact of equal length. By John W. McKecknie, perspective expert.

to be the only one left us; but this theory has never previously been announced as an explanation for the construction of curves in plan convex to the point of vision. It is, however, clear that all curves in plan convex to the line of vision produce an effect of curves in elevation. I am indebted to Prof. Wm. R. Ware, of Columbia College, for the information that at an angle of forty-five degrees a curve of five inches in plan, when not perceived by the eye, will produce an effect of five inches curve in elevation. From all points of view further removed, the effect will be less, but the builders of the *Maison Carrée* and of the second court of Medinet Habou seem to have

Medinet Habou, but we have seen that, owing to the late announcement by Pennethorne (1878) and the general oversight by Egyptologists of this announcement, their existence even here is still generally unknown to science. A few words, then, as to my own observations in Egypt. My trip here was made in the interest of other studies and the subject of lotus ornament and its influence on Greek patterns. My measurements and observations were consequently hurried and imperfect. Still, here are the facts. Although the great court at Karnak is so filled with rubbish that one can climb in several places to the top of the architraves. I am able to



Diagrams showing an optical effect of curves and obliquities in lines which are in fact straight and parallel.
From Thiersch, *Optische Täuschungen auf dem Gebiete der Architectur*.

purposed to make this good by making the curves correspondingly heavier to begin with.

In the Parthenon the curve is under 4 inches in 228 feet. At Medinet Habou the heaviest curve is 8 inches in less than 100 feet, and at Nimes it is nearly 5 inches in about 100 feet.

To the above points we must now add the general revision in the attitude of archæology to the question of curves in ancient architecture, which is probably involved in my observations for curves in plan in the courts at Karnak, at Luxor and at Edfou. The conservatism and habits of repetition in Egyptian art would under any circumstances make it highly improbable that the curves in Egyptian architecture were confined to the one temple of

announce, as far as these architraves are concerned, that curves convex to the court are visible. At Luxor the columns of the largest court on two sides have leaned forward so far as to threaten downfall and have been shored up accordingly by beams during and since the excavations not quite completed in 1891. Measurements taken by me in all three courts at Luxor show curves in all lines of columns at the bases, all convex to the centres of the courts, varying from $1\frac{1}{2}$ to 7 inches. It is clear at Medinet Habou that the lower curves in the lines of the basis and in the lines of columns near the bases were comparatively slight and that the curve was obtained in the architrave and cornice (as it was at Nimes) by leaning

forward the centre columns. This would explain the movement of the masonry which has required the columns at Luxor to be shored up by timbers. All earthquakes and other forces tending to disintegrate these buildings, such as pulling down and destroying the accessible parts of the temple, would tend to exaggerate the lean of the centre columns and bring about the threatened downfall now imminent at Luxor. My observations at Edfou point the same way. On all four sides of the court I have measured curves in the line of the bases, of $1\frac{1}{2}$ inches on each side of the court. Very heavy curves, of 10 inches in one case, appear in the cornice lines, but the cornices have moved forward and the original lean of the centre columns has been exaggerated by accidental tipping. The joints of the columns have parted at the rear and it will require careful examination and survey at Edfou to show how much of the upper curve is due to movement of the masonry and how much is due to construction. One main fact remains to be mentioned for Egyptian temples. Although their curves have so far been utterly ignored and neglected, excepting by Pennethorne and myself,* the existence of other perspective illusions is admitted for Egyptian temples by Egyptological experts.

It is noted by a number of authors that the temples were generally built with pavements rising toward the sanctuary and with roofs gradually lowered in the same direction, and that this was done for perspective illusion. Maspero is one of the authorities who mentions this. Mentions are also made of this by Rawlinson and by Professor Reginald Stuart Poole.

V.

Although these various observations point to a perspective purpose in the Egyptian and Greek curves, I do not wish to appear to antagonize the view that optical refinements were used in Greek architecture to correct

optical illusions, for I believe that they may have been so used; but I wish to point out that the theories which are confined to correction are insufficient to meet all the facts, and that the theories which have considered the *creation* of optical illusions to have been one purpose of the refinements are now materially strengthened.

The existence of a temple at Nimes having curves on the flanks without having them in the entablature of the pediments tends to antagonize the view of Penrose that the correction of a downward optical deflection below the pediment was the first cause of the introduction of the curves in Greek architecture. The temple of Neptune at Paestum is quoted by Penrose, in support of his view, as having only curves under the pediments, but strange to say this temple at Paestum has been subsequently announced by Jacob Burckhardt to have convex curves on its flanks in horizontal planes.* This observation is also quoted by Thiersch. Thus I close my Paper by pointing out that we have at Paestum one ancient Greek precedent for the curves in plan at Nimes, and that both point to Egyptian influence. The city of Nimes was settled by a colony of Alexandrian Greeks from Egypt. It appears therefore probable that the curves in Greece were derived from Egypt and had the same purpose, but that the curves in the Egyptian courts were generally changed to curves in vertical planes by Greek art. This was a more refined expedient for attaining the same end, less conspicuous in buildings using colonnades for exterior porticoes as distinct from buildings using colonnades for the interiors of courts. It is comparatively easy to sight for a bulging curve on the exterior of a building, but more difficult to sight for it in the interior of a court. I was not able, for instance, to sight for the curve at Medinet Habou without going on the roof of the portico, but at Nimes I was able instantly to sight for the bulge on the long sides from the level of the street. These facts, therefore, coincide with the view that the general purpose of

* I must make an exception for Prof. Allan Marquand, of Princeton, who has briefly noticed in the *Am. Journal of Archaeology* the discovery of Pennethorne at Medinet Habou.

* Der Cicerone.

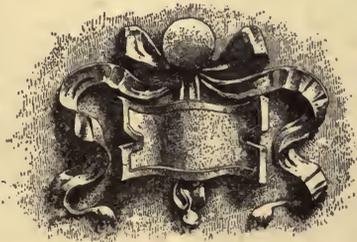
the curves in Greek art was connected with the wish to have them inconspicuous, and that the curves at Nimes represent either a direct influence from Egypt or the coarser taste of the Roman period. On the other hand the flank curves of the Neptune temple of Paestum, which is a very early Greek building, will represent the period of direct Egyptian transmission to Greece.

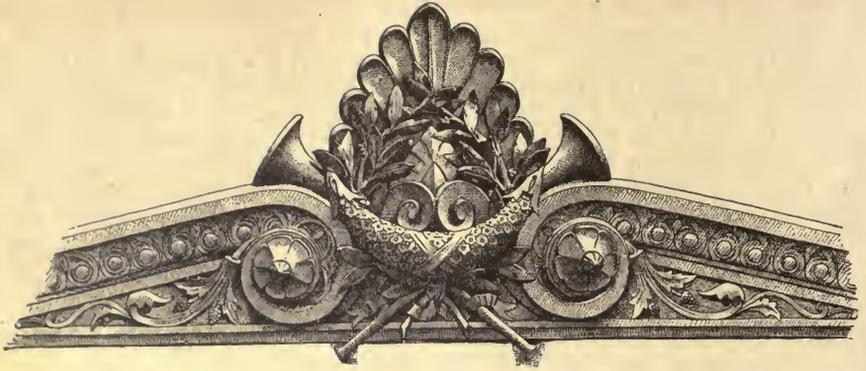
As it is generally conceded that Vitruvius drew his matter from earlier Greek authors whose works have perished and that he did not always fully comprehend the ideas of his sources, I have omitted any argument concerning his direction that the stylobate curves are to prevent an effect of "alveolation" (*i. e.* downward deflection) at the centre of the stylobate. The only modern author who has attempted to explain this direction by optical theories is Thiersch. This author gives his reasons for supposing that a spectator standing near an angle of the stylobate *and below the level of its platform* might experience an optical effect of downward deflection in the lines of the stylobate which an upward curve would correct, but inasmuch as a bulging curve in plan could not correct this effect for the standpoint near the angle, I have not considered his theory in this Paper and I only mention it as giving one more illustration of the new light thrown on the Greek refinements by the discovery of curves in horizontal planes. There

are very valuable remarks in Boutmy's work as to the general unreliability of Vitruvius for a comprehension of the Greek curves and one purpose of this Paper is to accent the value of Boutmy's contribution to the philosophy of Greek architecture. His work also contains quotations from Greek authors on the optics of architecture showing that intentional optical illusions and intentional optical corrections were alike familiar to them.

There is one thing more to be said before I close. The credit for the original suggestion that there is a historic connection between the Greek curves and those of Medinet Habou belongs to Mr. Pennethorne, as does the credit for both discoveries. The wholly original part of this Paper as regards historic facts is that which points to the fact that two classic buildings—one early Greek at Paestum and one late Roman at Nimes—show convex curves in plan which are *identical in character* with the curves in Egypt. The wholly original part of this Paper as regards observations is that which relates to Nimes, Karnak, Luxor and Edfou. The wholly original part of this Paper as regards the effect of the Greek horizontal curves is that which shows the optical results in actual historic buildings of convex curves in horizontal planes. I am willing to leave the question of purpose to the expert and to the general reader.

Wm. Henry Goodyear.





LINEAL PERSPECTIVE — ELEMENTARY PRINCIPLES.

PART I.

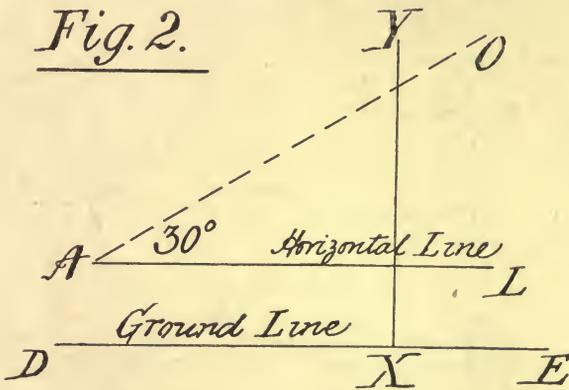
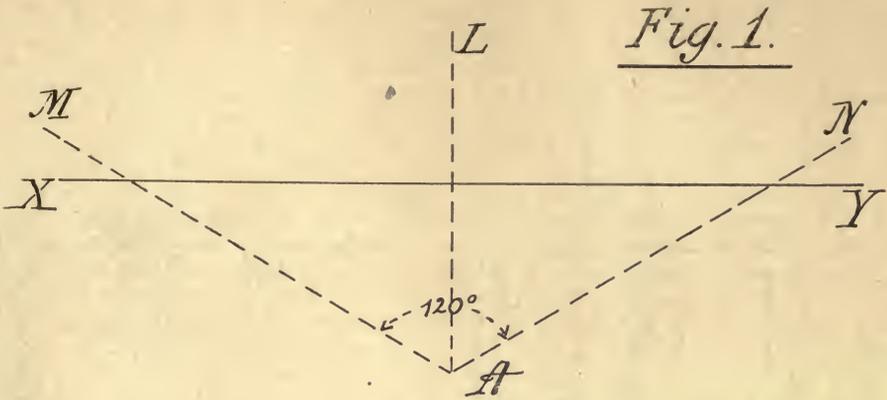
THE subject of Perspective is one which is approached from very different points of view by the architect and by the pictorial artist. The first considers it as the mechanical means by which, from given plans and elevations, he can construct a pictorial representation of the building which they represent, while the other looks upon it as comprising a series of laws with which his drawings must conform if they are to be pleasing to the eye. To write upon it, therefore, to meet the needs of both these classes of readers at the same time, is somewhat difficult, and it has been thought best, in attempting to accomplish this task, to consider it as a branch of solid geometry, taking the scientific rather than the architectural or the artistic point of view, and laying down, as clearly as may be, the laws which underlie it.

Speaking scientifically, then, and using the language of geometry, Perspective may be defined as a convergent projection of an object upon a superficies. The superficies (or surface) may, theoretically, be curved or plane, and, if plane, inclined at any angle, in any direction. Almost invariably the projection is made upon a plane vertical surface (a piece of paper or a canvass held vertically), but there are notable exceptions as in the well known pictorial diorama, where the projection

is made upon a vertical cylindrical surface, and in the photographic camera when the operator tilts his camera and produces what looks like a distorted picture, however scientifically correct it may be.

Farther than this the architect must bear in mind that in the mechanical production of a perspective picture there is no account taken of *focus*, or, rather, the want of it, which goes so far to give reality to a picture; and, on the other side, a painting or drawing may have the hazy, ærial effects of distance properly graded with the sharp precision of the prominent and near objects, and yet be faulty from want of observance of these same rules of perspective, neither of itself being sufficient to indicate the difference between near and distant objects as seen by the human eye.

Taking Perspective, then, in its most usual but very limited sense, to be a convergent (or divergent) projection of an object upon a plane surface, it still has further limits in its applicability—limits which do not apply when the projection is made upon cylindrical or spherical surfaces. These cases are so rare, however, that in these articles plane surface projection alone will be treated; and the primary limitation here is that of the angle of vision within which man's eye is capable of seeing with tolerable distinctness.



This is shown in Figs. 1 and 2. Fig. 1 is a plan of a vertical sheet of glass, XY , through which a person is looking who is standing at A . He is supposed to be looking directly in front of him towards L , the line AL being at right angles to the plane of the glass, XY . It will be found then that he will only see, with even tolerable clearness, objects which lie within the angle NAM , which is an angle of 120° ; or, in other words, he can only see within an angle of 60° on either side of him. Some people can see within a slightly wider angle, but even if so, everything beyond is extremely hazy, as, in fact, it has become long before this limit is reached.

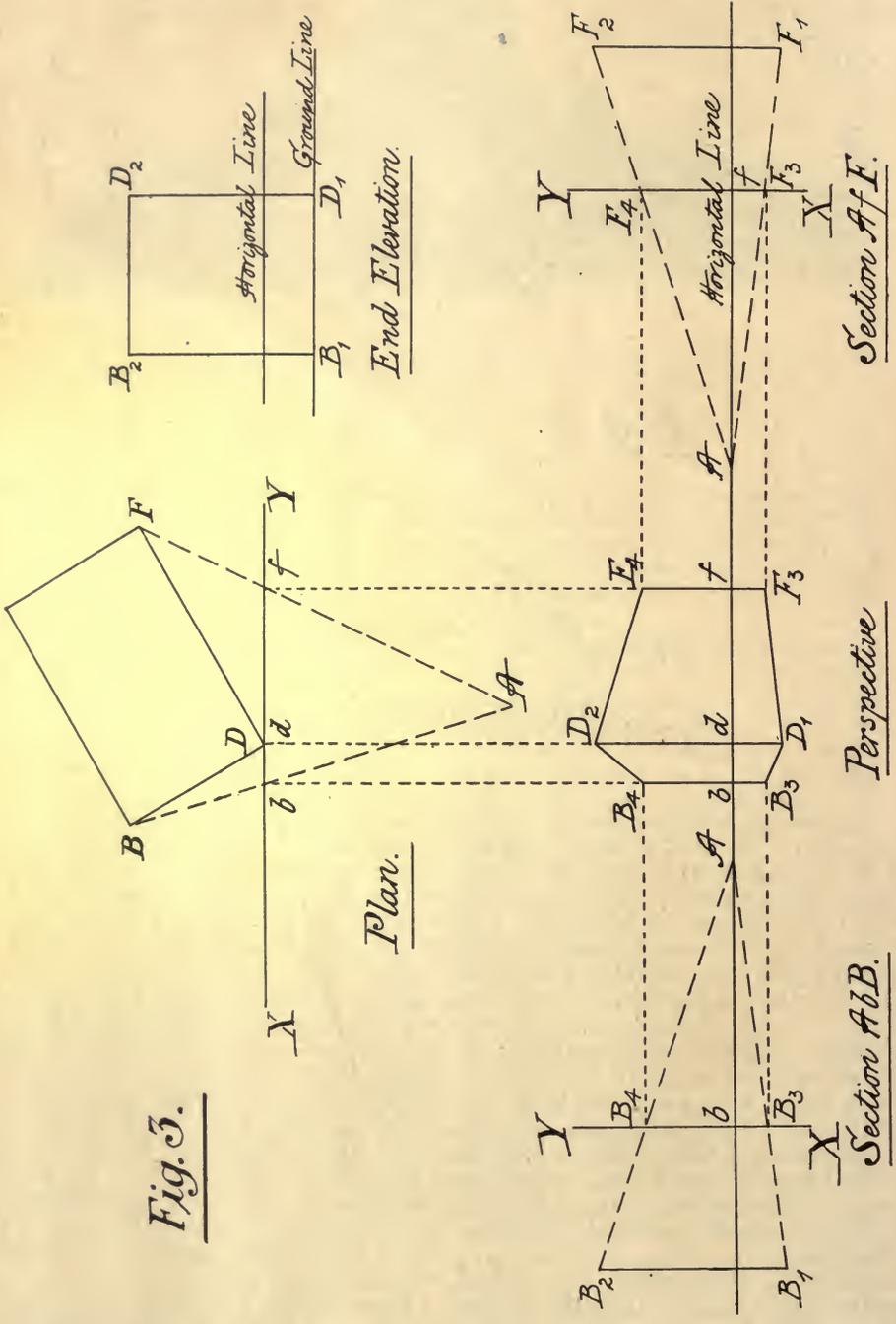
Similarly with regard to vertical angles (see Fig 2). A person having his eye at A , some little distance above the ground line DE , and looking straight in front of him along the line

AL , through the sheet of glass shown in section at XY , can only see objects above the level of his eye which fall within the angle OAL , which is but an angle of 30° , and at the same time he can see downwards within a similar limit.

It is better in practice to confine one's work within much smaller angles, as an appearance of distortion is set up as the wider limits are reached, and in fact that draughtsman is wise who limits himself to an angle of 30° to either right or left of the line drawn at right angles from the eye to the picture plane (as the vertical intercepting sheet of glass is called), and to an angle of 15° either upwards or downwards from the horizontal.

Remembering the definition of Perspective, and conforming with the limits mentioned above, it is possible already for a student to make a perspective

Fig. 3.



drawing if supplied with plans and elevations of any simple object by the laborious process of direct projection both of lengths and heights. Such a simple projected perspective is shown in Fig. 3, fully worked out, and the diagram and its explanation are worth following closely, as, if understood, any other problem, even of considerable complexity, can be solved by anyone of moderate ability who does not grudge the necessary labor involved.

Taking the plan first, it is seen that B D F represents a rectangular block, the point of sight, or position of observer, and X Y the plane upon which the projection (or perspective drawing) is to be made. The position of this plane has been so chosen that it touches the point D, this being a device commonly adopted by architectural draughtsmen to diminish their labor, but by no means necessary nor always advisable. The projection of D upon X Y is therefore at the same spot, *d*.

The projections of B and F upon the plane are obtained by joining B A and F A, cutting X Y in *b* and *f*. The points *b*, *d* and *f* therefore are the projections upon the plan of the *picture plane* of the points B, D and F.

Lines are now drawn vertically down from *b*, *d* and *f*, and the perspective representation of the angles of the building will be found somewhere in these vertical lines.

Referring to the "End Elevation," it will be seen that the rectangular end, B₁ B₂ D₂ D₁, is cut at about one-third of its height from the ground line by the *horizontal line*—drawn horizontally at a height above the ground line which is equal to the height of the eye of the observer above the ground.

Another *horizontal line*, to represent this one, is now drawn through the vertical lines projected downwards from *b*, *d* and *f* to be made the basis of sections along the lines A *b* B and A *f* F, and of the eventual perspective drawing. First, a section along the line A *b* B is set down, the distances and heights being obtained from plan and elevation, the line B₁ B₂ being similar in its dimensions, both above and below the horizontal line, with the

similarly lettered line on the elevation. By joining B₁ and B₂ to A on the section the picture plane, X Y, is found to be cut by the converging lines at B₃ and B₄. This is the true perspective height, with relation to the horizontal line of the angle B₁ B₂; and by drawing horizontal lines through B₃ and B₄ until the vertical line downwards from *b* on plan is reached in the similarly lettered points, the true perspective representation of the angle at B is obtained.

By making a similar section along the line A *f* F on plan and similarly projecting, the true perspective representation of the angle at F is obtained at F₃ *f* F₄; and the representation of the angle at D is got by direct scaling of the heights D₁ *d* D₂ from the elevation.

It is now only necessary to join B₄ to D₂, D₂ to F₄, B₃ to D₁, and D₁ to F₃ to obtain a complete perspective representation of the block—the fourth angle being, of course, hidden from the spectator.

Of course it is quite possible for all these operations—the making of sections along each of the converging lines, and even the erection of a perspective—upon separate pieces of paper, all heights and distances being transferred by means of measurements marked upon the edges of paper strips instead of being directly projected by vertical and horizontal lines; and, in point of fact, this is absolutely necessary where many sections have to be made along many different converging lines. It is usual, however, for practical workers to avoid making these sections almost entirely, as they involve much labor; but it will be seen that from the rules already laid down it is possible to obtain the perspective representation of any number of points of which the plan and elevation are both known, and consequently of a building of any degree of complexity of which there are complete plans made. So far as projection from the plan itself is concerned, however, the method here shown of projecting from the various points to A, so as to cut the *Picture Plane* (XY), is that almost universally adopted.

It is now necessary to observe and consider various phenomena which have

become apparent. While the representations of the vertical lines at the angles have remained vertical, the representations of the horizontal lines are seen to converge— $D_1 B_2$ and $D_1 B_3$ towards the left, and $D_1 F_3$ and $D_1 F_4$ towards the right; and, if produced, it will be found that each pair of convergent lines will meet in some point in the *horizontal line*—which point is known as the *vanishing point* or V. P.

The reason for the lines converging

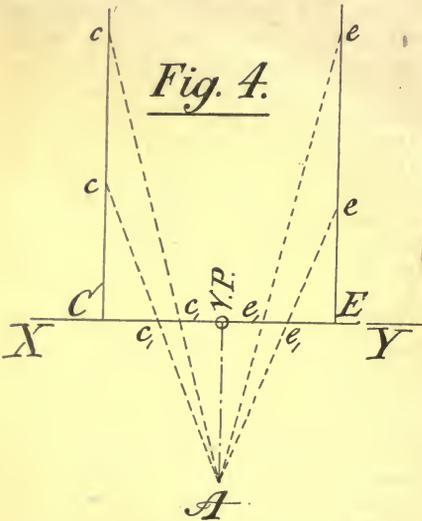


Fig. 4.

this is not far to seek. In Fig. 4 there are shown two parallel lines Ccc and Eee on plan, drawn at right angles to

the picture plane $X Y$, the spectator being so placed that another line, drawn parallel to these from his Point of Sight A , will cut the $X Y$ between C and E . Where it cuts will be the $V P$; for, as lines drawn from A to various points in the line Ccc , the representations cc of these points on the $X Y$ come nearer and nearer to the $V P$ the further and further away the points taken are from the $X Y$, and it is the same with points in the line Eee . At length, as these lines are prolonged indefinitely, the representation of points in them becomes infinitely near to the $V P$, and, though never actually reaching it, may be said to do so without error to our finite understandings. As usually expressed, the perspective representations of the lines Ccc and Eee are said to vanish in the $V. P.$

Similarly, if the lines be drawn, as are Ggg and Hhh in Fig. 5 at any angle to the picture plane other than a right angle, their representations again vanish in the $V. P.$, which is again ascertained by drawing a line from A parallel to Ggg and Hhh until it meets the $X Y$.

Precisely the same thing happens if a section be taken, as in Fig. 6. The lines $Xxxx$ along the ground, and $Mmmm$ parallel to the ground (or horizontal), vanish in the $V P$, which is obtained by drawing a line from A horizontally until it cuts the $X Y$. Thus all lines lying in horizontal planes

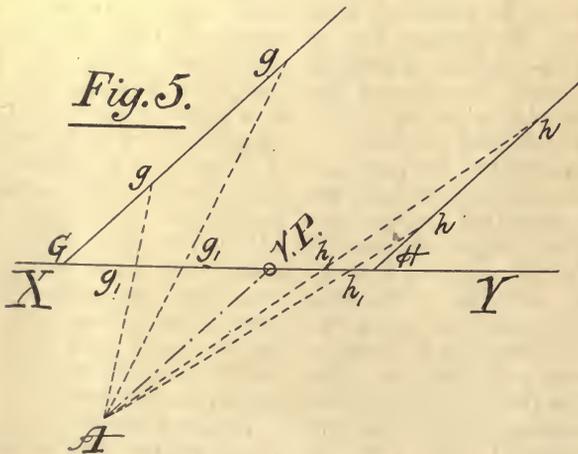


Fig. 5.

vanish somewhere in the *horizontal line*, which is itself thus the *vanishing line* of all horizontal planes.

Returning now to the consideration of the same rectangular block as is worked out in Fig. 3, it is shown worked out again, and more rapidly, by the use of the *V P s* in Fig. 7. It will be seen that, on plan, lines have been drawn from *A* parallel to *DB* and *DF*, cutting the *XY* and *V P₁* and *V P₂*. Lines have then been drawn vertically down from *V P₁* and *V P₂*, thus ascertained on plan until they have cut the horizontal line on the perspective, at points *V P₃* and *V P₄*, respectively. The height *D d D₂*, having then been laid down to scale in the same way as was done in

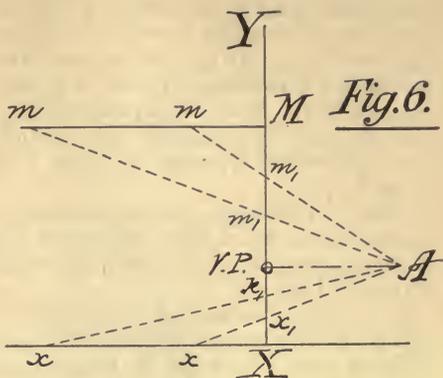
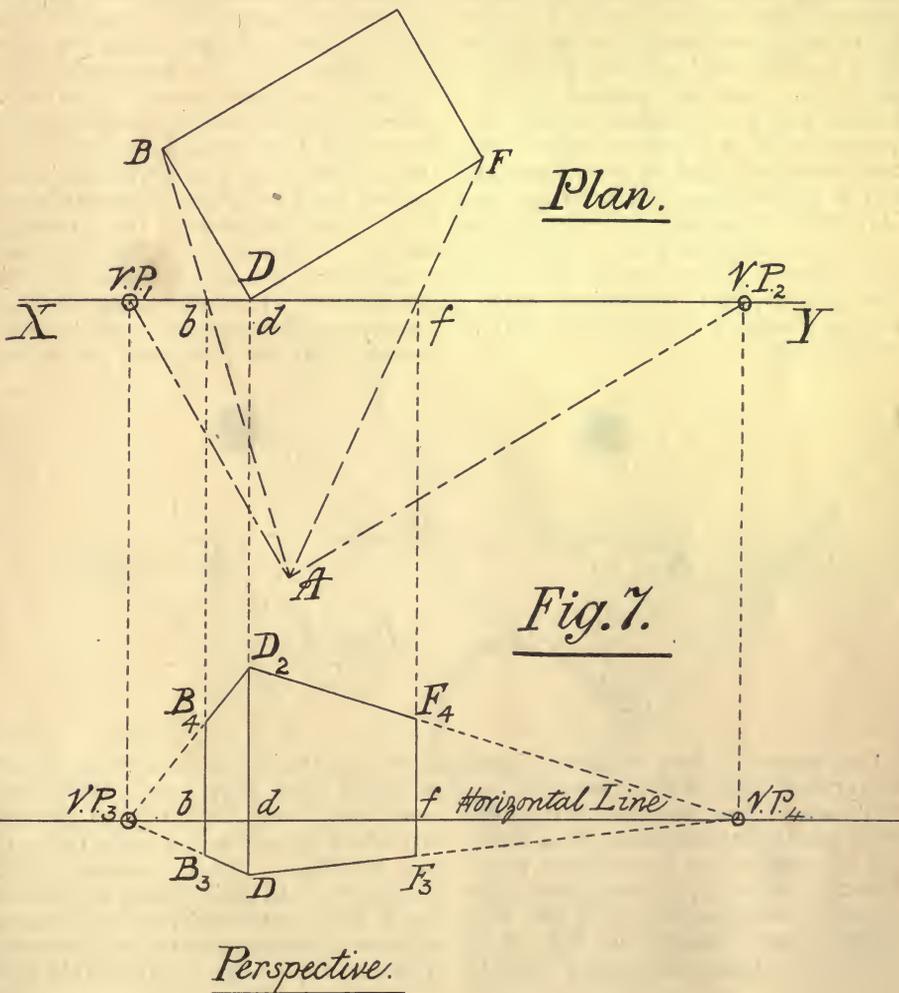


Fig. 3 (these, owing to the picture plane touching the angle $\frac{1}{2}D$ of the building,



being the same as the heights shown on elevation), lines are drawn from D and D_2 to $V P_1$, cutting the vertical line projected downward from b in B_2 and B_3 , and other lines are drawn from D and D_2 to $V P_2$, cutting the vertical line projected downward from f in F_2 and F_3 .

The perspective representation is now seen to have been obtained, and to correspond in all respects with that shown in Fig. 3.

From what has already been said, it will be readily comprehended that lines lying in planes parallel to the picture plane (*i. e.*, in vertical planes, save in the rare instances when inclined planes are used as picture planes) have no vanishing points; and this necessarily includes all vertical lines. The perspective representations of such lines must be obtained by direct projection, as in Fig. 3, and they will be found, in perspective, to be parallel to their elevations upon the picture plane, only reduced or enlarged in size according as the picture plane has been assumed in front of or behind them, it being quite a common practice, when it is desired to obtain a large perspective from small-scale plans, to project onto a picture plane behind instead of in front of the object.

are shown of a series which lie in range, parallel to the $X Y$. When projected the representation $a b$ of the near column P is much less than the representation $c d$ of the far column Q . To show them thus upon a drawing would call down criticism of a none too flattering kind—it is only one example of many which could be cited to show that projection upon a plane surface is only a convenience and not correct pictorially; sufficiently near to the truth for all practical purposes, and to be adhered to with circumspection.

In Fig. 9 is shown the method of obtaining a perspective representation of a summer-house, according to the rules laid down with reference to Figs. 3 and 7; numbers having been used to indicate the various points. It will be seen that, the point of sight A , and the picture plane, and the horizontal line, having been determined to suit the view which it is intended to obtain (the horizontal line being 5 feet or about the height of a man's eye above the ground line), the plan is then projected on to the picture plane by lines converging to A , the points thus obtained transferred by measurement to the perspective. The heights are all then ascertained, by one section, at the point marked 8 on the plan, and are carried

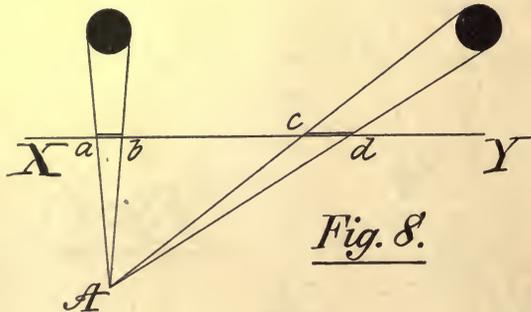


Fig. 8.

It is necessary here to give a word of warning against the too great use of parallel perspective, as it is called when whole plane surfaces of a building lie parallel to the picture plane. The effect is rarely pleasing, and often actually distortate, as in the well-known case illustrated in Fig. 8, in which two circular columns, P and Q ,

thence, on the perspective, from point to point until they reach their final position by using the $V. P.$'s to right and left which pertain to the main faces of the building. Most workers drive strong pins into their boards at A and at the $V. P.$'s to enable the lines converging to these points to be more readily drawn with a straight edge. An example with

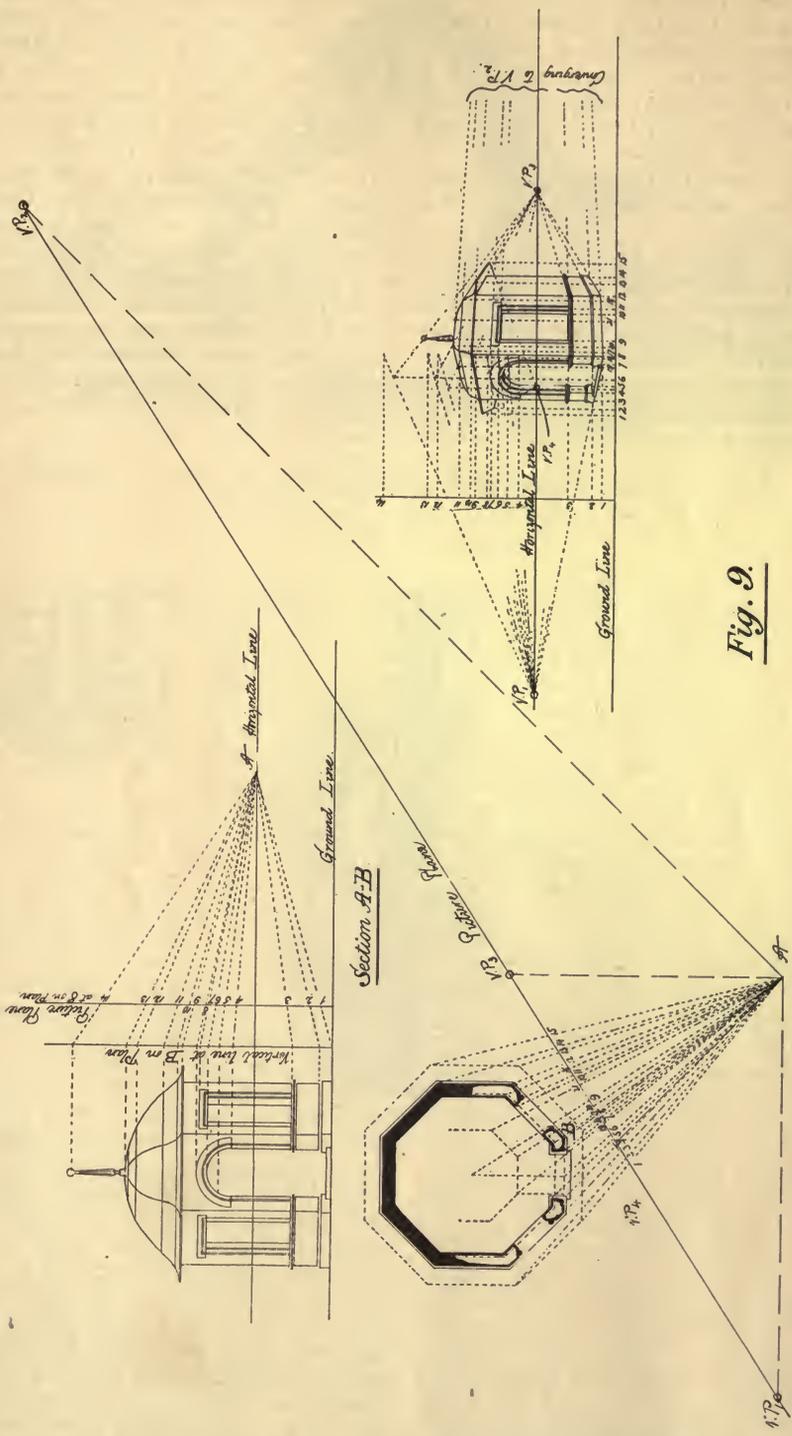


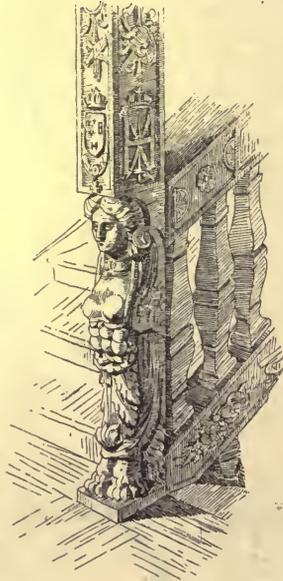
Fig. 9.

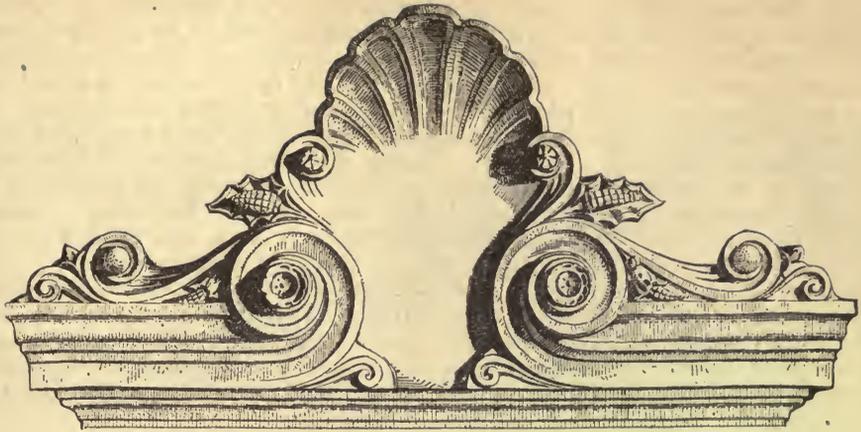
a curved roof has purposely been chosen, to show that points in curves are treated precisely as any other points, the main planes being utilized, or, in cases of great complexity, direct projection possibly resorted to (though this is rare). These points being ultimately joined by freehand in the perspective to obtain the representation of the curves.

Only the main points and lines, it will be seen, have been thus laid down. A beginner, or a very exact and conscientious man, may take the trouble to ascertain everything precisely in this way; but most draughtsmen take the outline thus obtained, rub out the construction lines entirely and almost

the outline also, and finish in ink and color, using this outline as a guide to prevent their going wrong, rather than as a series of precise lines which have to be rigidly shown, and filling in any omitted details by sketching. It is, however, a matter of choice and circumstance entirely, whether the eventual drawing shall be free or rigid in feeling. A free and somewhat coarse sketchy treatment would suit a summer-house; but a theatre or a parliament house would probably call for severity and precision, which could be obtained by merely inking in, with care, a carefully and exactly prepared pencil perspective drawing.

G. A. Middleton.





ARCHITECTURAL ABERRATIONS.

No. XIII.—THE CAIRO.



THE national capital contains some very tough examples of the art of architecture. It is in spite of these that it has attained the reputation, which upon the whole perhaps it deserves, of the handsomest of American cities. That reputation it owes first to the providence of Pierre L'Enfant, the French major of engineers, who planned it a hundred and five years ago; secondly, to the "Ring" which swept and garnished it at great expense eighty years later; thirdly, to the architects of the public buildings, from Dr. Thornton, the Philadelphian amateur, to Walter; fourthly, to the owners and architects of the small minority of seemingly and respectable private buildings that have been put up since Shepherd and his associates converted the place into habitableness. The bulk of the private building, however, is still bad—much of it outrageously bad. It is really pitiful to note how little effect the seemliness and decorum of the older public buildings have had upon the projectors of shops and dwellings. In order to admire Pennsylvania avenue it is necessary either to fix one's regards exclusively

upon one of the really admirable buildings that stop the vista at either end, or else, with Mr. Swiveller's Marchioness, "to make believe a good deal." There is nothing admirable in the street itself, except the width and the paving. It would be an excellent foreground for noble buildings, even for buildings merely inoffensive and tolerably uniform. But the riparian buildings are not even inoffensive and not even uniform. They recall the "straggling village in a drained swamp" of the first half of the century. They range from three stories up to five, and they exhibit all the provincialism and all the vulgarity of the worst period of American architecture. They show the mischievous results of individualism, and the advantage of public control when the question is of making a beautiful and stately city. One thinks that an extensive conflagration would be a great cosmetic, but the thought is checked by the reflection that there is nothing to prevent the buildings reared in their stead from being as ugly and depressing as themselves. Public control has produced the beauty of Washington. The right of an American citizen to do as he likes with his own has gone far to destroy its beauty. There is a patent absurdity in taking thought and spending vast sums of

money for the purpose of making a harmonious city and then permitting any promiscuous private person who can get possession of a piece of ground and raise money enough to put a building on it to nullify all your dispositions and vulgarize your town.

There is one refreshing fact, however, to which the straggling and stupid buildings of Pennsylvania avenue bear gratifying witness, and that is that there is plenty of room in Washington. The straggle shows that it is still the City of Magnificent Distances that it used to be, and that five stories, or the altitude that can be reached by the unassisted human leg, is still the limit of loftiness in buildings. Here is a town, the spectator, revolted by the incongruity between the stateliness and uniformity of the public buildings and the mean and heterogeneous private buildings, may have said to himself, and in fact has often said to himself, here is a town that is at least secure from the sky-scraper. He might have said this even a year ago, when he would still have been confident that no vandal would put up an example of the Chicago construction in Washington, because the intelligent vandal would be convinced that where land was so abundant and expansion of area so easy, the sky-scraper would not pay. Alas! he can say so no longer. A vandal has been convinced that the sky-scraper would pay, and, being unrestrained by statute or propriety, has carried this revolting notion into execution. The result is "The Cairo," the present aberration.

"A ten-story building in a ten-acre lot" is necessarily an architectural aberration; and a twelve-story building in a city of magnificent distances is a contradiction in terms. It does not so much matter what kind of a building it is. The owner might have employed an artistic architect, and the architect might have produced as admirable a building as the Dakotah in New York, distinctly the most successful of the lofty apartment houses. The owner would still be a public malefactor, and the architect an accomplice in a public offense, which is not punishable by law only because we are too imperfectly

civilized to punish public offenses of the æsthetic kind. Our ears and noses are the objects of judicial solicitude, but not our eyes. A man may not establish a soap-boiling establishment, or a slaughter-house, or a boiler-shop in a quiet residential quarter, but he may put up a sky-scraper and none can say him nay. We whip the devil around the stump, when a man raises a stench or a clatter, by pretending that it is dangerous to health, which is mostly bosh, both as to the soap-factory and the boiler-shop, but when he constructs an eyesore we can do nothing except relieve our feelings in print, as in the present instance.

But now specifically. Granted, what no reasonable or humane person will ever grant, the propriety or necessity of a sky-scraper in Washington, what kind of sky-scraper is the Cairo. It is the worst kind. There is only one malefactor concerned in the designing of it, for the owner, it seems, is also the architect. That is satisfactory, for one likes to think ill of as few fellow creatures as possible. It would be more satisfactory if there were any evidence that the owner had applied to artistic architects to help him gild his pill, and they had particularly refused to abet him and left him to bear the odium alone. But there is no real reason to think so well of the practitioners of architecture. They are too apt to say with the owner, *il faut manger*, and the answer is equally obvious and familiar in each case. At any rate the pill is ungilded. The building is a box and the combined owner and architect has done nothing to mitigate its boxiness. Indeed, he seems purposely to have aggravated its rectangularity. In the prospectus which, in his quality of spider, he has published as an allurement to the prospective tenant, in the quality of fly—"Will you walk into my sky-scraper"—he says, "The outer brick and stone facings serve merely as a protection from the weather, and do not enter into its structural study whatever." He might have added that they did not enter into its architectural study "whatever," for there is no architectural study whatever. It is a box full of holes. True, the bottom is



THE CAIRO APARTMENT HOUSE.

Washington, D. C.

of stone, which is presumably stronger than brickwork, and therefore is properly used as a substructure when the substructure supports the superstructure, but meaningless when both substructure and superstructure are hung on steel frames. Of course this is the case with the best architectural renderings of the Chicago construction, as well as the worst. The architects play that these envelopes of masonry are real buildings, and they ask the spectators to pretend the same thing. It is, from this point of view, proper that the basement should be massive enough, apparently, to carry what is over it, that the bottom should be the strongest and simplest, and the top the lightest and richest part of the assumed structure, and that the same canons of criticism should be applied as if the assumed structure were the real one. This structure goes to pieces at once under such a scrutiny. True the basement is of masonry, but it is not massive or strong of aspect, being painfully weak and thin. Moreover, it is not set off by any architectural devices as an essential division of the building. It is not even clear where it stops, for in the middle it goes a story higher than in the flanks, and in both places stops without any architectural punctuation, as if the builder had merely run out of stone and had to take to brick at this point. As to the relation of voids and solids there is properly no such relation. The ends and the centre are projected a little, and the windows are varied in form, some being square-headed and some round-headed. But it is plain that these dispositions have had no more artistic origin than the desire to "obtain variety," and variety without purpose is mere confusion. The terminal pavilions are lean and hard, the central projection confused in mass and crude in detail, the fenestration architecturally nothing at all. Making this front various has only accentuated the fact that it is monotonous. "The more it changes, the more it is the same thing," as the lively Gaul observes. It is curious how the effect of boxiness, inherent in the original paralleloiped, is enhanced by all the things the architect has put on it ostensibly to relieve it of that appearance. The balconies at the angles, at the centre, and between the two, are merely box-like troughs, and so is the cornice a mere projecting box. It almost seems as if the designer must have projected these boxes in a cynical spirit, as if instead of trying to mitigate the boxiness of the building he were intent upon aggravating it and "rubbing it in." Upon the whole we decidedly prefer the side, where he has not pretended to do any architecture, to the front, where he has made his unsuccessful pretensions in that direction. The side is an ugly object, a very ugly object, but it makes no pretensions, and thus escapes vulgarity. It is the pretension of being an architectural work that makes the front so exasperating, when it is as evidently as the side, a box, *box et præterea nihil*. There may be as bad buildings elsewhere as the Cairo, we freely admit, and bad for the same reasons and in the same way. The owner and architect may inquire why we single out his bad twelve-story box for animadversion, and let the other bad twelve-story boxes go? It is because other bad twelve-story boxes have an excuse for their existence, if not for their badness, which his box lacks. "A twelve-story building in a twelve-acre lot," is an absurdity as well as an outrage, and a twelve-story apartment house in Washington is gratuitous and inexcusable, and denotes a deeper dye of depravity than it would in a more crowded city, where land is not to be had. Moreover, such a building in Washington is an indictment not only of its projector, or of the community, but of American civilization. The aspect of the national capital is a matter of concern not only to its own inhabitants, but to all American citizens. We understand that since this sky-scraper has been reared to this bad eminence, the authorities of the district have taken steps to prevent the rearing of any more like it. But the shameful fact remains that there has been no way found of preventing the erection of the Cairo in the capital of the United States.

THE ALPHABET OF ARCHITECTURE.*

THE DATA OF EGYPTIAN ARCHITECTURE.

IN the two preceding chapters we have considered briefly the nature of Architecture and some of the more important of the factors or influences which have worked to produce the many historical phases which the art presents to us to-day. We have seen that the development of Architecture, from its simplest beginnings to its most complex condition, has been rather a continuous process than a series of independent and unrelated efforts; and we have sketched for ourselves a rough outline map of this development, which shows us that if we set out from the present day, purposing to travel backward along the great architectural highway, we pass successively through the temporal region of the Renaissance, dotted with the palaces of kings, and the chateaux of nobles; through Mediæval Europe, with its picturesque Gothic profile—its cathedral spires and castle turrets,—through ancient Rome, splendid with richly-wrought colonnades and grandiose triumphal arches; through Greece, with its serene temples and noble statuary. Beyond, should we press further into the past, we attain the outermost limit of the historical road, in Egypt, at a period between three and four thousand years before Christ.

It is our business at this moment to make this long backward journey; for, prompted by the knowledge that Architecture has never broken with the past, we are, of course, particularly anxious to begin our survey of the art as remotely as possible.

The oldest known buildings in the world stand in the Nile valley,

“In all the imploring beauty of decay.”

Every age, we may say, has recorded its astonishment at the larger of the many pyramids which stand at the verge of the desert, near to the modern city of Cairo, and its admiration of the vast, many-columned temples at Karnak, “shadowy with solemn thoughts.”

But though the world has been acquainted with these monuments for so long—they loom up in the background of human history like remnants of the primal world—it is only recently, comparatively speaking, that the measure of their antiquity has been taken with anything like scientific precision, and still more recently it is that the architectural student has awakened to an active, penetrating interest in them. Until a few years ago, the tombs and temples of the Nile valley were regarded as representing an isolated phase of art, out of

* Preceding chapters in Vol. III., Nos. 1 and 2.

touch of, or, at the closest, only very distantly connected with, the historical development of Architecture. Better knowledge of Egyptian architecture and its relations is rapidly changing this false notion.

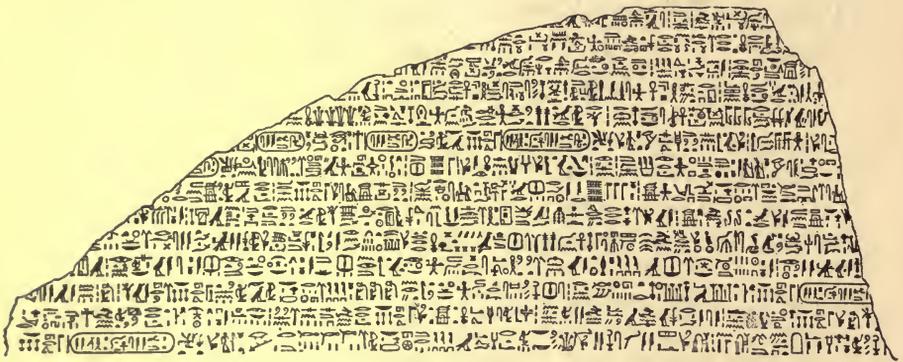
It must be remembered, however, that ancient Egypt is really a modern discovery. Within the last century there has been dug up in the Nile valley an immense tract of time that had been almost lost, and in many particulars quite lost, to the memory of man. Archæologists and others have succeeded in restoring to view the civilization of this forgotten period with very much of its original color and movement. They have peopled the old land with its ancient inhabitants and revealed them to us busy in their daily routine. This restoration is one of the most brilliant achievements of modern curiosity and modern methods. A literature, utterly dumb for centuries, has been made vocal again. The dead have been resurrected, and interrogated, and have repaid this unceremonious treatment with strange tales of their affairs. They have testified to so much that had been obliterated from human knowledge that we, to-day, have become almost contemporaries of that remote, many-colored world of theirs, to which they closed their eyes at a time when European history was far from its commencement. We see more of Egyptian life than Herodotus could have seen when he traveled along the Nile in the fifth century before Christ. Of the history of the country we know more than was known to the best informed of the priests he talked with. Within recent years we have uncovered buildings and entered chambers, and trodden floors of which the Ptolemies were ignorant.

Two keys opened all this knowledge to us. One, the decipherment of the hieroglyphics—the sacred or priestly form of writing of the ancient Egyptians; the other, the spade, which has unearthed from the soil, wherein they were buried for centuries, portions of lost cities and forgotten temples and hidden tombs, in addition to thousands of articles of daily life. A few words about these matters are necessary.

The Egyptians used three different kinds of writing: the hieroglyphic—the writing on the monuments; the hieratic—a speedier, cursive form of hieroglyphic; and the demotic or common script, used first in the ninth century B. C., in social and commercial intercourse. The queer-looking signs that appear to be partly pictorial, partly symbolic or conventional (of which the following are examples), which we find carved or painted on nearly everything Egyptian—on obelisks, on the front and interior walls of buildings, on the surface of coffins, etc.—are hieroglyphics. The truth is the old Egyptian was a great scribbler, and apparently every blank space tempted him grievously to grave or paint something upon it. For history's sake this was a very happy and fortunate practice. It gave to a great number of usually fleeting

François Champollion. To these names should be added that of Akerblad, a pioneer, the value of whose labors was quite important. It was Young who made the first firm step forward. He determined the real character of the hieroglyphics, made them speak, utter, after so long a silence, a few indubitable sounds; but to Champollion belongs the greater credit of having rendered them fluent, by perfecting, with rare ingenuity, the new discovery, so that it became a complete instrument for the decipherment of the old language.

Briefly, the riddle was solved in the following manner: In 1799 a slab of black basalt, inscribed with fourteen lines of hieroglyphics, thirty-two lines of demotic and fifty-four lines of Greek text, was discovered by a French military officer named Boussard near the Rosetta



THE HIEROGLYPHIC PORTION OF THE ROSETTA STONE.

mouth of the Nile. This is the famous Rosetta stone, the finding of which greatly quickened the activity of hieroglyphic students the world over and led to the solution of the old puzzle. The inscription upon its face is a decree of the priests in honor of Ptolemy V., Epiphanes, a King who ruled over Egypt B. C. 195. This much was surmised from the lines written in Greek. Now, it was guessed that hiero-



Āāh-mes-se-pa-āri.

A CARTOUCHE.

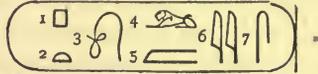
glyphics were letters of phonetic import, like our alphabet, and that the groups of signs surrounded by an oval (technically termed a cartouche), found so frequently on the old Egyptian monuments, were royal names;

the circle around them being intended as a distinguishing mark of honor. On the Rosetta stone there was only one royal name, presumably that of the King, Ptolemy—supposing, of course, that the accompanying Greek writing on the slab was of the same purport as the hieroglyphics. The Rosetta stone, whispering as it did the meaning of the hieroglyphics in a language well understood, was the immediate inspiration to the labors of Young and Champollion.

The material it offered, however, was not in itself sufficient for scholars to work with. In order to obtain complete mastery of the old writing an additional discovery was necessary.

It happened that in London at the time there was an obelisk recently brought to that city. Upon it there was not only a royal name, the signs for which were precisely similar to those within the cartouche on the Rosetta stone, but also a second royal name; and the Greek inscription found upon the base in Egypt, from which the obelisk had been taken, indicated that the hieroglyphics represented a petition addressed not only to Ptolemy, but also to Cleopatra his sister and Cleopatra his wife. The names were written thus :

NO. 1, PTOLEMY.



NO. 2, CLEOPATRA.



Champollion argued: Clearly if the surmise about the identity of the royal names be accurate, and if hieroglyphics, as supposed, represent letters, the signs for the T, the O, the L and the E in the word *Ptolemy* on the Rosetta stone and on the obelisk would not only be repeated in the second royal name, *Cleopatra*, on the obelisk, but would occupy therein certain definite positions; for these letters occur in *Ptolemy* and *Cleopatra*. This guess was the flash of light by which the first glimpse of all great discoveries is caught. Analysis proved that the theory and the facts harmonized. Working in this manner with other royal names Champollion established the value of one hundred and eleven signs. All this, of course, was only a first step; but it opened the road for others. The secret of the hieroglyphics was no longer a riddle.

Egyptian monuments and remains then began to speak to us about

their history. And how much they had to say, these garrulous monuments, about forgotten Kings and old beliefs and a civilization so ancient that it is not quite easy now to bring it within our perspective of antiquity; for Egypt is a land covered with inscriptions. But abundant as the information is which the hieroglyphics yield, our knowledge of Egyptian history and Egyptian life would still be very fragmentary and incomplete were it not for the enormous historical quarry uncovered by the spade. Literally, the story of the old Pharaohs and their people has been excavated age after age very much as the geologist has laid bare the record of the rocks. Egypt in great part, let it be remembered, is a land of sand. The climate is extraordinarily dry. Rain is a rare phenomenon, so that everything confided to the soil is preserved beyond memory in rare integrity. The faith of the people, too, was such that they not only buried their dead with elaborate precaution to secure the perpetual preservation of the body, but they provided the corpse with many of the articles of daily life. They surrounded the mummy with paintings of scenes and images of objects familiar to the deceased. Thus it happened that a very considerable part and an unusually full representation of each generation of Egyptian civilization passed, we may say, underground. The ever-moving caravan of the dead, which travels elsewhere so scantily furnished, set out in the Nile valley heavily laden with mortuary furniture and trappings. The Egyptian necropolis, indeed, was a well-furnished city. And so densely peopled! Three hundred years ago mummy was a common drug in apothecaries' shops, medicinally of good repute for the treatment of bruises and sores! In our own day it has been used for manure! It has been computed that perhaps more than 700,000,000 bodies were buried during the ancient dynasties.

But the Egyptian was not the only interrer who confided fragments of the old life to the keeping of the soil. Time and the vicissitudes of human affairs were also busy providing material for the modern explorer with his spade and pick.

The traveler as he progresses along the Nile cannot but remark the number of mounds that dot the country like hillocks. His imagination of how busy and teeming a land old Egypt was is immensely stimulated when he learns that each of these mounds marks the site, is the tumulus of an ancient town or village, nay, frequently of a series of towns or villages superimposed one above the other, like strata. The manner in which these elevations were created will make clear how great is their value to the archæologist and the historian. Let us speak generally. The habitations of the townsfolk of an Egyptian city were constructed not of stone, as the great architectural remains of temple and pyramid might suggest, but of very perishable material—of timber,

or, in greater part, of wattle and daub, or of crude brick made of lightly pressed Nile mud. These are the handiest building materials which the country affords. They are immediately available everywhere. Very serviceable, too, is this mud in a land where rain is practically unknown and where at times the annual Nile inundation works destruction by transgressing the ordinary limits—with it, it was so easy to rebuild whatever had been swept away. If we picture to ourselves now a considerable Egyptian town, we see the centre of it is usually the sanctuary of one of the gods. Around the temple are grouped the houses of the people. The sacred edifice, of course, is built of stone, and in the natural way of things outlasts the meaner domiciles it overshadows. In the periodic rebuilding of the city, the easiest and natural course is merely to raze to the ground the old structures and erect the new edifice upon the debris, as upon a foundation. Thus, as time progresses the tendency is for the level of our city to be elevated, until perhaps the temple stands in a hollow, as in an amphitheatre. Then may be our town reached its heyday. It languishes. Its buildings fall into decay. The material of which they are constructed is resolved in part into its original state. The pious become few. The temple is no longer maintained in repair. Worship in it ceases. Greek and Roman rule come and dominate the land, for Egypt felt the foot of the alien conqueror many times. The ancient faith expires. New generations which know not Ra nor Osiris nor any of the ancient gods build their habitations within the temple inclosure, perhaps for convenience sake against the very walls of the building, much of the stone of which is carried away as from a quarry for other edifices. The mound of earth encroaches upon the temple, surrounds it, invades it, perchance buries it, until finally, with the waning fortunes of the country, the last inhabitants of the place pass away and the site is permanently deserted. Centuries later, the modern excavator arrives in search of old buildings and of buried remains belonging to the former dwellers there. Accident and disaster have deposited much for him in the soil.

In some such fashion as the foregoing the mounds were created. These mounds and the many buildings which have stood in Egypt, in visible grandeur, slowly decaying for ages while the world has been moving so briskly elsewhere, are the great repositories of the knowledge we possess of the Pharaohs and their people.

But, it may be asked, why say so much about these matters? What have national beliefs and popular practices, and all such historical talk, to do with architecture? Let us clear this up. It is important to do so.

To thoroughly understand the architecture of a nation it is essential to know a great many things about the people who produced it

and about the land in which it is found. Scarcely any fact from any direction comes amiss in the work of interpretation. A nation's habitations are concrete expressions of a multitude of circumstances and influences. We have touched upon this matter already in a previous chapter, but to repeat will only be to reinforce facts which must not be forgotten. We have said climate plays a part in the shaping of buildings, and the architect's hand is moved and his activity directed by the nature of the material resources at his command, by the condition of the society in which he lives—its habitudes and requirements—by national antecedents, by international intercourse, by tradition—meaning by it that wider connection of an historical nature which unites the present in general with the past in general, and associates a community in a manner often so indirect and roundabout with the travails of the entire human race.

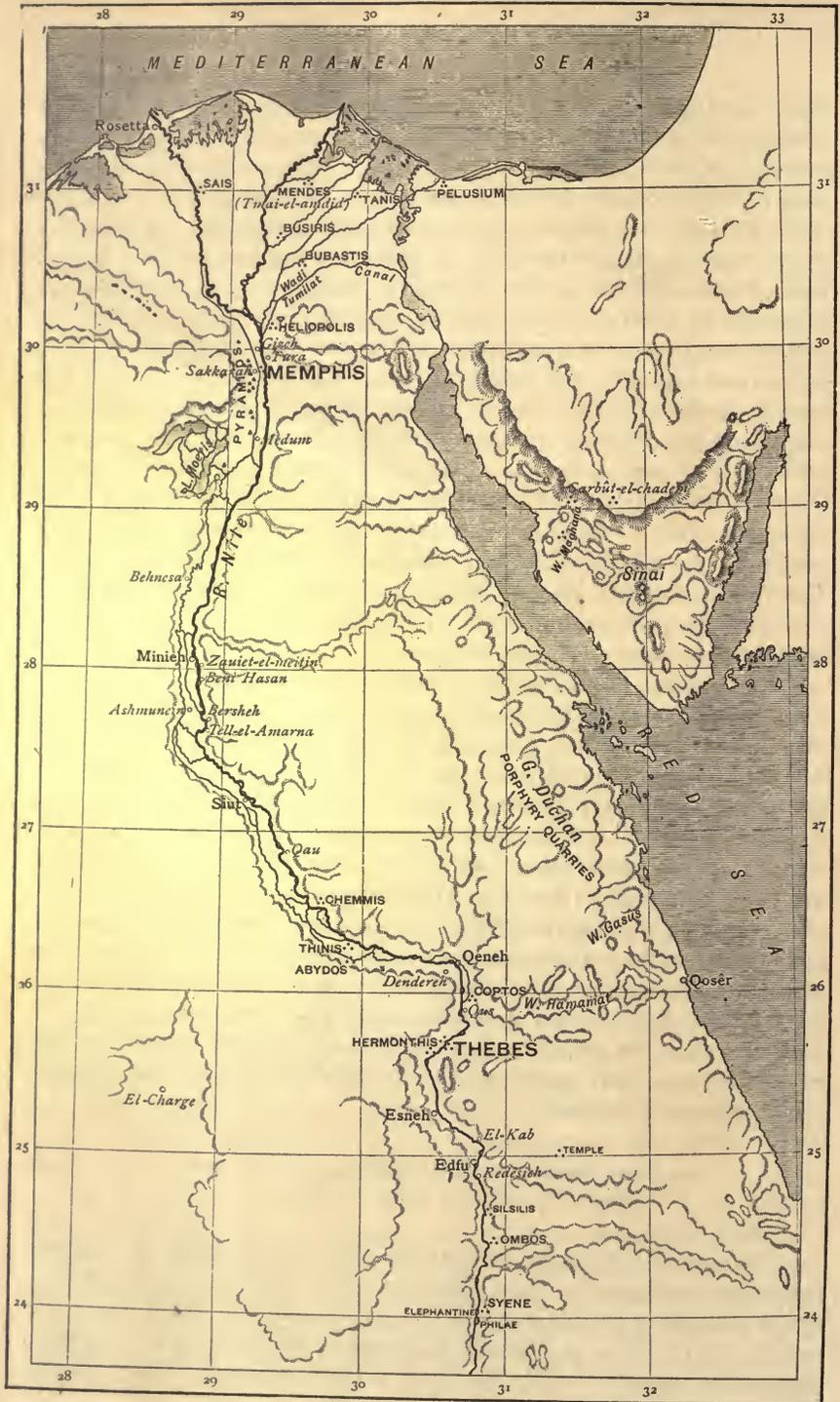
For example, let us glance at the early period of architecture in the United States. The first colonists in New England and Virginia, forced by the call of immediate necessities, made use at once of the abundance of timber at hand, and constructed their primitive habitations of logs or hewn lumber. We may say the selection, under the circumstances, was inevitable. Nothing else was practically possible until the colonies had become somewhat more populous and wealthy. And growth and development *did* speedily affect building. The log-house was replaced by the dwelling of sawn lumber, and the rude meeting-house by the brick church. And, now, mark, as soon as building became architectural—something more than rough provision for shelter—national antecedents began to play their parts. The settler in New England, New Netherland, New Sweden, turned for precept and example to his mother country, and adopted in his new home the style prevailing at the moment in the old home. In these particular cases the established mode in the old countries was the Renaissance; and, as the influence of the English became paramount in the colonies, it was the English phase of the Renaissance, the Renaissance of Queen Anne and the Georges that was reproduced everywhere along the Atlantic coast from the Canadian boundary to the limit of Spanish influence in the South. But the reproduction was a reproduction with differences. Masons were few in the new country, and bricks, at any rate for a time, too expensive for common use. Wood was the natural building material. It was obtainable everywhere. The carpenter was the master-builder, and inevitably in translating the architectural forms he borrowed from brick and stone into timber, he modified his copies in accordance with the natural character of the material he worked with. Slenderer dimensions, finer details, greater elaboration were possible in wood than in masonry; and these we know are the very characteristics

which distinguished the "Old Colonial" style, as the first phase of American architecture is called, from the style it was patterned after. Indeed, the "Old Colonial" style has been aptly defined as the carpenter's interpretation of the Renaissance. Moreover, the new buildings were step by step adapted not only to the particular requirements of the colonists, but to the different climatic conditions of the country. The obvious addition of the verandah, unnecessary in England, but demanded by comfort in the warmer American summers, need not be pointed out. Any one, too, who compares the New England dwelling of colonial days with the Virginian home of that time, will perceive at once evidence of the strongly marked social differences which distinguished the Puritan community of the North from the Southern aristocracy of slave-owners. It is not necessary to push the example further. Enough has been said to illustrate what is meant by the statement that a nation's habitations are concrete expressions of a multitude of circumstances and influences, and that the work of the architect is directed by such matters as climate, material resources, the condition and requirements of society, by national antecedents, international intercourse, and the like.

Every phase of architecture, thus, can be to some extent accounted for, and to understand thoroughly we must know a great many things that at first sight seem to be utterly foreign to architecture. However, it musn't be thought that when we have enumerated all matters like the foregoing we have before us every element of architecture. There is still to be taken into consideration not only that subtler and complexer force, the personal genius of the architect, but also the native genius of his people in which he is a sharer, that spirituality or temper of mind which is obvious enough in its stronger manifestations, as, for instance, when we compare the work of the Asiatic with the work of the European, the work of the German with the work of the Frenchman. Each is marked by a clearly recognizable style, or character or "look." Architecture is the artistic characterization of certain necessities and conditions, but in the artistic expression imparted there is an element that baffles cold analysis:

"One thought, one grace, one wonder at the least,
Which into words no virtue can digest."

Turning to Egyptian architecture with this in mind we become curious at the outset to know what sort of a country ancient Egypt was, and what kind of people lived in it. Was it a land of great extent, of rich fertility? Was it liberally endowed by nature? Was it arable, pastoral or mountainous? Was it an inland country? What was the



MAP OF ANCIENT EGYPT.

From Erman's "Life in Ancient Egypt."

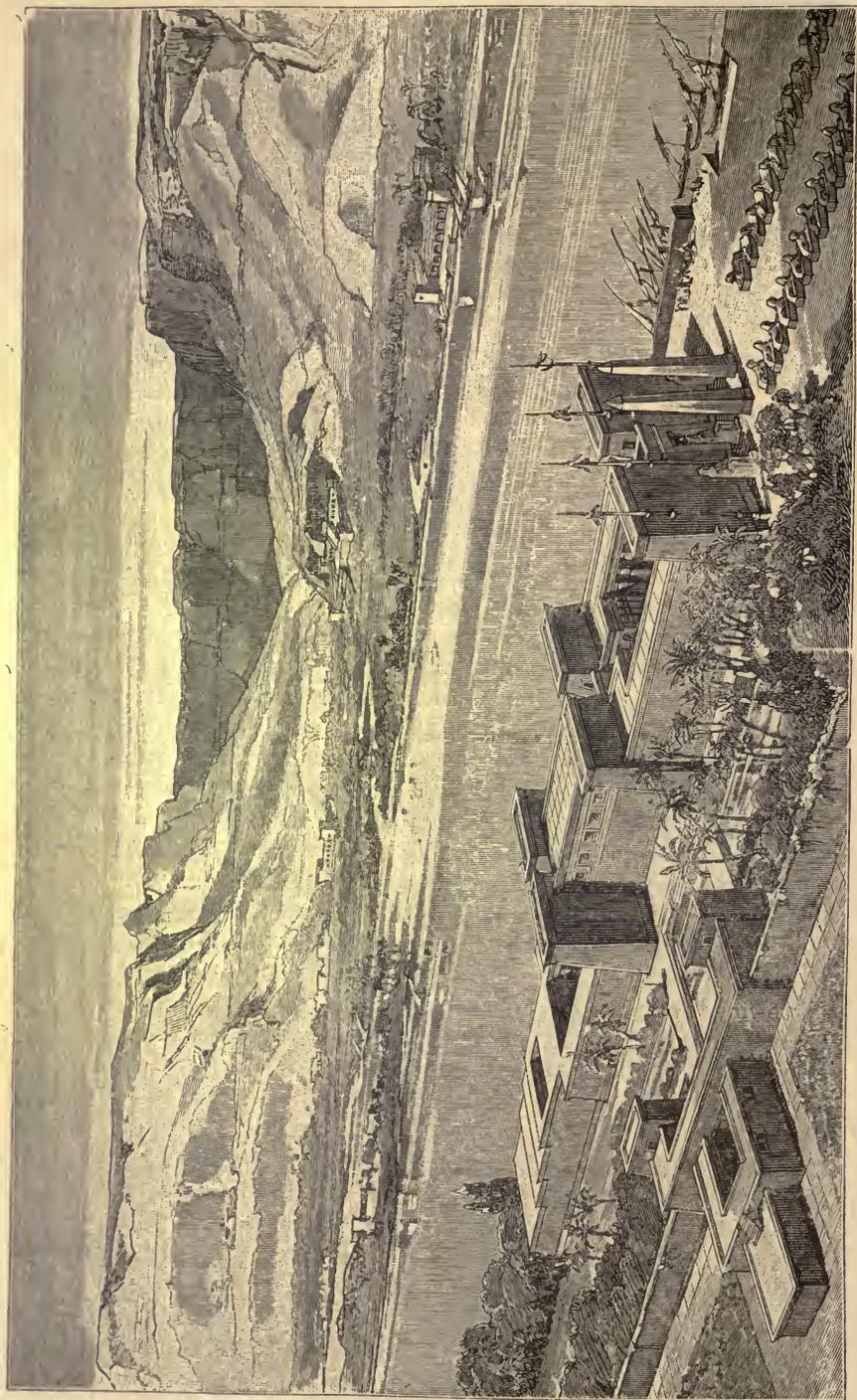
social state of its inhabitants, the nature of their faith and ideals? What were their international associations? What was the course of their history? We are sure, now, that the matters touched by these questions "got into" their architecture, in some degree at least.

To speak first of size. Contrary to the general notion Egypt is a very small country. True, it has great extent. It is "nearly all length," as the saying is. But if we measure the area of its cultivable soil we find it amounts to less than that of any country of Europe, excepting Belgium and Servia. Limited thus, it comprises some 12,000 square miles. Holland is larger by about 1,000 square miles, and Denmark exceeds it by about 3,000 square miles. To take our comparisons nearer home, the land which the Pharaohs ruled over,* the seat of one of the greatest and most splendidly-colored civilizations that mankind has seen is only one-half as large again as Massachusetts.

It might be thought that so contracted a field should restrain our expectations as to the grandeur and richness of Egyptian architecture and the importance of that architecture in the history of the art. Undoubtedly, but for special circumstances the marvelous concentration of human activity within a very restricted area which occurred in Egypt would have been impossible. This particularity was the great fertility of the soil and, again, this remarkable productiveness was itself the result of the extraordinary behavior of the River Nile. Not only is the land of Egypt most easily entered and perambulated by following the Nile stream, but it may be said the history of the country likewise is traversed by the Father of Rivers. To see the one, to understand the other, the same journey is necessary.

The form of Egypt may be likened to a lotus bud attached to a long stalk. The bud is the district known as the Delta—a wide, flat alluvial plain stretching in fan-shape along the Mediterranean and narrowing to a point inland not far distant from the modern city of Cairo. Here, about one hundred miles from the sea, begins the stalk. This stalk division of the country is styled Upper Egypt in contradistinction to Lower Egypt—the Delta lands. Its physical features differ extremely from those of the Delta. Essentially, it is merely a long cañon, only a few miles in width, traversed from end to end by the Nile. Passing up the river the traveler sees on one hand and on the other at a distance varying from a few yards to fifteen miles a rocky wall of hills bounding the valley. At places these grey stony palisades (they are not unlike the Palisades on the Hudson) creep up almost to the river's edge. Elsewhere they recede, and the cultivable soil, the fertile fringe bordering the banks of the stream, contracts or expands in com-

* We omit from consideration the sphere of Egyptian influence in Asia, which was a variable and uncertain quantity.



VIEW OF THE NILE AT THEBES.
(Temple in foreground restored.)

pany with them. This green strip is the only land of a productive nature in all Upper Egypt. At the base of the hills there is sand and beyond the hills there is sand—westward, the Sahara, the type of desolation, eastward the Arabian desert, a scarcely less solitary wilderness penetrated by a few gorges which support a scanty vegetation, and have served from the earliest days as highways between Egypt and the shores of the Red Sea. The length of this green stalk, measuring southward to the first cataract below Syene is about 600 miles. The Delta is over 100 miles from apex to periphery, and the greatest width, along the Mediterranean, about 160 miles. This is Egypt, not political nor geographical Egypt, it is true; but Egypt of industrial life. If at first the statement that the land of the Pharaohs was in effective extent but a



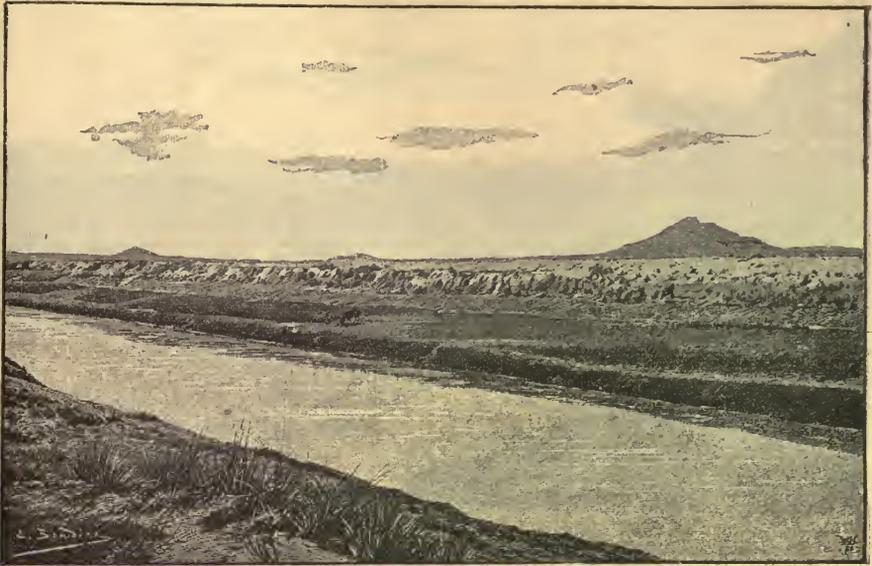
THE BANKS OF THE NILE.

third-rate territory, contradicts one's general impression, it is clear now why the cultivable area of the country was so scanty. The dead parched land of the desert, the region of sand, was a barren addition to the national geography.

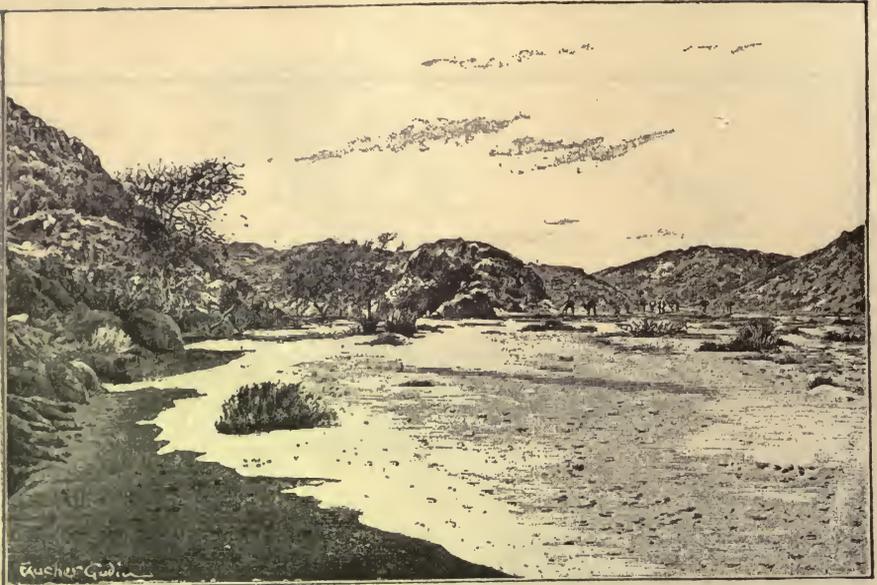
But, even the narrow fertility which we have just defined would not exist save for the peculiar behavior of the Nile. Ever since Herodotus penned the phrase the world has been re-echoing it: "Egypt is the gift of the River." The phrase is not only a happy one but it is strictly true. Euripides in one of his tragedies makes Helen say, "The river that waters Egypt is fed by pure melting snow instead of by rain from Heaven." The poet is not quite correct but nearly so. The Nile, our geographies tell us, rises in the Central African lakes, but the greater part of its stream is obtained from the tropical rains which fall upon



EGYPTIAN SCENERY.



EGYPTIAN SCENERY.

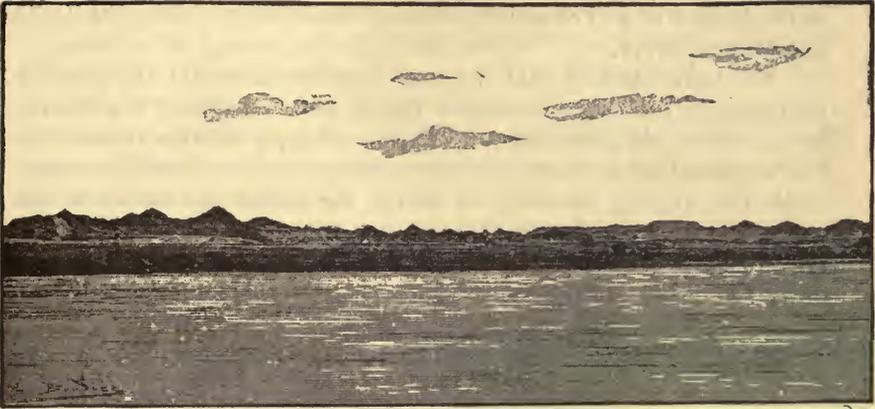


EGYPTIAN SCENERY.

the mountains of Abyssinia in the spring—as well as from the “pure melting snows” which Euripides speaks of. The Blue Nile receives the swollen torrent—there is another equatorial affluent, the White Nile—from the mountains, and this flood traveling southward early in the year is the source of the river’s greatness.

Naturally, the Father of Rivers is lank and shrunken. Immediately before the inundation the Nile is a meagre stream, panting under a burning sun. It drains sluggishly between high mud banks, through a country which lies baked and dusty. Scarcely half the bed of the river is covered then. It is early in June when the coming of the new flood is heralded at the southern entrance of Egypt. As it has a long distance to travel, it is not until about the middle of the month the water begins to rise at Cairo. A few days later the first effects of the inundation are noticeable in the Delta. In the beginning, the river expands slowly. Imperceptibly does it overflow the limits of its narrowest channel and creep outward towards the flood banks. Nearly a month elapses before the tide is at its height, but at its height the river has become a majestic stream and its deep waters are heavily charged with a muddy deposit which serves to fertilize the Egyptian harvest fields.

It is ordinarily supposed that the inundation is a haphazard and,



VIEW OF THE BANKS OF THE NILE.

in a sense, catastrophic event, not very unlike the spring floods that occur in our turbulent rivers in the United States—the Mississippi, for instance. It is essential to remember that this is not the case. The overflow of the Nile is a regular and regulated occurrence. From the very earliest day it has been controlled and directed by an elaborate system of dykes, canals and sluices. The memory of man runneth not to the contrary. Legend attributes the foundation of the system to the god Osiris. It was worthy of divine origin, the old Egyptians thought. Menes, the first of the Pharaohs, was gratefully remembered by them



VIEW OF THE BANKS OF THE NILE.

as the builder of a dyke which conferred much benefit upon the Delta and Middle Egypt.

We have already said the marvelous fertility of Egypt, and in consequence the populousness of Egypt, were created by the Nile, so we must now add government likewise, in Egypt, must have arisen in the beginning, or at least must have taken form, in no small measure, under the pressing necessity for having the annual inundation in the hands of authority, local perhaps at first, transferred later to a central government. We know that in the earliest historical period public disorder arose and many heads were broken in personal and sectional



VIEW OF THE NILE DURING THE INUNDATION.

bickering about irrigation. Irrigation everywhere tends to become a governmental affair. It creates authority and officialism. Wherever it exists it begets crossing interests. This is particularly the case in Egypt for there when the Nile is at its height the lands contiguous to the river are not inundated by the waters bursting over the banks. Uncontrolled, that is what would happen; but then the fertilized area would be very much less than it is when the water is conducted through arteries and expanded by small piecemeal overflows, brought about by dykes. At "high Nile," usually about the middle of July, it is decided to open the dykes that confine the river to its course. Then the water flows into the transverse channels and these, at certain places being dammed spread the water abroad.

In this manner, step by step, the country is inundated until at last it takes on the appearance of a vast lake, dotted with islets and crossed by artificial causeways which connect village with village. The inundation is complete (at Cairo) in September. The dykes at the entrances of the canals are then closed in order to retain the water sufficiently on the land, for outside in the main current the flood soon begins to fall and the river to contract.

This regular recurrent rise and fall of the Nile was the pulse of Egyptian life. It regulated and directed the activities of the people, and was for them what the alternation of the seasons has been to others. No wonder the Egyptians deified the river and fixed their New Year's day on the 15th of September, the date when usually the Nile is at its highest.

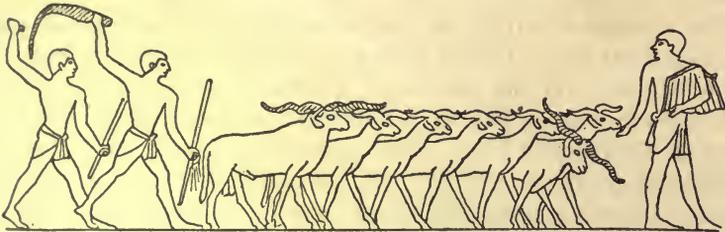
The inundation divided the twelve months into three equal parts for the agriculturist. (1) The period of inundation, from June to the end of October; (2) the period of growing crops, from the end of October to the end of February, and (3) the period of harvest from the end of February to June. And agriculture, let us remember, was the chief pursuit of the people. The prosperity of the land depended upon it. Nature's largess did not take any form other than the remarkable fertility of the soil. There were no rich mines in the country, no wealth of timber, no abundant and diversified flora and fauna. The only common forest trees of the land were the sycamore (which the people worshiped) and the acacia. Neither is of much importance in the mechanical arts. The latter is serviceable enough for furniture, doors, and constructions of that nature, but the supply of it was always very limited, even in early times. Indeed, it became almost extinct within the limits of Egypt proper at a remote day, and pine wood was imported from Syria and acacia from Nubia to take its place. As to the sycamore, it furnishes very inferior timber, being knotty and yellow, and laborious to utilize. The only other important trees in the country were the Date palm and the Dôm palm, and these, too, were poor material for the carpenter. So, from our picture of Egypt in historical times, we must banish all forest landscapes and well-wooded stretches. Rather, we must think of the country as a long, narrow, flat, "bottom land," hemmed in, as we have indicated, by two walls of stone, every square foot of soil possible being devoted to the cultivation of industrial crops.

Annually, as soon as the waters of the inundation had subsided, the tillers went out into the fields to turn up the earth freshly fertilized with the silt which the river had deposited. The ploughman guides the primitive share and the ox-driver goads his beasts. Then follows the hoeing to break the heavy clods and prepare the earth for the seed which is trodden into the damp mould by flocks of sheep, which are noisily driven



Ploughing. (From an ancient drawing.)

about the freshly-sown field. The chief crops raised are wheat and barley and black millet or durra. Onions, cucumbers, and melons are plentiful. In short, wherever we turn our gaze, all the arable land is under the subjection of the plough. There are no waste places, or unpeopled wilds, no "remote" spots, no forests, no meadows colored



Treading in the seed. (From an ancient drawing.)

with wild flowers throughout all the Nile valley within touch of the river's flow or the more laborious reach of irrigation with the slavish shaduf. And, where vegetation ceases on the eastern and western limits the barrenness of the desert sand is sharply defined.



The Shaduf. (From an ancient drawing.)

It may be imagined that because of the special and peculiar provision which Nature had made for the fertilization of the soil, agriculture in Egypt was a less laborious and unending toil than it is elsewhere. The fact is that perhaps the farmer has nowhere been so hardly tasked as in the Nile valley ; for besides the ordinary work of seed time and harvest time there was the added necessity of perpetual labor to build, repair and operate the network of canals, sluices, dykes and dams required for artificial irrigation. Moreover, a portion of the soil maintained under cultivation did not receive sufficient moisture from the river's overflow, and beyond the furthest limit of the inundation there was land which had been annexed to the fertile belt by tiresome mechanical irrigation. Both of these divisions demanded incessant labor during the growing of crops. Nature, to sum up, gave abundantly in Egypt, but not with tropical ease and generosity.

As to the fauna of the country it was not quite as limited as the flora. For the latitude, however, it was decidedly poor. The tombs of Egypt are covered with representations of animals. It is computed that in thirty-one years half a million head of cattle were devoted to the temples alone. And, the wealth which these figures indicate was produced chiefly by close domestication. The extreme cultivation and settlement of the land in Upper Egypt naturally operated to preclude roving herds. Even the maintenance of cattle within the narrow limits of the fertile valley was a difficult matter and we find, therefore, that the herds were kept in the north, in the marshy land of the Delta. The natural pasture of the country was there and the herdsmen who tended the stock in these northern plains lived with their animals in reed huts and were regarded almost as pariahs.

Let us conclude this brief sketch of agricultural life in Egypt with the summary of a recent writer upon the subject. "Everything," he says, "tends to show that the Egyptians themselves felt that agriculture, together with cattle-breeding, was the most important industry of the country. Nevertheless, the prestige of this idea had no influence upon the position of the agricultural laborer who was always looked down upon as a hard-worked creature." The important fact for us is that, despite paradoxical results, societies are in great degree shaped by the condition of the fundamental class of the people ; and by and by we shall find much in Egyptian life and, therefore, in Egyptian architecture which receives its final explanation in the character of the pursuit, the grinding toil of the multitude who were constrained to devote themselves to the "most important industry of the country."

The multitude who labored in the arts and crafts were scarcely

better circumstanced, or, as a class, more highly esteemed than the farmers and herdsman. The old monuments do not speak pleasantly of their lot. They tell of its irksome, of its long hours, of the light lit at night to prolong the day's toil, of its scanty rewards, its inglorious circumstances. We must be careful, however, in accepting any generalized statement about a large number of people; and particularly we must allow for the point of view of him who makes the statement. The Egyptian monuments and papyri do not picture the farmer's and craftsman's personal view of their own existence. In the hieroglyphics and old paintings it is through the eyes of the priest, the official and scribe that we see; and the aristocratic vision of the toiler's life is always drap and sombre. We know that in our own times the representation which the "upper classes" would give of the existence led by the multitude would be lacking somewhat in color and light. We may be sure that if we had a popular version of the farmer's and artisan's circumstances under the Pharaohs, we should feel in it the warmth of those elementary comforts and the stir of those common satisfactions which are not absent from existence and human intercourse even under the most adverse conditions. The native genius of the Egyptian laborer, too, was not dark or morose. The element of peasant mirth was strong in his composition, and he looks at us from the old monuments with a happy serenity, a soft, natural smile which brightens the gloomy portraiture of the ancient texts.

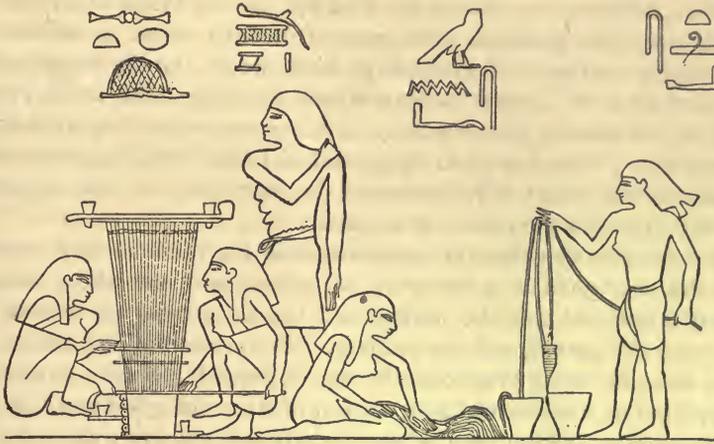
Apart from the fields and pastures, Egypt was a busy land. The potter's wheel was ever moving, for the country was rich in ceramic



Potters at work. (From an ancient drawing.)

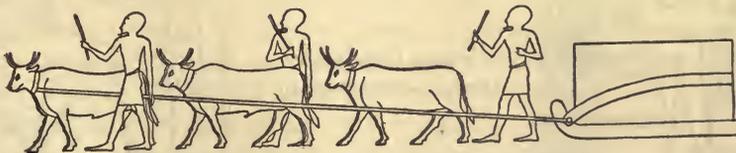
clay. The abundant flax fields supplied a multitude of looms, the products of which were of high excellence. The papyrus reeds of the Delta marshes were worked into mats and sandals, and ropes and paper,

for which Egypt had a wide renown in antiquity. These reeds, moreover, were used in the manufacture even of boats. Tanning was extensively carried on. Despite the lack of native timber the carpen-



Weaving. (From an ancient drawing.)

ter was a busy and ingenious artisan. Metal-working was an important industry. The great skill and artistic touch of the ancient Egyptian goldsmith is even to this day a matter for high admiration. Of the building craft, we shall speak at length later on. Its wonderful triumphs in some respects have never been excelled; in others, even with modern machinery, they are unapproached. It is well, however, to refer here to the richness of the country in building stone. Egypt, as we have seen, is literally walled in with stone walls. Down south, near the first cataract, there is granite. It was from the quarries at Syene that the superb red granite came for the adornment of some of the great pyramids, for the huge obelisks and for the colossal statues of the Pharaohs. North of Syene the Nile cliffs are of sandstone, and

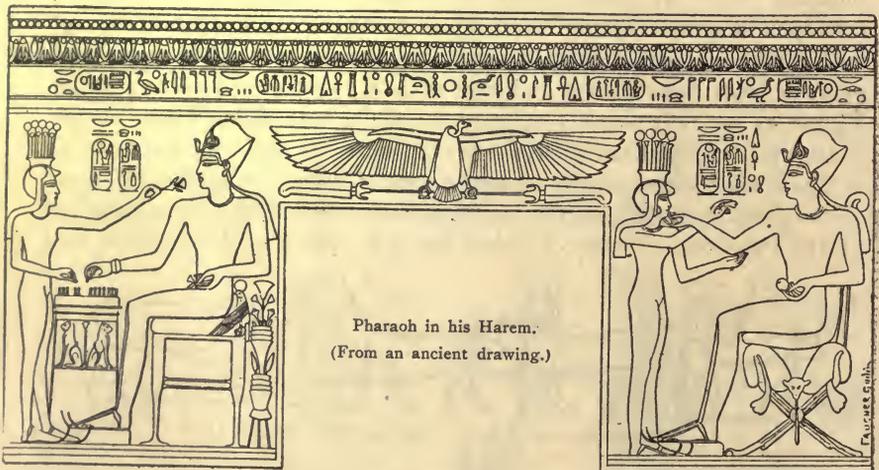


The transportation of stone. (From an ancient drawing.)

thither went the masons for the material for many of the temples and tombs. Near Silsilis this sandstone formation gives place to limestone, which extends along the remainder of the length of upper Egypt. Near Memphis, at Turah, on the east bank of the Nile, there were great limestone quarries, worked from the remotest time, which supplied the

stone for the pyramids and tombs in the vast necropolis in the desert on the other side of the river. Not far from Turah, and at a distance from the Nile to be measured by about four hours' journey were alabaster quarries. Between Coptos and the Red Sea in the Wadi Hammamât was obtained the precious dark-colored Bechen stone of which so many kingly statues and sarcophagi were made. Great expeditions were sent into the desert to Hammamât to bring back to Egypt a supply of this stone. Even as many as 8,000 men were dispatched on one occasion. Thus it is plain Egypt did not lack building stone, and if Nature in the Nile Valley hampered the carpenter by her niggardliness she provided the mason abundantly.

Searching further into the composition of Egyptian society we find above the craftsmen a great army of scribes and officials, a multitudinous priesthood and the nobles, and the King with his retinue of servants of all degrees, and the soldiery. At the head of the nation, of course, was the ruling Pharaoh, who was regarded not only as master of Egypt, but as a terrestrial god, the son of Ra, "the good god" as his subjects piously spoke of him, whose divinity was solemnly saluted and verbosely eulogized. Immediately surrounding him were the numerous royal household consisting of the imperial consort and her attendants, the King's harem, his scores of children (Ramses II. had two hundred sons and daughters), the court retinue of officials, workmen, domestics.



The royal palace and its necessary appendages constituted a town of no mean dimensions. It was the centre of the nation, the high seat of power and authority which was exerted throughout the land into every nook and corner by an elaborate system of officialism. In earlier days

Egypt was a feudal state. The Pharaoh was nominally and in some measure actually the owner of all the soil. Personally he possessed a large domain, farmed by "royal slaves," but the bulk of the land was held by feudal lords whose tenure of their fiefs was hereditary and conditioned only by the payment of regular tribute to the imperial treasury, by personal military service and by the duty of furnishing the monarch with a fixed number of armed men in time of war. In transmission by descent, the new ownership had to receive the sanction of the King. Thus grouped around the central power and attached to it by ties, the strength and closeness of which varied with the personal force, prestige and fortune of the ruling monarch, were a number of petty sovereigns whose sway in their own principalities was practically supreme. These vassals maintained courts in their several provinces, smaller copies of the royal establishment. There was a palace like the Pharaoh's, peopled with courtiers, officials, scribes, concubines, workmen and domestics. The lord farmed part of his domain himself and let the remainder of it to his subjects, who paid him in services and in kind. He kept an army and navy, and though not a god he was high-priest and law-giver. Such in brief were the conditions which prevailed in the earlier days of Egyptian history. There is no fixity, however, in human affairs, and in Egypt as everywhere else there were not only the slow changes brought about almost insensibly by daily events, but there were revolutionary alterations produced by conquest and by violent internal ferment. As we shall show further on, the feudal state entirely disappeared in Egypt in the middle of the national career, and was replaced by the rule of the military cast and the priestly cast, the latter predominating.

Beneath the Pharaoh, the petty rulers, feudal, military or priestly, the multitudinous minor officials charged with the inferior details of administration and the collection of taxes, came the mass of the people, the vast commonalty of craftsmen, farmers, peasants and serfs, docile, limited and ignorant, to whom existence was very much an affair of the commoner instincts. We have already sketched their pursuits sufficiently for our present purpose, and now the reader perhaps may be able to make for himself some picture of the national life of ancient Egypt, and it is this picture the foregoing descriptions have been intended to create—in the town, the palace of the noble, the houses of the rich, the army of functionaries, the temple with its priesthood, the military, the several classes of workmen, each class united in a corporation under a master-workman (for in Egypt everybody owned some master) and grouped in certain quarters of the city; the small crowded habitations of the poor, the open space where the weekly markets were held and artisans and peasantry from the country around congre-



AN EGYPTIAN VILLAGE.

gated to barter and haggle over their wares and produce. Outside the city, the rural population lived, huddled in villages of mud huts, not in farmhouses scattered along country lanes; for the river was the great highway of travel, it led everywhere, and the canals that intersected the fields made roadways and vehicular traffic almost impossible.

There is still to be added to our picture of Egyptian civilization an essential element which as yet has scarcely been hinted. The central fact in every civilization is its religion. Despite errors, absurdities and superstitions, with which the intellect may not sympathize, it is religion that embodies the prevalent moral ideas of the time, we may say presses them into action, thus contributing immensely in the formation of the type of civilization produced by a people. It shapes their ideals and furnishes them with that ultimate sanction for conduct to which all their activities constantly tend to conform. Moreover, all the higher moods of man if not formally religious have strong affinities for religion, and as in Art there is inevitably an element of spiritual elation (Art is, indeed, a notation of the higher moods), it is at all times closely associated with religion. Architecture, particularly, has attained to its highest reach upon the consecrated ground of each generation, and nowhere more closely than in Egypt has architecture been allied with

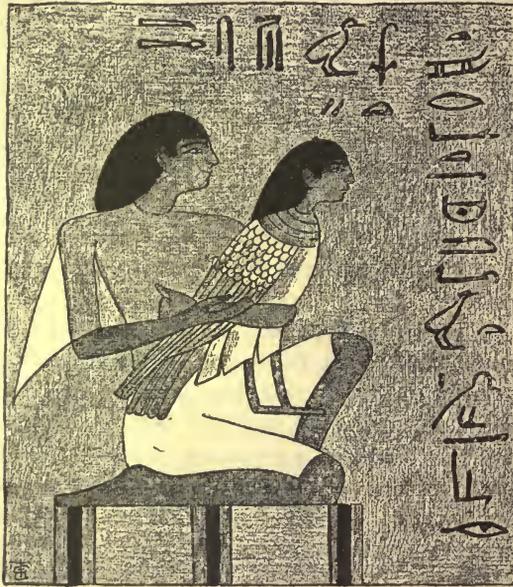
religion. It is impossible to understand the one without some knowledge of the other.

It is not necessary here to undertake an elaborate account of the very difficult subject of Egyptian mythology. The facts we have to keep in mind are few. The Egyptian worshiped a great number of gods, "a rabble of gods," it has been said that "severally represented a function, a moment in the life of man or of the universe." In the Egyptian pantheon were sun-gods, star-gods, gods identified with certain animals, reptiles, and plants. It is very probable that in the times preceding the historical period Egypt was a land of petty states, and that each little principality was not only the seat of a separate government, but of many other local differences, of which, no doubt, those of a religious character were the most important. Each district had its specially favored divinity or divinities. In one it was Ra, in another Ptah, in another Amon, in another Hathor, in another Osiris, in another Set, or Isis, or Thot, as the case may be, and it is easy to understand how in the political unification of the country and in the parts which the nomes or principalities played in subsequent national history the prestige of the several gods increased or diminished with the fortunes of their worshipers. The influence of the local god was extended with each enlargement of the sphere of the political sway of his town or district. In this way there arose *great-gods*, distinct from the small, local, inferior divinities. Even among the great-gods themselves ranks and orders were evolved, the lines of which were pretty definitely established before the beginning of the historical period. Intercourse and the growth of national sentiment not only tended to produce a national pantheon, a grouping of the "rabble of gods" into a related family, but several divinities were merged into one by a process of identification, or were amalgamated into types, so that many gods came to be regarded as merely different manifestations of the same divine personality. The evolution of Egyptian religion progressed towards the conception of one god, but it never attained to the abolition of polytheism. There were always the greater gods and the lesser, gods purely local and gods of national repute, and with the cult of each were associated legends and tales, wonderful as the stories of mythology are wont to be.

And to all these gods clung so much of human nature that they appear to us as very little more than magnified men and women. A dwelling was needed for the god, so temples were built for him; he needed meat and drink, consequently the table of offerings were laden with sacrificial food; he had a "mystical harem" of women of high rank who sang before him, and it was the duty of the priest even to dress and rouge the god (represented by, if not loosely identified with,

the image of the divinity). There were, of course, days of festival and feast in his honor when the sacred statue, inclosed in a shrine so that the profane might not see it, was carried in procession among the people. The priests alone officiated in the worship. The populace were pious spectators of the ceremonial, at least they were no more than such during the greater part of the Egyptian history.

In the very early days there was a lay priesthood as well as the strictly sacerdotal class which officiated in the temples, but in the course of time the religious administration passed exclusively into the control of the ecclesiastics, who during the New Empire became the dominant force in national affairs. This was inevitable almost, their

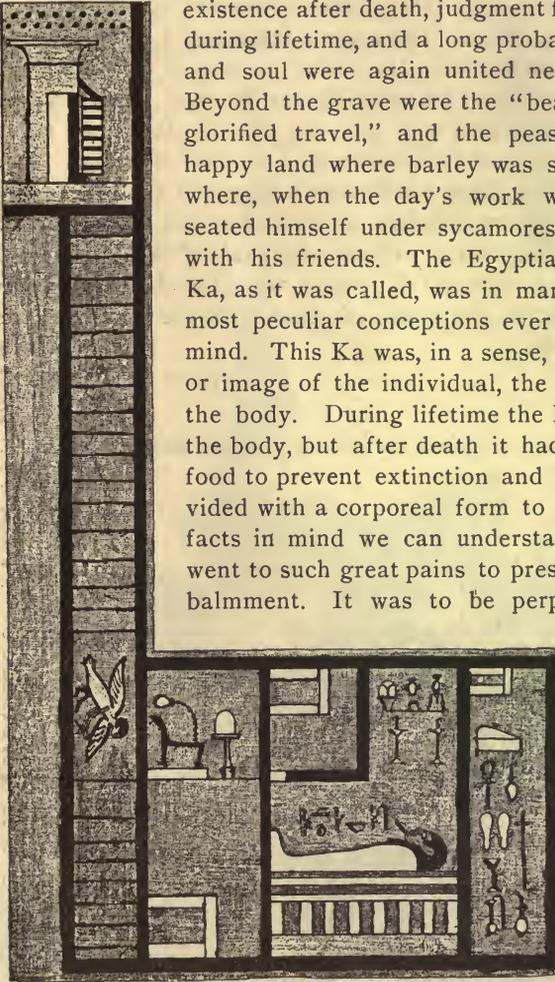


An Egyptian and his Ka. (From an ancient drawing.)

riches were so enormous, created by gifts of the pious and the generosity of the Kings. For instance, in thirty-one years Ramses III. bestowed upon the temples of Egypt 169 towns, 113,433 slaves, 1,071,780 plots of ground, 514,968 head of cattle, 178 ships, 680,714 geese, 5,740,352 sacks of corn, 6,744,428 loaves of bread, \$1,000,000 worth of the precious metals (reckoned at the present greatly diminished valuation of gold and silver), 1,093,803 valuable stones, not to speak of enormous gifts of wine, beer, honey, fish, fruits, incense, and the like.

But the foregoing tells us nothing of the nature of the faith of the people, of the personal interest of the Egyptian in the religion he pro-

fessed. The gods were something more to him than the centres of an imposing ceremonial. They dispensed to the faithful good fortune, health and abundance, they were the protectors of the state or the district or the town, as the case might be, and it was to gain the favor of his god that the pious Egyptian brought to the priests the first fruits of the harvest. Besides, the Egyptian believed in an existence after death, judgment for offences committed during lifetime, and a long probation, after which body and soul were again united never to be dissociated. Beyond the grave were the "beautiful ways which the glorified travel," and the peasantry dreamed of a happy land where barley was seven cubits high and where, when the day's work was done, the laborer seated himself under sycamores and played draughts with his friends. The Egyptian idea of the soul or Ka, as it was called, was in many respects one of the most peculiar conceptions ever formed by the human mind. This Ka was, in a sense, the spiritual "double" or image of the individual, the vital spirit residing in the body. During lifetime the Ka was nourished with the body, but after death it had to be sustained with food to prevent extinction and at the same time provided with a corporeal form to abide in. With these facts in mind we can understand why the Egyptian went to such great pains to preserve the body by embalment. It was to be perpetuated for the final



Representation of Ka descending a tomb shaft to join the mummy.

reunion with the soul, and in order that the Ka might take possession of it whenever it so pleased. The extinction of the Ka meant the annihilation of the individual. Herein we find the explanation of the great pyramids and the elaborate methods of sepulture devised by the Egyp-

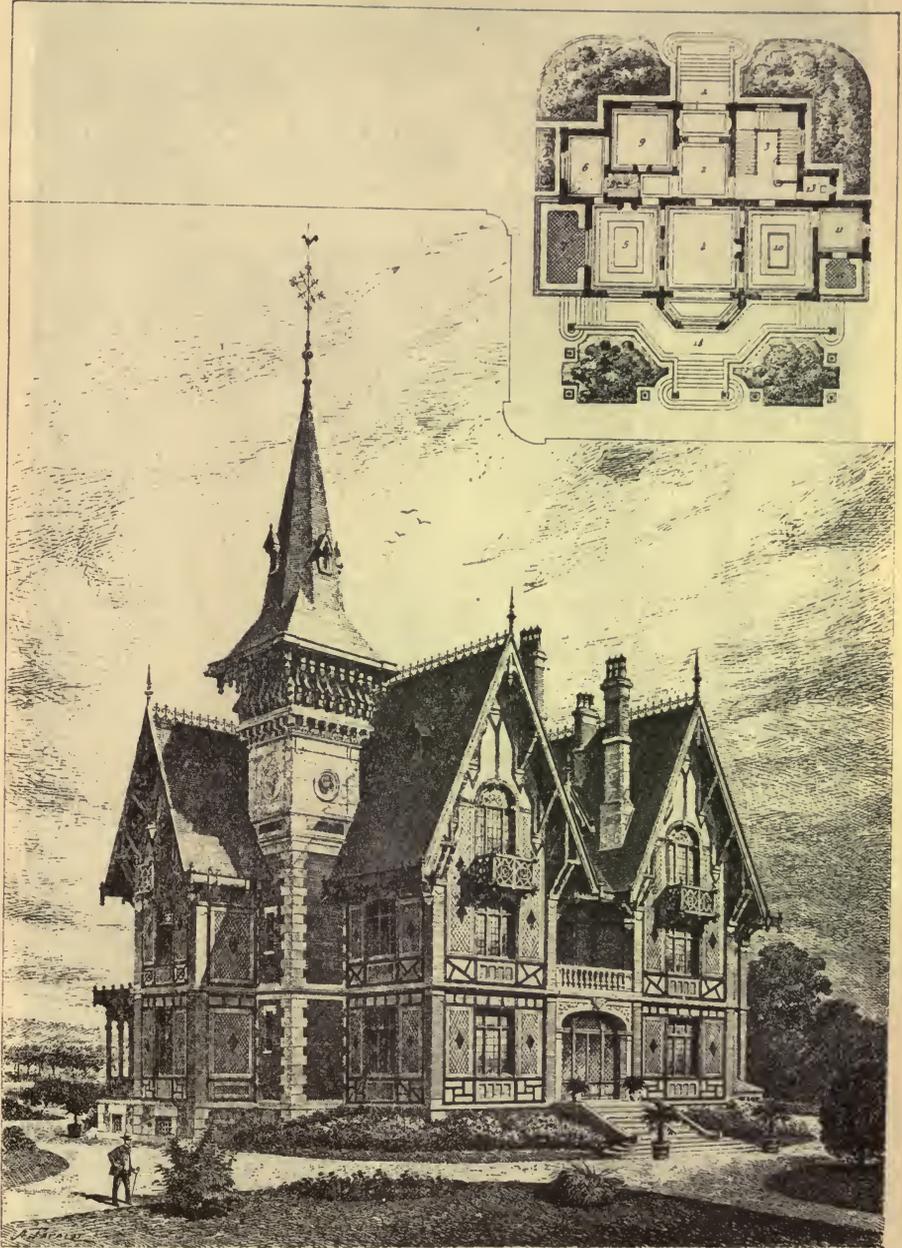
tians. Existence did not cease with death. The wants of the deceased continued in the tomb, hence it was the highest duty of the living to provide the mummy with food and extensive mortuary furniture.

Usually we find associated with beliefs like the foregoing a strange confusion between actual things and the representations of them; that is, a picture or image of an object is regarded as in some measure identical with the object itself. The Egyptians held this notion. Consequently it was natural for them in providing for the requirements and comforts of the dead, not only to supply the Ka with actual food and drink and so forth, but with more durable pictures of offerings and with statues of the deceased. The former constituted a kind of magical or spiritual subsistence, and the latter in case of accident to the mummy served as a sufficient embodiment for the Ka. Hence we find the Egyptian tomb decorated with pictures of a profusion of loaves, meat, fruit, jars of wine, and furnished with a number of statues. Even inscriptions enumerating these supplies were regarded as sufficient substitutes, and on the tombs petitions addressed to the pious passer-by were placed, supplicating him to exclaim on behalf of the dead, "grant thousands of loaves, thousands of jars of wine, thousands of jars of beer, thousands of beeves, thousands of geese," for the ghostly sustenance of the departed Ka.

Harry W. Desmond.

In the chapter to follow will be shown the relation of the foregoing data to Egyptian architecture and its history.





St. Germain-en-Laye, France.

CHATEAU ST. LÉGER,

Léon Carle, Architect.



Chicago.

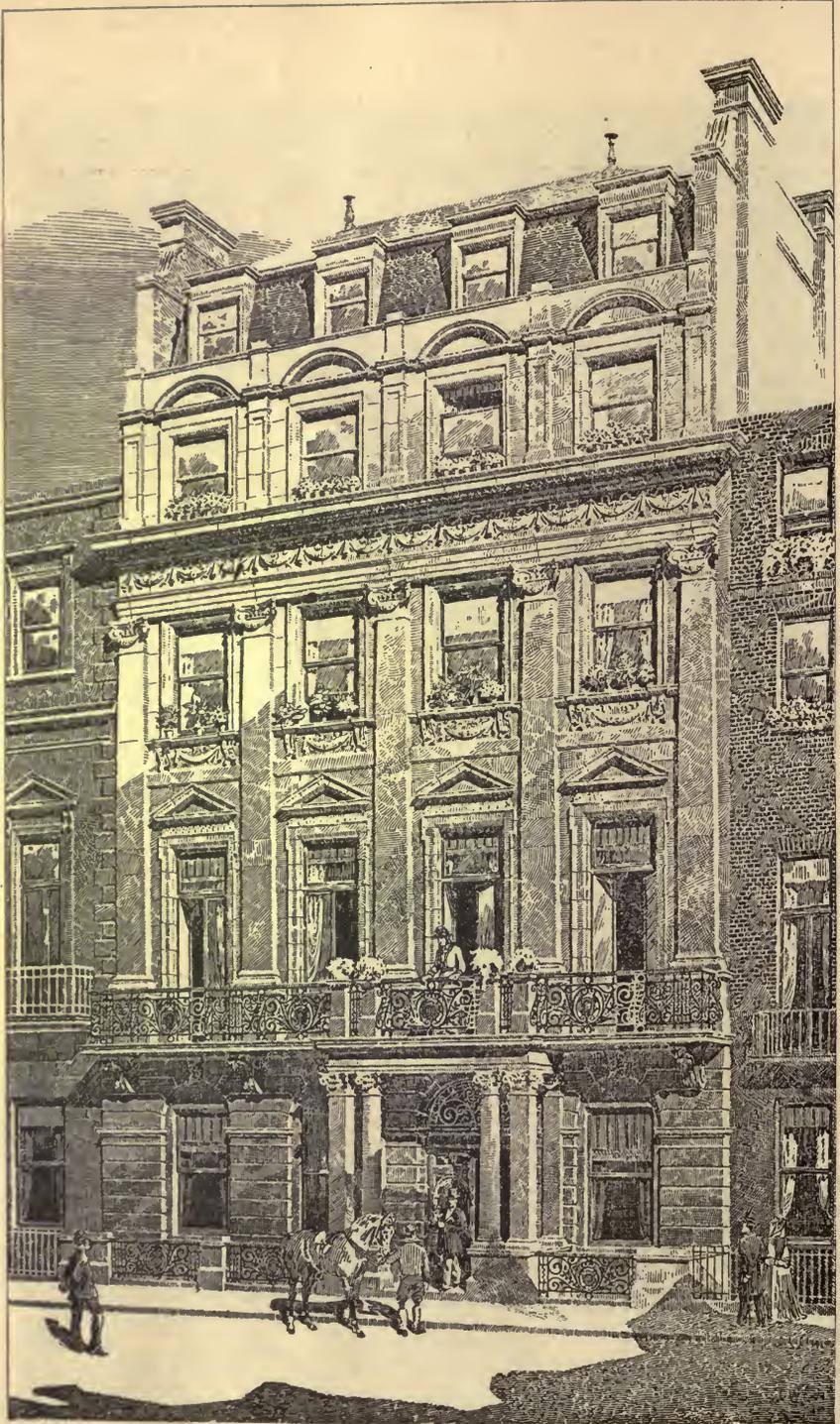
ENTRANCE 147 STATE STREET,

Winslow Bros. & Co.



THE ORPHAN.

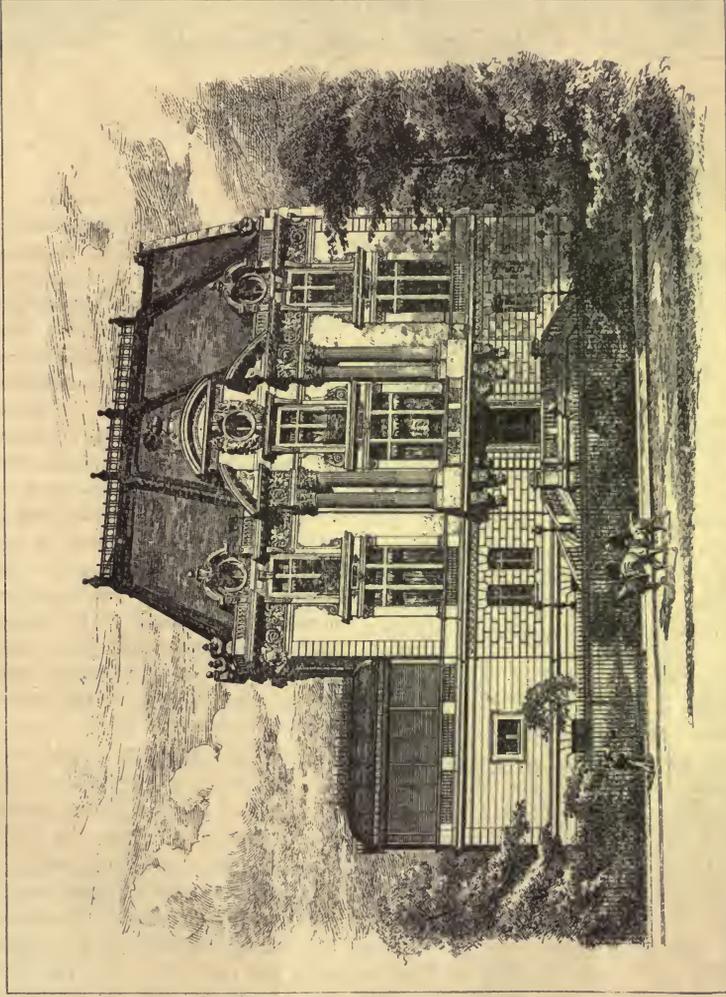
By V. A. Fucigna, Sculptor.



London, Eng

11 CHARLES ST, MAYFAIR.

Wimpers & Arber, Architects.



Bois de Boulogne, Paris.

RESIDENCE.

A. Pollet, Architect.



NEW BOOKS.

A SUGGESTION.

The translation into English of valuable books on art is continually prevented by the costly character of the books. To take an extreme case: Here is, now nearly complete, the magnificent work by Geymueller on the "Renaissance Architecture of Tuscany." It will cost, when complete, two thousand marks; and what American publisher would dare to undertake an edition of that, with English text? And yet, to note its extreme importance; to observe the list of biographies of great artists that it will contain, all of them treated with fullness, all up to date, all embodying the result of the latest research; to see that here will be what exists nowhere else, the life and works, with abundant illustrations, of Brunellesco, Desiderio, Rossellino, Baccio d'Agnolo, Donatello, Verrocchio, Alberti, Mino da Fiesole and their compeers, thirty-eight of them in all; to examine the noble photographic plates and the trustworthy engraved plans, sections and details, to turn over, in short, any one of the sixteen double numbers that have appeared so far is to long as one without hope for the introduction of Americans to this monumental book.

Well, not even if all in English could this book be bought by many private persons. But in scores of towns there are societies who could buy it, and who would make up their minds to the pull if only the text were in English. In every great city there will be three or four copies bought; there might be many more, if only the text were in English.

So that, as the *desideratum*, or an edition with English text, seems wholly unattainable, the thing to hope for and to strive for would seem to be a translation of the text and its publication by itself. It would make about 1,600 octavo pages, or three volumes like those of Viollet-le-Duc's

Dictionnaire, or rather more than Fergusson's "Ancient and Mediæval Architecture." In America and England an edition of such a book might well be sold, for it would have its great and peculiar value apart from the plates and without them, while by means of it every copy of the original German work would become for us what it is for Germans. In other words, the library which would buy the folios and pay \$500 for them, would also pay \$15 for the text in English; and that, by the way, in a far handier form than the huge original, with its pages of 17½ by 24 inches. It must be premised and agreed upon that great care be taken with references alike to the large plates and to the numerous illustrations in the text; that is of course. And the translation must be a worthy one; absolutely complete, very close to the original, and written in as elegant English as the destinies allow.

There are other books of this grandiose sort. Bode's work on the "Sculpture of the Renaissance" is to consist of about seventy parts at twenty marks each. The work on "Greek and Roman Portrait Art," by Brunn, Arndt and Bruckman, is to be of eighty parts, at the same price per part. Brunn's "Monuments of Greek and Roman Sculpture," now complete, is of the same size and cost. And these books are all of general interest; not one of them is a monograph or devoted to the excavations upon one site or within one State, or to the buildings of one town, or to the sculpture of one artist or of one collection. Each one of these books is of primary importance, and ought to be made accessible to every student.

Let us now be reasonable and modest in our requirements and speak of smaller matters. Here is Salzenberg's book on the buildings of Constan-

tinople, to which attention has been called by the valuable book of Messrs. Lethaby and Swainson, which we review. Salzenberg's folio is not very large, and his quarto of text is thin. No one need pay more than fifteen or twenty dollars for the original, and an English translation of the text could be included in a two-dollar octavo. Choisy's "Art of Building Among the Byzantines" is still smaller and still less costly. Byzantine architecture is exciting some interest just now, one is glad to see. Well, no one can be said to know much about it until he has studied these two books. And it must be said plainly that looking at the plates and puzzling out a little of the German or French text which describes the plates is *not* studying the book or the subject, whatever the sanguine may suppose. Turn the question around. Ask yourself how much a Frenchman who cannot read English any more easily and naturally than most of us read French is likely to get from one of the few books of critical value which we have in the English library of art. Is it not evident that he will misread and misjudge fully as often as he will receive the right impression from the text?

Therefore, we ask for translation and publication in an inexpensive form of the text of art-books in German, French and Italian; perhaps also in Spanish; perhaps also in Russian; of periodicals if not books in Greek; of now and then a monograph in the language of one of those small States whose citizens publish their important scientific and scholarly work in French—Denmark, Sweden or the Netherlands. A foundation like the Avery Architectural Library ought to have a fund for this special purpose, and little by little its treasures should be made accessible to all its beneficiaries by English translations of the right sort.

The Church of Sancta Sophia, Constantinople.
A Study of Byzantine Building. By W. R. Lethaby and Harold Swainson. London and New York: Macmillan & Co. 8vo., pp. viii., 307.

This is a beautiful book. It is printed on laid paper with the "Alliance" water mark, of pleasant surface and left with rough edges. The printing is good English work. The illustrations, seventy-five in number, are unusually attractive; all from original drawings, all having a certain resemblance to one another in their system of black and white, and all pleasantly quaint and archaic looking, as if from a fifteenth century book. Moreover, a slight glance at the book is enough to show that it is full of most valuable matter. It

is not well arranged however. One looks in vain for a list of illustrations and the text mentions "fig. 5" or "fig. 26" without any mention of where the said figure may be, whether above or below. The distribution of the material of the text is unsystematic; made so, perhaps inevitably, by the succession of long transcripts, from Procopius, Agathias, Eragrius, and especially Paul the Silentiary, which are succeeded by a long inquiry into the original and later arrangements and furnishing of the church, this by an account of the reparations of 1847, and this finally by an analysis of the construction and decorative character of the church, partly original and partly founded on the books of Salzenberg, Choisy and Labarte. The authors have gone to the building with open eyes and a fine reverential feeling for the noblest church of Christendom, they have compared the most important ancient writers and have guided themselves by the most trustworthy modern authorities, but their book is a bringing together of valuable material rather than a well-arranged history or a criticism. The index goes far to complete the work; and yet the index itself in giving after the term "Dome of S. Sophia" thirteen page-numbers without further explanation, eight such numbers to the word "Capitals" and as many to the word "Vaults" cannot be thought to help the student much. Every student knows the impatient despair with which, after looking up four or five of these pages in a vain attempt to find a special thing, he drops the subject. This is a good book to read—one may even read one chapter and skip another; but books of this class are far more useful for reference than for perusal, and as a book of reference this is not a complete success.

"Sancta Sophia is the most interesting building on the world's surface. Like Karnak in Egypt, or the Athenian Parthenon, it is one of the four great pinnacles of architecture, but unlike them this is no ruin nor does it belong to a past world of constructive ideas, although it precedes by seven hundred years the fourth culmination of the building art in Chartres, Amiens, or Bourges, and thus must ever stand as the supreme monument of the Christian cycle." These words quoted from the preface show the authors' point of view, assuredly the right point of view to take in discussing as architectural critics any great building of the past. The book is full of a wise and sympathetic appreciation of what is great in architecture and of what is instructive in liturgical and decorative archæology and will repay all the study that may be given to it.

Rational Building. Being a Translation of the article "Construction," in the Dictionnaire Raisonné de l'Architecture Française of M. Eugène - Emmanuel Viollet - le - Duc. By George Martin Huss. Macmillan. 8vo., pp. vii., 367, \$3.00.

The publication of translations of scientific and critical works is only commendable when the translation is literal and complete. The English reader who cannot read a given foreign language has a right to complain if he is offered a translation partial, or incomplete, of a book in that language which he desires to use. Such a translation goes far to prevent the issue of a complete one. And as for the partial translation itself, the student is within his rights when he asserts that the translator has no business to do his selecting, his choosing—that is to say, the first and most important part of his studying for him. This is the more especially to be insisted upon because it is notorious that most translations are made by wholly incompetent persons. A young woman who can speak French fluently and who has read a number of French books would be a person above rather than below the average of translators, and yet such a person would probably be ignorant of the exact meaning of many modes of expression and turns of phrase and would certainly be ignorant of the exact force of the technical terms employed.

The above preamble is to explain why the book

under consideration seems to us important—although the translation of only one article selected from a large work of reference. The translation is extremely literal, sentence by sentence, phrase by phrase. Every one of the 156 illustrations of the original is given in its proper place, reduced in size, it is true, and less pleasing, but as useful as the French originals. As with the illustrations so with the text. It is less pleasant to read than the original, because of a certain stiffness which comes of the attempt to be severely exact, but the whole work is here for whomsoever would study it.

As to the importance of the work itself it must be noted that of the nine volumes of M. Viollet-le-Duc's text, half of a volume is devoted to this one article, *Construction*, and much more than half a volume to the one article, *Architecture*; that these two articles embody the author's theories and convictions as to ancient and mediæval building as a science and as an art; and that this discussion covers all the art of architecture previous to the day of steel and iron construction as made possible by modern organized industry. All our styles of architecture are based upon the systems of building which are analyzed and criticised in these two articles, *Architecture* and *Construction*. One of the two is given in this book in intelligible English, and now we shall hope for the other.



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