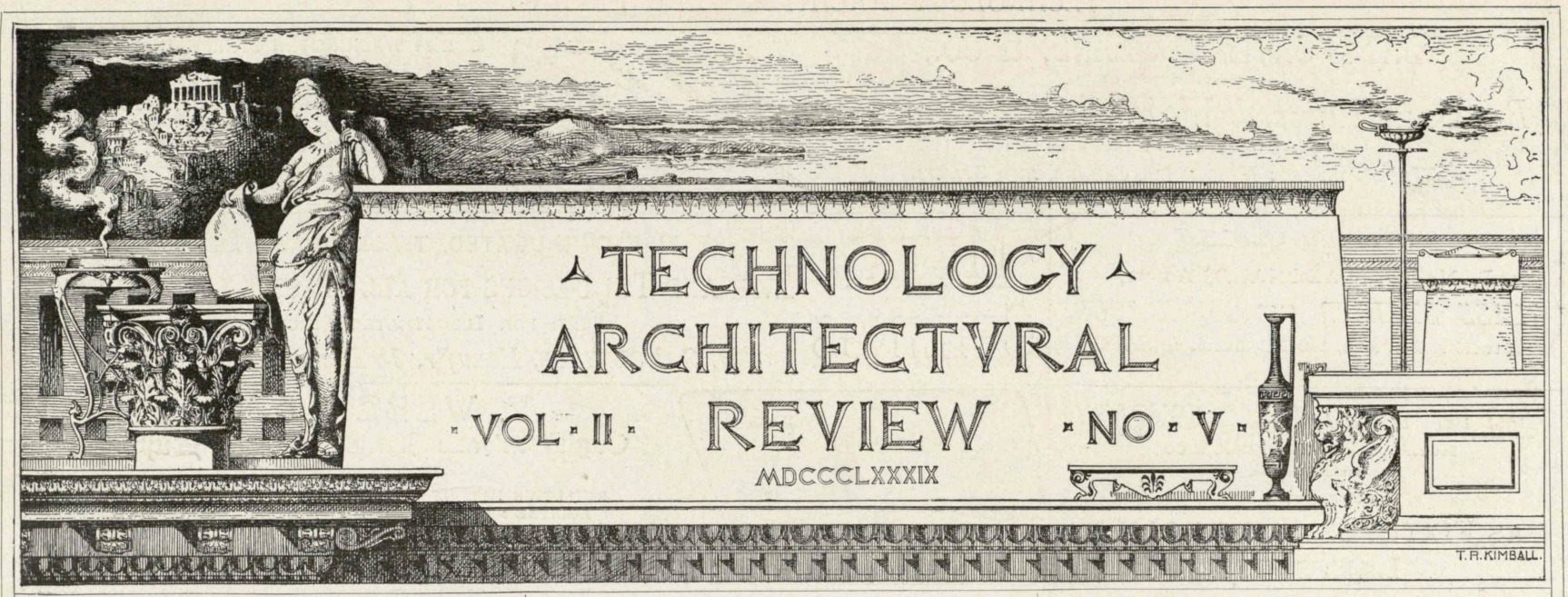

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Massachusetts Institute of Technology.

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FREEHAND DRAWING.

A PROFICIENCY in freehand drawing is indispensable in the daily practice of an architect's office. The cases are very rare in which time enough can be given to the preparation of elaborate mechanical perspective drawings; but there is an almost hourly need of such ready freehand representations of the work in hand as will serve for study on the part of the architect himself, and for a better understanding of it on the part of the client. This kind of readiness the master of an office seldom finds in his subordinates, and he must be able to furnish it himself or do without it, which latter is most commonly the case.

Good draughtsmanship in this country may be said to be in its infancy, owing partly to the kind of technical preliminary instruction of the schools, but more largely to the lack of persistent work on the part of the pupil himself. There has been indoor when there should have been outdoor instruction; it has been the T square and the ruling pen when it should have been Nature and the broad pencil; there has been too much of the teacher's dictum and too little of the pupil's instinct. Schools can teach much, but the pupil can teach himself more. He can never be taught to be an artist, but he can teach himself to be something more than a mere mechanical draughtsman.

If we suppose him to be well grounded in the principles of perspective, and to be able to establish the plane of his picture and all his points with especial reference to the particular features of the subject in hand which it is desirable to emphasize, let him lay aside all the mechanical methods he has previously employed, and with his own good right hand — or left, if it so happen — let him boldly feel his way through his work without any thought as to whether it will be a pretty picture or otherwise, so it be a fair, honest expression of the thought in his mind. One such drawing, thought out, is worth a dozen measured out. One such drawing in the pupil's own way is worth a score in the school's way. At all events, he is beginning to stand on his own feet, to consult his own soul only, and rely on his own hand. If he is ever to be a creator of beauty, he has taken the first lesson; if he is ever to be himself and not somebody else, he has taken the first step.

It is precisely here that his instruction first really begins; he is henceforth to instruct himself. He will ascertain for himself how John Sell Cotman drew the old churches of England with the etcher's point, and Prout the old cottages with the brush, Harding picturesque trees and ruins with pencil, and Pennell the beauties of old towns with the pen. These masters he cannot study too conscientiously, nor copy too closely; they will present new beauties to him daily, each with his own interpretation of his subject, and his own manner of expressing it. The young draughtsman need not be a servile copyist of any one of these masters; it is a great step in his education to be able to appreciate the high quality of their work. The school of such teachers as these never closes. They furnish no diplomas that an education is finished. With them Art is indeed long and cannot be taught in six easy lessons.

Now what we especially desire to enforce in all this is, that while technical teaching in the schools can do much, it cannot do all. It is something to have taught the alphabet of art, if it can be taught; but it is unreasonable to expect that it will or can teach more.

Augustus Welby Pugin is, perhaps, the very best example of a technically trained architectural draughtsman. With a natural fondness for drawing, he was very carefully trained in his father's office in all the elements of mechanical drawing and perspective; but he chafed under these restraints and preferred the freedom of drawing from natural objects; he rejected the vanishing points and the T square and practised his art in a different field; but the exactness of the work required in the subjects he had undertaken was such that the compass and the ruling pen were afterward almost always in requisition, and they were never so handled before.

The photographic copies of the drawings in pencil and ink in his album are models of most careful and exact drawing, the perspective being especially worthy of study. They are the union of freehand and mechanical art in perfection, and we hardly know whether the art that can be taught is more admirably illustrated, or that which cannot, is more wonderfully expressed. So firm was his hand from long practice, and so complete his mastery of the tools with which he worked, that it is related of him that some of the most elaborate and carefully drawn plates illustrating his principles of Gothic architecture were etched by him in a rough passage from France.

Pugin never forgot his thorough apprenticeship in architectural drawing; while John Sell Cotman, one of the best draughtsmen of architectural subjects that ever lived, probably never had any preliminary instruction in this branch of his art, and never understood the first principles of perspective as taught in the schools.

George Edmund Street's drawings, over which he spent so much time, are specimens of clever mechanical work, but nothing more; while those of Ernest George are the work of an artist, as well as a skilfully trained draughtsman.

The perspective drawings in most of the American publications devoted to building are lamentable illustrations of the truth that a little knowledge of drawing is a dangerous thing.

It is enough to say, however, that the drawings are as good as the designs themselves.

The result is an exaggeration of an exaggeration. Human ingenuity can hardly go further in inventing towers, round and

square, high and low; balconies, chimneys, doors and windows, and pillars and pilasters, of all shapes; rounded corners, and all kinds of materials, — the whole flung together with no other idea than to compress as many of them as possible into the smallest given space. Imagine them all given over to a draughtsman who, with a poor knowledge of perspective at best, is a complete castaway in the presence of such a mass of bewildering details, but who, undaunted, scratches his way into the midst of them, and comes out at last, leaving us in doubt as to what is building, tree, chimney, or sky; and whether, after all, the horse and the hand-cart may not have been meant for dog and sentimental young woman under an umbrella.

Now, the drawings in the foreign architectural periodicals are sometimes bad enough, but those in the American publications are largely so; and we regret to have seen in a late number of the "American Architect" a reproduction, or a borrowing, of an extremely bad, scratchy, spotty pen-drawing from the English "Architect;" and this, too, at a time when we had been promised a higher standard of drawings in the enlarged edition of this American weekly.

The recently published work by Pennell on Pen Draughtsmanship is a book full of instruction. Pennell's influence is already being seen in the illustrated magazines and weeklies; and architects and book illustrators are, in a measure, catching his touch and his methods of representing the buildings of the old English towns.

Herbert Railton's pen-work is brilliant and fascinating, but he has a certain mannerism which makes all his drawings of things, new and old, look alike; and he has always in stock the same old foregrounds and shadows, and the everlasting black bricks for his chimney tops.

Raffles Davison's drawings, with a fine pen, are very effective; and architects are under obligation to him for the many quaint bits of picturesque England which his industry has made familiar to them. But he is not a wholly reliable master for the young draughtsman to follow; the peculiarities of his methods being likely to be exaggerated, and an artificial and not an honest way of seeing and representing things to be the result.

For the few years past, the drawings published in the English "Architect" and "The Builder," by the medal scholars, Pugin students, and the younger draughtsmen, are models of nice and exact representations of intricate architectural subjects; the work of Arnold B. Mitchell being notably worthy of study as showing how a complete knowledge of technical methods may be united or subordinated to an easy freehand and natural delineation of them.

The young English draughtsman, besides abundant opportunities for careful academic training, is in the habit of sketching constantly from Nature. Attractive subjects, to be sure, are always within his easy reach, and the result of an afternoon's work out of doors is a picture as well as practice. But it is the practice that is needed; the picture will come in good time. A book of sketches from South Boston and Cambridgeport may not be of the most enlivening character; but the shadows fall in their streets, and the clouds fly over them, as they do in Chester and Clovelly. And some day the poor boy whose only sketching ground was the back alleys of South Cove, but who thoroughly mastered the humble subjects before him, — making brick always look like brick, stone like stone, and wood like wood, and the consumptive shrubbery and the Monday's wash to maintain their own individuality, — may stand high above the technically trained draughtsmen of the future.

From what has been above written, it is obvious that the especial purpose of this article is to insist on the importance of a more thorough training in freehand drawing and a less regard to mere mechanical drawing. We believe a greater progress can be made in the former than in the latter method, and if the pupil have any aptitude or talent, it will be the more quickly developed.

The drawings accompanying this article were made to illustrate certain methods in execution from which the pupil may perhaps derive some advantage. Each is the result of less than an hour's sketching, as may be obvious, — the upper one, of a somewhat nondescript and impossible building, being drawn with an English reed pen, and the gate lodge below with a wooden toothpick. The clear shadows and the expression of scale and mass of which these tools are productive may commend their more extensive use, and so the humble reed and the ignominious toothpick may bring forth fruit not originally conceived by their creator.

W. R. Emerson.

[*To be continued.*]

REPORT.

ROTCH TRAVELLING SCHOLARSHIP.

1887–89.

(*Continued from No.* 4)

. . . . . .

Returning from Constantinople, we spent a week in Athens about the wonderful old Greek ruins, sketching bits of the beautiful detail and making notes by the way. One feels in coming face to face with these world-renowned monuments that he already has a pleasing familiarity with them, which adds much to their enjoyment. At the same time, it is quickly realized that there are many revelations in their actual presence, and profound impressions not to be gained in any other way but by real acquaintance.

This period being passed, we left Athens by the railroad, which took us by the city and Gulf of Corinth to Patras, where we immediately took a steamer for Brindisi. Once more in Italy we started up the east coast, going directly to Ancona, and from there visiting successively Ravenna, Bologna, and Venice; a stop of three weeks being made in the latter city. In relation to Venice, I might say that St. Mark's pleased me more than any church seen during all my travelling, preferring it even to St. Sophia, and there is about it the greatest abundance of beautiful detail for any one who wished to sketch this kind of work or to make studies in color of mosaics and decoration. During my stay in Venice I made sketches about the Doge's Palace and St. Mark's, and some at Torcello, and a few small water-colors, including one of the House of Gold.

From Venice my route took me through Vicenza, Verona, Brescia, Pavia, and Milan, and from Milan I started to return to Paris, going by way of Como, the St. Gothard Railroad, Fluëlen, Lucern, Bâle, and Troyes. Of these cities in Northern Italy, Verona and Pavia seemed to me to offer the best work for the student, particularly Verona. At Bâle in Switzerland there was a lot of nice work where I had not expected much, — mostly executed in the reddish-brown local stone. Troyes is a city rich in good Gothic.

Paris was reached July 26, and a stop was made here of two weeks and a half before proceeding to England. The great Exposition demanded some attention, and in this connection I might mention the very interesting collection of buildings erected to illustrate the history of the habitations of man, comprising, after a representation of the earliest rude huts, a dozen buildings or more in as many different styles, and all sufficiently large to display well the characteristics of the different periods. Two of these — a Pompeian house and one of the French Renaissance — were particularly

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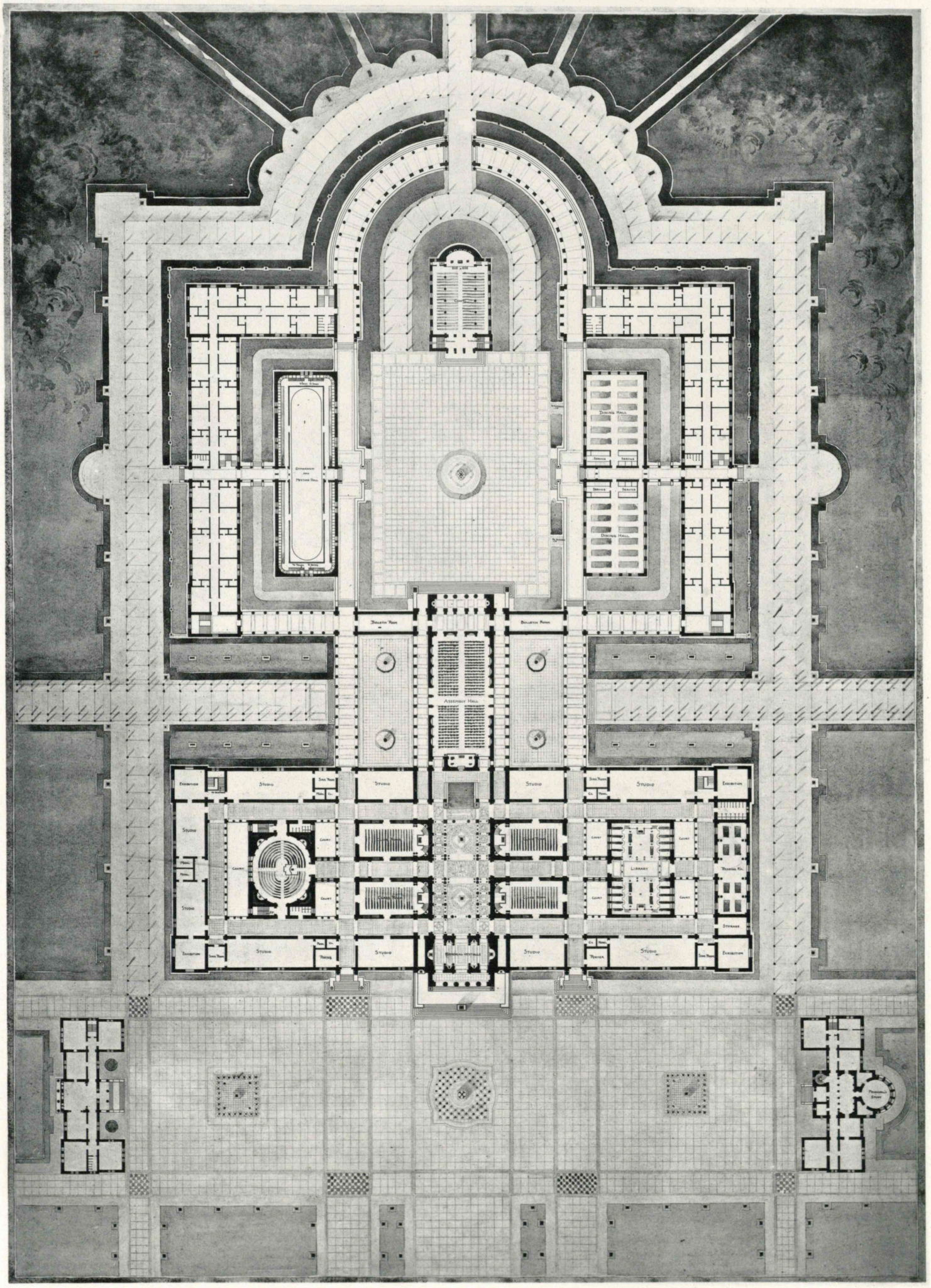

GROUND PLAN.

ROTCH TRAVELLING SCHOLARSHIP COMPETITION.

AN ART COLLEGE IN A CITY PARK.

BY HENRY BACON, JR.

HELIOTYPE PRINTING CO., BOSTON.

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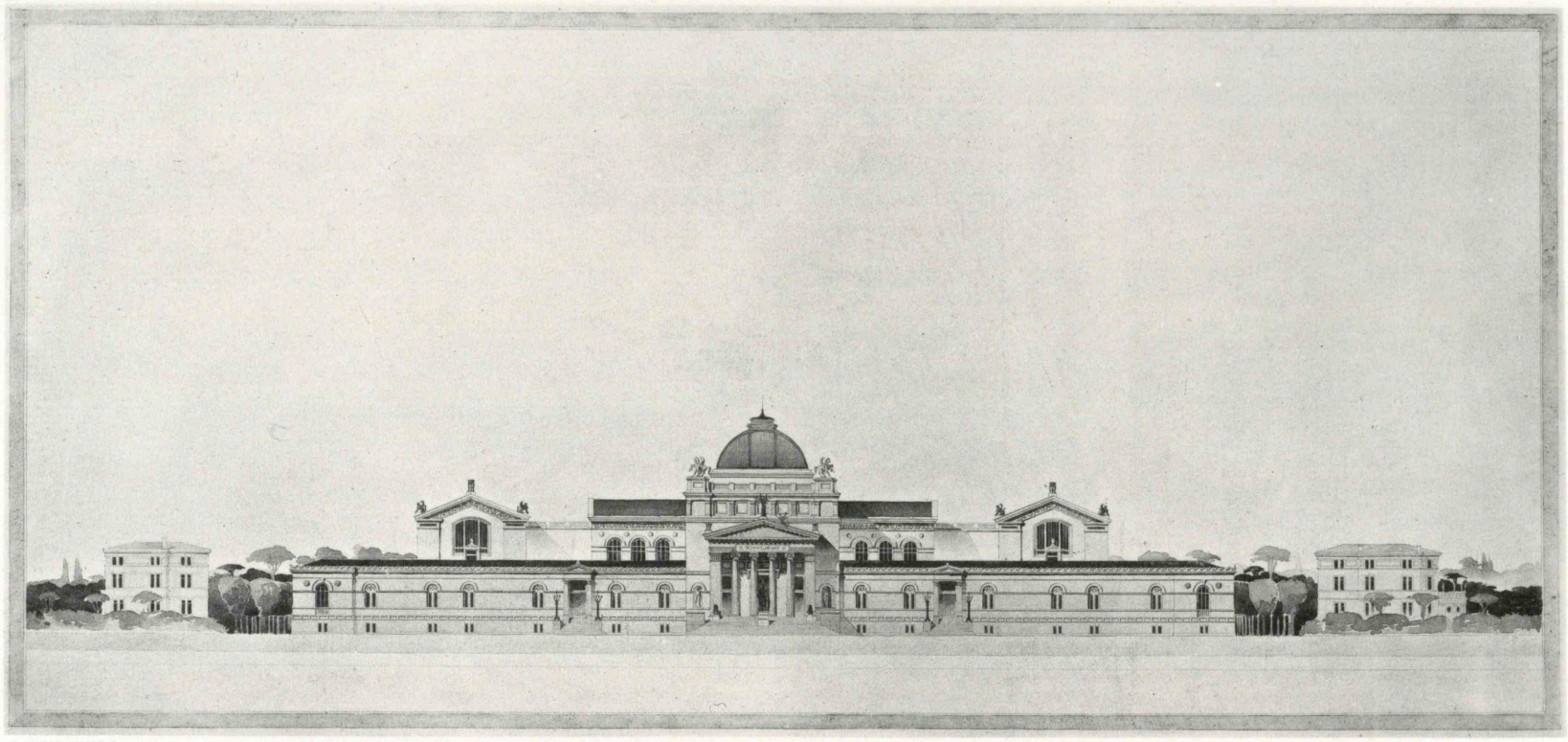
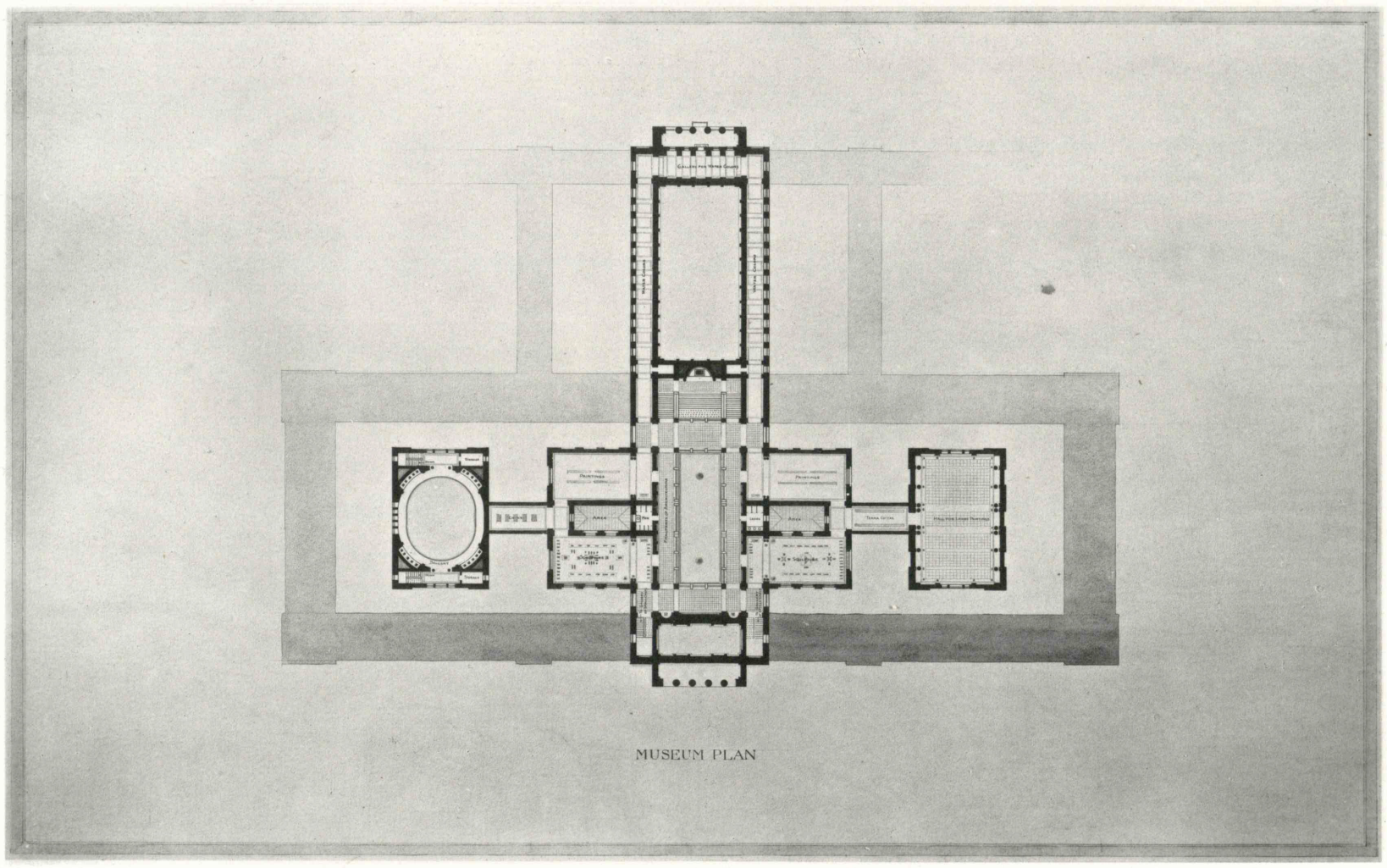


FRONT ELEVATION.



MUSEUM PLAN

SECOND STORY PLAN.

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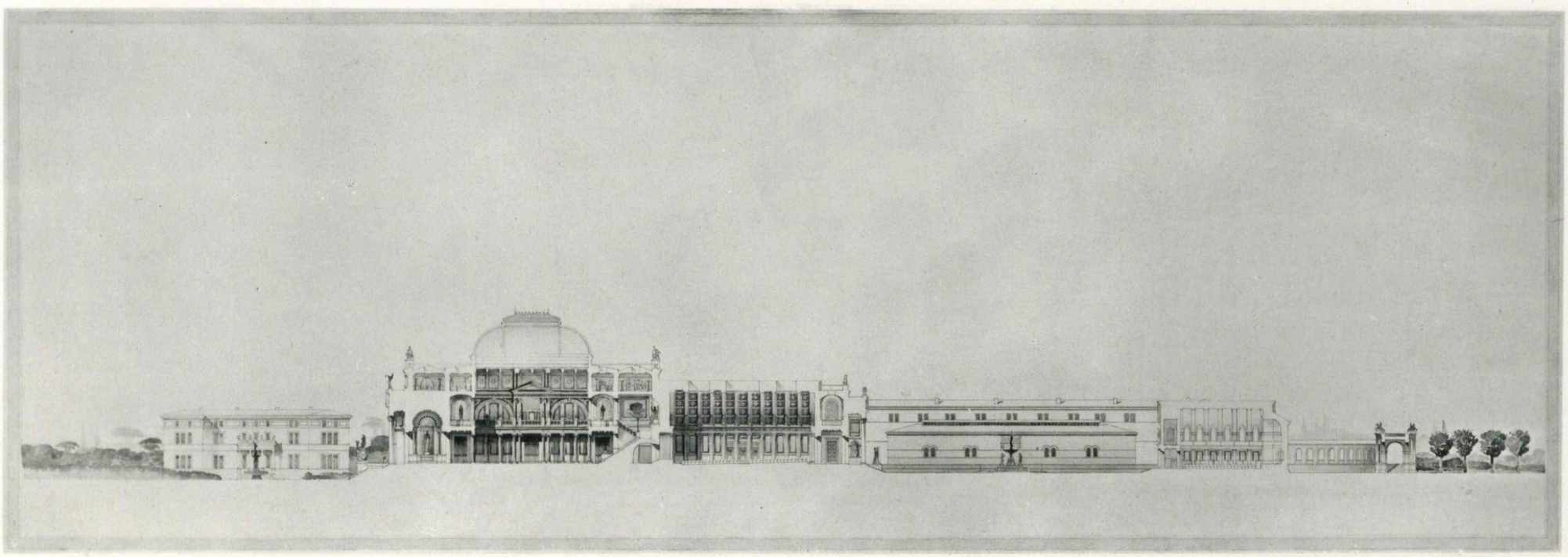

LONGITUDINAL SECTION.

ROTCH TRAVELLING SCHOLARSHIP COMPETITION.

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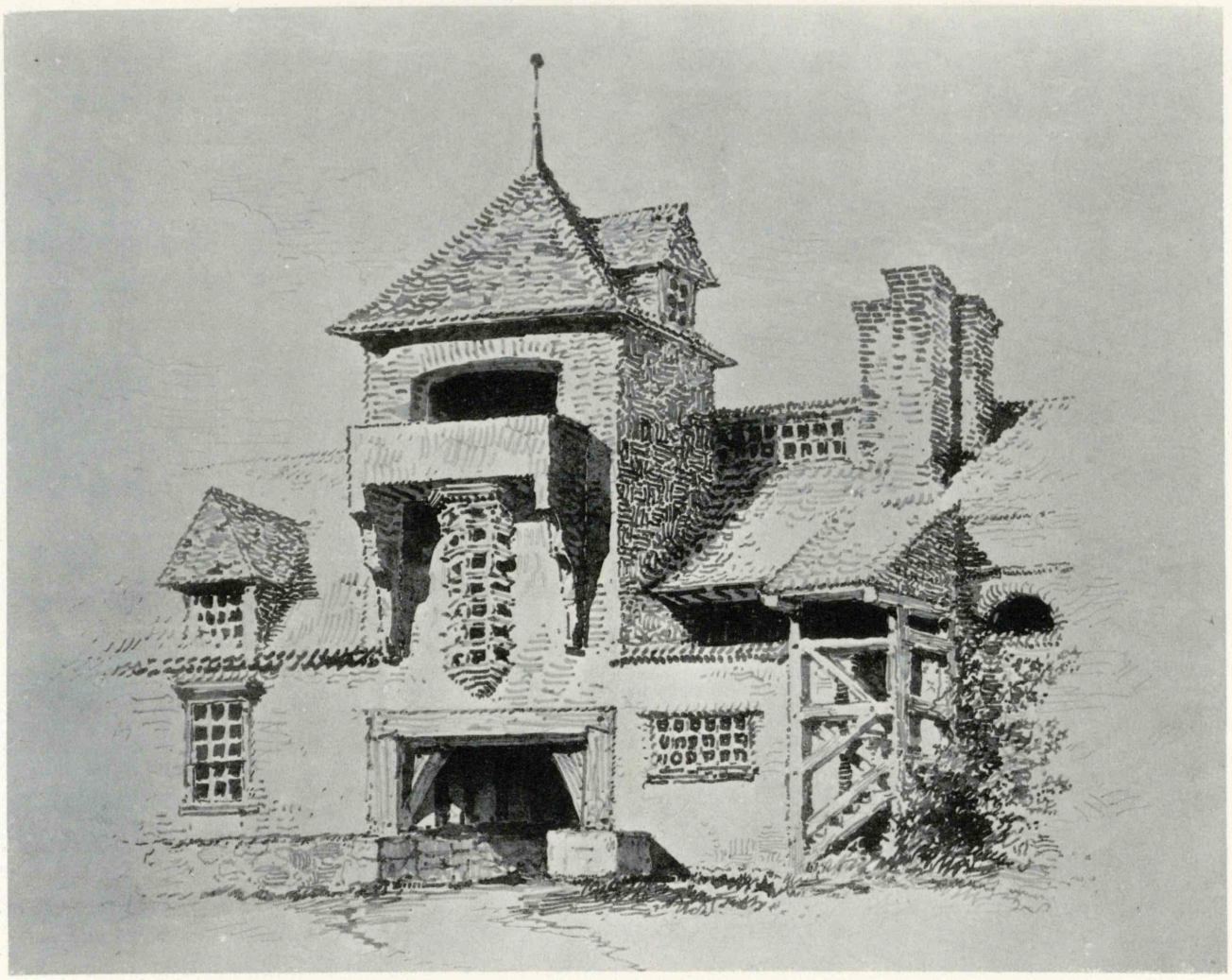

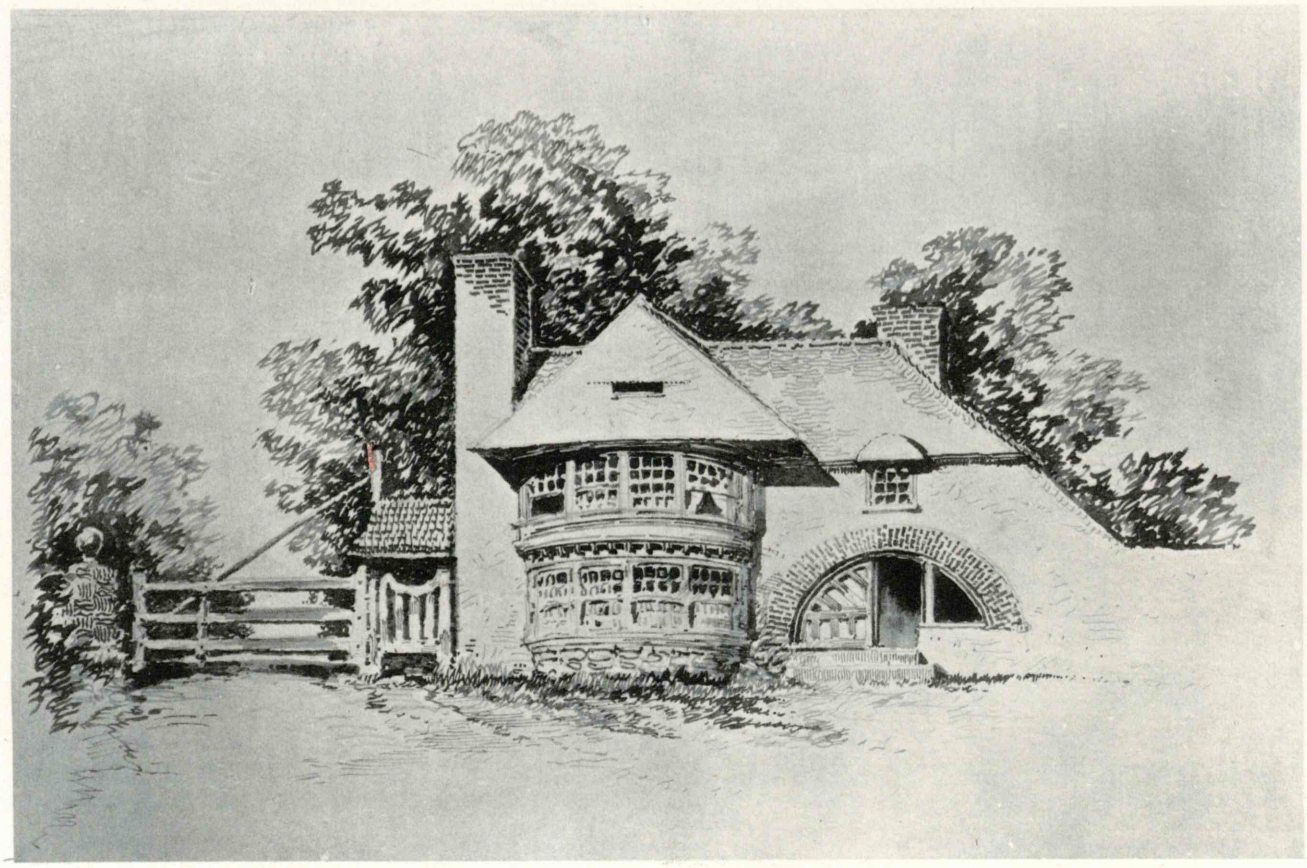

FREE HAND DRAWING,
BY
WILLIAM R. EMERSON.

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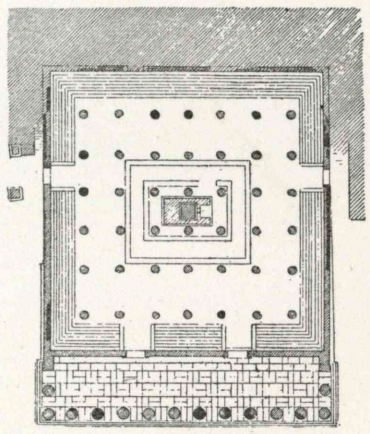
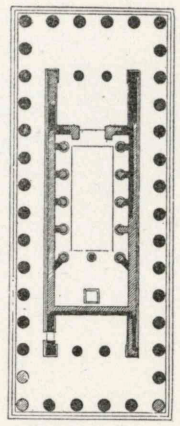
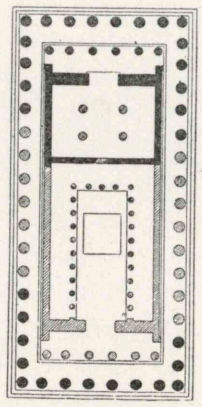


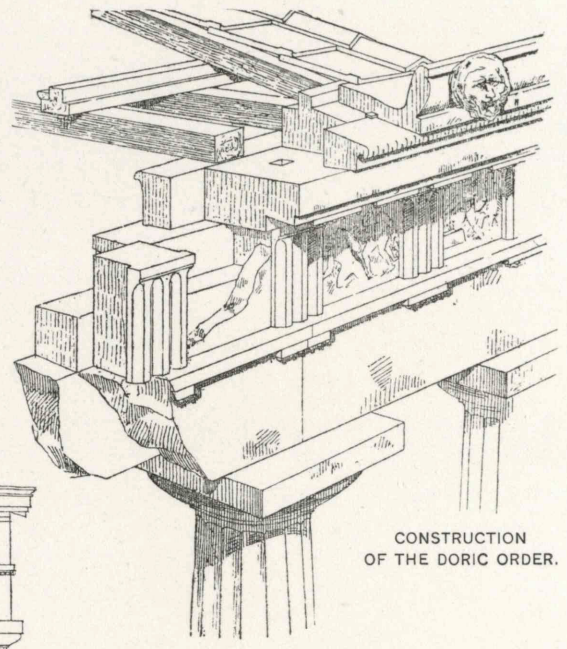
PLAN OF THE TEMPLE AT ELEUSIS.



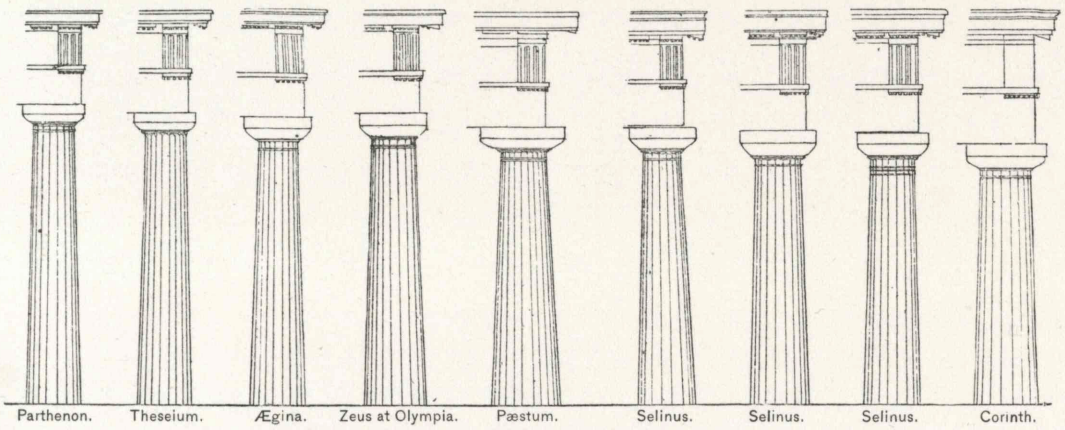
PLAN OF THE TEMPLE OF APOLLO AT BASSÆ.



PLAN OF THE PARTHENON.

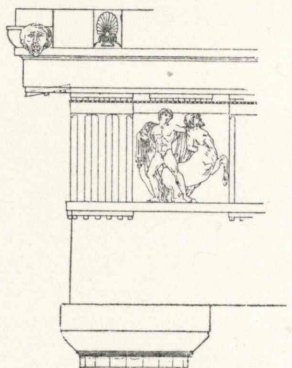


CONSTRUCTION OF THE DORIC ORDER.



Parthenon. Theseium. Ægina. Zeus at Olympia. Pæstum. Selinus. Selinus. Selinus. Corinth.

PARALLEL OF THE PRINCIPAL EXAMPLES OF THE DORIC ORDER.



ORDER OF THE PARTHENON.

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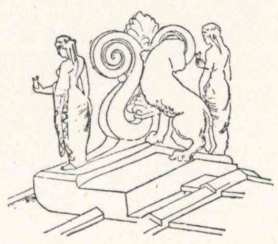
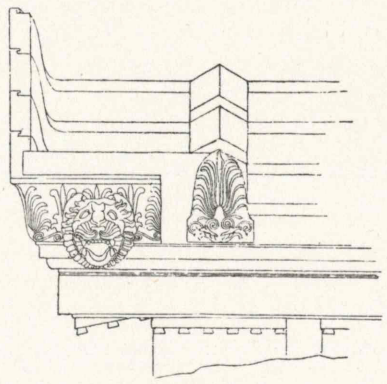
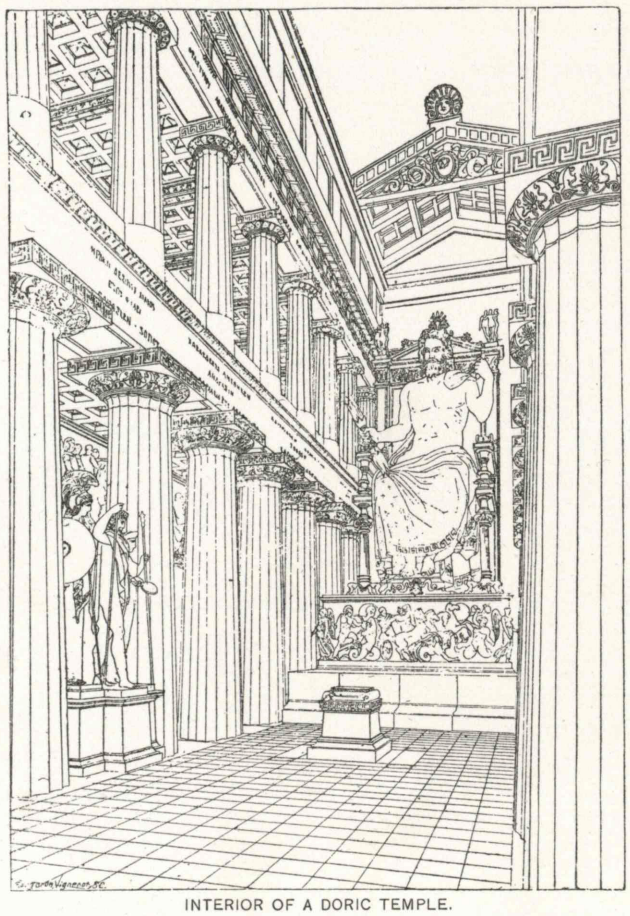
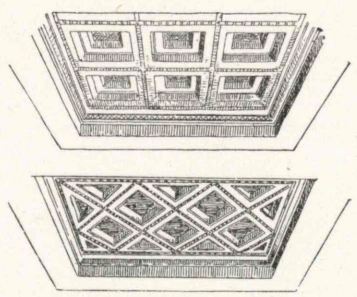




DORIC CORNICE.

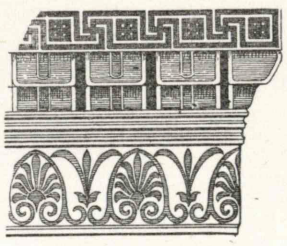


INTERIOR OF A DORIC TEMPLE.



CEILINGS SHOWING PANELLING.

ACROTERIUM.



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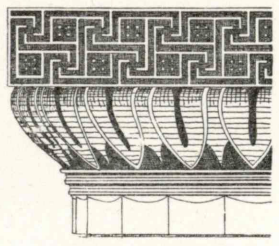

CAPITAL OF COLUMN.

SHOWING DISPOSITION OF COLOR.

A STUDY OF DECORATION,

By C. HOWARD WALKER.

ILLUSTRATIONS FROM "L'ARCHITECTURE GRECQUE," BY V. LALOUX

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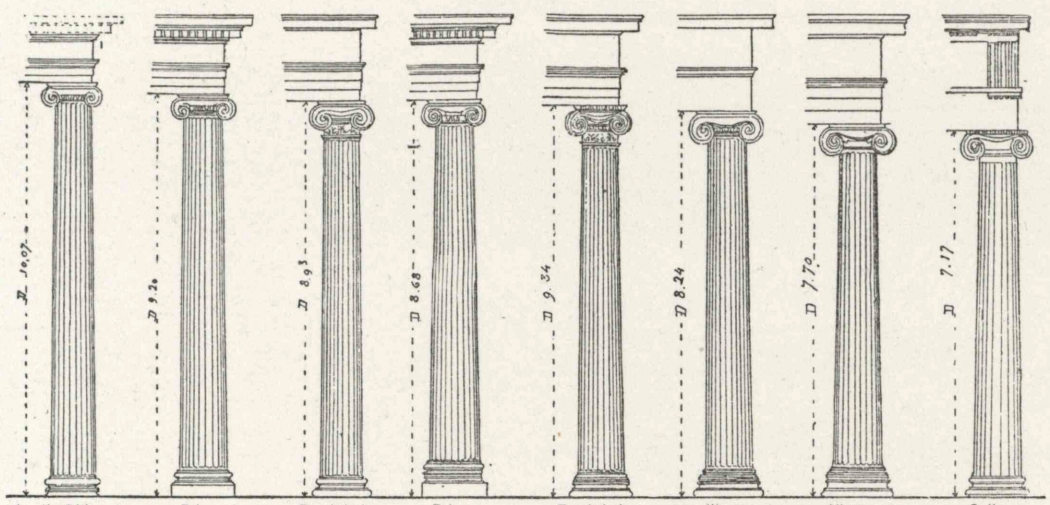
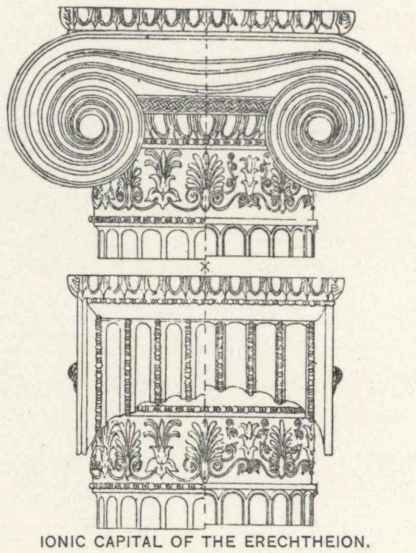


PARALLEL OF THE PRINCIPAL EXAMPLES OF THE IONIC ORDER.



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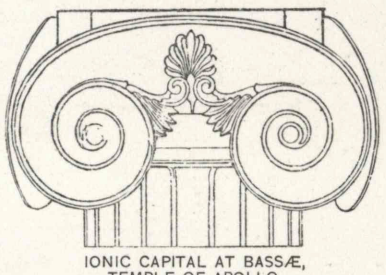
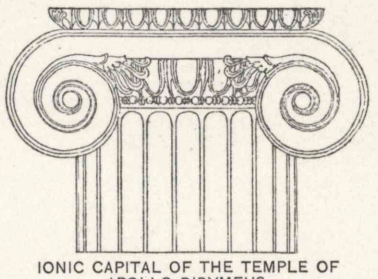
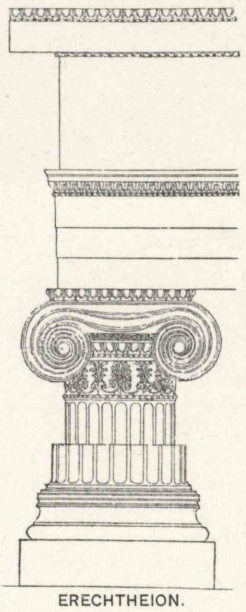


IONIC CAPITAL AT BASSÆ, TEMPLE OF APOLLO.



IONIC CAPITAL OF THE TEMPLE OF APOLLO DIDYMEUS.



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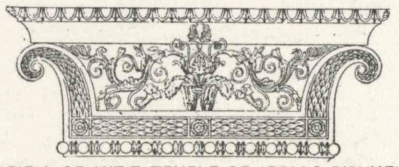

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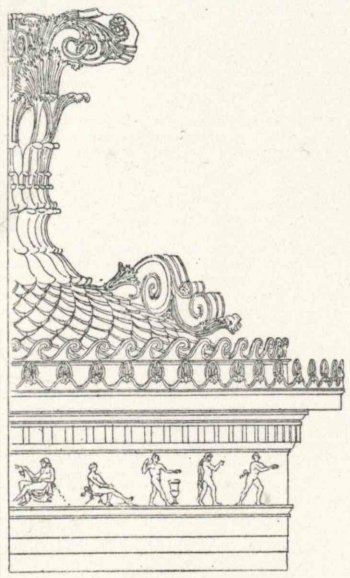
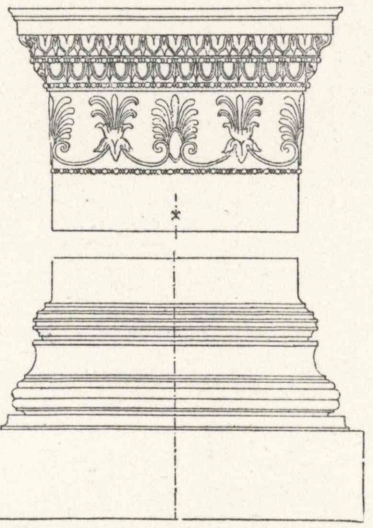
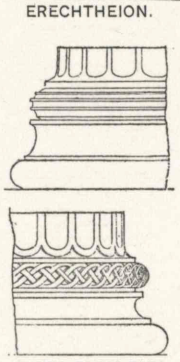


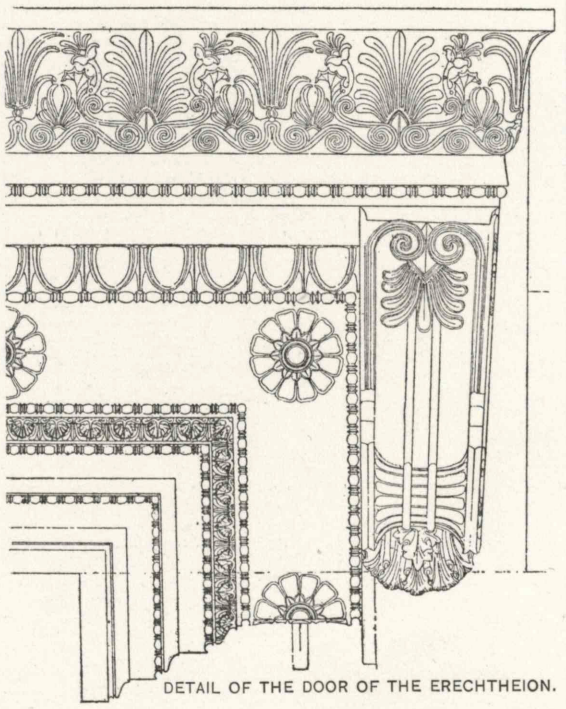
ROOF AND TERMINATION OF THE CHORAGIC MONUMENT OF LYSICRATES.



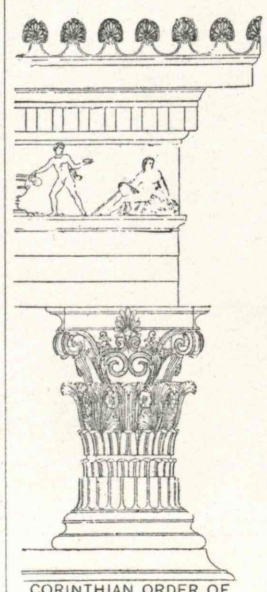
CAPITAL AND BASE OF THE IONIC ANTÆ OF THE ERECHTHEION.



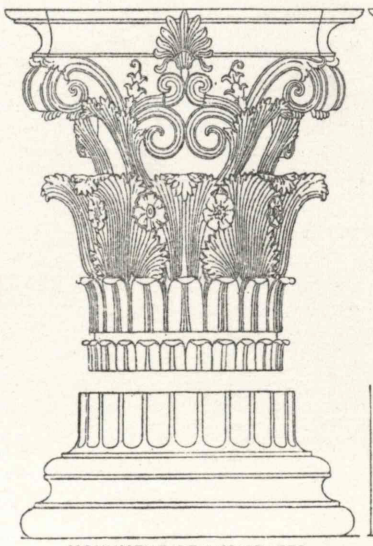
BASES FROM THE ERECHTHEION.



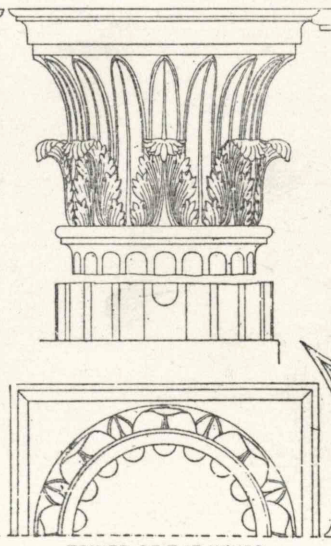
DETAIL OF THE DOOR OF THE ERECHTHEION.



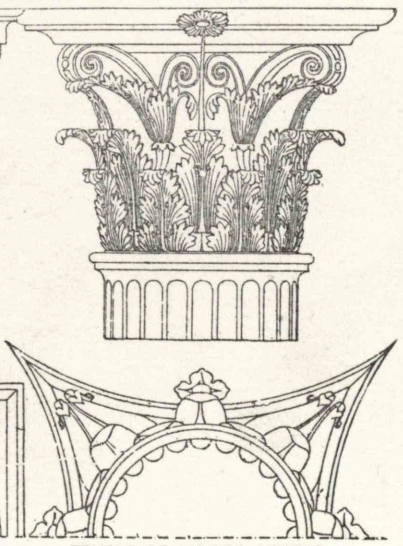
CORINTHIAN ORDER OF CHORAGIC MONUMENT.



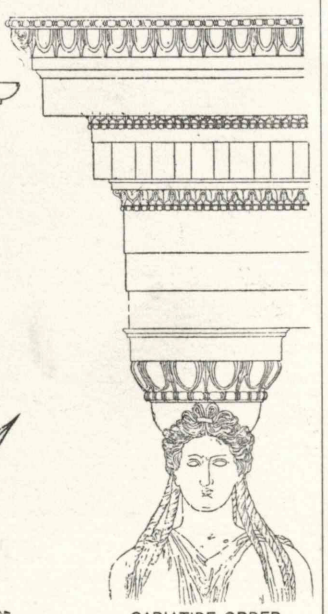
MONUMENT OF LYSICRATES.



TOWER OF THE WINDS.



TEMPLE OF JUPITER, ATHENS.



CARIATIDE ORDER. ERECHTHEION.

CORINTHIAN CAPITALS.

A STUDY OF DECORATION,

By C. HOWARD WALKER.

ILLUSTRATIONS FROM "L'ARCHITECTURE GRECQUE," BY V. LALOUX.

good. Another exhibit is the new collection of architectural casts in the Trocadero, comprising full-sized models of the portals of Arles, St. Gilles, and Moissac, and a number of other Romanesque and Gothic subjects. It is a most admirable collection, and as the surface of the plaster is painted the exact color of the stone, it has a most realistic effect. One cannot go through the architectural museums of the Trocadero and South Kensington without wishing that similar ones could be instituted in our own country for the advantage of students and all lovers of art.

The last four weeks of my time in Europe were devoted to a trip in England, spending a little over a week in London, and the remaining time in the country. London, while having a certain number of fine monuments, hardly possesses the interest one would expect from its great size. It possesses, however, an interest of its own in a certain class of modern work that is more pleasing than work of the same period in Paris or elsewhere, particularly in certain buildings where terra-cotta has been used successfully. The Natural History Museum at South Kensington is a good example of this, and is a most admirable building. The domestic work around about London is worthy of much study.

My trip through the English country in the two or three weeks just before sailing for America took me to the following places: Canterbury, St. Albans, Hatfield, Cambridge, Ely, Peterboro', Lincoln, Stratford-on-Avon, the manor-house of Compton Wyngate, Oxford, Chester, and Liverpool. This route embraced a number of cathedrals and two of the best manor-houses in England, — Hatfield House, the seat of the Marquis of Salisbury, with fine Elizabethan interior; and Compton Wyngate, small but beautifully picturesque, especially in the exterior, which is built of brick with light stone trimmings and timber work in the gables, of the Elizabethan or perhaps a little later period. What was perhaps the most valuable of all were the university towns of Cambridge and Oxford. The college buildings in these two towns are not only most charming for their picturesqueness and age, but contain numberless fine groupings of archways, windows, and gables, that form the best models one could have for similar buildings in America, and give suggestions without number of picturesque effects for domestic work, that are easily applicable even to other styles than the appropriate one that is used there. If I could not go to any other place in England, I should wish to be sure to see these two towns. Sketches were made of attractive subjects in most of the places mentioned.

During all my travelling I made it a simple point to do all the sketching time would allow, preferring this to making any measured drawings, since my study in Paris had given me abundant practice in that kind of work. At the same time I made it a practice to place sufficient measurements on sketches to give their proper scale, and also to take measurements of other subjects to serve the same purpose on photographs. A considerable number of written notes were taken along the way. Where time permitted, a few sketches in color were made.

I hope the Committee and Society will approve of the way in which I have devoted the time spent abroad, and the results that have been accomplished. I must express the high appreciation that I hold of the great advantages and opportunities afforded by this period of study and travel, and the benefits I have personally derived from it; and I hope the students of Massachusetts will realize more and more every year the great value of this privilege placed in their hands by those who have so generously founded the scholarship. In conclusion I would like to sincerely thank the President of the Committee and Society for his kindness shown through many letters, and his advice and constant interest in the course pursued.

EDGAR A. JOSSELYN.

BOSTON, 1889.

EXAMINATION IN DESIGN

OF CANDIDATES FOR THE ROTCH TRAVELLING SCHOLARSHIP.

Problem: AN ART COLLEGE IN A CITY PARK.

THIS building should contain a large hall, with seating capacity of three hundred and fifty; galleries for sculpture, architecture, and painting; library and reading-room; four class-rooms; ten studios; one amphitheatre; gymnasium and meeting-hall; chapel; refectory; and kitchen. It must also provide dormitories for three hundred and fifty students, administration offices, principal's apartments, and eight bedrooms for instructors.

The land occupied is to be five hundred feet in its least dimension.

The preliminary sketches must clearly indicate the scheme proposed, by a plan and elevation to a scale of one thirty-second of an inch to the foot.

The finished drawings, to be brought to the Museum of Fine Arts on April 20, are two plans, one elevation with shadows cast, and one section, all on a scale of one sixteenth of an inch to the foot; and one perspective on an Imperial sheet. The drawings must be accompanied by a thesis explaining the architectural character of the design. Too great a departure from the preliminary sketch will throw a design out of competition.

BOSTON, April 5, 1889.

PLATES I., II., AND III.

SUCCESSFUL DESIGN BY HENRY BACON, JR.

THESIS.

IN the accompanying plan, the dormitories, gymnasium, dining-halls, etc., and the school proper are separate, the assembly hall occupying a central position, accessible from both parts.

The school division consists of the class-rooms, amphitheatre, and library, arranged on the sides of the museum hall, with the studios surrounding them. The class-rooms are lighted by high windows over the roofs of the corridors.

The amphitheatre and library are placed in courts between the studios and class-rooms, the former being two stories high, and having at each end a toilet-room and a staircase leading to the gallery and the basement, also a staircase leading from the stand under the lecturer's desk to a model-room in the basement. The library has bookcases down the centre for manuscripts and rare editions. A librarian's desk is at each end, with steps near by to the second tier of books. The reading-room is connected with the library by a short corridor, and is isolated from the studios. All of the studios are lighted by skylights, and open into a rectangular corridor, which is itself subdivided by passages running from the side entrances past the ends of the class-rooms back to the dormitories. The parts of these corridors on the courts are to be glazed in winter. The parts between the class-rooms and the studios, and also the parts between the class-rooms, are lighted overhead. At each angle of the school building are exhibition rooms for the scholars, of drawings, paintings, and sculpture executed in the school.

The central feature of the plan is a hall for architecture, running up the whole height of the building, and from which a staircase leads to the sculpture and paintings on the second floor. It is lighted by glass coffers in the ceiling. As the museum division is intended to be semi-public, the class-rooms and studios do not open directly into this hall, through which the museums are to be reached, in order that the privacy of the scholars may not be disturbed.

At the entrance is a memorial vestibule, having at each end a statue of one of the two founders of the school. The principal's apartments and the administration building are each at the right and left end, respectively, of the square in front of the school, the second floor of the administration building being for the use of the instructors.

DORMITORY DIVISION. — The dormitory halls are L-shaped, and enclose the chapel, dining-halls, and gymnasium, leaving a tiled square between the last three buildings and the assembly hall. This division is connected with the school by four corridors, the two next the assembly hall leading to the museum department, and the others to the class-rooms, studios, etc., and terminating at the front side entrances.

The gymnasium and meeting-hall have three rows of lockers with seats in front around the outside wall, and these are separated from the working floor by a wall nine feet high, which supports the running track overhead. Stairs at each end lead to the baths in the basement and to the running track.

The dining-halls are in a building opposite the gymnasium, and have service rooms, as shown, with staircases leading from them to the basement kitchen. Walks from the exedra lead to the recreation grounds in the park.

SECOND FLOOR. — The two branches from the main staircase land on a gallery for architectural fragments. From this gallery open the painting and sculpture rooms, with adjoining coin and terra-cotta rooms, the hall over the library being used for large paintings. All the rooms for paintings are lighted by skylights. The balcony of the amphitheatre is for the scholars' exhibitions of drawings from the model. Around the wall of the assembly hall is a gallery for water-colors. Staircases in the front of the building lead to a gallery for small casts. The gymnasium and dining-hall buildings are each one story high. The second and third stories of the dormitories are similar to the first.

ELEVATION. — The disposition of the required rooms is expressed to an extent in the elevation, the museums, etc., rising above the surrounding studios, which serve as a base, and all the parts running from the architectural hall, which is the centre of interest, dominating the whole. The school is enclosed by the studios, which, being lighted by skylights and needing but few windows, suggest rampart walls, giving a feeling of seclusion to the school. A straight driveway leads from the park gates to the entrance at the centre, so that the view of the building may be symmetrical. In the architectural expression of the whole, quietness without severity has been the aim of the competitor.

THE STUDY OF DECORATION.

(*Continued from No.* 4.)

PERSIA.

THE fall of Assyria freed the Asiatic nations and Egypt from vassalage; and during the period between 600 B. C. and 500 B. C. Western Asia was occupied in successive struggles between neighboring states, without any one becoming permanently dominant. Nebuchadnezzar, the son of the mutinous Assyrian governor, who had secured the Babylonian throne, governed the largest extent of territory in the East for forty years; and the twenty-sixth dynasty in Egypt revived much of the glory of a thousand years before. East of the Halys, Media, after its share in the downfall of Assyria, slumbered under a king whose long reign was one of peace, and an entire generation of Medes grew up without knowledge of war. At this period of the world's history inaction prefaced destruction; and Cyrus, the Persian vassal of the Median king, taking advantage of his opportunity, rebelled, and conquered in turn Media, Lydia, and Babylonia (538 B. C.); his son Cambyses conquered Egypt and Ethiopia; and Darius, his successor, completed the union of the great empire of the Persians (519 B. C.). The Greeks alone were unconquered, — the Greeks, who were planting their colonies along all the seacoast of the Mediterranean, who were imbued with a spirit of independence which seemed invincible, and who were developing an intellectual ascendency such as the world had never known. Henceforth the struggle was between Asia and Europe.

Cambyses, returning from Egypt with Darius, having seen the great halls of Thebes, brought with him a colony of Egyptian artisans and workmen, and began to erect buildings at Passargardæ. Before this period, as has been mentioned, the architecture of Assyria was one of brick, with stone used as a veneer only, and without the use of columns; but with the advent of Egyptian ideas began the use of stone construction and of columnar forms and columned halls. The palaces of the kings had the great terraced platforms of previous Assyrian work, and the convex character of the sculpture, and the voluted and scrolled lines of that work, were retained; but the pose of the figures and many of the units of decoration were distinctively Egyptian. Darius and Xerxes, his successor, built during the fifth and fourth centuries B. C. at Persepolis and Susa. The buildings were of stone, with central square halls filled with columns at regular intervals, carrying a heavily beamed flat roof of wood, the beams often plated with gold. The columns had many flutes, were long and slender, ten or twelve diameters in height, and had two types of capital, — one a bell-cap with leaves falling downward from its base and with voluted forms above; the other a bracketed cap with bulls' heads and fore-quarters. This use of the bull as a supporting member, and the representations of subservient bulls attacked by lions on the walls of the palaces, probably symbolized the conquest and subjugation of Assyria. The halls had a portico at the entrance, a detail adopted later by the Greeks, and occasionally porticos upon the sides. Upon the roofs were a prayer platform and an altar. The processional character of the sculptures was even more pronounced than with the Egyptians, and quite as prevalent as with the Greeks, the human figure being used as a unit of decoration, and repeated at regular intervals. The value of regular repetition in producing the effect of unity and stability is always recognized in Eastern art.

CHAPTER III. — GREECE.

WITH the art of Greece begins the history of the art of to-day; for whatever multiple types may have arisen, whatever styles may have developed and declined, through all can be traced the influence, more or less intense, of the marvellous subtlety and skill of the Greek. Even the Gothic, which seems so far removed, is affected by the same spirit. For the art of Greece is the epitome of all art, — it is the highest exponent of the laws that must govern both visual and intellectual sense of beauty. Previously, art has been symbolic or narrative; with Greece it becomes for the first time purely æsthetic. The feeling for line, for color, for form, grows so keen that the refinement of perception is often apparent only after careful study. The Greek never rests until he has refined whatever he touches to its utmost, and produced a result that it is impossible to improve. He has the good fortune, however, to be free from the embarrassment of many precedents that encumber the development of later art; the forms upon which he concentrates his energy, whether architectural or decorative, are comparatively few in number, and their use is by religious dictate absolutely determined. Religious observances are most carefully defined, and each has its set of hieratic forms peculiarly its own; and any change of the use of these forms is religious heresy, and to be severely punished. The Greek, therefore, very early in his history is bound hand and foot as far as the variety of large motives is concerned, and his entire energy is turned toward carrying to perfection the few types he has chosen. These very limitations prevent the artistic concentration from becoming diffuse, and leave it possible for each generation of Greek artists to have no other resource than to attempt to improve upon the work that has gone before. Their achievement is a constant lesson to the modern, with his desire for new motives before the old ones have been skilfully developed.

The great Aryan migration from the East, which is evidenced by the similarity of the Indo-European languages, divided in Asia Minor into three groups. One group settled in Phrygia, and remained there. A second, the Pelasgians, occupied the coasts of Asia Minor, and eventually the peninsular portion of Greece. The third, the Hellenes, crossed the Hellespont, and occupied Macedonia, from which they later descended into the peninsula, drove out or reduced to servitude the Pelasgians, and became the nucleus of the Greek nation. The Pelasgians and Hellenes are of the same race, the Pelasgians appearing earlier in history. To them belongs the crude art found by Dr. Schliemann at Hissarlik or Troy, the decoration of this period belonging more to the prehistoric type than to the historic. At Mykenæ, in Greece, however, there is found work of a later date and of individual character, — largely work of gold, copper, and bronze, with the feeling for roundness of curve that would indicate Eastern influence. The gold is for the most part repoussé work, — stamped plaques, overlapping leaves to be sewn on to garments like scales, and golden studs to decorate objects of gold and leather, such as sword scabbards. These studs have what is in a way a unique kind of pattern, — a design composed of a meandering ribbon carried around little circular bosses. Concentric circles are also used; and there are designs with the foliage of aquatic plants, marine animals such as the octopus, medusæ, and starfish, all having a local and individual character. These designs probably belong to the twelfth century B. C., before the Assyrian and Phœnician arts began to influence the Greek. Greece was always in direct communication with Asia Minor and Egypt, and the maritime Phœnicians established trading posts all along her shores. It is a perceptible fact that seaports which harbor colonies from foreign nations are much more influenced by the art of those nations than are cities along caravan routes, and Greece was a nation of seaport towns. The Phœnicians brought the influence of a mixture of styles, partly Assyrian and partly Egyptian. The Egyptian influence is most marked in the

character of the early sculpture, but Assyrian motives passed directly from the enamelled brick of Assyria to the painted vases of Greece. Such are the palmleaf and the rosette. From the East also is borrowed the idea of winged figures, — of griffs and chimeras and the processions of animals or humans upon the vases. The treatment of zones on the early Greek vases is descended from the superimposed friezes of the East. But the Greek soon assimilates this heterogeneous mass of material, and imbues it with an individual character of his own. Up to the seventh century B. C. the work is largely in metals.

The fact that the Greeks colored their architecture and their sculpture is now everywhere acknowledged; but in regard to the extent to which the color was used there is still discussion. It seems well determined, however, that the earlier archaic work was more liberally and crudely colored than the later work, and that the same refining influence that was manifest in the development of architectural and sculptural forms also acted upon color and its use. The earlier temples of roughly cut stone are covered with a coating of stucco to obtain fine forms and a light surface to color upon. In the time of Pisistratus the columns seem to have been colored a pale yellow; upon the echinus of the capitals is found a trace of painted palmleaves somewhat like those of Egypt. The architrave at Ægina is painted a uniform red as a background for the golden shields, and in other cases the same surface has been found with traces of blue and green. The triglyphs have their channels painted blue, and the metopes have backgrounds to the sculpture of red and occasionally of blue. The background of the pediment is usually blue, and the mouldings have red-and-green and red-and-blue leaves, while the terra-cotta gutters, acroteria, and antefixæ are colored in red, white, and black. The scheme of color seems to have been one of a contrast of broad masses with delicate or subdivided detail. The colors are not graded, but each is full and clear and even in the space it occupies, and is sharply outlined either by the contrasting ground upon which it is placed or by black or white. They are contrasted with great skill, and the primaries red, blue, and yellow are more frequently used than the other colors; green comes next in order, and then a number of purple tones. This applies only to the Doric temples, which have no sculptured mouldings, and upon which the decoration is entirely in flat masses. When marble is substituted for stone and stucco, it is tinted with saffron and milk, and the coloring becomes less in proportion to the ground upon which it is placed and is greatly refined.

By 700 B. C. the Greek had mastered the technique of the arts, especially of working in metals and the art of soldering, which had been discovered; but the work in the Greek islands of the Cyclades, especially at Samos, was in advance of that on the mainland. By the fortieth Olympiad (about 620 B. C.) the architectural orders were formed, and the wooden images of the gods overlaid with bronze and gold plates were succeeded by statues of marble.

The Dorian invasion of the Peloponnesus and the subsequent ascendency gained by the Dorians and the Ionians over the remainder of the Greek tribes gave an impetus to Greek art which carried it within two hundred years to that wonderful height which has never been approached by the art of other nationalities. The varied causes which united to produce such a result would naturally be a study in themselves, but a few of the principal ones can be summed up in a few words, — an intense activity and keenness of mind, induced by an invigorating climate, by the alertness necessitated by the life of either a mountaineer or of a mariner, by the constant interchange of both commerce and hostilities with foreign nations, by mutual jealousies, and consequently by mutual ambitions. With the Greek it was indeed a truth that "eternal vigilance was the price of safety;" and the same acumen for which he was and is noted as a trader was, under the more concentrative conditions of the past, equally prominent in his literature and art. Acting in connection with this mental sensitiveness is the absolute dogmatism and tyranny of the forms of the Greek religion, already spoken of, which formulates every action and expression, and in consequence concentrates effort upon a limited number of objects, causing a constant refining and perfecting along carefully defined lines. With the Greek, up to the time of the Macedonian conquest, the house and the palace are as nothing compared to the temple, upon which all skill and thought and wealth are lavished; and the temple has one universal plan, varied in minor details only. This consists of a central rectangular hall, or cella, simple as at Sunium, filled with columns like a Persian hall as at Eleusis, with attached columns on the sides as at Bassæ, or with the more usual double row of columns forming a central aisle as at Corinth or in the Parthenon. The cella is often divided into two parts by a cross wall. It is roofed with a pitched roof, and lighted through the roof. The exterior of the temple has columns at either end, and often along the sides. The roof forms two low gables, or pediments, at the ends. This entire construction is manifestly derived from wooden cabins, the columns representing the wooden posts supporting beams, which in their turn carried the roof rafters.

According to M. Chipiez, there are five types of temples: 1. Temples of metal, probably faced with metal only, — a type that would be derived from Eastern sources; 2. Wooden temples, merely enlarged cabins, the choice of material being forced by the poverty of the cities; 3. Temples of metal below and wood above in the roof; 4. Cave temples; 5. The temple of stone. These temples are designed in three orders of architecture, devised and brought to perfection by the Greek, — the Doric, the Ionic, and the Corinthian. Of these, the Doric appears about the seventh century B. C. simultaneously in all the Dorian possessions in Greece, Sicily, and Italy; for by this time the Greek has largely taken the place of the Phœnician, and has colonies along the entire length of the Mediterranean seaboard. The Ionic appears first in the Ionian colonies of Asia Minor, at Ephesus, about 580 B. C. The Corinthian order, principally differentiated from the Ionic by its capital, owes this capital to a design for capitals in metal for isolated monumental columns, which columns were so liked by the Greeks that they made an order of them, and used them first as an interior order at Tegra, 396 B. C., and as an exterior order in the Choragic monument of Lysicrates, 335 B. C. The characteristics of the orders can be rapidly summed up: —

Common to all:	Column	Shaft with flutes.
		Capital.
		Entasis to column.
		Epistyle.
	Entablature	Frieze.
		Cornice.

DORIC. — Stylobate, or sub-base of steps, with column resting directly upon it.

COLUMN. — No base to column. Shaft, with twenty flutings with sharp arrises, has entasis or swelling of column. Cushion or echinus capital, with heavy square abacus above.

ENTABLATURE.

Architrave, or *epistyle*, in most cases plain (exception at Assos), with single stone from column to column. Flat moulding above (*the tænia*) separating epistyle from frieze.

Frieze divided by triglyphs, representing end of cross beams, one above each column. These triglyphs have two full upright channels on face of each, and a half one at each side. Spaces between triglyphs originally left open, but afterward filled with slabs of stone, which are sculptured and decorated.

Cornice projects beyond members below, has a curved moulding at top (*the cyma*), and flat perpendicular surface below (*the corona*), under which are a set of flat corbels probably representing the ends of the roof-rafters, with small rows of truncated cones representing the bolt-heads by which the bronze plates on previous work were fastened.

The height of the Doric column is from four to five and a half times its own diameter at the base, the order constantly growing slighter in its proportions. The entablature diminishes in width as the column grows more slender. The echinus of the capital becomes more and more upright, and the curve becomes firmer.

The Doric order reaches its best expression during the fifth century B. C. in the Parthenon at Athens. In the fourth century the Ionic becomes more popular, and in Ionia the Doric is proscribed by the architects from national jealousy.

IONIC. — Stylobate.

COLUMN. — With moulded base. Flutes on shaft without sharp arrises, but with small space between each flute. Capital with volutes, derived from Oriental motives. Echinus very small, and decorated with egg and dart. Thin abacus. Occasionally a necking. Occasionally base of shaft ornamented with sculpture, as at Ephesus. Variations of capital: (1) When horns of volute are connected by depressed curved line, — this is the best type, — as in the Nike Apteros temple at Athens ; (2) When this line is an elevated curve, as at Phigalia ; (3) When this line is straight, as is usual in Asia Minor.

ENTABLATURE.

Epistyle divided into three faces, separated from frieze by decorated ogee moulding.

Frieze continuous, plain or sculptured.

Cornice without mutules, but with vigorous set of mouldings below corona forming bedmould, these mouldings occasionally consisting of a dentil course and egg and dart courses.

The Ionic order has a pilaster to correspond with the cap, which consists of a necking with double moulding of egg and dart and leaf and dart above it. There is a second pilaster cap with slight volutes at each end and sculpture between. The Ionic column with a Doric entablature is used in the Empedocles Temple at Selinunte.

Height of Ionic columns, seven to ten diameters.

CORINTHIAN.

COLUMN. — Principal difference from Ionic is in the capital, which is a bell-cap supporting an abacus with four concave sides, the corners of which are supported by diagonally placed small volutes, the bell of cap being covered by a double row of acanthus leaves, eight in each row, placed alternately with the central leaf of the upper row on the axis of column, and the leaf on the diagonal axis under the volute. Heavier base than Ionic in proportion to diameter of column. There are several varieties of the Corinthian cap, — those of the Choragic monument of Lysicrates, the so-called Tower of the Winds at Athens, and the Temple of Jupiter Olympus at Athens presenting the greatest differences.

ENTABLATURE. — Principal difference in Greek Corinthian from Ionic is a heavier bedmould and lighter corona and richer development.

Height of column, about ten diameters.

The temples, which were classified according to the disposition of the columns upon the exterior and the distance apart of those columns on centres, had the sculpture confined to the metopes, the friezes, and the pediments ; the decoration was applied to the mouldings, the capitals, and to the terminations of the ridge tiles and the apex and ends of the pediments. Shields of gold are hung along the architraves. The gutters are decorated with lions' heads as spouts. The ornament on the ends of the pediment, which is known as an acroterium, is either half a palmet or a griffin. The apex of the pediment, which is decorated, has usually a motive derived from the palmet, with perhaps supporting figures on either side as at Ægina, or a disk of concentric circles as in the Heraion at Olympia. The decorative units are but few, and as in Egypt the lotus and papyrus are at the root of nearly all the decorative work, so with the Greek the acanthus and the anthemion are the universal motive ideas. Both have the same principle in their composition, — the principle of the divergence of radial lines from a common centre and their termination by an elliptical or circular form. The anthemion, which at its simplest is a delicate form of palmet of three varieties, later develops the individual units of the palmet and converts them into more compound units, such as acanthus and other leaves, so that the palmet becomes as an anthemion a compound acanthus motive subject to the laws of divergence of the simplest radial form. The acanthus, which is sculptured and rarely if ever painted, has at first sharp angular and but slightly divided lobes and later develops into two distinct types, — one where the outlines of the lobes are markedly concave, and the other the olive acanthus, where they are convex. The Greek acanthus is usually full-faced and not quartering or seen from the side. Its lobes lap both over and under, but never both on the same leaf ; the eyes are deeply cut, the ribs carried down from the eyes sharply defined, the cuttings of the leaf hollow and not convex, but like so many narrowing flutes with sharp arrises carried to the very base of the leaf and spreading slightly at the base. The central stem of the leaf is very firm, and the tip of the leaf rolls over with a vigorous, elastic curve. With the acanthus is used the scroll, much more delicate than heretofore, and with long lines between the coils.

The guilloche, which begins to make its appearance in Persia, is developed. The scale patterns of overlapping leaves or scales are frequently used, usually of the laurel leaf. The vine makes its appearance again. Garlands of leaves and fruit are sculptured about the altars ; the heads of animals are made centres of ornament. All the successive forms of sacrificial worship are utilized as decorative motives. Serpents are used occasionally, — usually as emblems of Æsculapius. The attributes of the gods are more and more used as the art becomes more developed, and a symbolism which is, however, always secondary to the æsthetic idea, begins to become manifest. The same motives of ornament are applied indiscriminately to all materials, but not to all objects, each set of objects having its own class of decoration to a great extent prescribed by the religion. It is upon the coins, perhaps, that the greatest freedom of idea is to be found, as these were untrammelled by restrictions.

The polychromy of the Greeks is one of sharp contrasts in quantities of excellent proportions. In the terra-cotta work the coloring is along the outlines of the moulded forms, and in the centres of the lobes of the palmets, etc., leaving the ground of the material to form an outline color around the pigment. When the pure white of the marble begins to be used, the colored designs placed upon it as a background are much more delicately used than in the previous work, and with the sculptured mouldings of the Ionic order the scheme of application of the color changes completely. It is no longer used in broad masses, but only to accentuate the carving, and appears as outlining and as centre lining of the scrolls, palmets, and other decorative units. Gold begins to appear in the ceilings and in the scrolls and eyes of the volutes. Red and blue are principally used with the Ionic order. The ornament that was painted in the Doric is carved in the Ionic, and painted decoration largely disappears. In the Corinthian order there is still less color used than in the Ionic, but more advantage is taken of combinations of material, such as the use of marble and bronze and gold. The capitals are frequently of bronze, and, alike with the Doric and Ionic, shields, helmets, and all instruments of metal are made in bronze and fastened to the marble. The use of different-colored marbles for columns, etc., does not, however, appear in the Greek work. The beams of stone across the ceiling of the peristyle divide it into square, deeply sunk panels, or caissons, with rich mouldings carried around the inner edges, and with frets upon the surface of the beams ; and these form the prototypes for a long series of caissoned ceilings, developed to their utmost under the Renaissance. The arch, though used occasionally in construction by the Greeks, does not become an architectural motive. Mosaic is found in quite early work, at first of pebbles of different colors and afterward of small tesseræ of colored marbles. The ornament is usually very conventional ; there is much more ground than ornament, and this ground is usually white. The mosaic is confined to the floors, and has a strong border to separate it from the walls. The colors are white, black, red, and a dull yellow. There is no glass mosaic.

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C. HOWARD WALKER.

[*To be continued.*]