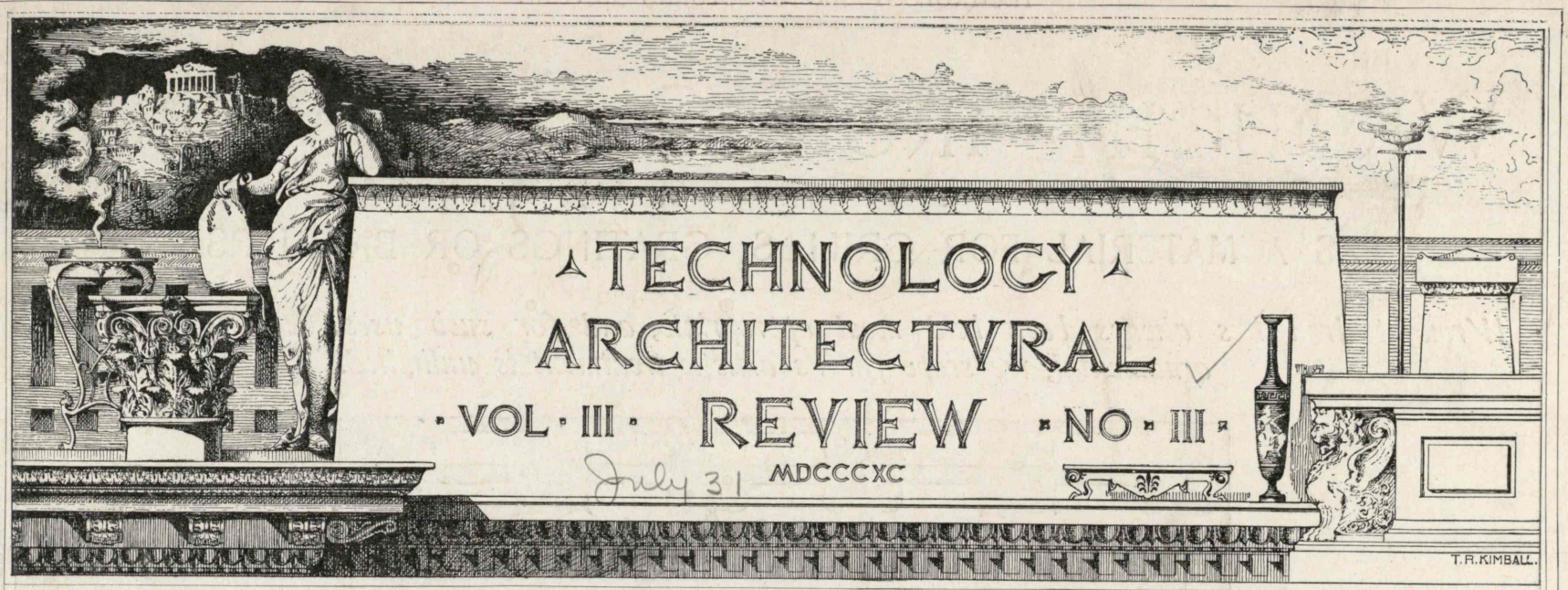

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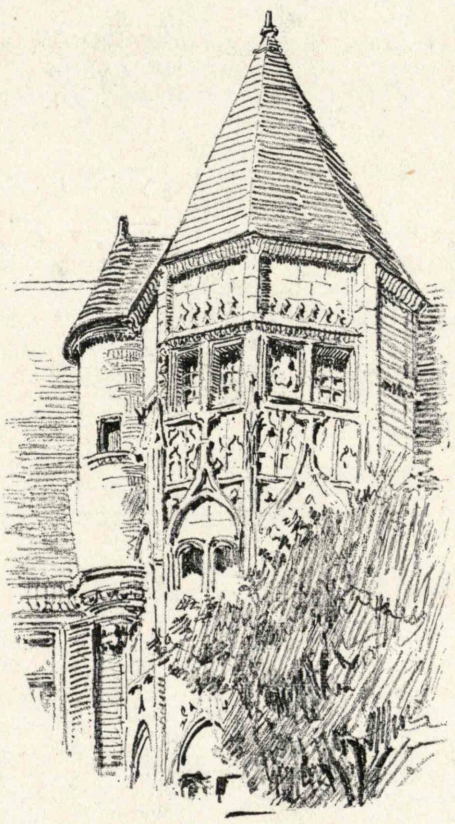

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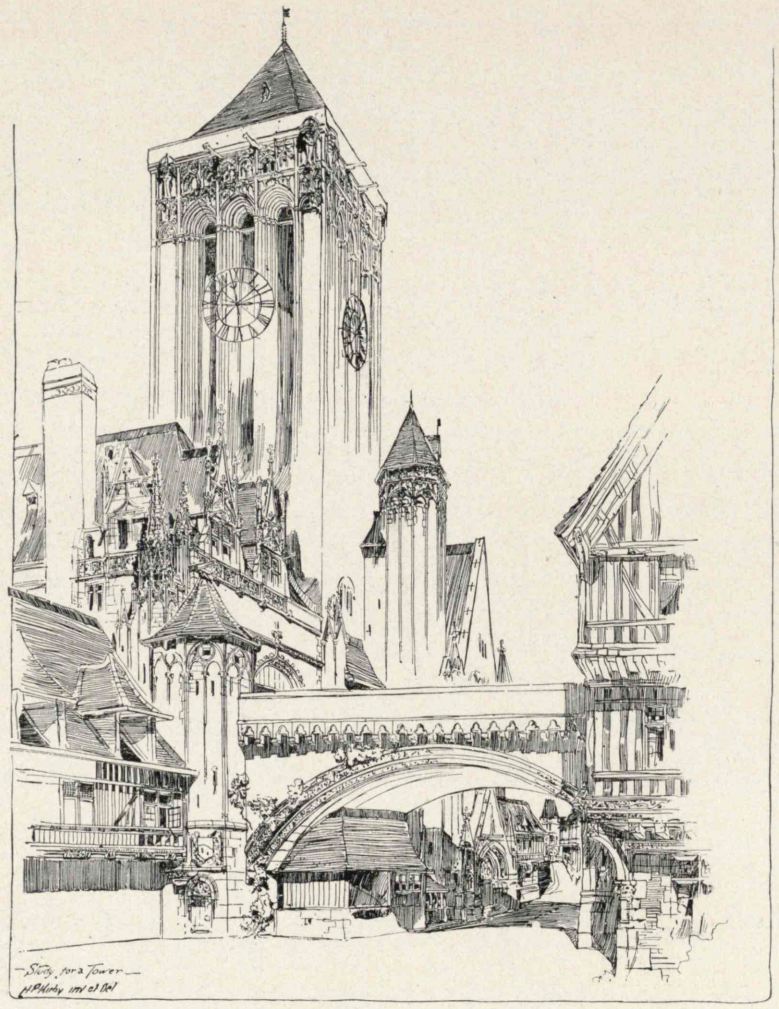

The publishers of the TECHNOLOGY ARCHITECTURAL REVIEW *announce that they have in preparation for early publication a portfolio of drawings by Mr.* HENRY P. KIRBY, *of New York.*

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ORIGIN OF THE DORIC STYLE.

BY WILHELM DÖRPFELD,

First Secretary of the Imperial German Archæological Institute at Athens.

TRANSLATED BY EDWARD ROBINSON.

(Continued from Vol. III, No. 2.)

Let us try now to reconstruct the type of an ancient brick and wood building, as it would have appeared before the time of the stone Doric temple. A naos (cella), surrounded by walls of sun-dried brick, is provided with a special pronaos upon one side. The bricks rest upon a foundation of stone. The pronaos, shaped like a *templum in antis*, has on both sides two short brick walls, which end on the front in wooden antæ. Between the antæ stand two wooden columns, which rest either upon stone bases or upon a stone threshold. From anta to anta a wooden architrave is laid over both columns. This architrave does not encircle the building, but on the brick walls is replaced by a plank, which answers perfectly as a support for the beams of the ceiling. These beams reach from wall to wall, and use the entire thickness of the walls as rests. Their ends, which are visible, are covered, and form the triglyphs. The roof was originally horizontal, and, for the protection of the walls, projected equally on all four sides. This explains the fact that the corona [of a Doric temple] is carried horizontally around all sides. The covering of the roof was made of clay, and presumably in the same manner as is customary in the Orient to-day. It was the invention of terra-cotta roof-tiles that first made the construction of a sloping roof possible, and with it the arrangement of the two pediments. The buildings of Troy and Tiryns had horizontal clay roofs.

When a building of this type had a peripteral colonnade, the columns, of wood, were erected upon stone steps, and supported a continuous wooden architrave. In this case the beams of the cella ceiling were not cut off on the outer face of the wall, but extended across the passage to the outer architrave. In the same way the horizontal roof was carried across the colonnade, and formed, above the triglyph-frieze, a heavily projecting and sheltering corona.

To restore the proportions of such a building, let us start again from the simple *templum in antis*, and assume figures which have been determined for the individual measurements. Supposing that the cella is from twenty feet to twenty-six feet wide inside, then, from the analogy of the Trojan buildings, we must take at least four feet one inch as the thickness of the walls. In this case the height of the columns would never exceed sixteen feet four inches, and would generally be much less. As to the façade, the two wooden antæ of the pronaos have the same breadth as the walls, that is, four feet one inch, and are at most sixteen feet four inches high. Under the most favorable conditions, therefore, the relation of breadth to height would have been 1:4. This gives, however, very squat proportions. To be sure, the artistic sense of the early Greeks would not have been so far developed that they would have given the same solid proportions to the wooden columns that stood between the two antæ, yet it is perfectly obvious that the effect would have been very disagreeable were thin, slender columns placed between such massive pilasters; and we may presume that the thick clay wall, with its antæ, led to the construction of heavier columns than the nature of wood demanded. The same is true of the epistyle. A light architrave could not well be laid on the broad heavy antæ; its dimensions must correspond, at least in some degree, to its supports. But there was still another reason for selecting the thickest possible beam for the architrave. The architrave had to carry the large ceiling beams, and these again had to be very strong in order to support the extremely heavy clay roof. Those who have had the opportunity to see, in the East, a clay roof of this kind will certainly have noticed the powerful wooden beams in the rooms, which, in spite of their size, are often considerably bent. To hold the layer of clay, which averaged about one foot in thickness, thick planks and stout beams were necessary, and the latter required for their support a heavy architrave.

It has sometimes been doubted that there existed in ancient Greece timber massive enough to furnish columns and beams of great thickness; but since the inscription describing the arsenal of Philon [in the Peiraieus] has been discovered, and we learn from it that even in the fourth century B. C. wooden beams, twenty-nine inches thick, were used in places where beams one-third the size would have been quite sufficient, there is no further ground for these doubts.

From the buildings just described, of sun-dried brick and wood, I believe the Doric style to have been evolved. The wooden members led to the formation of the characteristic elements of the style, in somewhat the manner described by Vitruvius. With these, however, the thick clay walls and the heavy roof had the effect of making the proportions heavier and more solid than they would have been in a purely wooden construction.

The objection may be raised that if the stone Doric temple was really developed from a building of clay and wood, at least the foundations or the stone base of one such temple must have been preserved in Greece, especially as the number of them could have

been by no means small. In fact, the excavations of recent years have given us one building of this class,—a peripteral temple, the foundation of which was of stone, its columns and antæ of wood, and its walls of clay bricks,—namely, the temple of Hera, at Olympia.

Unfortunately there exists as yet no complete description of this primeval and, for the history of Doric architecture, most important edifice, to which I might refer the reader. The preliminary publications contain only short accounts of this temple, and the final work on the discoveries of Olympia has not yet appeared. I must therefore make note, in a few words, of the points which are of importance to us. The temple of Hera consists, as is well known, of a long cella, with a pronaos and opisthodomos, and is surrounded by a colonnade. There are still preserved, *in situ*, the outer stylobate with a few drums of most of the columns, the wall of the cella, pronaos and opisthodomos to a height of about three feet, one drum of each of the two columns of the pronaos, and the stylobates of the interior columns. There are wanting, therefore, the entire outer entablature, the columns of the cella and opisthodomos, the upper part of the cella wall and the whole ceiling. The columns still extant differ from one another greatly, not only in diameter and shape, but also in material and in technical peculiarities. They must have been erected, therefore, one after another, in the course of centuries, as the earlier columns gave out. In the time of Pausanias (second century after Christ), one of these earlier columns, of wood, was still standing in the opisthodomos. Hence we may conclude, without hesitation, that originally all the columns were of wood. During the excavations not a stone was found of either epistyle, triglyph-frieze, or corona; and inasmuch as of all the other edifices at Olympia, ruined as they are, the building materials have been found in abundance, we are justified in assuming that the entire outer entablature of this temple was of wood, and remained so until its destruction.

For the same reason the ceilings both of the cella and the colonnades must have been of wood. The large beams extended, as we can see from the axial line of the inner and outer supports, from one side, across the cella, to the columns of the other, and were doubtless characterized by triglyphs on the ends.

When the temple was excavated, we found, above the base of the wall, which consisted of large blocks of stone, a Byzantine wall constructed of pedestals of statues, blocks of *poros*, and lime. We wondered at the time why the Byzantines should have torn down all the upper part of the temple wall, and taken the trouble to build a new one on the same foundation. Could the upper part of the wall have been built of some perishable material, which was no longer serviceable when the Byzantines wanted to make use of the temple? As a matter of fact it can be proved, from indisputable technical indications which I cannot enumerate here, that no course of stone could have been laid above the extant base. Of what material, then, did the upper part of the wall consist? Of wood? The thickness of the wall forbids that, for a wooden wall is not made three feet eleven inches thick. Of baked bricks? If so, we cannot understand why the Byzantines did not leave at least a part of the wall standing, and also why they did not employ some of the bricks in building their new wall. It must, therefore, have been of sun-dried bricks. The thickness of the walls is well adapted for these; and they must, moreover, have fallen apart and become disintegrated when the roof of the temple was destroyed; so that their material was not fit for use in the new structure. These facts alone would enable us to believe in the employment of sun-dried bricks on the temple of Hera, but fortunately there is a more definite—in fact, positive—proof of their presence.

In excavating this temple, a layer of greenish-yellow clay, about a yard thick, was found both inside the building and around it, upon which the so-called Slav walls stood. At the time we thought that this stratum, which was found nowhere else in the excavations, was due to a landslide from the neighboring Kronos hill. But I have satisfied myself, by examination on the spot, that a landslide from that hill would never have buried the temple of Hera alone, and that therefore we must explain the presence of this bed of clay in some other manner. It is clear now, that it must have come from the bricks of which the cella wall was built. So long as the roof of the temple lasted, they were preserved through centuries. But as soon as the roof was destroyed, and the rain could reach them, they were disintegrated rapidly, and buried the whole temple to the depth of about a yard. Thus it was the clay bricks which preserved for us the Hermes of Praxiteles, as it lay upon the temple floor.

The cella wall, then, was built of blocks of *poros* in the lower part, and sun-dried bricks above. The ends of the wall, in both pronaos and opisthodomos, were covered with wooden antæ, and the door-frames were also of wood, as can still be clearly determined. The temple of Hera at Olympia, therefore, is one of those buildings which preceded stone Doric architecture, and in which the Doric style was developed. It confirms brilliantly the thesis which we have been arguing, that sun-dried brick, as well as wood, was influential in the development of the Doric style.

EDWARD ROBINSON.

DEPARTMENT OF ARCHITECTURE.

MONTHLY PROBLEMS.

THIRD YEAR REGULARS AND SECOND YEAR SPECIALS.

A LOGGIA ERECTED AS A MEMORIAL TO A SCULPTOR.

PLATE X.

PROGRAMME: The loggia is assumed to be placed against the boundary wall of a public garden, on the axis of an avenue or path, as the termination of a vista. It is to be upon a terrace of approximate size, and is to have approaches, staircases, balustrades, and seats from which the views, which are supposed to be fine, can be seen. The loggia is to be open at each end, but can, if desired, have a balustrade between its piers on its long side.

It is to be eighty feet in length, and twenty-five feet in width. The rear wall is to be devoted to sculpture, either in niches or as bas-relief; and groups of sculpture can be used within the openings, between the piers or columns, or on the face of the piers, or upon the posts of the balustrade above the cornice, if such a balustrade is used. The roof may be flat or pitched, as desired.

Material, light-colored stone; no split or rock-faced stone to be used.

Refer to Letarouilly,—Edifices de Rome Moderne. Famin,—L'Architecture Toscane. Parallels: Loggia dei Lanzi, Florence; Loggia del Papa, Siena.

C. HOWARD WALKER.

JUDGMENT.

First Mention, ... EDGAR V. SEELER,
Second Mention, ... JOS. A. MEYER, JR.

CRITICISM.

Such a problem as the loggia has two prominent requirements, a building open at the sides and covered above. It is, therefore, essential to support it at intervals sufficiently wide to allow of getting a view of the contents of the loggia. The contents are the chief object, the covering is subordinate, and should be treated as an appropriate setting of a jewel.

The building, however, has, as a whole, a further object. It is to be a feature in the landscape, and with its approaches, steps and balustrades, is to form a fitting termination to a chief avenue. It is chiefly on this account that No. 1 seems more appropriate than No. 2, as the roof, one of its essential

features, is not masked, and so adds to the vital truth and interest of the building; and there is, also, more thought shown in the arrangement of its platform and the approaches, the long wall behind it giving width to the design, as a whole, and a sense of being a part of some larger scheme,— a feeling which always adds dignity to a design.

The double columns, in No. 1, are preferable to the square columns of No. 2, in that the archivolts are thus less crowded; but this tends to a slight appearance of weakness, which is, perhaps, permissible in the comparatively light structure and roof of the first design.

Both designs show a very commendable reserve, and an evident desire to follow good models, rather than to aim at originality.

R. Clipston Sturgis, *Critic*.

A Crematory. Plates XI, XII, and XIII.

Programme: The building is to be one story, with basement, and to consist of a large mortuary chapel, with four smaller chapels for private services; a receiving room; two rooms for the administration; a columbarium or room for funeral urns; the furnace room, containing one furnace, which can be shown on the plan as a rectangle of seven by twelve feet. Material, stone.

The following explanation of the different rooms may make the requirements of the problem a little clearer:

The Large Chapel.—The main chapel is for services to be held upon the arrival of the usual-sized funeral: i. e., it should accommodate about two hundred people, or be approximately two thousand square feet in area. The service in the chapel would often be a choral service.

The Small Chapels (about fifteen by eighteen feet).—The four small chapels are to meet the following contingencies: First— small services, where but twelve to twenty people are present; second — masses for souls of the dead; third — these chapels can be reserved for private individuals. It is not likely that services in these chapels will be carried on at the same time, as in the large chapel; but masses can be carried on while service is being held in the large chapel, and the existence of the small chapels would expedite matters when several services came at about the same time. The small chapels should be entered without passing through the large chapel; and, if desired, they can be entered from an exterior colonnade or arcade. They should, however, open into the main chapel, in some way, so that they may form a part of it.

The Receiving Room.—The receiving room is to be used to receive bodies before services, and keep them until the services, which may sometimes be for several days. The bodies will be taken from this room into the chapels for the services. The receiving room should be near the administration rooms, and should have an outside entrance.

Administration.—The administration rooms are to keep records only, and consist of a small office and a bed room for the watchman. The rooms are unimportant, and only need to be conveniently placed.

Furnace Room, etc.—The room to which the body is taken after the service, and from which it is taken down into the furnace room, — or else forming an ante-chamber to the furnace room, should be accessible from all the chapels,— and should accommodate some twenty persons.

The Columbarium.—The columbarium can be either in a separate room or rooms, in the aisles, in a cloister, or in the vestibule. In all cases the urns must be kept so as to be seen, but be out of reach.

C. Howard Walker.

JUDGMENT.

First Mention, ...	E. W. Donn, Jr.
Second Mention, ...	V. A. Wright.
Third Mention, ...	Jas. McA. Vance.

CRITICISM.

To consider, first, the plan of this building, we require a large chapel and certain small ones sufficiently lighted for services, and certain thoroughfares, namely, from the outside to the receiving room and recording room; from this room, to all or any of the chapels; from thence to the depositing room, and, finally, for general circulation, without interfering with the services; this last, especially, having easy approach from the outside, and connecting as directly as possible with the columbarium.

The special requirements of the case, beyond the points already noted, are the suitability of the chapels for their needs, and the convenient location of such accessory rooms as are needed for the administration and for the services of the chapels.

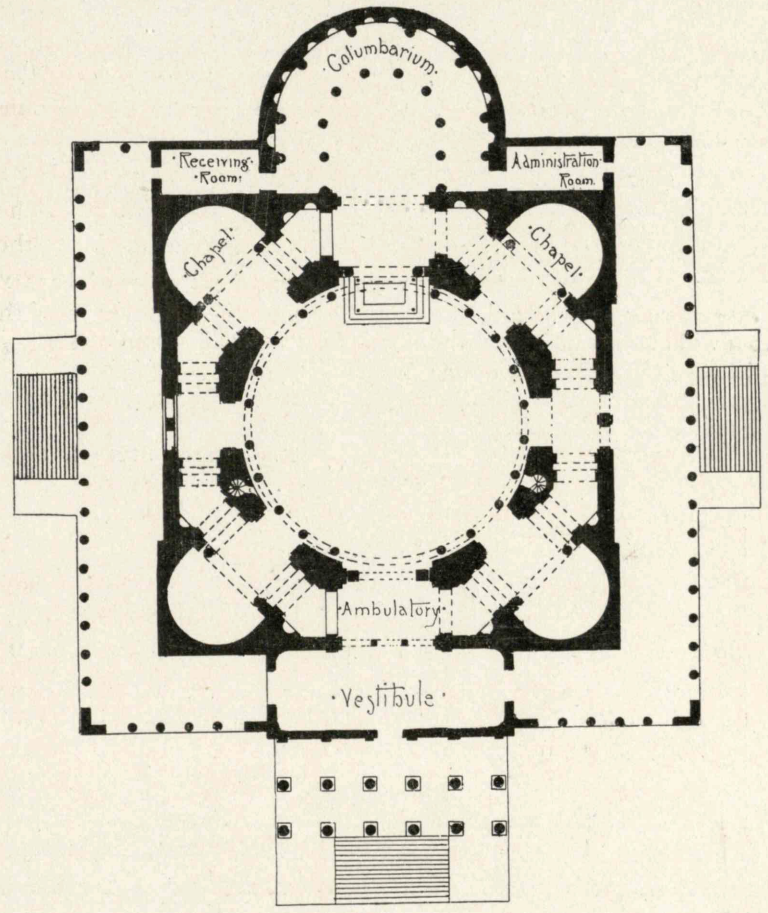
To take up these points in order:

The plans under consideration are all rather dimly lighted. To a certain extent, this is admissible, as in no burial service is much light needed.

No. 1 gives no indication of light in the small chapels, leaving us to infer top light for these and for the rest of the building, which, however, is not indicated on the elevation nor made clear by a section. Where direct light is easily accessible, and not objectionable, there is on excuse for refusing to perforate the walls for that purpose.

No. 2 has direct light for the side chapels, and properly placed well above the aisle; but the amount provided for the central chapel is meagre.

No. 3 has a superabundance of light in the small chapels, so low, however, as to be annoying, and to seriously interfere with the services. The light for the central portion of the building, drawn from these various side chapels and from the dome, would be sufficient.



PLAN OF No. 1.

As to thoroughfares, that to the receiving room is properly considered in all except No. 2, which gives the depositing room the outside entrance. This seems, however, like a draughting error; but neither in No. 1 nor No. 2 are the receiving rooms placed as called for, conveniently near the adminstration room, so that cremations can be recorded.

The thoroughfare from the receiving room to all or any of the chapels is best arranged in No. 2, which unites this with the ambulatory, and so saves room. No. 1 requires either an outside passage through its colonnade, to one of the main entrances or going through the columbarium, either of which is objectionabie.

No. 3 has no continuous passage without going through the central chapel. (It should be noted, however, that, as this plan is unlettered, there is some doubt as to the various uses of the rooms; and if what might be called the nave were used as the large chapel, and the crossing under the dome were the columbarium, this difficulty would be somewhat obviated).

The thoroughfare from the chapels to the depositing room is really considered only in No. 2.

Finally, No. 1 and No. 2 have good ambulatories, and all have ample entrances, indeed, a super-abundance,—making the building difficult to close or watch.

The details surrounding the entrances have received the most careful study in No. 2, where proper vestibules are provided (although unlighted), and a certain number of small rooms, which would be sure to find their proper use in a building of this importance.

In regard to the arrangement of the main chapel, one point, especially mentioned by Mr. Walker, has been overlooked entirely by No. 1 and No. 2, and only partly provided for by No. 3,—that is, the probability of choral services.

In 1 and 2 there is no choir, nor, indeed, anything appertaining to the services of either the Roman or Anglican Church, which churches are evidently intended to be provided for, as they alone use masses for the dead,—mentioned in the programme as part of the services in the small chapels.

No. 3 has a choir, but has it open at the sides, and with steps there approaching it; and the necessary vesting rooms for priests and choir are shown only in No. 2.

On the whole, then, as far as the plan is concerned, No. 2 has shown the most intelligent handling of the problem.

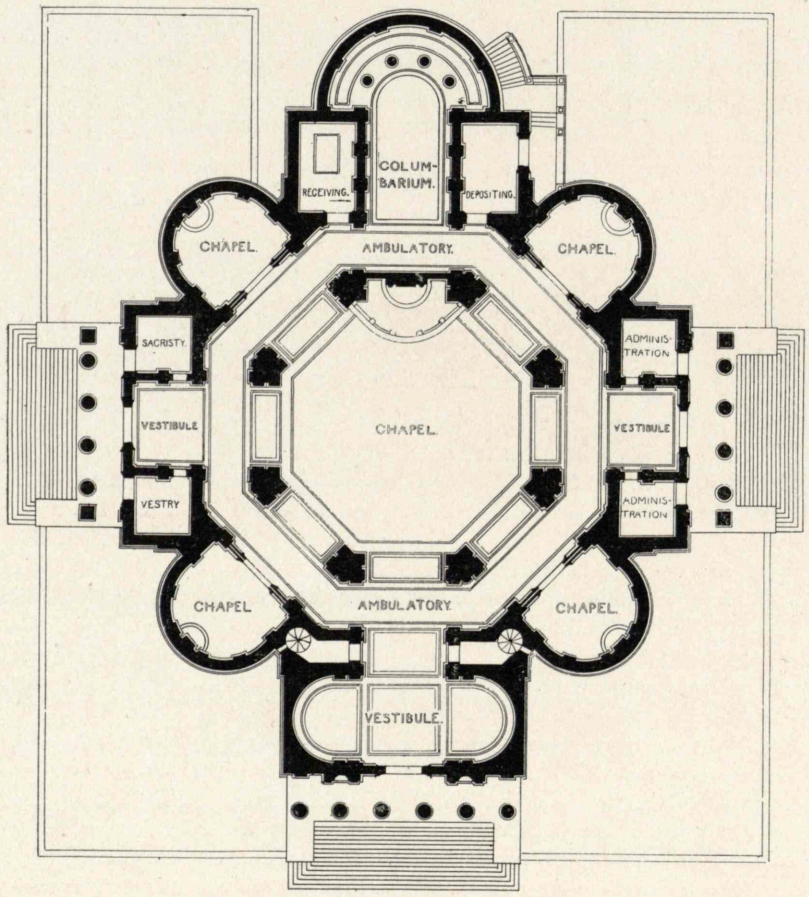
When we turn to the outside, we have no precedent, no association of ideas, by which to guide our design, as a Christian crematory is a thing of to-day only; but, as being a place of worship and religious ceremony, the building should rather give the impression of a church than of any other sort of public building.

In No. 1 great dignity is obtained by the colonnade, and much commendable reserve is shown in the quiet subordination of the other features. The proportions are good, especially the relation of the pedimented porch to the colonnade, and the semi-circular columbarium would break the monotony at the rear.

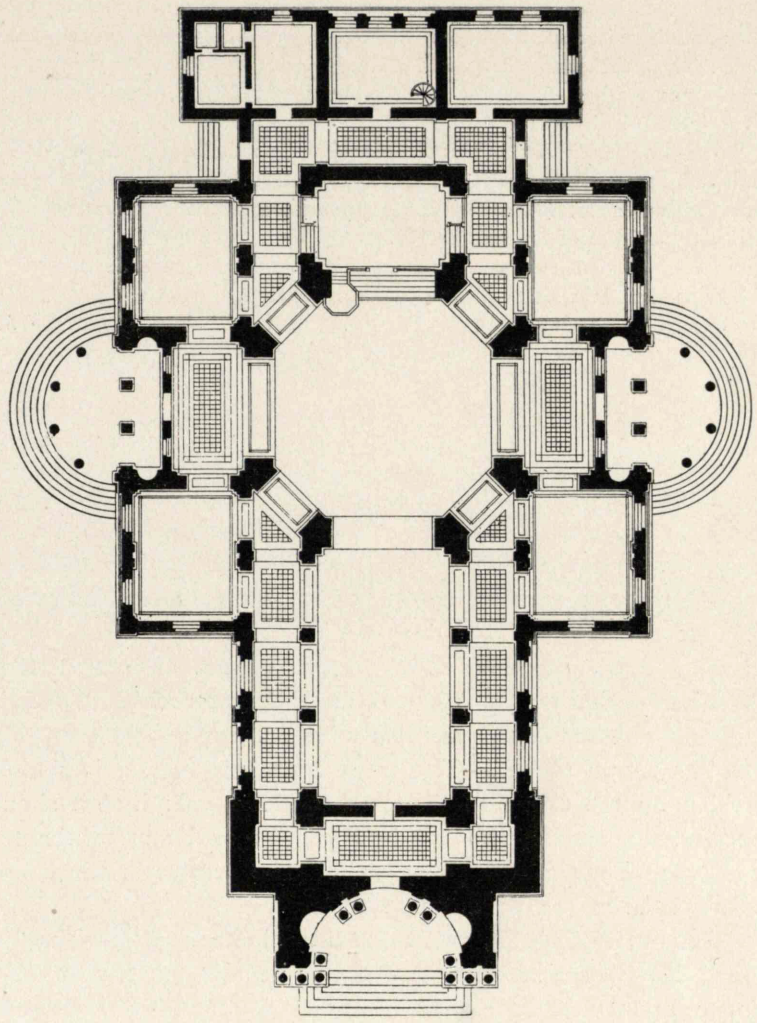
Both No. 2 and No. 3 have undue height for the size of the plan, and based, as they are, on the main chapel to accommodate 200, are too grand and elaborate. The lower part of No. 2 is very quiet and in good proportion, and shows the same thoughtful study as the plan, but the upper portion is heavy and cumbrous. A dome of such flat proportions should not be used as the central and one important feature of so large a building. (In No. 1 it is only accessory.) When used in conjunction with towers, and other such features, its use and appropriateness as a covering for an inner dome, make it permissible, but not otherwise.

No. 3 is very pleasing in many ways, the general proportion of the whole (which would probably be better rather than worse in perspective), and the grace and outline of the turrets, with their domes, make it above the average in interest. The larger dome is hardly so good, and could probably have stood a larger entablature and a slightly-greater rise, and would be improved by reducing the base of the cupola.

R. Clipston Sturgis, *Critic.*



PLAN OF No. 2.



PLAN OF No. 3.

A STUDY OF DECORATION.

(Continued from Vol. III, No. 2.)

ARABIC AND MOORISH.

From the time of Assyria, the *nuclei* of new developments of art moved gradually westward, and as each nation rose to power its influence was felt on the table lands of Central Asia, in successive waves which constantly grew weaker. Intercourse with Egypt, the rise of Cyrus, the Persian wars, the march of the Ten Thousand, the conquests of Alexander, the sway of the Romans and of the Byzantine Emperors, each had passed over this land and left its impress, and the art that had been individual became merely a reflection of slightly-felt influences from distant centers.

Craftmanship, under such conditions, especially when cities had dwindled to petty towns, and kingdoms to small districts under a satrap, had little stimulus, and devoted itself to small things, so that after the reign of the Persian Kings at Persepolis and Susa, there is little noble architecture or decoration to be found in Central Asia for some centuries. The art of Cambyses and of Cyrus was to a great extent a refined adaptation of Assyrian motives. Stone, which was obtained with great difficulty in Babylon and Nineveh, was plentiful upon the foothills of the mountains where the Persian monarchs built their cities; and with the use of stone came also the use of the column. The columns were slender and delicate, and placed comparatively far apart on centres, and the Persian palaces were the first of the slender-columned pavilions which are later so universal in the East. The capitals are bracketted with horses' and bulls' heads above a bell cap, and the bases are high and decorated with leaves growing downward. There are

occasional roll mouldings and guilloches. The beams and ceilings, and possibly the walls, were decorated with sheets of metal. Tiles are considerably developed, and their use as a covering to wall surfaces as well as to floors is begun. The palaces were built upon high platforms, approached by broad flights of steps, as in the earlier Assyrian work. The sculptures, especially the bas-reliefs, were kept low and flat. This method of keeping the face of the relief in a plane is peculiarly oriental; neither in Egypt, Assyria, nor in Persia, is the outline of a figure or piece of ornament sacrificed to the light and shade of the modelling, and this peculiarity has descended to all oriental work, and is one of the marked differences between it and the work of the West. Keeping modelled work down to a plane is like keeping coloring down to a monotone; harmony of result is assured, but at the cost of loss of contrast; all oriental sculpture, for this reason, needs to be picked out in color; its light and shade alone is not enough to preserve it from grayness. Greek artists soon shook off the mannerism of this oriental flatness of modelling, and Rome went to the other extreme and modelled the work over-much. It is pretty safe to assume that relief and color should complement each other; and in proportion as the one is diminished the other should be increased. However that may be, the fact exists that in Central Asia there was gradually developed an art, or perhaps better several phases of art, which suppressed relief ornament and glorified color. This art had already influenced Byzantine mosaics and Sassanian sculptures before it had an opportunity to attain distinction itself. The art of Greece and the art of Byzantium had each as its stimulus a religion. The art of the East required a similar motive. The religion of Christ seemed abstract and cold to the oriental; and when, in the seventh century, Mahomet announced himself as prophet, all the slumbering nations of the East awoke and flocked to his standard. Here, at last, was a romantic leader, and one who led with the sword. History repeats itself, and in the same way that Christian churches sprang up all over the western world under the protection of Constantine, so three hundred years later, Moslem mosques appeared throughout the East. Byzantium barred the gates of Europe, and the followers of the prophet swept westward along the coast of Africa to the Atlantic. It took but a short time to found Moslem dynasties, and the jealousies between Ommaiad and Fatimite and Abasside leaders were nearly as bitter as their hatred for the Christian.

The plans of the mosques are similar throughout. A large entrance court, with an imposing gate-way, the court surrounded often by a cloistered arcade, and the mosque itself a great columned and arcaded hall, consisting of a number of parallel aisles opening directly from the court. The ceilings in the early mosques were of heavy wooden beams, and the decoration was confined largely to bands or belts surrounding the openings, running along the top of a marble or tile dado, and forming a frieze around under the ceiling. The ornament had that peculiarity of all Mohammedan work, the absence of the portrayal of any natural form. There is a famous text in the Koran, that while it does not absolutely forbid the representation of natural form, states that any such portrayal is an attempt of man to rival Allah in creating, and consequently is irreverent, and this text has determined the character of all Mohammedan work. It must not be realistic; it must, therefore, be purely conventional, and in that fact lies its harmony and its charm. Ingenuity and skill, instead of being exercised in copying what is better in the original, has been devoted to elaborating and refining geometric motives and the harmonies, subtleties and intricacies of line and color. The result is decoration, pure and simple, at the same time that it is most complex; decoration that attempts to tell no story, but merely to beautify a form or a surface.

The rise of Mohammedanism is extremely rapid, and, from the year of the Hegira, or journey to Mecca, 622 A. D., until the Persian king and the Byzantine emperor are threatened by this new power, there elapses but the short interval of eight years. For thirty years, the two fathers-in-law and two of the sons-in-law of Mahomet lead the fast-increasing hosts of Islam, in battle after battle, usually to victory. The new faith is propagated by the sword, and non-conformers must pay a heavy tribute. Thus, both by conquest and by exacted tax, the caliphs became rich, and expended their wealth upon shrines or mosques in every city over which they held sway. Then soon arose dissension amongst the leaders, and Moawiad, Governor of Syria, usurped the throne and founded the Ommaiad dynasty, with the seat of the caliphate at Damascus, and, by 715 A. D., his emirs had conquered the entire north coast of Africa.

Spain, at this period, was governed in provinces by Ostro-Gothic kings, who, in their internecine warfare, called in the aid of Mohammedan mercenaries from Africa. In 711, Tarik, one of the Ommaiad emirs, recognizing the great fertility of Andalusia, invaded Spain, and began its conquest, and finally founded a caliphate at Cordova. The Moors in Spain and on the North African coast were, therefore, Ommaiads. Meantime, in Persia, the rightful successor of Mahomet revolted, founded the Abasside dynasty, with the caliphate at Bagdad. Finally, there is a another caliphate, founded by the Fatimite caliphs in the tenth century, at Cairo. While the Mohammedans have caliphs of the East in Bagdad and Damascus, and caliphs of the West in Cordova, so the Christians have an emperor of the East at Constantinople, and an emperor of the West, whose seat of government is a changing one. The Western caliph and Western emperor are at swords' points with each other, as are also their Eastern contemporaries; but each receives and gives succor to the distant champion of the opposing creed, so that we find the caliphs of Cordova receiving mosaics and workmen from the Byzantine emperor at the very time when they are struggling with the Frankish emperor; and the caliphs of Damascus and Cairo, having commercial relations with Italy and France, while they are attacking Constantinople. The result is felt in architecture and art, as is evidenced by the fact that Cordova shows Byzantine influence in its early work, and Venice adopts many motives from Cairo.

The Mohammedan work in the East, and that in the West, vary considerably, the Eastern work being less complicated and developed, simpler in its outlines, and usually the ornament is in one plane, as if jig-sawed out of some thin material and placed against the plane which forms its ground. In all oriental work, strong borders are carried around all openings and at all changes of surfaces. Arched openings, or forms, have usually their own border inside of a larger one, which does not follow the arched form, but makes a square or rectangular panel about it. Wall surfaces are frequently divided into panels by these borders, in somewhat the same fashion as were the simpler of the Pompeian walls; and dadoes, either of color or of tiles, are usual. These dadoes, as well as the borders, seem to have been developed from the Assyro-Persian wall decorations of successive horizontal bands of ornament. The arches themselves are of two kinds,—the pointed arch and the horse-shoe arch. The former is markedly different from the Gothic arch, which it antedates; much more subtle, and with a curve that starts its spring vigorously, then straightens into a long line which continues to the point of the arch, where it sometimes ascends very slightly, giving a flamboyant apex. The horse-shoe arch, which is little used except by the Moors in North Africa and in Spain, is sufficiently described by its name. The arches vary, also, in their elaboration. Most of the Eastern arches are undecorated within the simple line of their intradoes, but the Moorish arches have numberless little cusps and stalactites

fretting their profiles; these, in time, destroy all appearance of construction, and give the Moorish architecture that peculiarly fanciful and phantasmal character which has its individual charm. Especially is this true of the later brick arches, such as those on the Giralda tower in Seville. Within the bands around the openings, and dividing the surfaces, these surfaces themselves are filled with the most complicated of arabesques, of all-over patterns and of geometric designs. Deprived of the opportunity to portray natural forms, the Mohammedan has devoted himself to making every conceivable combination of geometric forms, and the result has been the most intricate, subtle, and delicate ornament the world has ever produced. Much of it, in the tile dadoes, upon the wooden and bronze doors, and upon the ceilings, is of purely geometric character, based on overlapping squares, triangles, hexagons, octagons, etc., and occasionally with the use of such intractable figures as pentagons and seven and nine-sided polygons. Whoever desires to follow out the intricacies of these patterns can do so upon the skeleton analyses of them in Bourgoin's "Art Arabes." The arabesques are, to a great extent, developed from the simple motive of a scroll terminating in a conventional two or three-lobed leaf, which usually follows the direction of an ogee line, and has its centre lobe much superior to the others. The ogee curve is the prevalent line in all Mohammedan floriated work. These conventional leaves are often laid parallel to and echoing each other, as were the Byzantine leaves; and it is usually more by their coloring, and by their subdivision and decoration, that they are differentiated than by their variety. The decoration of the surface of the Arabian leafage, at Cairo, in the ninth century mosques, such as those of Sultan Touloun and of Sultan Bakouk, is a series of slightly-radiating lines terminating in scrolls,—these lines produced by cutting away between the leaves down to the ground of the ornament. The decoration of the Moorish leafage, on the contrary, is of two kinds: one a set of incised lines on the surface of the leaf, like the wards of a complicated key, starting in from its outer edge, and usually filled with red; and an arabesque of small trefoils painted in blue. In the work, in Persia, the leaves are made subordinate to the fine, delicately-curving stems, and serve merely to knot them together and terminate them; in India, the surfaces of the leafage are modelled, and become convex with softened, rounded outer edges, and with the ornament thickly covering the ground. The wall patterns are strengthened and divided by large interlaces of ribbons, making a diamond pattern over the face of the wall; the ornament then repeats with what is known as the drop-repeat,—that is, in repeating, the motive drops diagonally half its own height. This method of repeat is originally oriental, and is now the usual repeat with wall papers, stuffs, etc. It distributes a tone over the surface much better than either a horizontal or perpendicular repeat, and prevents occurrence of too strong lines in either direction. All drop-repeats must necessarily be based on the diamond motive. In painted, as well as in modelled ornament, the oriental method is to have two or more schemes of ornament, one showing through the other. When painted, these schemes become smaller in scale as they fill the ground; that is, the ornament which is shown complete is the largest; that which shows filling in around it, next in size; and that which fills around the second ornament, smaller still; and so on. In modelled ornament the motives are arranged in successive planes, and become smaller in size as the planes recede. Occasionally there is a bit of high relief, as a contrast to the flickering light and shade of the rich ornament. The borders are apt to be divided into alternate long and short panels, the latter being squares at the corners of borders and at intervals between. The smaller panels are the more simply decorated, with a rose of some sort, or in plain color, and are often made by their outlines into quatrefoils, with ogival instead of circular lobes—the ends of the long panels being terminated in similar fashion. The larger panels are frequently filled with inscriptions. The tile dadoes, especially with the Moors, were wonderfully made, and are practically a carefully-fitted mosaic of little glazed brick, the art having descended, undoubtedly, from the use of glazed brick in Assyria. These tiles, or azulejos, are cut to fit each other very exactly, and form rich and beautiful surfaces of color. They are in blue, ranging from a rich sky-blue to turquoise; green, from deep green to a peacock green; a rich yellow, toning to a golden brown; a warm chocolate, black and white. The yellow and the chocolate seem to have been added later than the other colors. White always predominates. The Spaniards tried to imitate the Moorish patterns, especially those of the Solomon's star, but painted each star on a single tile, and the colors ran in firing, with a result that is pitiable when compared with the clean-cut brilliancy of the Moorish azulejos. In Cairo, and farther east, the dadoes are of marble slabs, occasionally separated by bands of mosaic. Besides the dadoes, the wall patterns, the geometric patterns upon the doors and the ceilings, there were, also, the geometric corbellings, which developed into the stalactite ceilings, such as those of the Hall of the Two Sisters and the Hall of the Abencerrages, in the Alhambra. These complicated masses of forms are developed from a very simple corbelling, such as may be found in many Turkish houses of to-day, carried around a dome in ascending concentric circles. It is seldom that any of the Moorish decoration is in stone, being usually cast in stucco, which material allowed its frequent repeats and great expanses of decoration to be easily and economically reproduced. This stucco is very hard, and has sharp, clean edges: it forms a most excellent surface for color. The palette used is very similar to that of the Greeks, and does not begin to be as complex as that of the Pompeians.

As with all oriental nations, the effects are produced by the subdivision of strong, clear colors, not by mixing pigments. Red and blue, especially, are almost infinitely subdivided, and exquisite opalescent effects are produced in consequence; rich red, intense blue, and gold are used in the largest proportions; these are supplemented by green, a warm chocolate, and yellow (very little used.) The method of coloring, as with the Greeks, seems to have been well defined: the ground of the ornament was picked out in either red or in blue, red predominating; the interlaces, all stems, all centres and knots of ornament, and the principal leafage in the arabesques, were gilded. The smaller leafage was left white, with a blue trefoil arabesque painted on it, and the peculiar incisions in the larger leaves were colored in contrast to the ground on which the leaves were displayed. It appears that none of the reveals of the ornament were colored; and if such was the case, it must have added infinitely to the subtlety of effect, as a delicate cobweb of white lines would then have seemed woven over the whole pattern, which shifted and changed at every varying point of view. The palaces, which consisted of groups of columned peristyles or courts or patios, surrounded by rooms opening out from them, were in most cases one-storied. They contained a mosque within their precincts which was usually in miniature, a fragment of the great mosque, such as those of Cairo and of Cordova.

The mosque of Cordova, which was built in the ninth century, differs in many respects, in its decoration, from that of the later work: the ceilings are bolder in conception, and the coloring seems to have been mostly of chocolate, picked out with gold. The mosaics of the Mihrab, and the carving of the spandrels of the mosque windows, partake very strongly of Byzantine character, and were probably done by craftsmen who had studied at Byzantium.

[*To be continued.*]

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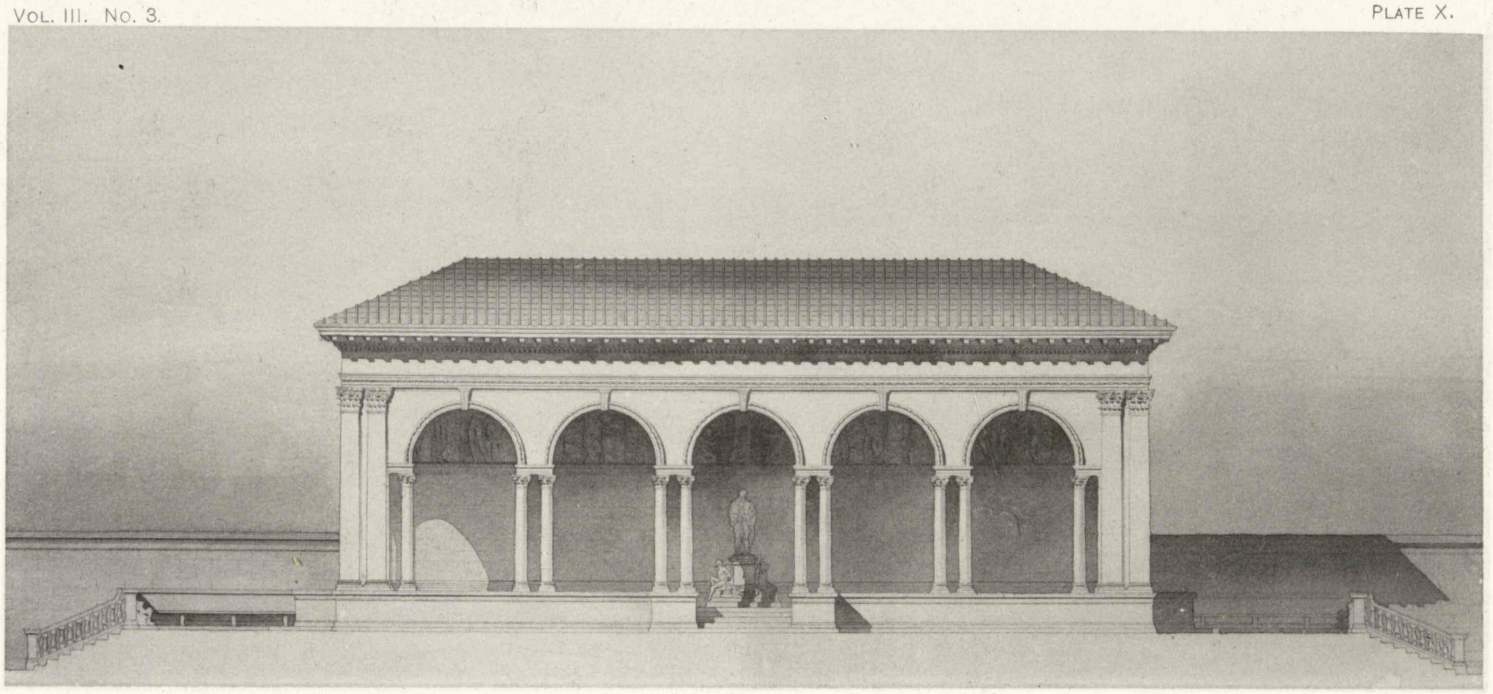
PLATE X.



FIRST MENTION.

EDGAR V. SEELER.

SECOND MENTION.

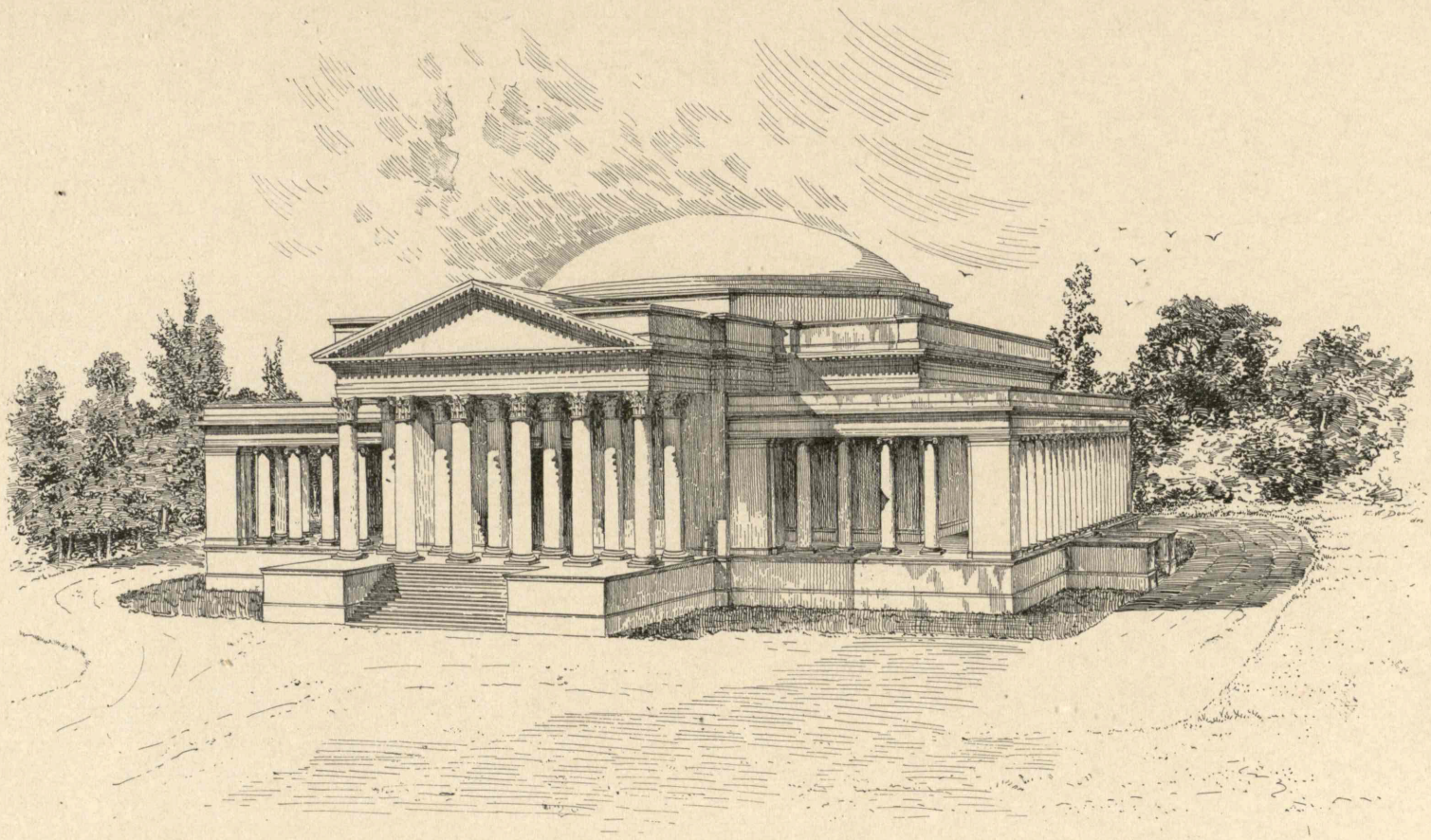
JOS. A. MEYER, JR.

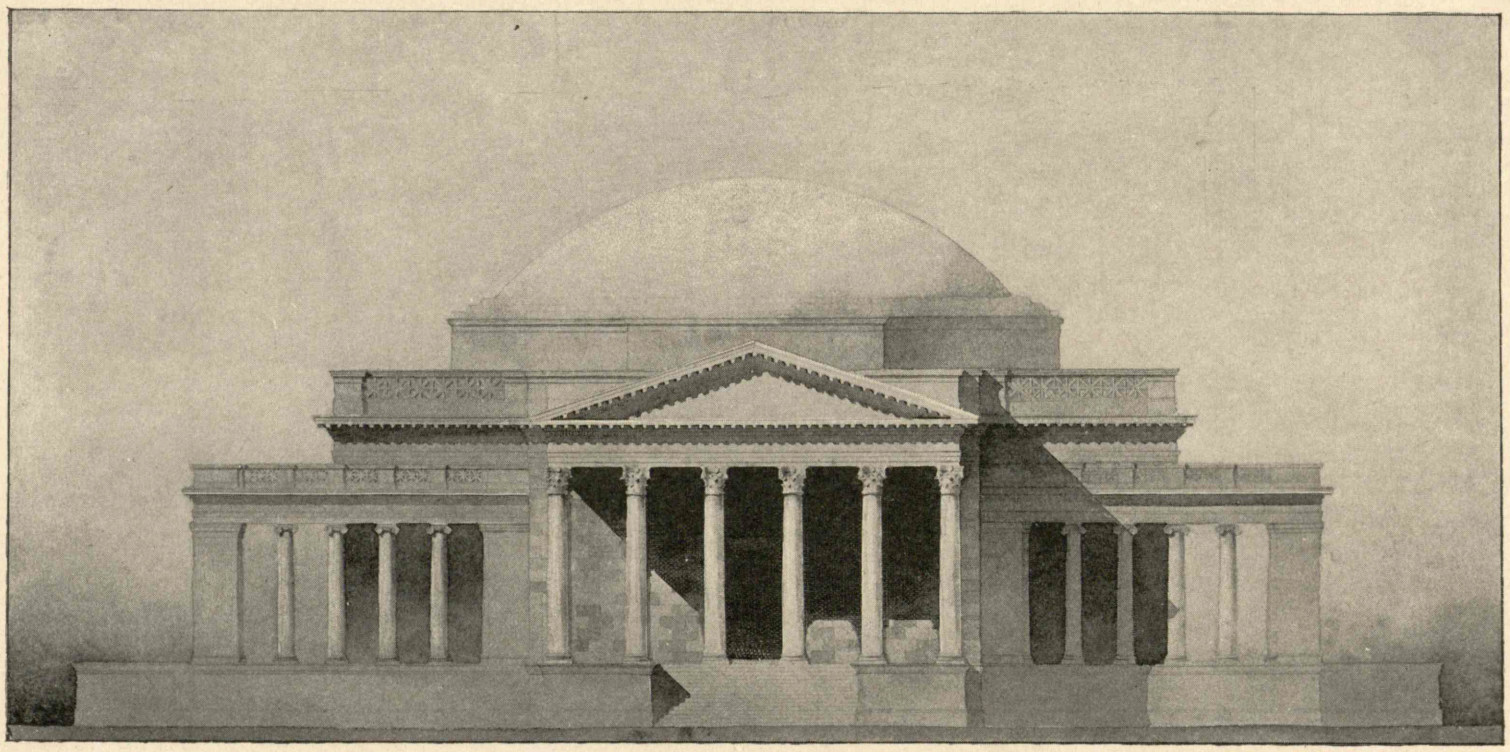
PROBLEM IN DESIGN.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

A MEMORIAL LOGGIA.

THIRD YEAR.



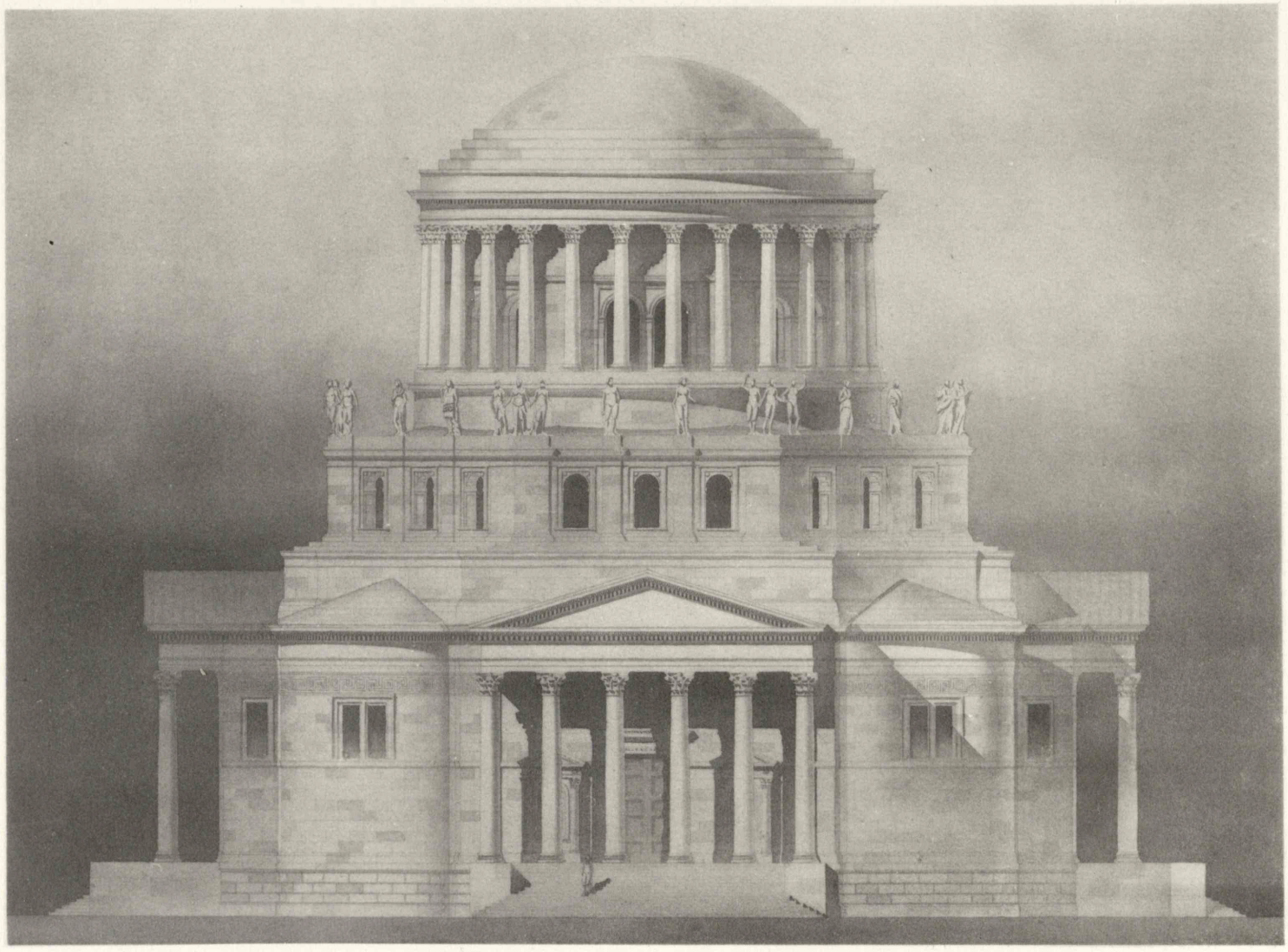


FIRST MENTION. THIRD YEAR.

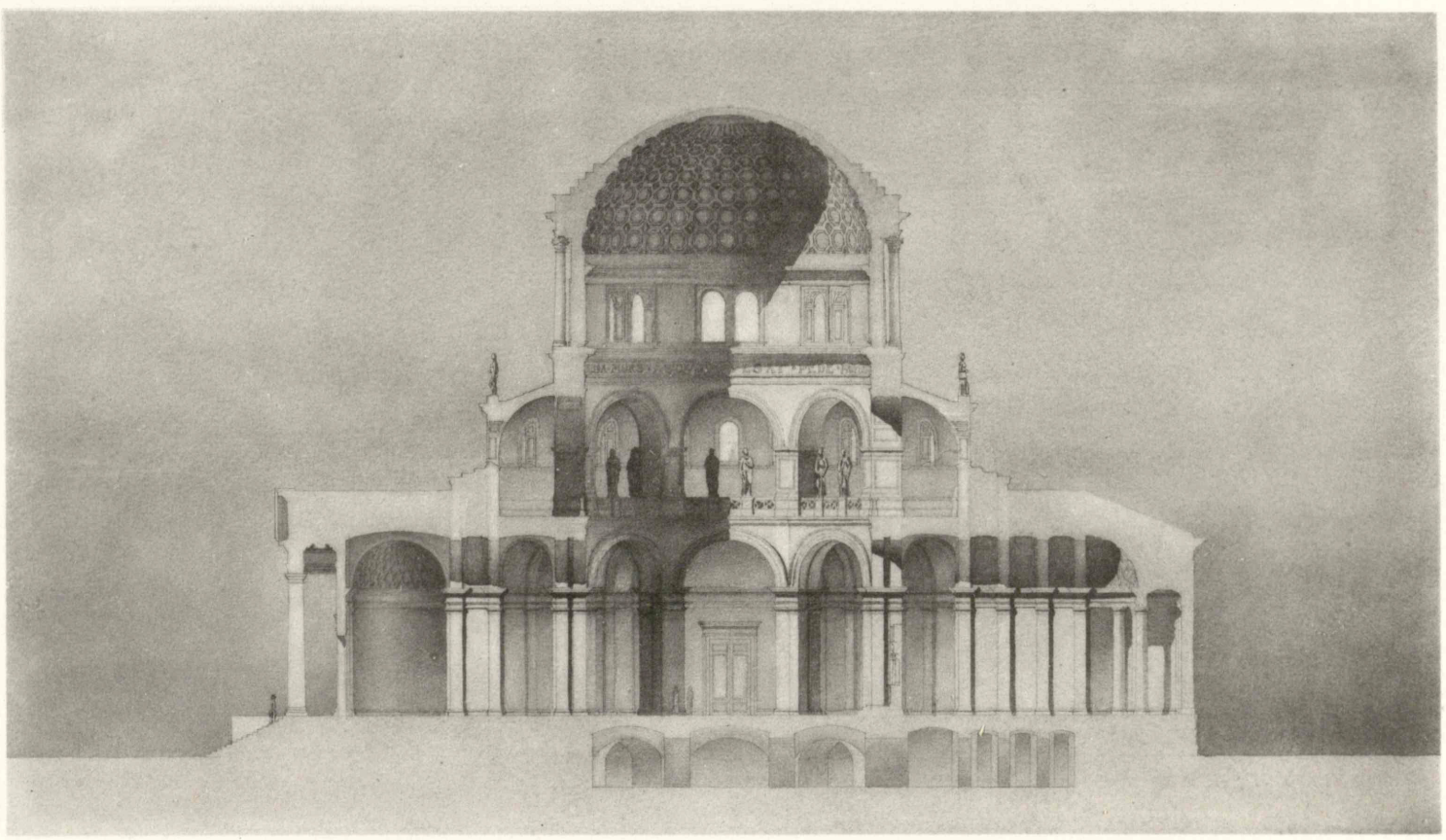
PROBLEM IN DESIGN.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

A CREMATORY, BY E. W. DONN, JR.



FRONT ELEVATION.



SECOND MENTION. LONGITUDINAL SECTION. THIRD YEAR.

PROBLEM IN DESIGN.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

A CREMATORY, BY V. A. WRIGHT.

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PLATE XIII.

THIRD MENTION.

THIRD YEAR.

PROBLEM IN DESIGN.

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A CREMATORY, BY J. McA. VANCE.

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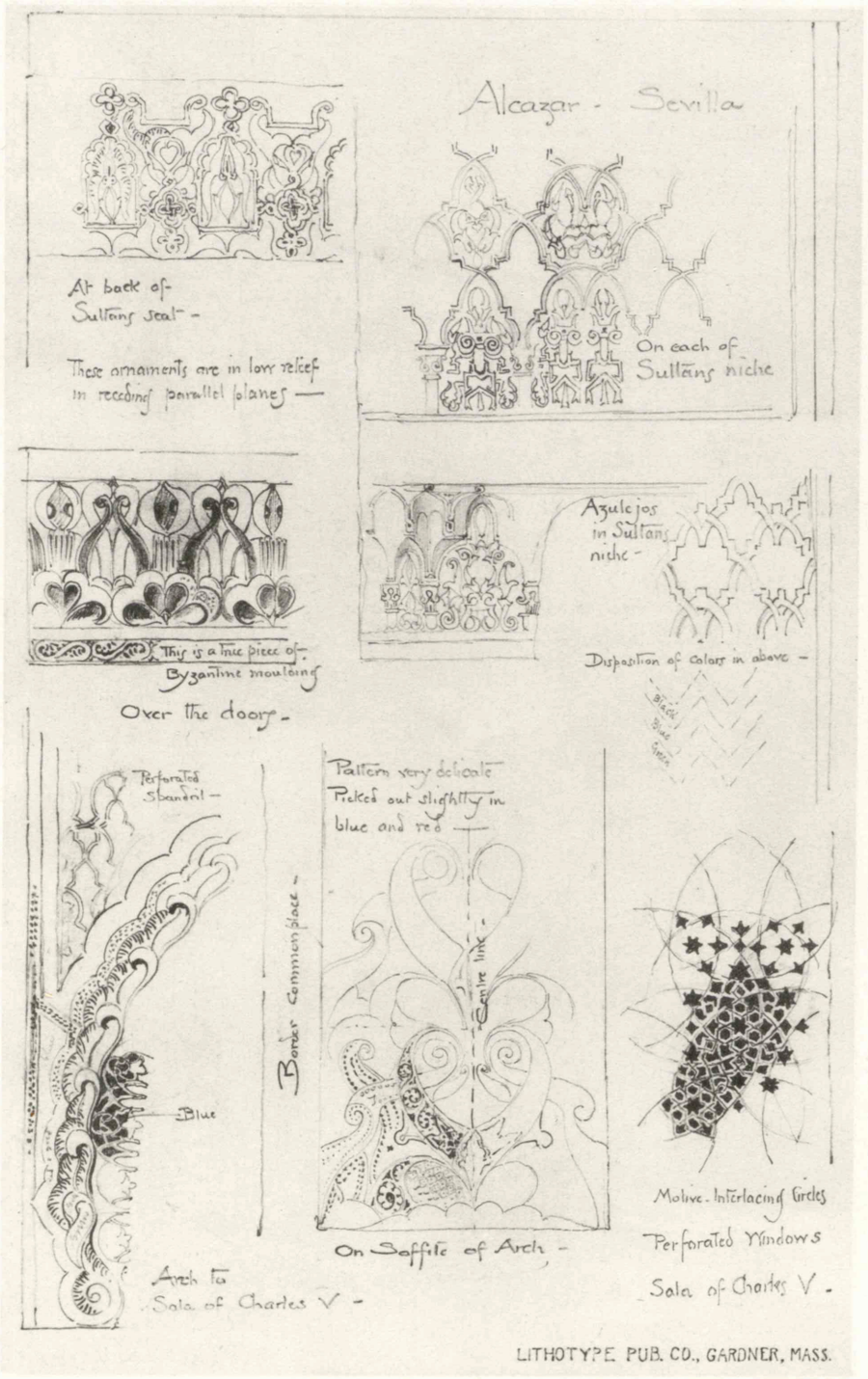

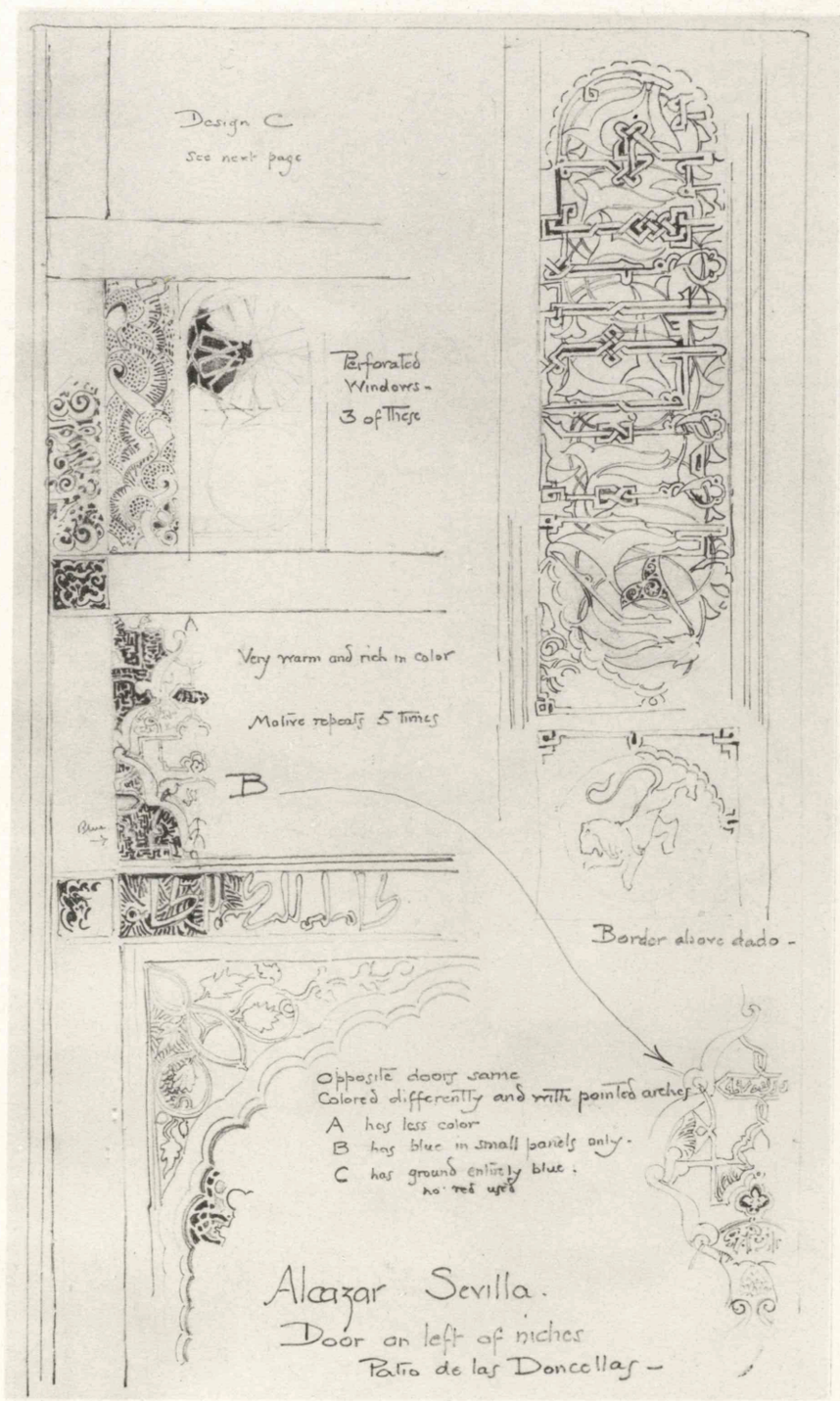

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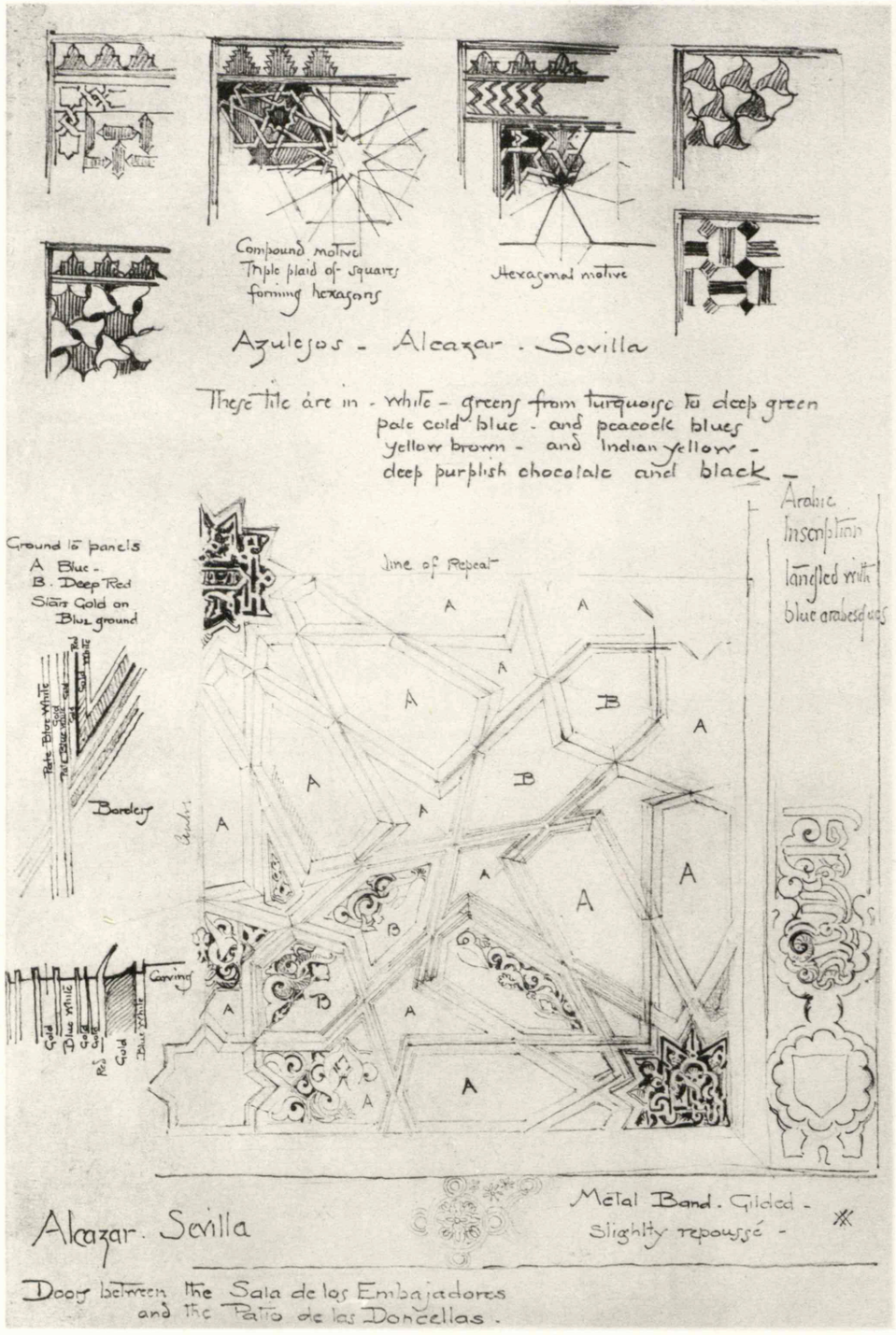

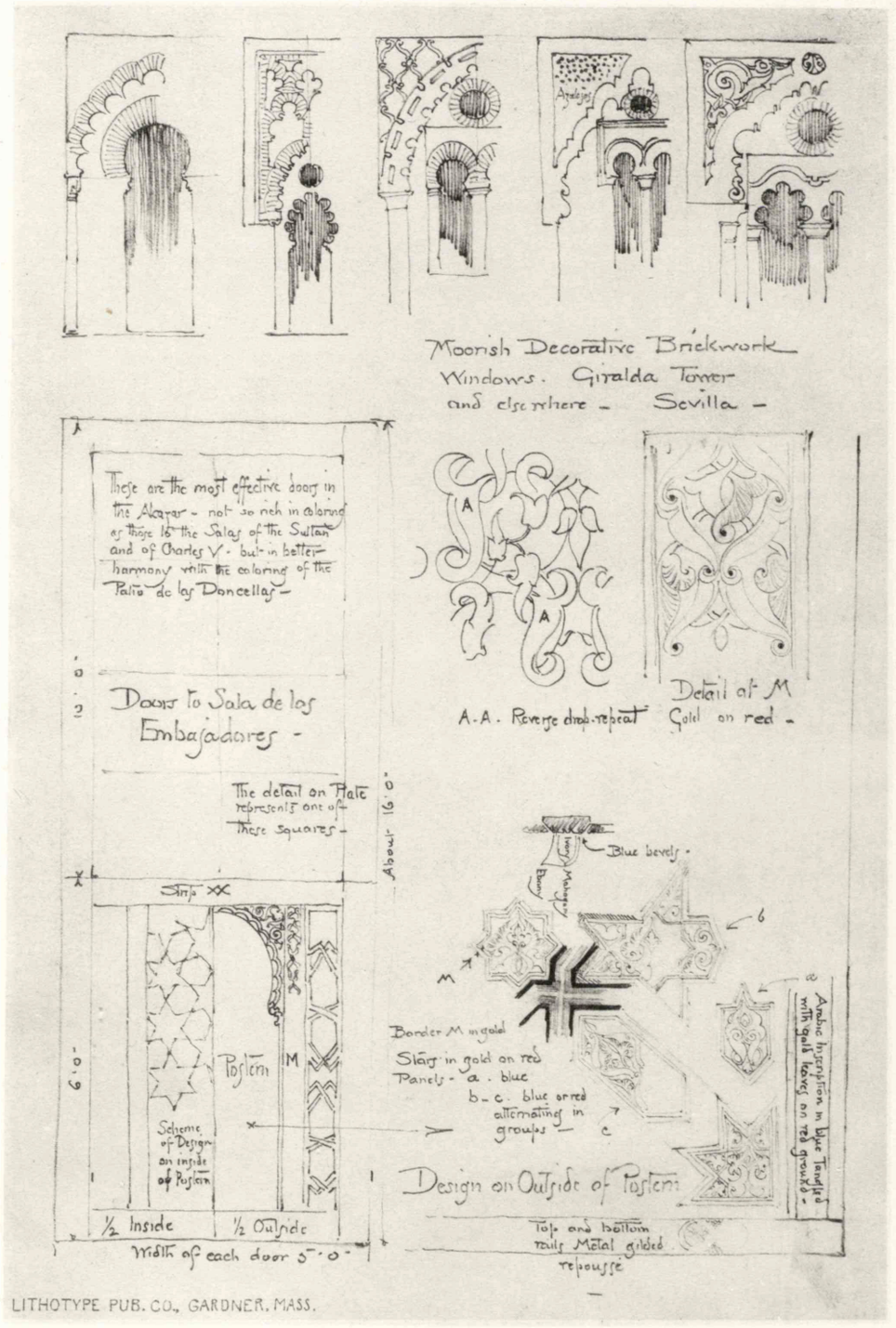

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