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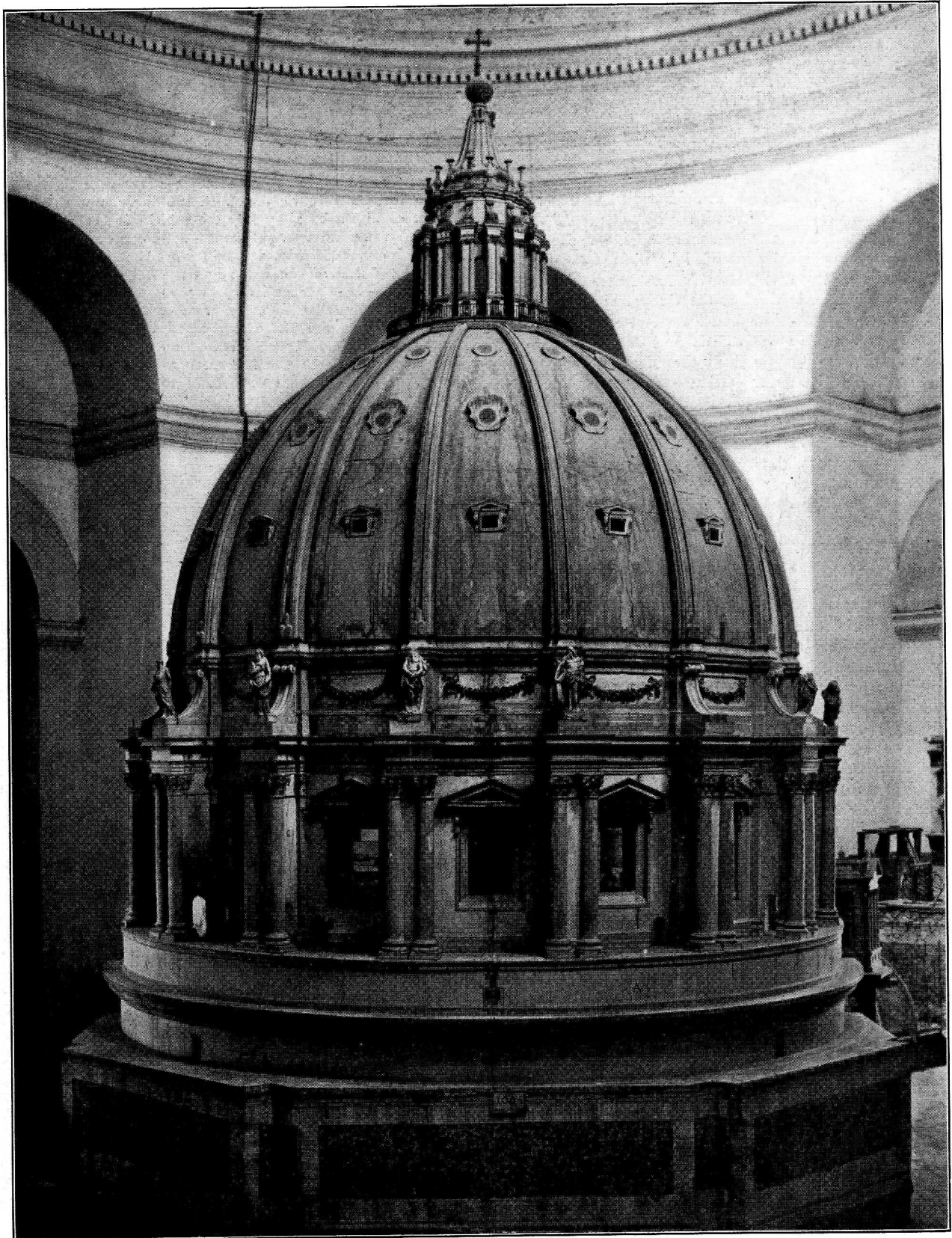
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THE DOME OF ST. PETER'S, AS EXECUTED





MICHELANGELO'S MODEL OF THE DOME OF ST. PETER'S

# Comparative Notes on the Dome of St. Peter's and the Original Model by Michelangiolo

By VICTOR L. S. HAFNER

*Fellow of the American Academy in Rome in Architecture*

The scholar or tourist who has seen, in Rome, the original model of the dome of St. Peter's by Michelangiolo and who has compared it with the dome as it exists today cannot but feel that steps should be taken to complete the dome as originally intended by the master architect.

About the year 1547 Michelangiolo Buonarroti was appointed architect-in-chief of the Cathedral of St. Peter's. On taking this office he found the state of affairs at the building quite serious, and his first duties were to free the church and himself from the clique of unscrupulous contractors and inferior workmen, who were parasites in the very vitals of the work. His predecessors as early as Bramante's time encountered these individuals and money had been misappropriated by many fraudulent devices. San Gallo had not the force of character or strength of mind to arrest these conditions. Michelangiolo made his position sure by refusing all payments for his services. This enabled him to use a strong hand in checking dishonesty and eliminating many lazy workmen. Naturally, these measures made many enemies. The workmen immediately appointed a committee of deputies to protest to the Pope and to check Michelangiolo. He termed them "Setta San Gallesca," and showed his shrewdness by keeping the injured officials in darkness as to his plan, giving information from day to day only as the work progressed. This continued until the year 1557. The committee of deputies appointed Nanni di Baccio Bigio, an incompetent architect, an enemy of Michelangiolo, as spokesman. The Pope received the committee and appointed a relative to investigate their grievances. There was nothing to report against Michelangiolo's actions, who, however, tendered his resignation, which the Pope wisely refused. In 1559 Pius IV strictly forbade any changes from Michelangiolo's designs. This was the condition the new architect had to meet on entering the office of architect-in-chief of St. Peter's and is the reason for the model which proved such a help to the subsequent architects who carried out the original designs.

When Michelangiolo had reached the sublime age of 82, his friends, Cardinal of Capri Donato Giannotti Lottino, Tommaseo Cavalieri, and Francesco Bandini, advised him to have a model prepared so that, in case of his death, his work would be continued as he intended. (If only his friends could have persuaded him to have had a model made of the Façade as he dreamed it!) This we know to be the case from the following letter written to his nephew:

From Rome, 13 February, 1557.

To LEONARDINO DI BUONARROTO SIMONI in Florence:

"When, about two years ago, Messer Leonardo, a servitor of the Duke of Florence, came to visit me here in Rome, he told me His Lordship would have been greatly pleased if I had then returned to Florence, and held out many inducements in the name of the Duke. I replied that I

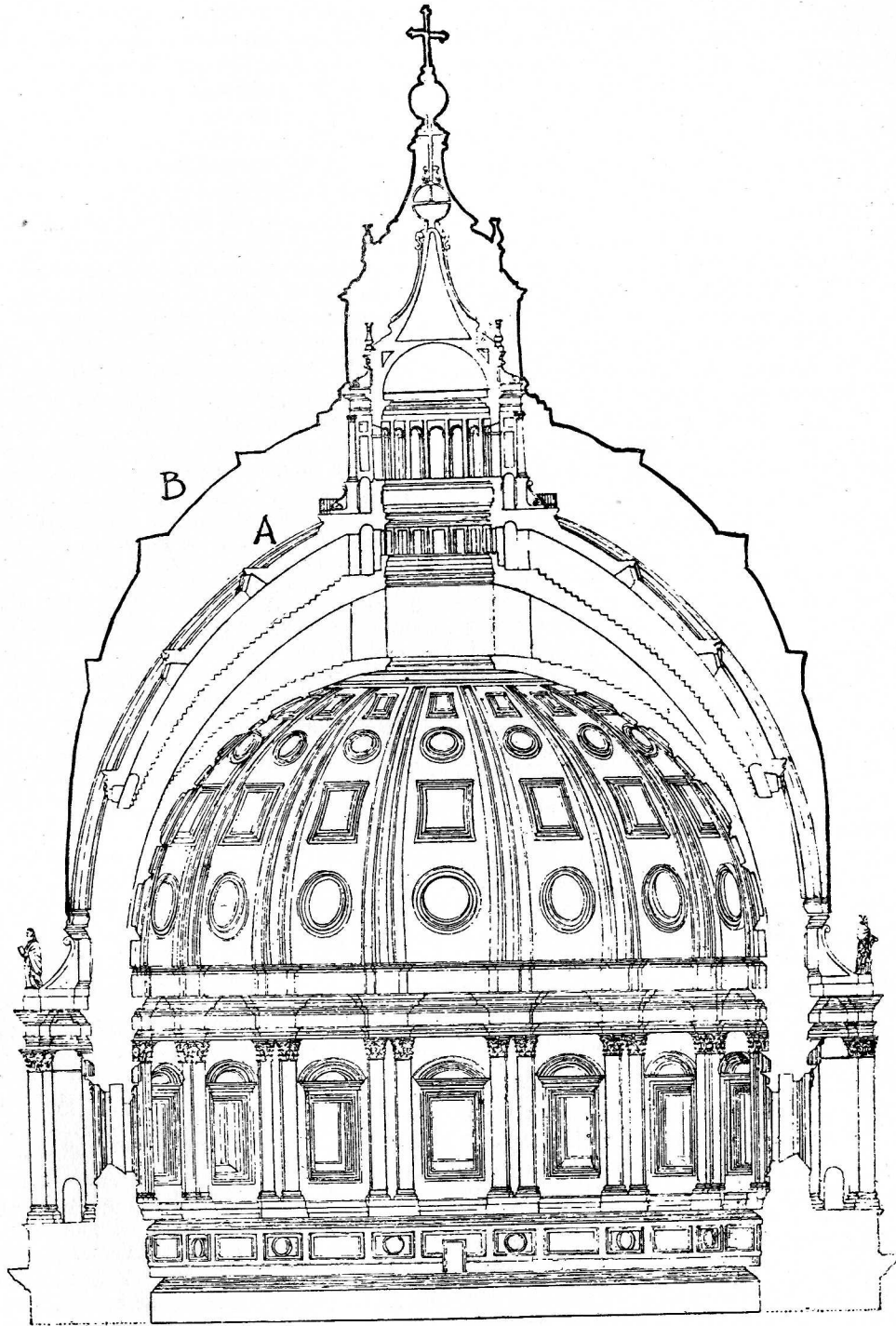
begged His Lordship to grant me sufficient time to enable me to leave the fabric of St. Peter's in such a condition that it could not be altered by the substitution of any other design for my own. As I heard nothing more about the matter I proceeded with the said work, but it has not yet reached the desired condition; and not only that, *but I am obliged now to construct a large wooden model of the dome and lantern so as to show the exact manner in which it is to be finished.* All Rome has asked me to do this, the Reverend Cardinal di Capri especially, and I estimate that it will keep me in Rome for another year; at least I entreat the Duke for the love of God and St. Peter to grant me this delay so that I may come back to Florence freed from this haunting thought, and feeling that I shall never be obliged to return to Rome again. *With reference to the work having been stopped,* this is not true, for between masons, bricklayers and laborers, there are still sixty men at work, as may readily be seen, with good hope of continuing. I wish thee to read this letter to the Duke and to beg His Lordship on my behalf to allow me to remain here for the period already mentioned, which will be necessary before I can return to Florence; for, if my dispositions now *incorporated in the structure* were to be changed, which *certain envious persons* here seek to compass, it would be as though in all this time I had accomplished nothing.

MICHELANGELO BUONARROTI."

The model was a year in construction and we are told that a certain Giovanni Franzese is responsible for this work. (Vasari speaks of him as Jean: Vasari XII 252, 253). It measures 12 feet 6 inches in diameter by 20 feet in height. This model has fortunately come down to us practically intact and now rests in a room over the left aisle of St. Peter's Cathedral. It is soon to be moved, however, to a new museum under construction and adjacent to the Cathedral. I have carefully measured the model and shall reproduce it exactly, and I hope that my reproduction will be permanently exhibited in a museum in the United States. Thus, thanks to Cardinal of Capri and his friends, the world has now among its collections of many domes the finest example ever created by the human mind. Still, it is not yet complete as Michelangiolo intended it.

By looking at the two photographs accompanying this article, it will be noted that several changes took place even in the time of the great architect, for it is known that the dome had reached the height of the cornice of the buttresses at the time of his death (1564). One will notice that he varied the window heads between the buttresses. In the model they are all pedimental, whereas in the actual dome they are alternately pedimental and segmental. Other changes took place in the detail of the festoons and in the insertion of the lion heads above the swags. In addition the detail of the leaves of the corinthian capitals is much more ornamental on the dome than in the model.





THE DOME OF ST. PETER'S IN ROME  
A—Contour of the Model  
B—Contour of the Existing Dome

# THE JOURNAL OF THE AMERICAN INSTITUTE OF ARCHITECTS

But the omission of the curved buttresses, or consoles, and the statues above the buttresses is the most important difference between the two. These features seem to me absolutely necessary to complete the silhouette of the dome. How graceful the lines of the dome would be if carried down to the buttresses! This would give the dome strength and grace, and do away with the sharp, angular effect now so apparent at the juncture of the dome and the buttresses. The omission of these details not only weakens the support given to the dome, but also lends a stilted effect to the dome by abruptly separating the perpendicular lines of the drum and attic from the domical portion. The addition of the figures of the apostles and the added superimposed weight would give more stability, both apparent and real, to the buttresses, and would terminate appropriately the steel-like quality of the line of the dome. How essential it is to complete the whole! Surely he who succeeds in correcting this error, which can even now be done, will receive great renown for his work.

A great change took place in the curvature of the dome as seen in the accompanying sketch. "A" shows the contour of the model and "B" that of the existing dome.

This change, no doubt, was made by Michelangiolo after experimenting with the model; he probably left instructions to be followed. Only a master's eye could have foretold that, seen from the ground in the immediate vicinity of the cathedral, the lantern would have been partly eclipsed by the curvature of the dome if the curvature of the model had been followed. The additional

heightening of the dome is more stately, more noble, more dignified. Certainly the curve as constructed is more stable as was proved by Du Bois Reymond, a French mathematician of the eighteenth century, who showed that the curve of the dome is the curve of maximum stability. The great master must have known this: at least I for one do not believe that the coincidence is a mere chance.

The other differences are in the interior. The model contains three shells, whereas in the present dome there are only two. Whether or not the omission of the lowermost dome took place in the time of Michelangiolo has been a subject of much discussion. Fontana and other early writers strongly insist on the fact that the architect's own plans and ideas were strictly followed. They never allude to a third or innermost vault. I feel that the elimination of the inner dome was a change made by Michelangiolo himself before his death. He probably found, in experimenting with the model, that the inner dome took away the soaring, sweeping quality he desired for the interior. Furthermore, an inner dome would have caused a long, dark, funnel-like shaft from the top of the lower dome to the lantern. The two existing shells of vaults are of brick, and the space between them gives access to the lantern. In order to resist the earthquakes, to which Rome is subject, chains were placed around certain portions of the dome. The chains were strengthened in 1747 when the second of the two shells displayed signs of cracking.

The architects subsequent to Fontana were Giacomo Della Porta and Vignola. The dome was finished according to the master's design in 1590.

## Cooperative Housing

By FREDERICK L. ACKERMAN

Cooperative housing has become a commonplace. That is to say, readers of the daily press (New York) have come to be familiar with the term. News items and the advertising columns carry information; salesmen will call upon request to furnish further details and initiate. So to understand "cooperation" one need no longer consult the volumes written about it by its friends. In fact, one need no longer cooperate to be a cooperator in a cooperative undertaking. So much down and so much a month takes care of the preliminaries; an operating company will manage—for a price. And if all goes as promised, one may sell out to some future cooperator for a profit.

Some will hold that these well-advertised undertakings which carry the name of cooperation are neither new nor cooperative. Others will hold that they serve to indicate a phase in a process of change—the decay of competitive enterprise carried on for gain and the rise of a system of cooperation as the same has been formulated by its friends. Debate concerning these points could at best only lead to academic classification. For these enterprises have all been classified in popular opinion, thanks to the news items and the advertising matter in the press. So that the point of interest here is not what these advertised

undertakings should be called, but what has "cooperative housing" come to mean to those who read and so become cooperators.

During the decade before the war a few cooperative housing enterprises were launched under the handicap of hostile opinion. The legal profession, for the most part, viewed such undertakings as extremely precarious ventures. Real estate interests and speculative builders could forecast nothing but disaster to those who so invested their savings. And what, above all, stood to render the launching of such undertakings extremely difficult was the reluctance of lenders and the current opinion that such investments were not to be rated as liquid assets.

But even so, under this reign of doubt and suspicion a number of so-called cooperative apartment houses were launched. For the most part these cooperating groups were recruited from the ranks of the more prosperous artists of one sort and another. In a few instances the enterprises were initiated by and for the cooperators themselves. Ordinarily they were "promoted" by some enterprising artist who had an eye out for gains easily secured. Characteristically and typically they were the outcome of a purpose to secure those pecuniary gains



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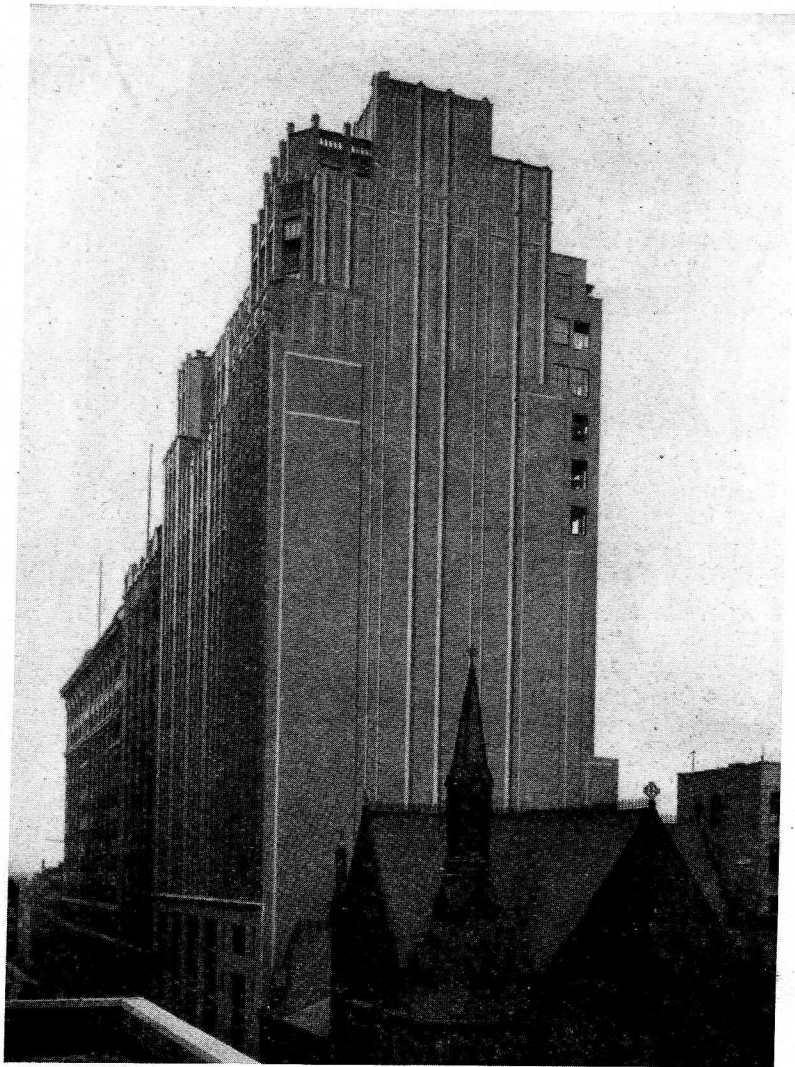
### THE INFLUENCE OF ZONING ON NEW YORK'S SKYLINE

BY HARVEY WILEY CORBETT, Associate A. I. A.; Fellow of the Society of Architects, London

*EDITOR'S NOTE: The Bush Terminal Building on Forty-second Street, New York, was designed by Helmle & Corbett and the plans filed some months before the adoption of a zoning regulation in New York. Certain features of this important structure no doubt suggestively influenced the present development of the stepped back type of tall building. The following article by Mr. Corbett is, therefore, of large interest and authoritative, being written by a man whose firm has from the very outset directly influenced the design of a type of building that has, to so marked a degree, pointed the way to the artistic development of New York's skyline.*

SOME men are born with prophetic vision, some will only look and see when others point, while the great majority never raise their eyes to look up and ahead. World progress is built by the first, who are the builders of the future. Their visions of the possibilities become realistic through the efforts of those willing to see and learn, and these two classes accomplish the big things in spite of the apathy of that all too common class, whose eyes are never raised above the dead level of their own sordid interests.

In an article by David Knickerbacker Boyd, architect, which appeared in THE AMERICAN ARCHITECT, issue of November 18, 1908, Mr. Boyd showed the development of a prophetic vision. He expressed strong protest against the rapidly



Gilbert Building

George & Edward Blum, Architects

Another example of blank side-wall decoration by means of "shadow" brick, used for the first time on the side walls of the Bush Building on Forty-second Street, and now becoming increasingly popular as an economical means of bringing uninteresting side walls into harmony with the front. The complete omission of cornices is worthy of note, being the logical solution to the high building situated in the center of a block where projections beyond the building line are only possible on the front

# REVIEW OF RECENT ARCHITECTURAL MAGAZINES

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

“THE scholar or tourist who has seen, in Rome, the original model of the dome of St. Peter’s by Michelangelo and who has compared it with the dome as it exists today cannot but feel that steps should be taken to complete the dome as originally intended by the master architect.”

This is the opening sentence of an article entitled Comparative Notes On The Dome of St. Peter’s and The Original Model by Michelangiolo; which appears in the *Journal of the American Institute of Architects* for December, and which is written by Victor L. S. Hafner, a Fellow of the American Academy in Rome in Architecture. It is hard enough to write an opening sentence anyway, but it is a stroke of genius to write one which contains in five lines two such surprising misstatements as does this. In the first place, most scholars or tourists who have seen the model, say “how interesting” and pass on to the next exhibit; if they happen to be architects, in addition to being scholars, they

are devoutly thankful that the dome was built as it is built and not as it is shown in the model; and in the second place, the model does not show the dome as Michelangelo originally intended it, nor as he finally decided to build it. It merely represents his ideas at the particular time the model was made; it is only a study, sketch if you like, and by the aid of this trial model, very important corrections and changes were made in the design that were not before apparent to the architect. Some of these changes, as noted by Mr. Hafner, are trivial. The alternating of the heads of the pedimented windows was a general practice at that time; possibly little attention was paid to

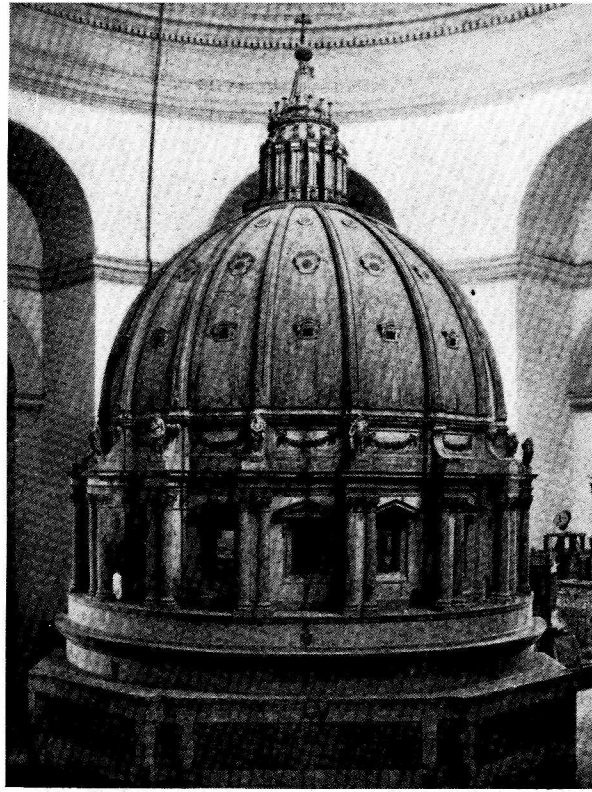
such details on the model; and the swags and capitals being done by a wood carver are naturally inferior to the execution in stone. The really important changes are very important indeed, the principal one being the heightening and the change in curvature of the dome itself, and the second, the deliberate omission of the

curved buttresses in the attic of the drum.

The change in curvature can possibly be explained as follows: It is only natural to assume that those in control of the work in Rome wished to outdo Brunelleschi’s dome in Florence and that they wanted something better, and something that did not at all resemble it. The Florence dome is very pointed, and was primarily made so for structural reasons. In Rome a more classic feeling prevailed, and it was to be expected that the designs of the original architects Bramante, Sangallo and others, would follow more closely the lines of the classic Roman flat dome. Michelangelo, however, rightly felt that such a dome would never be seen,

and further appreciated that the Roman dome was only a roof and generally not intended for exterior effect. He, too, wanted to outdo Brunelleschi, and he did. He felt that height was essential, and he raised his dome on a drum, and to make this drum stable he buttressed it by coupled columns, free standing perhaps at first, and later filled in solid to the drum for added strength. The consoles were probably part of his original conception, and the statues too, and there is no doubt that they have considerable constructive value, but they were purposely eliminated for reasons that I will later try to explain. I don’t doubt the original conception of the dome was much flatter

From “The Journal of the A. I. A.”



Michelangelo’s Model of the Dome of St. Peter’s

WAREHOUSE OF WILSON GROCERY COMPANY, PEORIA, ILL.  
HEWITT & EMERSON, ARCHITECTS



than the model; in fact I think the existing model is only one of many that were made. It must be remembered Michelangelo was primarily a sculptor; he could, and he probably did, model hundreds of little domes, and as they were probably of clay or wax, it is quite understandable that none of these models is in existence now. Then, too, Michelangelo was suspicious. He had reason to be, and he probably kept his designs very secret in the fear if there were available careful

models or designs of his dome, powerful influences might secure his discharge and the completion of the work might be made under other direction. It is quite possible, therefore, that he destroyed his models and his sketches, keeping merely the figured data in such shape as to be intelligible only to himself. I have no doubt the dome was heightened very gradually; it was hard to come back to the pointed Florentine example; but when the great model was finished there was no doubt in the designer's mind that the curve was too flat and he wisely increased it. Now, just what the curve as it exists really is, I don't know, and frankly I don't think anyone knows. I am aware

there are careful monographs on St. Peter's but I don't see how anyone ever measured the dome. Unless there are undoubted proofs to the contrary, I must consider all figures mere approximations. The curve seems to be a portion of a true arc with the center considerably one side of the axis. Possibly a telephoto taken from some point that would give the dome practically in elevation might, if enlarged, give a basis of a closer approximation, but there is no question the dome as built is much finer than the model.

Now, as to the consoles. In the first place, it is the obvious thing to do, constructively and artistically; on a drawing in elevation some easing off of the outline seems essential. It was also a common practice in Rome. But actually when built the consoles would be fussy in the extreme and the outline lost when seen in perspective. Michelangelo saw that at once from his large

model, although it may not have been so apparent in the smaller and less carefully made ones; and he finally decided to abolish the consoles and the statues entirely, and that this omission was made by Michelangelo himself is admitted by Mr. Hafner when he says "It is known that the dome had reached the height of the buttresses at the time of his death." Now, the reason for this confusion of outline is because the dome is circular. It is a fact that is self evident that projec-

tions from a form circular in plan tend to confusion, because they catch the light in different ways, and because they continually present different faces to the observer and continually change in outline. It is absolutely essential that all projections that are similar should be in the same surface of revolution and that they must be simple in outline. To illustrate this, consider a Corinthian cap. Unless the leaves are so modeled that all projections on the leaves are on one surface of revolution, the foliations being merely cut back from that surface, as it were, the cap will be confused in outline and present a poor imitation of a well worn feather duster. One has only

to compare the simple and majestic outline of St. Peter's with that of the Invalides, Val de Grace, Santa Maria della Salute, and some domes in this country to appreciate the wisdom of Michelangelo's simplification of outline.

But, there are other changes which Mr. Hafner has not noticed, the chief among these being the accentuation of the break of the cornice back of the coupled columns of the drum. This break is one of the most subtle things on the dome and that it exists at all in the model is conclusive proof that there must have been models prior to the existing one. The rational treatment of the entablature over the columns would be an unbroken return to the pilaster. Now, if the pilaster is in its natural position back of the column, the line of this unbroken cornice would form a decisive line which is not normal to the curve of the dome, and furthermore because of the fact

From "The Journal of the A. I. A."



The Dome of St. Peter's as Executed

that the distance between the pilasters on the drum of the dome would be quite a bit less than the distance between the coupled columns, the cornice of the drum wall would be very much shorter than the space between the cornice of the columns, and the wall face of the drum would be apparently lessened. The drum of the dome would seem to explode, to radiate unduly. Now, this condition can be only appreciated from a model. I know this because I have had several domes modeled, and I'm therefore sure prior models must have been made. A comparison of the photographs of the model and of St. Peter's will show that this breakback of the cornice has been much accentuated in reality, the pilaster is not in its natural position, and the coupled columns stand almost as isolated piers. It is a very clever stunt and done solely for effect.

There is another change which is significant, and that is the increased projections of the middle tier of windows on the curve of the dome. These windows or cartouches have a peculiar reason for being. The projection of the ribs is considerable, seemingly more on the dome than on the model. Now, when seen from below these ribs cross each other so that there is a depression in silhouette at the point of crossing. This is awkward and the windows are put in to cover up this defect in outline. Here again, it is absolutely impossible to conceive of this from a drawing; it only shows on the model, and this strengthens the suppositions that there were earlier models; otherwise these windows would not have been put on the wood model.

As to the inner dome, there can be no question. The change was undoubtedly made by Michelangelo himself as the result of study from the model. The Pantheon is, or is supposed to be, a true hemisphere, but in any dome raised on pendentives a full circle dome is depressing, particularly if there is, as is usual, in Renaissance domes a considerable space between the pendentives and the spring of the dome.

I find I have given much more space to this article than I had intended when I started, but it is of the greatest interest, to me at least, and I very much regret that such a series of misleading statements should be published in the *Journal of the American Institute of Architects*, and apparently with the sanction of the American Academy in Rome.

It is a far cry from Peter's dome to the tall, ungainly structures in this country which are known generally by the ridiculous and bumptious title of skyscrapers, but there is a certain similarity in the statements of Mr. Hafner above referred to, and those of Mr. John Taylor Boyd, Jr., who, in the December number of *The Architectural Record*, writes of A New Emphasis In Skyscraper Design. Mr. Boyd has discovered that somebody else has discovered the real and

only way to design these apparently undesignable buildings, which "to the World at large," so Mr. Boyd says, "are the one supreme feature of modern American architecture." "Citizens in the streets" he says "are thrilled by the lofty towers" and Europeans cry out "true child of American genius!" In spite of this unbridled enthusiasm shown by the man in the street, Mr. Boyd is rather inclined to be pessimistic about the architect's part in it all. "When the World beckons" he says "why does the architect hang back?" particularly as "the World cannot be expected to draw fine distinctions as to the quality of architecture." This implied reluctance on the part of the American architect to accept commissions to build skyscrapers, even with the comforting assurance that the world is not captious, seems a little strange to us in these lean years, but Mr. Boyd has given thought to the matter, has taken it up rather seriously, it seems, and has arrived at certain conclusions which, if carefully followed, will enable any young, struggling architect to lay aside his natural modesty and accept any commission, no matter how large. In the nice arrangement of the rules as advanced by Mr. Boyd in the young architect's *Vade Mecum*, there naturally occurs first a series of Don'ts; Don't use classic motives; Don't use the column formula of base, shaft and cap; Don't use large motives; Don't use Renaissance cornices five stories in height and above all don't use Gothic. We are quite willing to admit that five story cornices is putting it a bit strong, but as to Gothic—well, of course, skyscrapers are not churches, but still we do have a faint recollection that the Bush Building and the Woolworth Tower and the West Street Building have received rather favorable comment; but, of course, "the World cannot be expected to draw fine distinctions"—and in making this quotation we hasten to acquit Mr. Boyd of any Kleagleistic statements by saying emphatically that no reference is made to any particular newspaper—but as we have said, even if the man in the street or the world at large does have a sneaking fondness for Gothic, Mr. Boyd will have none of it; and states firmly that the scale is the thing. "The secret of skyscraper architecture" he says "would seem to lie in its small scale." "There are," he says, "ranks of rather small windows, almost domestic in scale, a hive where people work in offices," and with a further dip into Natural History he says "Even if we consult 'Nature,' as seems to be the vogue in discussions of this kind, do we find the cat less beautiful than the crab because the cat's skeleton is less evident in its design?" Looked at in this light, of course, there is nothing further to say. To be sure, the cat might be an up-to-date cat and repeat monotonously "Day by day in every way my skeleton becomes more evident." In fact, we have seen



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## THE DOME OF ST. PETER'S

tects' Registration Bill, which, as the engineers see it, will limit the legitimate practice of professional engineers. The subject is discussed in the engineering section of the paper. The engineers of South Africa seem not to be so keen on registration, and the discussion ends in these words: "The whole subject of professional registration bristles with difficulties, and it is a moot point—as witness the recent discussion in the United States—whether registration will accomplish all that is claimed for it and whether in a developing country it is to the public interest to be too rigid."

*Construction*, of Toronto (Dec. 22), gives space to the schools of the Dominion. In plan and elevation, especially in elevation, these buildings, generally worthy as they are, are too much like their ilk in the United States and too little like those of the mother country to intrigue me much. One of the best we reproduce.

Through the medium of the *Architect's Journal*, of London, we get a glimpse of Russian Soviet art, especially the art of the theatre, though as the originals of the illustrations are from Russia, we cannot be said to

view the product through English eyes. Weird, patched up, pseudo-symbolic stuff a lot of this stage scenery is. They, in Soviet Russia, do not seem to want beauty—it is too ideal; nor do they want realism in the Soviet Theatre: they want, seemingly, to get as far away from realism or any illusion of reality as is possible—and, knowing or imagining what Soviet reality is like, we cannot find it in our hearts to blame them. Mark Twain's description of his wrecked raft as "like a box of matches struck by lightning" would aptly characterize the setting of the balcony scene in "Romeo and Juliet" as presented at the Kamerny Theatre in the year of Grace 1922. I know not why I said "Grace," for that suggests charm, and charm has been banished from Soviet art. I could not say "the year of our Lord," for the Lord has been banished from Soviet life. Perhaps I may as well have said nothing.

My ports of call must be enchanted, for no deeply vital image seems to impress itself upon my retina. For all that, I am getting rather to enjoy these voyages—so faint a puff in the paper sail produces such an illusion of motion.

## Letters to the Editor

### The Dome of St. Peter's

Sir: In the *JOURNAL* for December, 1922, there appeared an article by me on the subject of some notes I had made in my research on the dome of St. Peter's. Mr. Egerton Swartwout, in the January issue of the *American Architect* took occasion to express, rather facetiously, his disagreement with my statements. I opine that he needs some correction in his facts. The delay in my reply is accounted for by the fact that I am in Rome.

From various of his statements, one is forced to believe that Mr. Swartwout has never seen the model of the dome which is not on public view at this writing. It can only be seen by special permission from the Vatican authorities. Thus the average tourist does not say, as Mr. Swartwout jocularly remarks: "how interesting, and pass to the next exhibit."

There is no record that Michelangelo made models previous to the one mentioned in the following letter<sup>1</sup> which was

<sup>1</sup> Michelangelo—A Record of His Life, by Robert W. Carden, pp. 300.

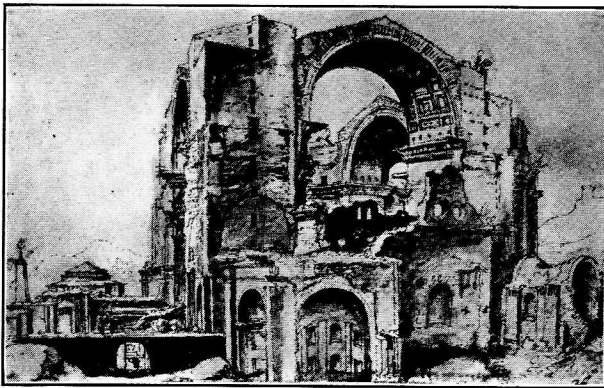


FIGURE 1 HEEMSKERCK—1532-1535



FIGURE 2 HEEMSKERCK—1532-1535

written in Rome by Michelangelo on February 13th, 1557, to Leonardo di Buonarrotto Simoni in Florence: ". . . that I begged His Lordship to grant me sufficient time to enable me to leave the fabric of *St. Peter's* in such a condition that it could not be altered by the substitution of any other design for my own. As I heard nothing more about the matter, I proceeded with the said work, but it has not yet reached the desired condition, and not only that, but I am obliged now to construct a large wooden model of the dome and lantern so as to show the exact manner in which it is to be finished. All Rome has asked me to do this, the Most Reverend Cardinal di Capri in special, and I estimate that it will keep me in Rome for another year at least. I entreat the Duke. . . ."



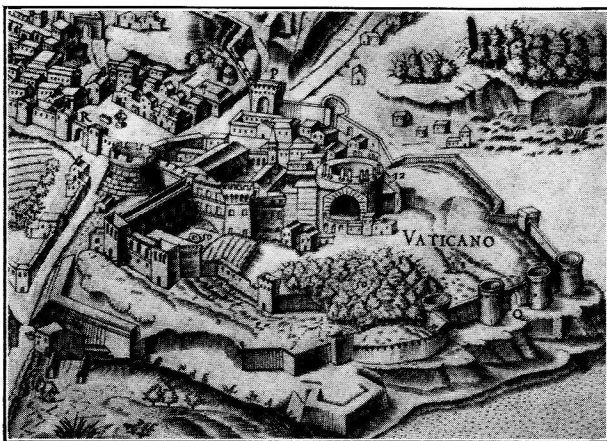


FIGURE 3 DATE AND ENGRAVER UNKNOWN

Mr. Swartwout says, "Michelangelo could and probably did model hundreds of little domes," which is no doubt true; but it appears certain that, up to the date of his letter, no models of his on anything like a large and intelligible scale had been provided for St. Peter's.

It is to be regretted that Mr. Swartwout, in his endeavor to prove his point, should so completely ignore what I said about the heightening of the dome. A person who had

not read my article would infer from his criticism that I did not so much as mention this salient change. Now then, Michelangelo made the model in 1557, seven years before his death. This gave him ample time to study the model from every angle and to realize what it was not possible for him to see before, namely, that the lantern would be eclipsed by the curvature of the dome as one approached the main entrance to the church as Michelangelo intended the church to be, that is, a church built in the form of a Greek cross, and not the church with a long nave as finally built.

Giacomo Della Porta, who was responsible for the completion of the cupola after Michelangelo's death, was a pupil of the great master. It is almost incredible that, if Della Porta had departed in so vital a point from Michelangelo's design as to heighten the dome very considerably, no notice should have been taken of the fact. Let me quote Symonds<sup>2</sup> on this subject; he says: "Taking, then, Vasari's statement in conjunction with the silence of Fontana, Poleni and other early writers, and duly observing the care with which the proportions of the dome"—that is, the dome as a whole—"have been preserved, I think we may safely conclude that Michelangelo himself abandoned the third or semispherical vault, and that cupola, as it exists, ought to be ascribed entirely to his conception." Further, it is a recorded fact<sup>3</sup> that Pope Pius IV strictly forbade any departure from Michelangelo's designs, although after the death of Pope Pius IV, Pope Sixtus V omitted the con-

<sup>2</sup> J. A. Symonds, PP., *Life of Michelangelo*.

<sup>3</sup> Charles H. Wilson, *Life and Work of Michelangelo*, p. 520.

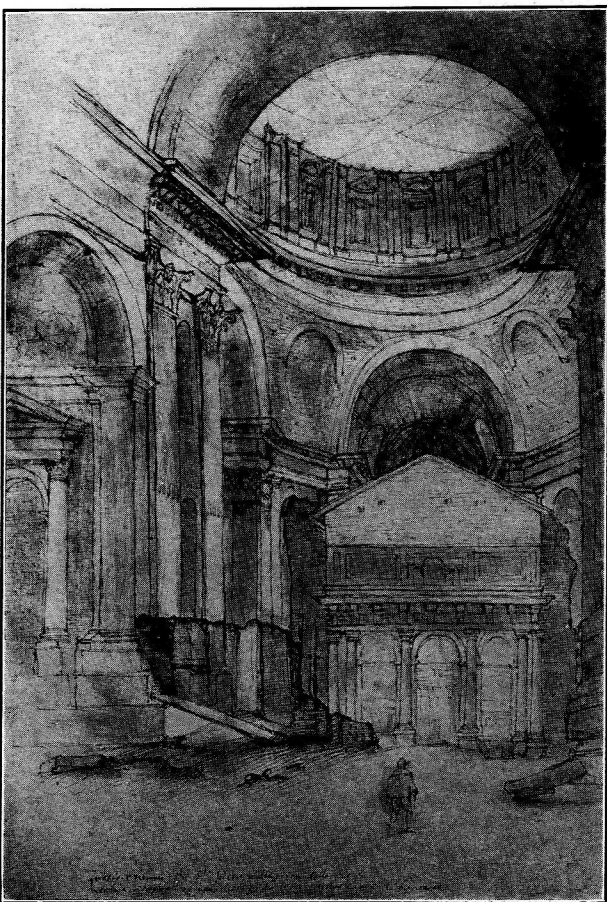


FIGURE 4 HEEMSKERCK—1532-1535

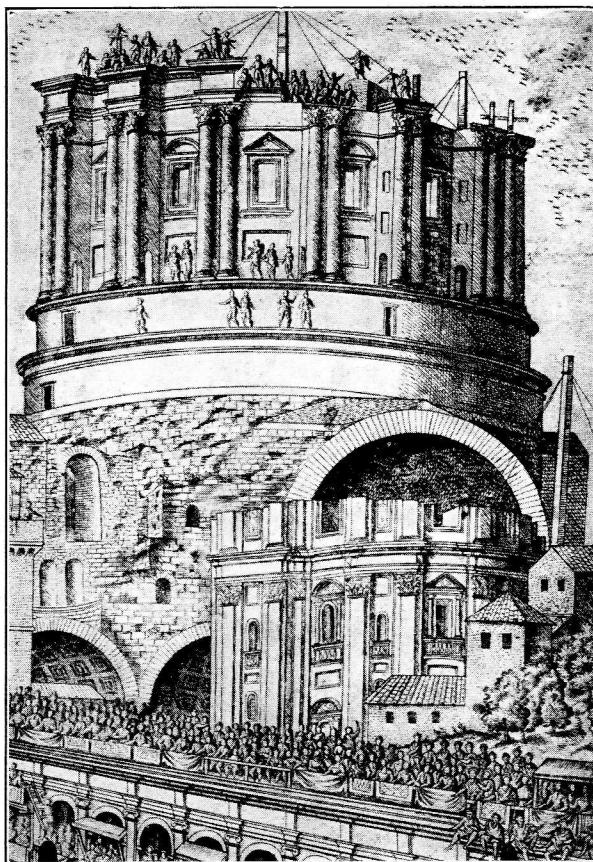


FIGURE 5 1563  
Note the engraver's inaccuracy in the panels below the windows

## THE DOME OF ST. PETER'S



FIGURE 6 GIAMBATTISTA—1575  
Note the engraver's inaccuracy in the window heads as in comparison with Fig. 5, where they are accurately shown.

soles and statues, probably because of a lack of funds, and his desire to see the dome free from scaffolding during his pontificate.

With these points clearly in mind, let us answer Mr. Swartwout's reasons for the omission of the consoles. He says, "that projections from a form circular in plan tend to confusion, because they catch light in different ways." It is this variation and play of light and shade which gives to the dome its beauty and which expresses its solidity. There is a similar variation in the flutes of a column,—a variation which is pleasant to the eye and gives form to the column. If one admits that the buttresses are correct in the design of the whole and are necessary for stability, then the consoles which are a continuation of the buttresses are correct. The steel-like line of the silhouette of the dome is not complete without the consoles, and, moreover, the long sweep was to have been terminated by the statues. As it stands today, the hard angular termination is far from being pleasant. The added weight of the statues at the end of the consoles would have given an added security to the thrust of the ribs, while the crown of Apostles, or Saints, would have increased the splendor of the design. Furthermore, the omission of the consoles not only weakens the support given to the ribs, but also gives a stilled effect to the dome by abruptly separating the perpendicular lines of the drum and attic from the curve of the dome. It is difficult to believe that this would have received the designer's consent. Charles Wilson<sup>4</sup> writes as follows, "The beautiful curved buttresses bending back from the blocking course at the corinthian piers are altogether omitted. So serious a change as this is not likely to have been the work of Michelangelo, and it may be therefore supposed that he did not build the attic. The effect of the omission is very unfortunate." And another quotation on the same point from the same author says: "The entablature of the drum breaks into projections over the buttresses, and it is particularly to be noticed, that above each of these, starting

from the summit of the blocking course, an abutment sweeps back or batters, with a beautiful curve, dying out in the cornice of the attic, just below the projecting ribs of the cupola. Not only is this admirable in design but it is equally so constructively and in harmony with sound principles."

Now let us spend a moment in observing the progress of the dome from the time Michelangelo became architect-in-chief until his death. First let us consider certain dates. Michelangelo became the architect in charge in 1547. The model was made in 1557. The work on the drum of the dome began in 1558, Michelangelo died in 1564. This list of dates will prepare the reader for some photographs taken from original engravings, now in the possession of Dr. Ashby, Director of the British School at Rome, which give an idea how the dome was progressing at different periods. The names of the engravers, where possible, and the date of the engraving, will be found under each illustration. Figures 1 and 2 show the condition of the supporting arches; figure 3 shows the columns of the buttresses being put in place; figure 4, that the work has reached the height of the entablature; figure 5, the entablature under construction; figure 6, that the work has reached the top of the entablature. This is the point where the work was stopped by the death of Michelangelo in 1564. Therefore, the reader will plainly see that there is no proof that the consoles and statues were intentionally omitted by Michelangelo.

Does Mr. Swartwout believe that Michelangelo would for a moment think of placing delicately carved statuary on a building before the latter was finished?

The work was discontinued for 20 years after the death

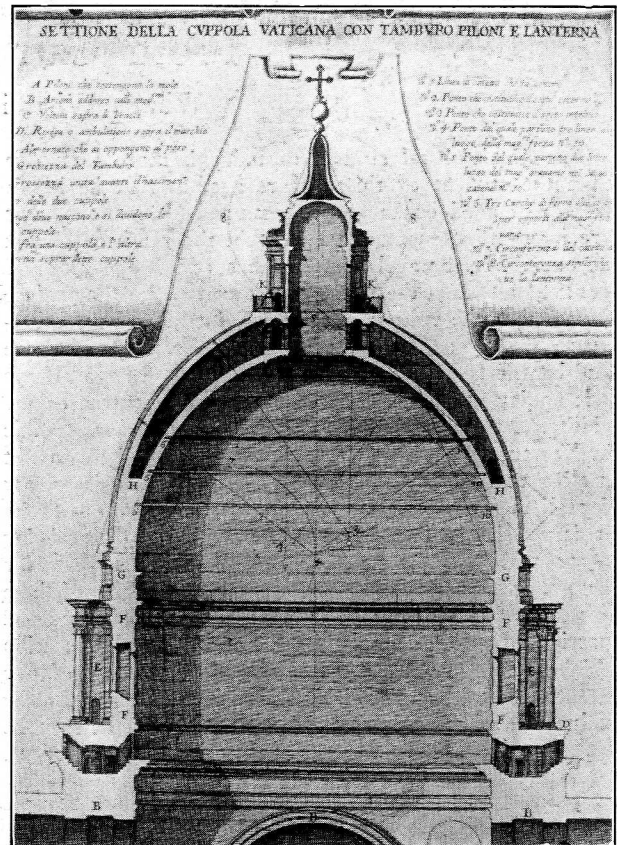


FIGURE 7

<sup>4</sup> *Ibid.*, p. 531.



of Michelangelo. Although exposure to the weather for so long a period may be the cause of some of the cracks visible today in the buttresses and drum, yet most of the cracks in the dome are due first, to a hasty erection of the dome under Della Porta and Fontana; second, to the fact that the dome has been struck by lightning several times; and last, to earthquakes. The cupola proper above the drum was completed by Della Porta from July 15, 1588, to May 19th, 1590, six to eight hundred workmen being employed day and night upon the work. A solemn mass was celebrated in the church below as the last stone was being laid. The cross, which contains relics, was placed on top in November, 1593.

Gimmaldi tells us that the mosaic of the inner dome was begun in 1598 and completed in 1612.

Mr. Swartwout says, "just what the curve as it exists really is I don't know, and frankly I don't think anyone knows." I would like to have him know, and I have, therefore, had a plate from Fontana photographed (fig. 7). Durum<sup>5</sup> and Poleni<sup>6</sup> will also show him very interesting diagrams. There are original drawings by Michelangelo in the Museum Wicar at Lille of the dome of St. Peter's, and another in the Museum Teyler at Haarlem. Domenico Fontana published in 1590 the work he had undertaken for St. Peter's. Carlo Fontana republished (edition of 1614) the works of his relative. In this connection it is interesting to know that the lines of both the external and internal domes were cut into the pavement outside the walls by

<sup>5</sup> Durum—*Baukunst der Renaissance*, p. 77-92.

<sup>6</sup> Giovanni Poleni—*Cupola del Tempio Vaticano*.

Della Porta and Domenico Fontana. Carlo Fontana compared these curves with the actual measurements of the domes, and he tells us that he found the curves to be correct. Unfortunately this pavement was destroyed in the 19th century, but unquestionably Carlo Fontana's publication gives us not only the curves in the pavement, but also the true profiles of both the real domes. The dome has been measured by others, as, for example, by Poleni. Particular attention is called to Carlo Fontana's book entitled *Templum Vaticanum, Ipsius Origo*, which contains many interesting engraved plates and data.

The breaks in the cornice of the buttresses, to which Mr. Swartwout refers, do exist in the model; I have measured them very carefully and have at hand all the dimensions.

He also refers to the windows on the curvature of the dome as changed from the model. This is not so: the ones on the curvature of the dome are a direct copy of the ones on the model. The windows on the model appear differently, it is true, because they are made of cardboard and are not in three dimensions, but the exact details which the windows were to take in the actual dome are drawn on the cardboard and have the shadows cast and rendered.

From Mr. Swartwout's "regrets," one would judge that he believes that the paid critic has exclusive right to the press. Surely the investigator should likewise have his place—he should even be encouraged to present his researches, especially if he has spent many days of careful study upon the originals.

VICTOR L. S. HAFNER,

*Fellow in Architecture, American Academy in Rome.*

## From Our Book Shelf

### What's What in English Gothic

The architectural student of today is more fortunate than the student of thirty years ago, in that he has a wealth of good books at his command—books, too, that are inexpensive enough to be within the reach of almost anyone. Mr. Samuel Gardner has added one more to the list,<sup>1</sup> although the following excerpts from the preface denote that the volume is primarily intended for the layman. He says: "I myself have derived so much pleasure and benefit from this delightful study that I have always felt anxious to interest others in it to the extent of my ability. Many people have told me that they love Gothic architecture, but know nothing about it. They do not realize that, as Ruskin puts it, "Architecture is an art for all men to learn, because all are concerned with it; it is so simple that there is no excuse for not being acquainted with its primary rules, any more than for ignorance of grammar or spelling, which are both of them far more difficult sciences. Nevertheless, enlightened and patriotic Englishmen who have had a liberal education think it no shame to confess complete ignorance of our great national art. And thus it will be so long as the value of æsthetic culture is ignored at our public schools.

<sup>1</sup> *A Guide to English Gothic Architecture*, by Samuel Gardner.

It is a truism that the love of beauty comes next to the love of goodness, but the cult of beauty, whether in nature or art, is sadly neglected under our modern systems of education."

Mr. Gardner's book is well thought out, concise and carefully arranged, and we must thank him for his sympathetic judgment in the selection of plates, for he has mingled well-known and monumental examples of Gothic architecture with the more modest and less known. There is a small architectural dictionary, illustrated with very attractive pen and ink drawings by Mr. Arnold Mitchell, and nearly two hundred plates. It seems a pity that the plates are not the full size of the page, for many of them are too small to use in studying detail; but perhaps the author's endeavor to keep the cost down had something to do with this.

It seems to me that Mr. Gardner has succeeded in what he set out to accomplish, and that his book might well be added to the stack of those given to high school boys and girls, though it isn't worth while for the man who is practicing architecture.

BERTRAM G. GOODHUE.