THE UNSOLVED PROBLEM OF BYZANTINE ARCHITECTURE
ITS EXTERIOR DESIGN

by

James Karl Dunaway

A Thesis
Presented to the Faculty of
The Rice Institute in Partial Fulfillment
of the Requirements for the Degree of
Master of Arts
in the
Department of Architecture

The Rice Institute
Houston, Texas
May, 1938
AUDITORIUM - RICE INSTITUTE
THE UNSOLVED PROBLEM OF BYZANTINE ARCHITECTURE
ITS EXTERIOR DESIGN

Byzantine architecture deserves its place among the great world styles by reason of the supreme quality of its structural design and of its colorful interiors. Roman architecture existed as a source upon which the Byzantines drew for their units of construction--the pier, arch, vault, and dome. Having chosen such, they proceeded to strip these units of all sham and unnatural usage: domes that were mere concrete slabs, columns and entabletures superimposed on arches and piers, buttresses hidden in the thickness of the walls. These purged structural forms they then moulded into a logical scheme whose expression was far more definite. The position of supremacy in this scheme was assigned to the dome as the crowning form beneath which all others were to cluster in compact unity. True, this structural system developed with variety, but of a pleasing sort, seldom becoming confused or obscure.

These structural forms--pier, arch, vault, and dome--were primarily simple, intended to be broad fields of plain masonry. It is evident that on such fields the decorative artist, developing the interior, could most read-
ily depict his newly acquired Eastern ideals of an art of color. This representation was through the medium of the glass mosaic, unsurpassed by any, and at best equaled only by Gothic stained-glass, as a vehicle for the artistic expression of color. Unhampered by complex structural forms, the mosaic decoration could spread over and literally engulf the entire interior surface, blending and moulding all forms into a complete and harmonious whole. The result of this combination of structure and color was an architecture and an art of the interior of amazing beauty and impressiveness and of a richness that surpassed that of all previous, contemporary, and subsequent styles.

But in turning to a consideration of the exterior, we can nowhere discover any such coherent expression of architectural principles as we have found characteristic of the interior and structure. Aesthetically speaking, there is in general, no such thing as a Byzantine exterior; the style has defined no specific mode of external design. Even that most striking architectural feature, the dome, never seems to have been treated by Byzantine architects with the appropriate regard to its external appearance. No common aim and few, if any, points of agreement are readily detectable. The churches
often impress one as mere boxes of brick masonry, bald and almost windowless, the dome reduced to a mere bulge in the roof and hardly perceivable at all. One feels a raw and unfinished aspect about them. At best the structure is given a crude clearness of expression, but more frequently the forms embody none of the directness of broad handling of the interior. They never seem able to reach that quality of design requisite of exterior forms, that are to declare by their nature more than a pitiful part of the splendid quality of that which lies within.

My interest in the above facts has led me to attempt, in a more detailed manner, an expression of this existant divergence of architectural quality between the interior structure and its exterior expression. With direct reference to the greater Byzantine monuments and more limited treatment of ones of secondary importance, together with a few elements in which the Byzantine has been merged with the Romanesque of other countries, I shall undertake to trace this lack of logical facade design through subsequent buildings down to and including those designs in modern times which have occasionally given a suggestion of a more appropriate fitness.
In addition to these approaches toward what one might term the unsolved problem of Byzantine architecture, I shall offer, not an attempt at solution, but rather suggestions concerning the possibilities remaining for a more complete design unity of the exterior and the interior.

Widely scattered though their monuments may be, the Byzantine architects were essentially Greek. True, they had changed considerably in the centuries that had lapsed since the Golden Age of classical Greek architecture, but it is still to this period that we must look for some of the basic elements of the Byzantine style.

Architecture, as well as art, is used to express the thoughts of man, deriving its character directly from the mind of the age which it interprets.* Greek thought is clear and articulate, precise and exacting, balanced and symmetrical; and so it is that Greek architecture takes on these same characteristics—*is an intelligently conceived, well thought-out embodiment of a most direct and simple structural scheme. Where Greek thought demanded precise definition of terms in speech, Greek aesthetics demanded precise definitions of functions in architec-

*Phillips, Form and Colour, 125.
ture. Thus we see in the Doric temple, with its post and lintel construction in which the supporting and supported members are at once evident, with its crisp, clear-cut form delineation free of any obscurity or vagueness and of any superfluous details that might obscure function, a perfect embodiment of the Greek religion of intellectualism.

But this intellectualism could not long confine Greek though within the bounds of its restricted fields. As Phillips puts it, "---there occurred a gradual weaning out of the processes of intellect, accompanied by an ever-growing consciousness that the mind possessed other more subtle and spiritual modes of divination." To this inward weakening was added an attack from without in the form of an influx of Eastern ideas. Macedonian imperialism had bridged the gap previously existent between the East and West and opened wide the stream of Eastern mystical thought. Yet never does the Greek lose sight of reason. "Profiting by the extraordinary Greek disinterestedness, which would harken to reason even in condemnation of reason, they were introduced by the intellect itself to its own rival."** The Greek's

*Phillips, 137.
**Phillips, 135.
ability to readily adapt himself to circumstances led to an absorption and an assimilation of this mysticism in which he found a satisfaction for his newly discovered spiritual longings, and an organization of these new ideas for the first time into a logical and coherent system.

This change of character marks the passage from pure classic art into the more emotional and spiritual style known as Hellenistic. But, as yet, the Greek was too steeped in the forms and expression of his native architecture to develop within the bounds of this period an architectural and artistic system that would be the natural embodiment of this new outlook on life. This was to appear only after classic architectural expression had completely broken down and been disposed of. This was to form the basis of Byzantine architecture.

In the Hellenistic period this change of ideas is seen as a degrading element in the architectural design. The old forms were put to new uses for which they were not entirely suited. Agitation and confusion replaced classic reserve and simplicity in architectural sculpture. The Greek was no longer engaged in a direct and intelligent pursuit of a well-defined, pre-conceived
end. The representation in architectural form of his logical system of ideas now seemed quite unimportant.

In the Roman architecture that follows and overlaps that of Hellenistic Greece, we begin to recognize more tangible but less significant contributions to Byzantine architecture. It was Greek logic that gave expression to Christian ideals, while Rome simply supplied superficial suggestions as to the outward forms that this expression might take.

Roman architecture is by no means a development from the Greek—not even of the Hellenistic period. At best, it is a shallow imitation of the latter. Where Rome missed its opportunity to make a great aesthetic contribution was in its denial of its only native tradition—the Etruscan. True, it did take from this school its system of construction based on the use of the arch and vault, and, ironically enough, it is in this phase of its architecture, in a daring and highly skillful application of a sound engineering knowledge, that lies Rome's chief claim to greatness. But in the other realm—that of aesthetic refinement and logical fitness—Roman architecture is definitely lacking. The artistic im-
pulse had little chance to develop in the practical-minded Roman, whose very nature led him to a denial of it as an unnecessary luxury in his earlier days of struggle, and later, in the more prosperous period of the Empire, to an acceptance of it still as a luxury and now necessary only as an evidence of this prosperity—a means to an end. With such an attitude, his expression would naturally take the form of pretentious display. Not feeling the artistic impulse an integral part of his life, he turned to import decadent Greek sculptors, decorators, and painters—not so much as men of distinguished ability but more as slaves and servants—to give a false Hellenic surfacing to his native culture. Oftener than not, his desire to impress by profusion and pomp led to an adornment of his truly great works of architectural engineering with misused scraps and veneers of Greek architecture and weak imitations of Greek ornamental sculpture. Thus Hellenic moderation and reasonableness became Roman practicality and swagger. The root of evil in Roman architecture, according to Porter,* lay in its wholesale character.

were in general, as we have mentioned before, of a material nature. They lay in a system of arch, vault, and dome construction and in a prototype of the Christian church plan—the Roman basilica, though of little relative importance to the final development of the centralized orthodox plan. It is curious to note that, with the single exception found in the Basilica of Constantine, the Romans themselves had never combined these two elements, that is, the basilica was not one of the types commonly vaulted. Over and above all this, we can see the Roman tradition of sumptuous and splendid building given expression in Byzantine work with the advent of the new capital at Constantinople.

By the time the Christian religion began assuming importance in Rome, Roman architecture had passed its zenith and was rapidly declining, and by the coming of the fifth century, it had sunk into the depths of decay. But those few coals still smouldering were fanned back into a new flame, burning with less intensity and feeding on more of the old than of the new material, through the fresh demands placed on architecture by the Christian Church.
Roman architecture was co-extensive with the Roman Empire, examples to be found throughout the Empire as well as all along its borders. Though the types were numerous - baths, aqueducts, amphitheaters, etc. - there is a notable uniformity of design within each type. Local characteristics were subdued under the leveling influence of the Empire, and became again noticeable only when its iron yoke had been removed. Thus Christian architecture developed in schools with more or less distinct characteristics. Those that most directly concern us are the schools of Rome and of the East--the Mediterranean, Mesopotamian, and Armenian.

The Early Christian architecture of Rome can be seen more distinctly as a development out of the Roman style. These early church builders had at first hand a Roman prototype--the basilica--which, with its long nave and axial arrangement, could be, with a few modifications, most admirably adapted to their needs. By this I do not mean to imply that the congregations simply took over the existing basilicas and turned them into places of worship, which, though it did occur,
was extremely rare, but rather that they used this type as the most convenient and suitable model from which to build their own structures.

The choice of the basilica was not the matter of an overnight decision brought about by Constantine's edict legalizing Christianity. Even less did this choice determine the form of all subsequent churches. In other parts of the Empire farther removed from persecution, Christians had already selected and developed to some extent the form their church was to take; however, evidence is so meager that no coherent development in this early period can be traced. Thus it is notable that the Christians in Rome, when they were allowed to worship in the open, took their clue from fellow Christians in those coastal provinces with which they had maintained more direct communication and went to the Roman basilica for the model of their church. Constantine's religious structures were practically all built on this plan.

In general, the Christian basilica consisted of a long nave divided from side aisles by colonnades carrying either lintels or arches and terminating in
an apse, generally semi-circular. The nave walls rose above the aisle roofs to admit light through clerestory windows. Except for the masonry semi-dome of the apse, the roofs were entirely of wood. The entrance was on the east (until the fifth century when the orientation was reversed) and generally through a narthex. This was preceded by a cloistered court or atrium. Characteristic of the exterior was its extreme simplicity and lack of architectural treatment, thus marking the completion of the transition commenced by the Romans—the transition from an architecture of the exterior (Greek) to one of the interior. True, certain provincial developments, particularly in Syria and Ravenna, showed some consideration of exterior decoration, but as a rule, the outside was constructed coarsely of brick or stone with little or no adornment. As we are soon to see, this formed a distinct characteristic of the Byzantine school as well.

Of the innovations made by the early Christian builders the most notable is the break with classic tradition in the placement of the arch directly on the column rather than resting it on piers with an entab-
lature. This scheme was first suggested in the early
fourth century in the arcades of Diocletian's palace
at Spalato. This change to a direct structural connec-
tion between the arch and the column or pier was to
assume ever increasing importance as the subsequent
styles developed. Other modifications of the Roman
basilican form were the elimination of the second apse
and its replacement by the principal entrance moved
over from the side to this end in order to meet the
demands made by the processional nature of the service.

Another church form employed by the Early Chris-
tians of Rome was that based on a circular plan covered
by a dome, possibly suggested by the pagan Pantheon.
It might be well to note here the clarity of structural
expression that exists in this Roman masterpiece. The
single great dome, resting on the circular drum that
forms the outside wall, is most impressive in its
massiveness. The broad horizontals and the total ab-
sence of any obscuring forms that might obstruct its
visibility do much to enhance this effect. The single
pedimented portico that forms its total exterior
adornment gives the proper emphasis where most needed.
The building might well serve as a model for the Byzantines in simplicity of expression were there not present elements totally foreign to their ideals—a circular plan impractical for a Christian church, a monolithic concrete dome apart from their method of construction, and a use of mere massiveness of wall to resist the dome thrust, again distasteful to their aesthetic love of clear embodiment of forces by the forms that contain them. This type was generally confined even in Christian Rome to the baptistery and seldom used for the main body of the church.

To the simple Roman form of a dome placed on a circular wall was added an encircling aisle as at San Costanza, Rome. A desire for an economical use of the ground space of the rectangular lots inspired the architect to attempt a placement of the dome over a square plan, but the best he was able to accomplish in this respect, until Byzantine times, was an octagon under the dome with the corners filled out to form a square (or rectangular) outside contour.

This Italian phase of Early Christian architecture had comparatively little influence on the subsequent Byzantine style. True, when Constantine
moved the capital to Constantinople, he took the basilicae plan with him to use in the churches he erected there, but the elements of this plan were already evident in the country around the newly selected capital and probably more frequently looked to than the Italian model.

Byzantine influence soon backfired into Italy, particularly through the medium of Ravenna, but this influence was felt primarily in decoration and little in architectural construction or forms. This latter fact is readily explicable when one considers the convenient presence of an almost inexhaustible supply of classic ruins from which materials might be pilfered, and the consequent tendency to stick to the old methods of construction, together with the very conservatism of Rome opposing any change in traditional types. To these same factors may be attributed the utter lack of progress of the architecture itself as against a notable advance in accessory arts—that of mosaic in particular.

The stronghold of the Early Christian style, as has been implied, was in Rome where its churches
show a continuity of application through the medieval period down to the dawn of the Renaissance. In the rest of Italy its expression died out soon after the barbaric invasion.

So far we have noted first the character of the architects who were to take hold of the Byzantine traditions and through their genius mould them into a great artistic style; and then the general influences exerted on this style by the West. But the basic, formal elements of the Byzantine church such as originated and developed in the East—in Syria, Mesopotamia, Persia, and other inland countries, particularly Armenia—have yet to be considered. This area formed the cradle of Christian Church architecture as well as a nursery for the religion itself. In this consideration, I have accepted Strygowski's views, for his logic is good and his investigation of and concentration on this subject have been most thorough. Moreover, the modern trend seems to be toward an acceptance of this theory of Eastern origin and a discredence of the one which confines the origin more strictly to the Mediterranean area.
Christianity spread eastward as well as westward, and it was in this eastward movement into those territories where the central organization of the Empire was less effective that it found conditions and environments more congenial to its early development as a religion. Even in Persia, where Mazdaism was the official religion, the Christians were granted far more freedom of worship than the state Hellenism of Rome ever allowed them, and it was only upon its adoption as the state religion of the Empire that Christianity underwent persecution in this country. Its progress in Armenia was much more fruitful, the religion receiving official sanction there as early as the third century—long before such sanction was given in Rome.

A spontaneous religious feeling, which would normally give rise to an impulse for its artistic expression, is more native to a free country, unhampered by burdensome and rigid organization. Artists and architects, living natural lives in such a country, in harmony with national feeling and ideas and uncompelled by autocratic patronage, would be likely to embody their faith in the form of church
monuments characterized by their fitness to both the country and the religion. And so it is that we turn from the over-ripe culture of the West to the artistically fertile soil of the eastern inland to discover the beginnings and early development of the basic forms of Byzantine architecture.

It must be remembered that, with the advent of Christianity, the Jews were wandering people with no established architectural traditions of their own, and so they could make no direct contributions to a Christian style of church building. Rather, their contribution was of another sort: by the very nature of their wandering they spread the religion to other lands of more settled peoples who were better equipped to give the style an indigenous architectural development.

Little remains of the earliest monuments in this eastern territory, but a fourth century survey of the field reveals in Armenia a predominant use of the dome over a square plan and in Mesopotamia of the barrel vault, while in the coastal regions
Roman influence had imposed the use of the timber-roofed basilica. In Syria this latter form was not long-lived, for a scarcity of wood forced its abandonment. The stone construction substituted consisted of transverse nave arches in the form of ribs supporting stone roof slabs. This scheme, while interesting and unique, was in no form carried over into the Byzantine style, being confined strictly to Syria. Another notable characteristic is the total absence of Roman classical orders. Entablatures became string-courses, and arches, broadened and lowered, were placed on squatty rectangular piers. The stone was hard and unusually difficult to cut; so sculptured ornament was simple as well as scarce.

Most important is the development in Armenia of the Greek-cross plan with a central dome. The method of using a dome over a square bay, Strzygowski asserts, is of Iranian origin.* But it was the Armenian who first adapted it to church buildings and provided proper dome abutment in the form

*Strzygowski, 58.
of niche-buttresses. The simplest surviving example is the Church of Mustafa (650 A.D.) with apses on the four sides of the central square and a severely plain exterior treatment. More interesting is the Cathedral of Artik in which both the interior and exterior are pleasingly ornamented with blind arcading on engaged shafts. A sense of strength and mass is produced by the simplicity of the exterior design and the pyramidal form based on the roofs of the four niches leading upward toward the crowning dome.

Most popular among the early churches of Mesopotamia was the barrel-vaulted transverse-nave type, as seen in the church of St. Jacob at Salih. Here the entrance facade looks as though it might be a side elevation, for the ridge of the roof shows rather than the customary gable. It is unadorned except for a few cornice mouldings. The long-nave church, introduced from the Mediterranean area was altered by the substitution of the Mesopotamian vault for the Hellenistic wooden roof.

It was in those areas where Hellenistic culture had dominated--along the Mediterranean coast--that
the timber-roofed basilica flourished. It was not an indigenous growth as was the domed plan of Armenia or the barrel-vault of Mesopotamia, but rather the adaptation of a traditional form.

When the buildings of these coastal lands—in the metropolitan cities of Antioch, Alexandria, Ephesus, and later Constantinople—began to show a departure from the set type, it was again through the influence of forms which had received their initial development elsewhere—in this case in the inland regions. True, the wealth of these centers allowed the construction of monuments of far greater magnificence than anything to be found in the churches of the less prosperous interior districts. Moreover, the resulting increase in richness of ornament and complexity of form at times almost entirely obscured the original importations; but the fact remains that they were essentially borrowers, not creators, and it was the Armenian dome and Mesopotamian barrel-vault that were the decisive form in their architecture.

Perhaps some credit should be given the possibility of a stronger continuity of Roman vaulted archi-
architecture in these near-Eastern cities than in imperial Rome, where an abrupt decline in the use of the vault marked the advent of the Christian building period, and it may be that such notable exceptions in the earlier periods as Constantine's octagon at Antioch and his buildings at Jerusalem and Constantinople are to be explained by the combined influences of a persistent Hellenistic vaulting tradition and of the near presence of the Armenian square-planned church employing a central dome.

Thus far we have assumed unhampered national developments of Christian church architecture in Eastern inland countries during the fourth and preceding centuries. This was utterly free of ecclesiastical control of any sort because the Church organization had not as yet reached that point in its evolution that it might exercise a control over the form its buildings were to take. Though this authority in religious architecture was established in Rome soon after Constantine's Edict of 313, the form here recognized by the Church was a local one. Likewise, in the ecclesiastical centers of Constantinople, Antioch, Carthage,
and Alexandria, which had maintained direct contact with Rome, the imposition of the accepted type involved no change, for their architectural development had been along the same Hellenistic lines as that of Rome. But in Armenia and the other countries of the central Asiatic group, official intervention was met with resistance, producing discord. But until conflict of this sort began in the fifth century, the native solutions were allowed full freedom in their development.

Local characteristics were too firmly rooted to be readily discarded at the command of the Church. Even those more essential requirements ensuing out of liturgical developments and the increasing size of the congregations were met with resistance. This characteristic stubbornness is more readily discernible in the almost immediate discordance of the wooden-roof basilica in Constantine's new capital on the Bosphorus after his attempt to establish it there as the authoritative model. In some cases the orthodox type was entirely ignored; in others it was largely submitted to, as at Qualb-Louzet in
Syria, where the timber roof was retained even in a district devoid of trees; but most typically a compromise was reached, out of which several individual types arose. In general they show the attempts of the architects to incorporate the long nave in their church plan with a retention of the dome as the dominant feature and without a loss of that spatial unity so inherent in their central domed structures.

The trefoil type was established when the western niche-buttress of the quatrefoil plan was replaced by a barrel vault, lengthening that end of the church. The domed basilica, adopted later in Salonica in the church of S. Sophia, was the result of modifications imposed on the Armenian single-domed type in Greek territory arising out of the need of galleries for women. The lateral buttresses for the dome were revised to allow a continuous passage of the galleries and aisles.

More important to Byzantine architecture was the Armenian solution of the Greek-cross plan, possible evolved out of the niche-buttressed square by a replacement of the spherical-headed apses with axial
barrel vaults, the dome remaining over a square bay and resting on corner piers. This type spread through Asia Minor to Constantinople where it was adopted in the ninth century, eventually becoming the consecrated form of the Greek Church. Other possibilities of the origin of the cruciform plan as offered by the Tomb of Galla Placidia at Ravenna I shall defer for later discussion under the heading of the Ravennate School.

The more typical solution of the problem presented by the necessity of a long nave is to be found in the domed hall-church. Here the desire of the Armenians for spatial unity led to a reduction of the outer aisles of the basilican plan to mere recesses in the outer walls, the piers supporting the dome remaining attached to these walls. Strzygowski discovers a fully developed example of this class in the seventh century Cathedral at Thalish from which he reasons that "a building of this period is unlikely to be the archetype; since the type affords the one satisfactory solution, we would expect the Armenian architects to have discovered it at the end of the fifth, or during the sixth cen-
tury, when the conflict between national and ecclesiastical influences was at its height."* More interesting is the Cathedral of Ani (late tenth century) in which the aisles are once more made continuous by the introduction of narrow arched passages between the recesses without impeding the direct expression of a well-defined interior space. The exterior is notable for its flat treatment of the gables and the interesting blind arcing on slender shafts along the aisle level. The dome and drum have fallen but were probably treated with similar arcing with windows set in the panels.

Further reference to the above types will be made where possible in the examinations of examples of the more fully developed Byzantine style. Their importance in this paper resides not so much in the direct influence that their exterior treatment might have had on subsequent Byzantine monuments as in the part they played in determining the structural forms characteristic of the style, of which the exterior is, or should be, the logical expression.

A point that remains to be noted in connection

*Strzygowski, 72.*
with the rejection of the timber-roofed basilica as a Byzantine form is its inadaptability to decorative, as well as spatial, unity. This fault lay primarily in the incongruous character of the wooden beams of the roof in a building constructed elsewhere entirely of masonry in forms adapted to masonry. The wooden roof of course could not be covered with mosaic or marble veneer whose consistent application made for unity in decoration. Likewise, the absence of any central dominant motive on the interior, to which all other forms might have been related, eliminated the possibility of a logical expression of a well-defined spatial content. When the wooden roof construction was retained, as, for examples in the two Ravenna churches of S. Apollinare en Classe and S. Apollinare Nuovo, it appears as a definite impediment in the way of complete Byzantine aesthetic expression.

The origins of Byzantine ornament deserve less consideration here. The departure from the ideals of classic representational ornament was more intimately involved in the newly established popularity
of ideas emanating from the East. This initially took the form of a change from Hellenic to Hellenistic expression, from symbolical representation to a more literal and even exaggerated interpretation of the facts of nature. The next step was in the Semitic adoption of representation in art for the purpose of instructing a more or less illiterate congregation in church doctrine. But a more significant progress was from Hellenistic objective emotional delineation, in turns of form, to the more typically Eastern expression, in colour, of subjective emotion. This involved a consequent change from a scientific and exacting portrayal of natural forms to a complete ignorance of their true shape and colour. The church adopted the didactic qualities of Semitic decoration, which required representation, and imposed then over the more natural tendencies of a non-representational art; but, in spite of this, the artists were able to retain the Eastern ideals of colour and their natural expression through the medium of glass mosaic. Thus Byzantine ornament remained basically non-representational, though assuming under the
ecclesiastical requirements a superficial representational nature—a situation similar to that which we have noted in the structural development.

Sculptural ornament, playing a less important part in so far as the Church was concerned, received a more indigenous treatment. It followed closely the application of space-filling design, generally of geometrical character, to flat surfaces or capitals of simple contour. This type of decorative sculpture came more directly from Persia passing through East-Aryan hands, with a brief pause in Syria before being snatched up by Byzantium decorators, almost intact in its original form. It was essentially of a non-representational nature, evincing a decided absence of any portrayal of the human figure in its medium of stone.

Now that the origins and other such basic considerations have been noted, we turn to an examination of the Byzantine monuments themselves. In a superficial sense, the Byzantine style of architecture came into existence in 324 A.D. with the foundation of the new capital of the Roman Empire at the

29
old city of Byzantium on the Bosporus. As we have seen, the Byzantine roots grew much deeper, and, basically speaking, the birth of Christian church architecture marked the actual beginning of the style. However, it was in the legalization of Christianity in 313 A.D., placing the Christian church in the national spotlight, that Byzantine architectural traditions first received universal consideration, and it was the foundation of Constantinople that gave them an immediate impetus toward a coherent development. The city was so located as to form an ideal point of contact between the Eastern and Western civilizations. So true is this that the event of its coming into existence has often been referred to metaphorically as "the marriage of the East and West." But this "marriage" had been preceded by a long and thorough courtship, and it was yet to be some time—about two centuries—before this union was to bear its full and perfect fruit.

The emperor Constantine had allowed church monuments a prominent place in his immense building program for his newly chosen capital. Notable among these

*Cheney, A History of World Art, 325.*

30
monuments were his churches dedicated to Irene and to the Holy Apostles. Fresh from Rome, the emperor imposed his native architectural traditions upon all building design, thus obstructing for the time the entrance of the Greek or Eastern elements. These basilican churches, built as the rest of his structures, in impatient haste, bore no more than a short existence, and, as a result of their unindigenous character, only a limited influence on subsequent development. Santa Sophia, constructed soon after his reign (360 A.D.) bore a similar fate.

It did not take long for the inhabitants to become conscious of the importance of their city and of a subsequent desire to express its entire independence of Rome. And so, for their architecture and art, as for the very substance of their thought, they turned their faces Eastward, conceiving this more as the most immediate and forceful evidence of their complete emancipation. Consequently, we see a positive development, particularly in the fifth and early sixth centuries, of the more truly Byzantine principles.
Existing monuments of this transitional period are scarce and a continuity between them difficult to establish. Late fourth-century Salonica supplied the circular church of St. George in which Roman characteristics were still predominant. The dome of this church rests on a circular wall, eighteen feet deep, in which all lateral thrusts are easily overcome by the sheer weight of masonry. On the outside, a raised drum and a low, conical roof above it mask any evidence of the interior dome. Furthermore, a false impression of an outer aisle is given by a considerable set-back in the thickness of the wall at the spring-line of the dome. But aside from these defects, the exterior is rather pleasing in its simple treatment of mass, with few opening and absolutely no adornment on the bare expanse of walls. The Byzantine origin assigned it by Texier and Pullan* has been largely contested by other critics who credit the Romans with its construction and the Christians only with its adoption and revision. However, the archaic character of its exterior design would seem

*Byzantine Architecture, 154.
to establish St. George as an early step in the transi-
tional stage.

Slightly farther removed from the Roman tradition is the basilican church of Askia Djouma (425 A.D.) in the same city. The plan is a simple one, having three aisles with galleries above the outer two, and a single apse. The exterior is notable for the window arcing along the aisle and gallery levels, with simple, stocky shafts imposed on that part of the wall left between the plain arched openings. The brick walls are at the present time faced with stucco, and the apse has not yet attained its important position as a field for decoration. The later church of S. Demetrius (585 A.D.) is of the same type, further developed and elaborated on the interior, but retaining the severe simplicity of the exterior.

It is in the older cathedral of S. Sophia in Salonica (495 A.D.) that we see Byzantine architecture more nearly approaching its goal. Here the emancipation from the undesirable elements of the Roman building was completed. The plan, while basilican with reference to its nave and two side
aisles, is more closely akin to the central type church. It possibly arose out of the domed basilian type of Armenia. The nave was strangely forced into the shape of a Greek cross with no relation to the isle surrounding it on three sides.

The portico preceding the narthex is at present a Turkish arcade, running the entire length of the church. According to Texier and Pullan, this was originally built by Byzantine architects, containing round arches and Byzantine columns and capitals.* Above this rises the aisle wall, covered over with a lean-to roof of lead and containing a battery of round-headed windows. At a third stage the barrel-vaulted arms of the cross are terminated by flat roofs, and immediately above this projects the drum, circular inside but formed on a square plan externally, with walls pierced by three broad, round-arched windows in each face. Double buttresses at a circular second drum, receiving the thrust of the lead-cover dome crowning the structure, have been placed over the angles of the square form below. Except for the front arcade, exterior adornment

*Byzantine Architecture, 143.
is notably absent, and what little interest may be
evoked here is confined to its pyramidal shape and
a nearly adequate expression of the dome in facade.
This latter was achieved through the imposition of
a drum in order to raise the dome to a point of vis-
ibility over the successive roof stages forming the
pyramid. The normal tendency of this early period
was to sacrifice the external aspect of this feature,
lowering the dome so as to achieve a more unified
spatial design. However, the drum here is narrow
and the dome shallow, and the interior is very little
the worse off. The window treatment is in general
unattractive: the band opening into the gallery dull,
those within the portico crudely simple (including
the doorway), and those piercing the drum and the
central apse at the rear with a decidedly needful
improvement through enrichment and refinement of
proportion. The transition from square to dome
through the use of the diagonal buttresses is aes-
thetically necessary but ungracefully accomplished.
At no point is the Greek-cross plan of the nave
apparent in the facade design, and no immediate and
coherent interpretation can be made of the structural form through the series of roofs that build up the pyramid. Moreover, the plain masonry of the exterior walls suggests none of the richness of decoration that lies within.

It has been suggested by Taxier and Pullan* that, because of its close resemblance to S. Sophia in Constantinople, the church at Salonica might have been built by the school of Anthemius, architect of the former, thus making the two contemporary in the sixth century. But I am inclined to agree with Jackson** that the church is of the preceding transitional period, that "in its arrangements there is something tentative, as if it were an experiment." It seems that the architect was attempting a form of construction with which he was not yet familiar, in search of that final embodiment of the ideals of his architecture and art which he was not yet fated to reach.

It was in the church of SS. Sergius and Bacchus that Byzantine architecture first assumed a more established form in Constantinople. Completed by Just-

*Byzantine Architecture, 142
**Byzantine and Romanesque Architecture, vol. I, 73.
tian in 528 A.D. under the reign of his uncle, Justin I, the edifice serves as an introduction to the expansive building program undertaken by the former upon his ascension to the imperial throne. The plan shows definite affinities with that of the nearly contemporary church at Ezra in Syria (515 A.D.). In both cases the square of the exterior is brought into an octagonal form inside by the use of semi-circular niches across the four angles. Likewise, in each church the encircling aisle is formed by the imposition of another, smaller octagon within the larger one, both covered with domes. The irregularity of the outer octagon in the Byzantine church, due to the smaller diagonal faces, provided the additional space necessary for the introduction of the semi-circular exedrae in the corresponding faces of the inner, regular form. The appearance of these exedrae in the plan was probably the result of a utilitarian demand for more space in the main body of the church, and so conditioned rather than followed the above mentioned irregularity. The suggestion for the form of the interior unit may possibly be traced back to the diagonally-butressed, quatre-foil plan of the Armenians.
The dome is at the present so distorted from a series of plaster coats that it is impossible to determine its construction at sight. M. Choisy shows it as a sixteen-ribbed, concave-panelled figure springing without pendentives from a horizontal octagonal shelf above the aisle arches, with each corner of the octagon at the center of some one of the panels.* Sturgis attributes this odd form to the experimental nature of the Greek mind which led the architects into these different paths of investigation.**

The exterior definitely lacks any sense of conscious design. A many-sided drum was carried up the side of the dome for a large part of its height, and complicated buttress forms project above the aisle roof at the eight corners of the octagon. The transition from the top of the drum to the receding contour of the dome was made by a rather awkward reverse curve in the eight-part lead roof. Procopius, in his book de Aedificiis*** speaks of the stones of the church outshining the sun itself; but we may readily infer that he had reference to the interior, for the ex-

---

*L'Art de Batir chez les Byzantins, pl.XX.
**Sturgis, History of Architecture, 148.
terior is obviously devoid of such enrichment. The walls are of plain brickwork. The dome buttresses confuse the composition, and destroy any pleasing simplicity of mass as was attained at S. George at Salonica. The outward treatment of the dome is far inferior to that of the S. Sophia we have already discussed, and no, in so far as the exterior is concerned, Ss. Sergius and Bacchus seems to be a regression rather than exhibiting any advance in design.

Before passing on, it is worthy of note that it was in this church that the principle of subordinate units to secure absolute scale was introduced to Byzantine architecture. The application here took the form of three arches on columns placed within the larger arch of the nave bays. This motif was soon to attain a common usage in interior design, and one can readily see how it might easily be adapted to exterior treatment.

In the examples just discussed, we see the Byzantine style approaching a completeness of expression—complete, that is, with respect to a system of con-
struction and interior decoration; yet there was one factor of prime importance that had not yet made its entrance in any pronounced degree. This was the element of splendour, possible only in the presence of an overflowing treasury and of an ambitious ruler willing to apply this wealth in an lavish display of pretentious magnificence through the medium of architecture. Splendour characterized the style; it is the first adjective that flashes in one's mind at the mention of the word Byzantine. It distinguished that architecture from all others as does Greek simplicity, Roman practicality, and Gothic devotion for their respective styles.

The Hellenic spirit expressed itself through noble sculpture, the medieval, later, through effects of mass and space. In Armenia, Syria, and Asia Minor, facings of dressed stone, with perhaps a bit of painted ornament, had composed the sole decorative finish. But Mesopotamia, Persia, and Egypt, lands of the great Eastern monarchies, were the well-springs and abodes of that desire to enhance the artistic effect by a richness of decoration that only the re-
sources of a despot can supply.

And so it is that we see the required conditions met in the person of the emperor Justinian immediately after his ascension to the imperial throne in 527 A.D. Peace and prosperity had reigned throughout the empire during the previous half century, and the state funds had grown steadily and rapidly. The new ruler was fired with ambitions to recapture the fame and glory of the old Caesars and of the Roman Empire at its height. He readily took advantage of the excellent standing army and the great wealth to launch a program of extensive conquests and building activity. The historian Procopius lists thousands of examples executed under Justinian, including churches, palaces, bridges, fortifications, etc.* In the Capital alone, he was responsible for the erection of 25 churches, the greatest of these, S. Sophia, worthy in itself of a lifetime's work.

But these new environments brought other and less desirable effects into the field of architecture. We have considered the attempts of an organized church to subordinate the artist's personal expression *de Aedificiis, quoted in Porter, 108.
toward the accomplishment of the uniformity in which lay its strength. But this subjugation did not terminate here. So far the end was confined within ecclesiastical bounds, and it was the Church alone that profited. But, with the rise of state power and the formation of an autocratic court policy, the Church itself was forced into the service of the emperor, and architecture and its decoration were further enslaved, now by an ambition which demanded an effective parade of power and a display of dazzling magnificence. It was no longer sufficient that the spectator be filled with a reverence of God and of the Church which represented him; he now must need be impressed with the power and wealth of the ruler who built and decorated the structure in which he worships. The Church was thus divorced from its true spiritual function by its subjugation to secular ends. We have only to look at Justinian's church of S. Vitale to see this particular phase in art. Here the decorator had to fulfill the necessity of representing Christ not only as a spiritual being but as a figure with superlative qualities worthy of the patronage of the emperor and
his empress Theodora, whose portraits appear on either side.

Insofar as it is to Constantinople that we must look for the most complete portrayal of the element of splendour, we should not expect to find there any evidence of a new, creative school of architecture nor should we be able to trace any formative influence radiating from that center. Rather, Constantinople set an example of magnificence in architectural expression, which, in reality, weights but little in the scales of aesthetics. Explaining this fact, Strzygowski says that "Art (and architecture as well) implies personality. Now a seat of government (Constantinople) may produce personalities in the sphere of politics, of which the aims is material domination. To personality of this kind art seems to be the best means of decking ambition in the garb of beauty, just as religion is the best means of clothing it with virtue and nobility. But the personality which inspired art is not like this. It flourishes less at courts than anywhere else in the world. For at the seat of power everything is subordinated to politics;
the forces willing to accept this fact are always welcome; those which are not willing must either emigrate or remain aloof. --In centers of political ambition art passes from the hands of creators into those of actors; it ceases to be an end in itself, redeeming us from reality; it becomes play-acting, a making-up to please inordinate wealth and power. The surest sign of court art are magnificence, and a change of the artists' motive from expression of feeling to dazzling effect."

It is not surprising then that the greatest of Byzantine monuments from the standpoint of size and richness should be built in Constantinople at this time. What is marvelous is that this monument, the church of St. Sophia, should likewise be the crowning achievement of the style in the more aesthetic qualities of structural clarity and decorative beauty.

The building of St. Sophia began in the year 532 A.D., after the burning of the old structure during the Nika sedition. The dedication of the church

*Origin of Christian Church Art, 48.*
took place in December, 537, only five years and ten months later.

In form S. Sophia is a distinct innovation. Roughly the plan is that of a Greek cross with the corners filled in. Porter describes it as "without parallel among great works of architecture in that its form was not the result of a long process of orderly development and evolution, but, as it were, created at a breath by the genius of one man." He suggests, by the nearest approach to a prototype, the Basilica of Constantine with its three great groin-vaulted central bays with barrel-vaulted aisles bays on either side. But the Armenian affinities, to me, seem a bit more definite. A formation out of the nichebuttressed square is conceivable when one considers that church ritual demanded a long nave with side aisles, thus eliminating the need for and desirability of the north and south semi-domes. These arms of the cross were then made rectangular, covered with barrel-vaults only as deep as necessary to replace the semi-dome buttresses, and screened from the nave to form the aisle passages.

The length of the aisle was finally completed by filling out the corners between the arms. Exedrae of the type employed at SS. Sergius and Bacchus were introduced in the semi-circles of the east and west arms, one placed on either side of the apse at the end and of the entrance at the front. These served the purpose not only of increasing the usable floor space but to form buttresses for the semi-domes as well.

The great central dome, spanning a nave over a hundred feet wide and rising to a height of 180 feet from the floor, rests on true spherical pendentives which most gracefully make the transition to the square bay. A multitude of ribs in the dome allow for the incision of windows between them at their spring-line, thus giving the interior a source of light around the focal point of interest. The galleries on either side repeat the aisle plan and are roofed with domes over each bay. Above the galleries in the north and south arms, lunettes fill in the barrel vaults, brought flush on the interior with the recess occurring outside. On the front are two
Thus we have a building composed of a cluster of domes. As Phillips describes it, "The whole system is raised on a succession of concave surfaces mutually self-supporting, and lesser domes, half-domes, and segments of domes, holding together and rising like a pile of bubbles, realized their appropriate issue at last in the central perfect specimen in which they all culminate and toward which they all converge. —Those lofty curves are the most perfect representation that exists in the world of the resources and possibilities that are latent in the arch principle."* The great crowning cupola, in effect 'almost detached from the main structure, seems, as Procopius early noticed, rather to float above the space beneath than to be built over it.**

Likewise worthy of note is a further development of the use of subordinate units to give scale to the interior. These are employed in the aisle and gallery arcades with a most definitely beautiful

*Form and Colour, 68-69.
**de Aedificiis, quoted in Jackson, 83.
and rhythmic effect, "like dancers in a chorus.*"

Of far greater importance to posterity was the contribution by the two architects, Anthemius and Isidorus, of a perfect solution and application of spherical pendentives for the first time on a monumental scale, thus giving succeeding styles of architecture the only logical and by far the most perfect means of accomplishing the transition from a square to a circular form.

The Armenian love of spatial unity finds its final expression on the interior of S. Sophia. The directness of the plan allows one to take in the whole inside at once; the entire design is obvious at a glance, and strikes one immediately with its majestic simplicity. Every inch of wall surface is embellished with mosaics and marble panelling, forming such a magnificent symphony of color that, as Procopius puts it, "One might fancy oneself to have happened on a lovely mead of flowers. One might duly admire of some the purple, of others the green; and in some the bloom of crimson, and in some white

*Procopius, op.cit., quoted in Jackson, 82.
flashes out, while nature, like a painter, tricks out the rest in contrasting tints." All this, and yet the structural clarity remains unimpaired; rather it is enhanced, evincing a determined regard for its retention on the part of the decorative artist. Such is the correlation between the structure and the interior decoration. "It is probable that on the whole S. Sophia is the noblest interior in the world."

Little attention seems to have been paid to the exterior of the church. It is now plastered over, but probably at first showed the naked brickwork. The horizontal banding in light and dark creates not an entirely unpleasant effect; rather it emphasizes the sturdy broad horizontal dimensions of the building. It is in the jumbled mass of domes, buttresses, and nartheces that the lack of design is at once evident. Such confusion was further increased by unintelligent additions around the base of the building by the Turks when they turned it into a mosque.

*Procopius, de Aedificiis, quoted in Hamilton, 28.
**Sturgis, 156.
The narthexes are two in number, the inner rising one story above the outer. Both are pierced by broad, round arches whose spring line is near the bottom of the opening they crown. These are divided by columnar mullions into three windows, giving a general effect of plain and artless units and of dull repetition. The broad horizontal of the western roofs break up the general form of the building and are only saved in part by being stopped by the two front minarets. Added in Moslem times at the four corners of the structure, these minarets, while not particularly outstanding for their own beauty, definitely add grace and dignity to the exterior composition.

Complete failure in attaining beautiful and expressive window opening is characteristic. In the windows at the base of the central dome and flanking semi-domes alone do we find exceptions. Here they are well placed and well formed. The band encircling the central dome at its spring-line, with each window set deep between the projecting buttresses, together with the broad swelling of
the lead-covered dome above, composes a unit of
time sturdiness which constitutes, if not the only,
certainly by far the most attractive feature of the
exterior. Likewise unique is the fine interior
effect of lightness and airiness provided by this
band of light. Elsewhere, notably in the lunettes
of the great north and south arches, the windows are
not only awkward on the exterior but ill-designed
for the interior as well. In these areas the open¬
ings are formed in two bands, the upper one increas¬
ing in height as it approaches the center of the arch.
Other than for this latter fact, one can discover no
attempt at composition within the semi-circle and
no feeling of design whatsoever in the windows them¬
selves. They seem to have been considered as a
necessary evil and used only as being essential for
the admission of light into the interior.

The great double buttresses on the north and
south undeniably add to the sense of strength and
stability of the structure, but their immensity is
plainly ill-proportioned, in a visible sense, to
all other units. This fault is evident in a struc-
tural consideration as well. By comparison, the buttressing semi-domes of the east and west sides seem insignificant and insufficient. Furthermore, the buttresses are in such a position as to be of no aid to the arch which they enclose in resisting the outward thrust of the dome at any point along its breadth. They serve only to strengthen the four great piers and to receive the transverse thrust of this enclosed arch. This would by no means necessitate the great height to which they are raised at their outer extremities—a height which does so much to break up and confuse the facades. Thus, like the windows in the lunettes mentioned above, they greatly detract from the exterior design without serving any structural or decorative ends.

The single exterior view of Santa Sophia that is pleasing is one taken at a distance which blends the confusion of masses into a pleasing pyramidal form, low and broad and well defined by the bounding minarets. But even here the ungainly buttresses add a harsh note to an otherwise magnificent silhou-
We are now confronted with the problem of explaining this deficiency of exterior design in Santa Sophia. A clue may be uncovered by a glance back at Greek architecture. It must be remembered that Constantinople had a large Greek population with a strong reverence of Greek culture, all speaking the Greek language. Its architects and artists were Greeks; hence we might expect to find a tendency to concentrate on an arbitrarily limited field as characterized their approach to their classical architecture. In the Parthenon, the Greek parallel of the Byzantine S. Sophia, the interest of the architect lies in structural perfection and its logical and refined expression in exterior decorative forms. We never speak of the interior of a Greek temple, for it was not there that the Greek meant for us to look. The pagan rites all took place outside the temple, the procession gathering at the back and proceeding along the two sides to the final ceremony in front. But the Christian re-
ligion required for its meeting place an interior which would hold the entire congregation. Why then should we expect to find a Christian church, designed by Greek architects using the same logical procedure of their ancestors, to contain anything more than an internal decorative expression of a well worked-out structure? True, the exterior can be seen by all concerned, and it is probably this very point which has subjected early Byzantine work to so much criticism because of its lack of facade design without a corresponding critical probing into the interiors of Greek temples to discover their design deficiencies.*

Considered in this light, S. Sophia is rather a return to Greek simplicity and directness, while Roman architecture may be considered both as a development and a departure: development in the sense that the progression was from a Greek concentration on exterior design to a Roman interest in both and

*We have noted a certain amount of interest in facade design in the early Armenian churches, but this phase was not carried over to the Byzantine Greek. It was rather the domical structure and plan elements that found a place in his architecture.
thenae to a Byzantine disregard for the outside and attention to the inside; departure in the sense that the Romans, failing to set for themselves any one such goal, fell short of the achievement of either. Also involved in this failure, is a lack of logical structural expression, which, on the other hand, is clearly and beautifully exhibited in all Byzantine interiors.

In Gothic architecture alone do we find all three elements combined and given their full and perfect embodiment, though even here the scales are tilted in favor of the interior. The Renaissance shows a return to Roman principles and a consequent absence of structural definition in either place, while the modern style is too close for the necessary perspective and too young for a critical judgment on these points.

That the Greek should later repeat his earlier success in a reversed field is nothing more than we might expect. What is marvelous, however, is the conditions under which this later success was achieved. The Greek was no longer in the congenial setting of
of his native city-state which allowed a full and unhampere²d expression of his thoughts and ideals. Rather, he was under the subjection of a luxurious and highly artificial court, whose love was for magnificence and pretentious display, not for the beauty to be found in simplicity and refinement. The richness of the interior and the magnitude of the monument testify the wealth and power of the Emperor. Yet this demand for ostentation would seem to show up on the exterior as well as the interior. Such is the case in the architecture of the Roman Empire. But here again we encounter that essential difference between the Greek and the Roman approach: The Roman attempting all and perfecting none; the Greek, considering the half better than the whole, limiting the goal of his endeavor and attaining it in its fullness. Thus we might in part attribute the deficiency of facade design to an imposition of this phase of the Greek character upon Byzantine architectural expression, even over the pressure of demands for pretention.

There are still these other possibilities to
consider: that the architects of S. Sophia, Anthemius and Isidorus, apart from simply ignoring the exterior, may have considered their design the most appropriate under the circumstances; or they might even have gone so far as to believe it the best of which they were capable. The former case is plausible, but the latter highly improbable, for one hardly feels that such inferior external treatment could be expressive of the best efforts of architects as brilliant as Anthemius and Isidorus have shown themselves to have been by the greatness of their designs for the interior and structure of S. Sophia.

Let us now consider the other alternative. There is no doubt but what the exterior clearly shows what lies beneath. Even those tremendous buttresses, which we have criticized for their excessive mass, exhibit a clearer knowledge and a more direct embodiment of the forces existent in the building than is to be found anywhere in the Roman method of resisting and incidentally masking the presence of the thrusts from vaults in the
sheer weight and thickness of their walls. Perhaps the architects felt that any attempt to modify the confusion of exterior forms and to decorate them to please the eye would detract from the clarity of structural expression. Thus they nowhere employ the false domes of the Renaissance nor use trabeated structural forms decoratively on an arched construction, a practice so common to Roman architecture. Again we might suppose it was a bit of Greek subtlety that led them to preserve the plainness of the outside in order to enhance the richness of that which lay within.

Despite the inferiority of its exterior design, S. Sophia ranks as one of mankind’s great achievements of all times.

Among the other works of Justinian in Constantinople were the churches of S. Irene and the Holy Apostles, both rebuilt from older churches first erected in Constantine’s time. S. Irene as it now stands, is mostly eighth-century work, the masonry below the spring line of the aisle vaults being all
that remains of Justinian's building.* But, according to Jackson, it is probably that the present building retains the original plan and scheme of construction.**

The plan is that of a domed basilica, with a second, elliptical dome over the extended west arm. Each of the two great nave bays is defined by broad, deep arches. At the floor level, the north and south arms, formed by these arches—in effect barrel vaults—are screened off from the nave by round arches on columns, thus defining the side aisles. At the gallery level the screen is stopped, the plan following a Greek-cross at this stage. The west dome is low and nearly flat, hardly protruding above the normal roof line; but the east dome is raised to a considerably greater height on a circular drum, pierced by a band of encircling windows. At the west end, a narthex, carried through two stories, stretches across the nave and aisles.

*W. S. George, quoted in Jackson, vol. I, 106.
The great buttressing vaults are expressed on the exterior by recessing the lunettes to a depth of about a foot. The distances between the outer edges of the arched form thus defined and the gabled roof and returning walls is so little as to give the whole bay a weak and flimsy appearance. To further increase the unpleasant effect, the huge wall spaces are given absolutely no architectural significance. Roman builders had used lunettes such as these as single great windows, filled in with a bronze framework or with pierced marble slabs to insure against any visible effect of instability. In the Gothic times to follow, such areas were to be utilized for stone-tracery windows as a characteristic feature of this style. But Byzantine builders of this time, and later as well, could devise no better scheme than that of carrying up solid walls pierced with comparatively small windows with no relation whatsoever to the form in which they were imposed. As they occur at S. Irene, the three rows of square-headed windows (originally with arched heads), identical in size
and regularly spaced, give no indication of what lies within, as well as no composition on the surface without. Even less intelligently designed than those of S. Sophia, they might just as well have been used in a tenement house.

Around the base of the dome, however, the ring of windows is very appropriately placed, forming a rather handsome feature. The scheme is similar to that used at S. Sophia, though in this latter church the openings had been placed in the dome itself, starting at its base, whereas in S. Irene they occur within the confines of a narrow drum. This drum on the outside is carried up above the spring-line of the dome, thus adding masonry at a point where the thrust of the dome is greatest—its haunch. Further buttressing is obtained through the use of projecting piers between each window, beginning at the spring-line of their arched heads. The additional height given the exterior drum allowed sufficient space above the tops of the openings to give the whole feature a pleasing
proportion. Though the dome itself is rather flattened out on the exterior by a lead roof, this central feature, raised as it is on a drum to a point of sufficient prominence, is outstanding as by far the best designed and most intelligently treated element of the whole structure.

A consideration of the rest of the exterior might not lend much weight to the above statement. The irregular surfaces of the gabled roofs over the vaulted arms, the formless masses stuck in corners between the arms, the extremely dull treatment of a half-hexagonal apse, the unthinking placement of windows which we have already noted, and a pronounced lack of ornamental interest in general, all lead one to wonder if there were any conscious design considerations given the exterior construction.

The number and widespread distribution of Justinian's edifices has already been remarked, but, except for his Ravennate work which will be considered later in this paper, this must conclude our discussion of such. That the erection of buildings on a monumental scale should have suddenly ceased
after the emperor's death is not at all surprising when one considers the complete exhaustion of the Empire's wealth and energy that Justinian's lavish expenditures had brought about. A condition of prosperity and peace was soon reduced to one of poverty and slavery, and the emperor was forced to resort to extortion and injustice to obtain money for his ventures. Put more forcefully by Gibbon, "The edifices of Justinian were cemented in the blood and treasure of his people."* And so we find no host of imitators of S. Sophia or any other monuments of this period as we do of the greatest works of all other architectural styles, and no school to carry on the traditions of its greatest architects, Anthemius and Isidorus. Rather, the building of the following centuries was confined to modest, unpretentious structures in various localities, built out of immediate need rather than as a part of any great scheme.

In Ravenna during the fifth and sixth centuries there developed a school of architecture which,

*Quoted in Jackson, Ill.
though for the larger part Byzantine, possessed distinct characteristics of its own. Due to the Italian elements present, the style is often referred to as Italo-Byzantine.

In 404 A.D., as a measure of safety, the Roman emperor Honorius had moved the capital east to the Italian city of Ravenna, isolated by impassable marshes and lagoons. Christian art in Italy had been making little progress during the fourth century because of the unsettled state of the Empire caused by Germanic invasions and a division of the capital between Christianity and paganism. When advance finally took place, it was in the more peaceful city of Ravenna. Here was to be found an incentive to build from a newly acquired prominence as capital city, a freedom from a too burdensome weight of tradition, and, most important, a direct contact with the new Eastern style.

Notable among the earlier buildings of the school are the Ursian baptistery and the Mausoleum of Galla Placidia. Built by the bishop Ursus during his episcopate (400-412), the baptistery is
a domed octagonal building, brought into a rounded square at its base by low niches on the oblique sides of the octagon. The interior is divided into two stages by broad arches one above the other on each face of the octagon. The lunettes of the upper arcade are pierced by single large windows.

The exterior walls of the octagon are carried up beyond the spring-line of the dome and support a low, pointed roof of tile. The space above the windows is decorated with blind arcading, two units on each face. These are further divided by two small arches supported on corbels.

The mausoleum was built in 425 A.D. to hold the body of Galla Placidia, sister of Honorius. The plan is purely that of a Greek cross with barrel-vaulted arms radiating from a central domed square. Almost the entire interior is covered with mosaic, forming an exquisite decorative unit. The dome over the crossing was formed after the method of pendentives but without the replacement by another dome of the saucer over the top point of intersection of the side arches.
On the outside, the walls of the square are continued up to conceal the dome and are covered by a low pyramidal tile roof. The barrel-vaulted arms are likewise covered by tile roofs forming gables at the ends. These gables are treated in the form of pediments in brick corbelled courses, a unique and on the whole a very interesting feature. Below, the wall surfaces are lined with blind arceding, without windows, while the walls of the central square are pierced with small, square-headed openings. The cornice of this raised unit is likewise of brick in corbelled courses, with the same interesting line of dentils.

All this is quite foreign to anything we have discovered so far in exterior design. The scale of the buildings we have discussed has been much larger, and the same amount of ornamental detail that we see here had failed to prevent an appearance of bareness in their outer walls. But in smaller unit the masses are well proportioned and the decorative treatment appropriately res-
trained. The smooth blending of the delicate pink of the brick with the soft gray of the mortar and a pleasing accent of a richer color in the roof tile, along with the excellent scale and detail, make the building outstanding as an exquisite gem of the style.

However, in its general character the mausoleum is more a part of Ravenna than of the Byzantine style as a whole, though it shows a strong affinity with the smaller eastern monuments of a succeeding age. There is a certain amount of deception through the complete masking of the domes and vaults, but, if we consider the accurate representation of the general interior masses that is accomplished, this criticism seems meager and unimportant.

That a building of this early date should contain elements in it that were to play such an important part in the fully developed style is remarkable if not astonishing. But, if we consider the insignificance of its size and purpose and its comparative isolation from the focal point of the
development, it does not seem likely that it played any important part in establishing, or even suggesting, the Greek cross as the orthodox church plan or the use of spherical pendentives to accomplish the transition from square to circle.

Two very interesting basilican churches are those of S. Apollinaire Nuovo, built by the Gothic king Theodoric, about 526 A.D., and S. Apollinaire en Classe, begun about ten years later under the Byzantine dominion. Both are simple, three-aisle churches, with an eastern apse and a wooden roof. An unusual feature common to both basilicas is the free-standing, circular tower. The Greek church did not employ a bell to call its members to services; so it is dubious that these towers were originally used as campaniles.

Characteristic of the exteriors of the two churches is their rugged simplicity and direct expression of the interior forms in the gabled nave roof and the lean-to aisle roofs. Even the blind arcading of all the aisle and clere-story walls of S. Apollinaire en Classe was probably
intended to suggest the rows of arches and columns lining the nave and aisles inside. The bareness of surface treatment was carried even farther on the faces of the octagonal apse, the total adornment reduced to simple round-headed window openings.

The outstanding monument of the Ravennate school is the unique church of S. Vitale. Although of later date than S. Sophia it exhibits an earlier phase of Byzantine architecture, possibly due to its distance from the capital. Though conceived under the Gothic rule in 526 A.D., it was not the subject of any serious building activity until the reign of Justinian, and it was not until 547 that its consecration took place.

The prototype of the plan was probably that of SS. Sergius and Bacchus in Constantinople, but there is a possibility that the form might have been suggested by the Armenian octofoil church, with its semi-circular apses on all faces of an interior octagon, through an intermediate stage of development as found in Constantine's
octagon at Antioch. The plan consists of a simple octagonal central area, surrounded by an aisle and gallery, the apse built out of the eastern end and the narthex added on the west and northwest faces. The outer wall, following the line of the inner, forms a regular eight-sided figure, whereas at SS. Sergius and Bacchus the exterior contour is brought from an irregular octagon inside through the aid of niches into an exterior square. Between each pillar of the central area are opened two-storied niches divided by columns into three lesser bays. The use of these exedrae here is not justifiable in any functional sense other than in the wonderful beauty they add to the decorative effect. In plan they serve to choke the aisle and gallery passages and almost destroy their value as circulatory units.

The architects here baulked at the problems challenged and so superbly solved at S. Sophia. The central dome they constructed of earthen pots, as in the earlier baptistry, in order to
minimize the weight, and rested this form on an octagon through the use of squinches. The buttresses for this dome are carried through the aisle and gallery and project from the outside wall at the eight corners. Secondary buttresses, carrying the thrusts of the intermediate aisle and gallery groin vaults, are likewise expressed on the exterior, defining bays three in each face with an aisle and a gallery window in each bay.

The central dome is hidden inside an octagonal drum, carried well above the sloping tile roofs over the gallery projections, and covered by a low, pointed roof of the same material. This scheme we have found to be typical of the Ravenna school. Though based on a falsehood, the resulting form is undeniably handsome in its imposing simplicity and in its well placed and excellently proportioned round-headed window openings, each recessed in a larger arch of the same shape. These windows, incidentally, are set in the dome itself and provide an ideal illumination for the interior as well as serving so excellent a pur-
pose in the design of the exterior. This is the first Byzantine monument of the central type in which we find window openings being used to enhance the beauty of the facade design rather than forming an impediment in the way of such an accomplishment. Likewise, it is here that the scheme of subordinate units within a large form is first given a use in exterior design. In the end of the choir vault over the apse, three windows with arched heads supported on columns are recessed in a larger arch which defines the vaulted form on the interior. The central window of the group was made slightly broader and higher in order to form a better composition in the lunette of the outer arch. Evidences of this scheme we shall further seek in subsequent examples, for the logic of its use on the exterior necessarily follows out the prominent part it played in interior design.

Though, the church of S. Vitale forms an important step in the development of Byzantine facade architecture, it is by no means a final expression of any phase of it. Most definitely
lacking is a proper position of prominence that should be given to the dome, the central theme of the composition. Moreover, the window openings, though well-designed as we have noted, are not yet capable of suggesting the monumental scale of the structure, and the plain exterior walls, devoid of any ornament, in no way exhibit the richness of decoration that lies within.

True, as Mr. Watkin has suggested, there is a great deal of interest to be found simply in the colour and texture of these walls, but this beauty alone is insufficient.*

The First Golden Age of Byzantine art and architecture ended with the death of Justinian (565 A.D.). From this time until the beginning of the Second Golden Age in the ninth century, development was retarded and building comparatively at a standstill—the inevitable pause that marks the period of paying for luxurious

*The Church of Tomorrow, 16.
splendour, extravagant over-building and over-expansion. While the Western Empire was being overrun by barbarian forces, the East was finding considerable difficulty in contending with the new-born fire of Islam, as well as suffering on the verge of downfall through the invasion of Greece and threatening attacks on the capital itself by the Bulgars and later the Russians.

Progress was further impeded by the Iconoclastic revolt during the latter half of the eighth century and first of the ninth. However, this movement, while widely destructive to the representational art of the time, had little effect on the architecture itself. Even sculpture, already essentially non-representational, was passed over lightly.

The more settled times that followed the re-establishment of representational art saw a revived interest in building, particularly under Basil I. Though generously sponsored by this emperor, the architecture did not again assume the same role of autocratic pretention that was
its lot under Justinian. Rather it was more the work of the people, of individual communities and provinces, each attiring it in a garb more native of their own ideas, just as the Ravennate School had done in an earlier age. True, at Constantinople, the greatest monument erected during the reign of Basil I—the famous "New Church"—was an imperial shrine rather than a community church, but this was an exception to the general rule of more intimate structures.

This church, consecrated in 881 A.D., has long since disappeared, but manuscripts handed down describe it as richly decorated both inside and out. Its roofs and five domes, covered with gilded plates of bronze, must have given it an appearance far more brilliant and imposing than was to be found in any of the earlier monuments. This fact characterizes all succeeding work in the Byzantine style—not the use of gilded domes but the new and vital attention given to the external aspect of the buildings.

These later churches were considerably reduced in size over those tremendous edifices.
erected in Justinian's day. They were all domical structures built on a Greek cross plan, enclosed in a square or rectangle externally. The arches over the arms of the cross were prolonged as barrel vaults to the outer walls, forming abutment for the dome and its pendentives. The four small squares remaining outside the cross were covered with domes or domical vaults. The cruciform scheme thus built up was expressed externally by the greater elevation of the central dome and the four main arms. Furthermore, as had been customary in the earlier churches, the rounded back of the barrel vault was often defined in the facade by an arched recession.

In Constantinople, the earlier monuments of the Second Golden Age were in general built solely of brick, whereas those of the later centuries added stone in their construction and design. The apses, most often three in number, were round on the inside and showed several faces of a polygon on the outside, decorated with arcading and tall and narrow round niches with semi-circular
heads.

It is in this period that, for the first time, we can discover any real advance in exterior design. More and more attention was paid to the external appearance of the edifices. The walls were enlivened with ornamental bands and arches of brick; the drums of the domes were heightened and multiplied, becoming prominent decorative features. The latter were generally polygonal in plan and adorned with angle-columns supporting arched cornices. Windows were round headed and often composed in units of two or three, thus logically adopting a feature already common to interior design for a further decorative use in the facades without. Along with a progression toward freeing the nave from encumbering elements and transforming it into a compact unit, was a growing tendency in the direction of a more elegant exterior, the somewhat heavy, box-like elevation giving way to one more harmoniously defined.

The Church of S. Theodosia (Gul Djami), erected in the ninth century, exhibits little to be commended in its outward appearance. It is high and heavy look-
ing, the angle chambers rising almost to the
height of the nave and transept roofs and
effectively hiding the low dome. The interest
is concentrated at the three apses, particularly
the side two where the faces of polygon are
decorated with tall narrow niches terminating
in conch-shaped heads. Above these are brick
dentil and vandyked courses.

Another church of that century, S. Mary
Dianaissa, likewise contains archaic character-
istics in its exterior design. Except for the
two nartheces and a raised central dome, it pre-
sents much the same cubical aspect as S. Theodo-
sia. The high dome is surrounded by an exterior
drum, carried up above its spring-line, and is
as yet covered with lead in a form similar to
that of S. Irene. The windows piercing the
drum are round-headed and without intermediate
columns or piers. The backs of the barrel vaults
in the arms are pleasantly expressed by double
receding arch rings, but the windows within show
little advance in logical composition over those
within the lunettes of S. Sophia or S. Irene.

No interesting brickwork is notable.

The church of the Monastery of the Myrelaion, restored in the first half of the tenth century, clearly marks the growing sense of exterior harmony and elegance in Byzantine Architecture. Though not so elaborate as the buildings of a still later date, the walls are very pleasingly enriched with brick patterns in cornices and arches. The old cubical form is here softened into a delightful composition based on the pyramid through a pronounced lowering of the angle spaces—a justifiable procedure in so far as these areas were of little relative importance to the principal plan and structure.

A beautiful example of the smaller structure is the eleventh-century Church of S. Theodore the Tiro. It exhibits the fully developed cruciform plan, but with a nave span of only fourteen feet. The central polygonal drum is faced with strongly projecting cornices enclosing windows set in several orders of arches. Arcades and niches give
a richness of treatment to the apses, and the walls themselves are enriched with saw-tooth cornices, arches, and thin red tile set in beds. The roof of the cross arms are finished off as triangular gables, with the line of the vaults strongly defined by recessed arches below. The dome itself is round and covered with lead, while the remainder of the building is roofed with tile.

Though illogically related in scale to the main body of the church, the exo-narthex, constructed in the fourteenth century, adds so considerably to the charm of the exterior design that Jackson has termed the building "the prettiest church in Constantinople." This graceful unit consists of five bays vaulted domically, the center and outer two raised on polygonal drums and covered with tile roofs. The main facade is divided into two levels by a string course, on which rests the several orders of each of the arches enclosing the five window groups. The openings in each of these bays are composed quite irrespective of those of

*Or. cit., 136.

80
the neighboring bays: some are double round-headed windows, others follow the line of the arch with a central dividing mullion. This irregularity is pronounced, but not unpleasant. At the lower level of the facade the treatment is even more unorthodox, the interior bays entirely ignored as to their exterior expression. In the center is a door and on either side tall, slender, semi-domed niches; then triple arched windows with the stilted heads resting on the fine bold capitals of the intermediate columns; and finally another such niche at each end.

What is lacking in logical design is more than made up in the exquisite decorative quality of the alternating bricks and stone in horizontal bands and in radiating lines in the arch rings of the upper story. This use of stone is new, being confined to the fourteenth-century work in the church, and is a very definite contribution toward securing the richness of a polychrome effect so desirable in the Byzantine facade. Likewise worthy of attention is the use of stone slabs carved with lozenges.
circles, rosettes, crosses, and other designs in the lower portion of the triple arcades to fill in below the window openings. These are excellent spots for a concentration of the ornate pattern work pervading the interior design, and, moreover, provided a convenient means of securing that elegant slenderness so desirable in the Byzantine arcade, where the allowable low-point of the window opening might otherwise restrict the needed height.

The church of S. Theodore, together with the later narthex, marks an important advancement toward a more logical treatment of Byzantine facade design, not so much in any excellence of general composition as in the appropriate richness of its individual parts. For expressive composition we shall have to look elsewhere than Constantinople.

The other churches of the city contained little that we have not already observed in S. Theodore. The Church of S. Saviour in the Chora (eleventh century) appears as a regression in facade development, possibly because of the considerable amount of alteration and addition it was subjected to in a
later age. As S. Theodore, it has a later exo-
narthex of a size enormous in relation to the
main body of the church. The central dome is
large and pleasingly imposing. Its drum is
surrounded by numerous arches on columns, alter¬
nately pierced by windows and confined beneath
an encircling horizontal cornice. The presence
of no less than six raised domes, most of which
are subsequent to the thirteenth century, would
seem to indicate the fondness of the later By-
zantine architect for an abundance of cupolas.
The lead roofs covering the arms follow the con¬
tour of the vaults.

As the outstanding characteristics of the
later style in Constantinople we note a central-
domed plan normally giving a pyramidal composi¬
tion and a well-deserved prominence to the cen¬
tral cupola; a development of the tower dome
through a considerable heightening of the drum
over a comparatively small span; a rich modeling
of this drum through the use of arcoing; an ab¬
sence of the nonstructural use of a wooden roof
over barrel vaults in a city when the fire hazard was great; an articulation of these and other interior vaults the exterior design; a more intelligently composed and decoratively effective grouping of windows; and above all a more appropriate expression of the sumptuous decoration of the interior in the exterior facades through the use of sparkling bricks and stone banding, of arches in successive rings recessed in the Gothic manner, of cornices containing dentil and saw-tooth courses and the new and equally rich vandyked form, of spots of carved stone ornament, and of niches with couch-shaped heads recessed in the walls between windows and doors and encircling the apses.

These examples bring us much closer to the perfect exterior expression we are seeking. The pyramidal composition about a crowning dome lends itself well to monumental structure. An elegance and charm has been achieved through the use of soft curved line and the meticulous elaboration of wall surfaces. Hamilton pays
them this tribute: "Bejewelled with marble and mosaic, theirs was a preciousness and loveliness like that of the chased and enamelled casket of the goldsmith."*

But these monuments are small; they lack the grandeur of the great S. Sophia, S. Irene, and S. Vitale. True, the rich decoration of their exteriors sufficiently reflects the splendour of the marble panelling and glass mosaic that lies within; yet nowhere in Constantinople can we discover an application of this principle on a reasonably monumental scale. Nor shall we find it in the architecture of any of the surrounding provinces, which will be considered later in this paper.

Domestic architecture is scarce. The one remarkable extant example is the Tekfur Serai, built sometime between the tenth and twelfth centuries. The three-story court facade of the palace is the best preserved and most interesting in its wealth of brick and stone patterning. Bricks, turned edgeways or cut into triangles and squares,

and white marble in strips and squares form geometric designs in the spandrils of the round-arched windows and horizontal bands separating the stories. The dark of the brick and the white of the stone is alternated in the arch rings and in horizontal courses in the wall itself. Its rich decoration and use of stone would seem to place the Tekfur Serai in the twelfth century rather than the tenth.

The final fall of the Empire to the Turks in the fifteenth century merely climaxed the period of steady decay that had begun even before the Latin conquest in 1204, though more definitely marked by that event. This was the official end of the Byzantine style and the actual end as regards Constantinople. The Turks converted the Christian churches into mosques, whitewashing the exteriors and covering mosaic which related too definitely to the Christian dogma. But other than this the destructive effect of their conquest was little.

The Turks straightway proceeded to fill Con-
stantinople with mosques of their own construction, though generally using a Greek or Armenian architect for the purpose. Outstanding is the Mosque of Mohamet II, built on the site of the now ruined Church of the Holy Apostles, and modelled after S. Sophia. Indeed, this Byzantine church, except for the presence of galleries, set a standard form for almost all Turkish religious edifices. The Turks added the charm of the beautiful faience which lines the walls and a homogeneous exterior treatment in marble. Though Byzantine artistic traditions themselves soon died out under the numbing influence of the fatalistic religion and the restricting authority of a foreign despot, the Constantinople (Stamboul) of today presents a most handsome spectacle with its great mosques, the numerous domes swelling one above the other toward the mighty central cupola and the graceful minarets which contrast so successfully with the broad curves of the domes.

And so we see Byzantine architecture approach and reach its final expression in the central
point of its development without accomplishing any desirable solution of the problem of an appropriate facade design. We have seen an attempt and a moderate success on an intimate scale but nowhere a solution such as might be applied to the more colossal proportions of S. Sophia. The very sophistication and autocratic—even snobbish—characteristics of the Byzantine style removed it too far above the interests and comprehension of the common people for it to attain any monumental expression through their hands as did the Gothic architecture of medieval France. For the erection of such edifices we must look to the efforts of the same sort of ambitious and luxurious court as built S. Sophia in the sixth century. But, with the decay and degradation and general decline of wealth in the later Empire, along with the ever-threatening danger of foreign invasion and the resulting unstable conditions, no such court arose during a period which saw the final awakening of interest in exterior design; and so the
ideal opportunity for the ultimate solution of this problem was never presented to the Byzantine architect.

We turn to the Byzantine architecture as it developed in other countries and surrounding provinces, but with little hope of finding a proper treatment of the facade in buildings of other than a very modest scale. It is only natural that Greece, the home of the ancestors of those who made the style great, should next occupy our attention.

By the end of the ninth century the country was well on its way to a recovery from the poverty-stricken ages that had preceded. Architecture flourished with the return of prosperity, and the Byzantine style received a new impetus toward further development. The basic traditions of the Greek manifested itself in the same beauty and fitness of site chosen for the Christian church as that for the ancient pagan temple, and in a classic restraint, productive of a quiet charm.
that allowed for neither the ornateness of the Serbian, the severity of the Armenian, nor the soft, luscious, effeminate exterior curves of the churches we have just examined.

Greece's prosperity was not the result of a rich cosmopolitan trade, but instead emanated from her vineyards, olive groves, and silk factories. She contained no imperial capital and entertained no luxurious court, and hence no buildings on a magnificent scale arose. Her architecture rather expressed the even, though restricted, tenor of the lives of her people in a careful construction and choice adornment of modest structures.

The churches of Athens present a uniform aspect in their small proportions (reminiscent of the classic temple cella), in their cruciform plan, in the use of a single central tower dome, in their pyramidal composition, and in their walls of squared stone jointed horizontally and vertically with narrow tile. The roof over the dome is of tile and was no longer projected to
form eaves. The slender angle columns on the polygonal drum support semi-circular stone arches, over radiating brick archivolts. The tile of the roof, adhering closely to the form of the dome, was brought down flush with the face of the arches to replace the spandrels between them. This type of drum and dome is characteristic of the Athenian churches and was widely imitated in the other parts of Greece. Windows, generally grouped in double or triple units, are elegantly slender with elongated, stilted, round heads and intermediate supports in the form of columns.

An early church of this group is the so-called Small Cathedral (tenth century). The raised cross arms terminate in gables pierced by a typical double window unit. The facades are essentially plain in form, though decorated by numerous slabs of carved white marble combining classic and Christian design.

The two eleventh century churches, SS. Theodore and Capricarca, are a bit more characteristically Athenian. The windows of SS. Theo-
dore are uniformly grouped in two's under a large enclosing arch, slightly projected and outlined in a richly modelled saw-tooth course. That area of the lunette remaining around the window heads with their brick archivolts is covered with a surface pattern in brick. The stilted arches of the openings rest on a single column in the center and a projected string course at the sides. This delightful treatment of the fenestration has been retained in most subsequent examples and is today widely accepted as a characteristic feature of Byzantine design. The angle chambers in both cases were lowered to give expression to the nave, transept, and choir arms, which end in a gable as at the Small Cathedral, the whole composing a most pleasing pyramidal form.

Byzantine churches of the Morea are numerous. The three twelfth-century churches of Argolis--at Merbaca, Areia, and Chonica--are characterized by massive bases of white marble and a greater wealth of detail above than we found in the Athen-
ian examples. The facades are meticulously adorned with stone cornices, broad meander friezes of brick, saw-tooth bands and archivolts, colored faience discs, and spots of sculptured ornament in the stone masonry.

The careful measure and clear articulation of the design through the symmetry of the plan, the well determined proportions of its structure, and the accurate fitting of the masonry suggest a revival (or survival) of the old Hellenic spirit. The presence of entrance porches and belltowers is characteristic, though as yet of little relative importance to the composition.

More famous are the Churches of Mistra, SS. Theodore (1295) is notable for its marble panelling on the exterior faces of the three projecting apses and a general richness of facade ornament. The central dome is larger than usual in Greek churches and the drum is divided by a greater number of arched bays, pierced alternately by windows.

Mistra attained a unique position of importance during the fourteenth century, the son of the Em-
peror being raised as despot of Morea with this city as his capital. Direct intercourse with Constantinople was established. In general the churches of this period show a mixture of Greek and Constantinopolitan elements in their design, with a touch of Western Gothic. The influence of the capital is evident in the use of domes over the angle chambers and in the traditional expression of the interior vault forms in the facades, by the lines of exterior arches. Western elements appear more as superficial adoptions of popular forms. In the Church of the Monastery of Pantanassa, the bell-tower contains trefoils and triple openings beneath pointed arches, and the apses are decorated with an arcade of pointed arches. These Gothic details exist along with the more indigenous Byzantine round-arched forms.

The latter churches at Salonica show more definite affinities with contemporary examples in the imperial city, though the tendency to decorate the exterior is carried much further. S. Elias, probably of the twelfth century, contains elaborate patterns in brickwork in the form of zigzags, dia-
monds, guilloches, and trellis work, capped by a vandyked cornice as in S. Theodosia. Below this banding in brick on the many-sided apse are placed flat niches recessed in several arch rings on each face. The dome is raised on an unusually lofty drum, surrounded by very slender arches with intermediate shaft-like columns rising to the cornice line. The reserved and almost delicate treatment of this central drum is a splendid and most delightful feature, quite worthy of repetition.

Even more remarkable for the charm of its elaborate patterning in brick is the Salonican Church of the Holy Apostles, built in the same century. Its plan is essentially that of the neighboring S. Sophia. Five dome-towers rise on the exterior, one over the central nave and one over each corner of the aisles. Here the architect has adopted the arched cornices supported on the angle columns of the polygonal drums. Saw-tooth courses predominate in these and all other exterior cornices of the structure, giving a rich play of light and shadow. An exquisite slenderness is no-
ticeable in the arched bays of the drums and in the flat niches of the apses, producing an elegance of aspect so essentially characteristic of Byzantine façade design. Open to the top on the interior, the elongated drums appear as lanterns rather than as simple dome coverings. An enumeration of the infinite variety of decorative brick designs used on the outer walls would be difficult if not impossible. They form bands almost continuous over the upper half of the central apse and effectively cover the wall surfaces within the niches and within all other arch-bound surfaces of the exterior. Interior vaults receive their typical expression on the façades.

Such was the development in and around the capital of the Empire. The territories farther to the east had by no means been inactive in the architectural field during the centuries that followed the initiation of the Byzantine style. They did not simply contribute their part to its formation and then retire into the background or
get out of the picture altogether. Though exercising influence of no such magnitude as was characteristic of the earlier stage, the later developments deserve at least a quick perusal.

A glance at subsequent monuments in Asia Minor will convince one beyond doubt that its prime importance lay in its early formative influence. In the seventh century, Arab invasions plunged the country into a state of misery and devastation that lasted through a period of four hundred years. The seclusion into which the inhabitants were driven provided ideal conditions for a development of monasticism with its characteristic architectural establishments. Thus its churches were of a more popular nature and a more modest scale. Their decorative art was simple in technique and narrative in style, contrasting with the official iconography of the capital cities. Stone was the exclusive material, windows were round-headed, doors enclosed in the square, almost classic frame so popular in Syria, and moulding simple in profile and strongly projected. The exteriors were essentially plain,
Influence from the more developed Byzantine style began to flow back into Asia Minor, taking effect in such an example as the eleventh century Tchangli-Kilisse. The principal material of construction remained stone, but brick was introduced for decorative effect. The central tower dome dominates the pyramidal structure. The decoration around its drum is in a series of slender recessed arch rings without the use of intermediate columns or arched cornices. The south wall of the church is profusely decorated, in a similar manner, in two stories of niches, with tile bands running along the wall and cutting through the niches.

The Latin occupation of the island of Cyprus, with a consequent construction of Western Catholic churches, influenced the native architecture toward an adoption of superficial Gothic details during the thirteenth and fourteenth centuries, and out of a final synthesis of the two forces during the two succeeding centuries grew a Gothic-Byzan-
tine style. Features of this combination were the frequent use of the pointed arch and vault and the employment of the dome in conjunction with a long nave and aisles.

In general, though Byzantine (and later, Gothic) influences were felt, the architecture of Asia Minor continued as more characteristic of the local school than of the Byzantine style as a whole, and had little to contribute to its later development.

In Mesopotamia the monuments are generally confined to an earlier period, a large number dated to the sixth century. It was during this period that Justinian gave an impetus to architectural construction through his erection of numerous churches and secular buildings. This activity was not long-lived and soon died out in the following centuries. With a pronounced lack of examples during the period in which an interest in facade design was finally aroused, Mesopotamia had little to contribute to the interest of our thesis. In general, the buildings employed stone for their walls and brick for their vaults, and a certain amount of earlier Hellenistic characteristics per-
sisted in their details.

In Syria, likewise, the Byzantine style experienced an early death. The country was overrun in the seventh century by the Moslems and ceased to be a part of the Empire. A large number of stone basilicas of the fourth, fifth, and sixth centuries exist today and uniformly present the same characteristics we have noted in an earlier chapter—roofs, occasionally of timber, but more often of stone slabs on transverse ribs, simple and rather crude mouldings cut from the hard stone, and an essentially non-representational ornament. Constantine and Justinian both had erected monuments at Antioch, though none were as typically Syrian as the examples of the less cosmopolitan districts of the country.

The architecture of Egypt is more essentially Gothic than Byzantine, though using the characteristic Byzantine dome, sometimes to the extent of employing as many as twenty domes in one structure. Egypt also suffered at the hands of the Arabs. The monuments now extant are small and of poor
material, none of the great churches of Alexandria surviving. It would normally have been to these latter churches that we would have looked for Byzantine elements, for the smaller edifices were products of the inland districts and subject to a more indigenous development with greater independence of outside sources.

The centralized plan types of Armenia have already been discussed in a search after the basic influences which determined the Byzantine orthodox plan, and the sense of interior spatial unity and the pleasing pyramidal form that characterize their style, have also been mentioned. Though of great importance to Byzantine development in these respects, Armenian architecture seems to have played a much smaller part, if any at all, in determining the more detailed aspects of exterior decoration.

Characteristically, Armenian traditions appear quite independent of any backwash of Byzantine influence during their later existence. The architecture is Byzantine only in those elements which Armenia herself had contributed; nowhere is
there evidence of other than natural developments.

The people of this country were essentially ecclesiastically minded, and their land is studded with innumerable churches. The century covering the last of the tenth and the first of the eleventh marks the height of Armenia's greatness and is consequently a period of considerable building activity, with many of its monuments remaining to attest the lively interest of the nation in this phase of its life. After this, Armenian history tells a continuous story of anarchy and oppression.

Faced with carefully fitted, square-cut stone, the monuments give an impression of solidity and firmness. A predominant use of the straight line, mostly vertical, manifested in the sharp corners, the angular pediments of the cross arms, the ridges of the steep pyramidal roof over the central dome, and in the slender columns imposed on the walls, tend to give the structure a rather severe aspect. This is further enhanced by the clear, briskly defined planes. Exterior ornamentation is kept simple and not
allowed to effectively offset the severity of the structural expression. The high cylindrical or polygonal drum supporting the central dome and the lower walls of the church are often lined with shallow blind arcades on tall slender colonnettes, as at the Church of the Redeemer and the Cathedral, both at Ani. In St. Gregory of the same city, the spandrels are filled with exquisite and delicate sculptures of birds, animals, and foliage, in this case modifying the austerity and adding a lightness and elegance. Tall V-shaped niches, terminating in ornamented arched heads, were often employed to break the exterior wall surfaces when windows were undesirable. Openings were never used in any abundance; where they do occur they are generally small and narrow with round heads topped by decorated arched mouldings turning away horizontally on either side of the spring-line.

Though we could find no proper place in a characteristic Byzantine church for this cold, colorless, austerely simple external treatment, it was quite appropriate to the Armenian struc-
ture whose interior was likewise executed in simple masses with all efforts directed solely toward the beauty that lay in a refined spatial unity and quite ignorant to the typical Byzantine love of sumptuous color and rich materials.

Not only their architectural monuments, but the Armenians themselves played an important part in the formation of the Byzantine style. Some of the most powerful emperors were of Armenian descent, and a number of the architects employed at Constantinople were born and trained in that country.

The Second Golden Age saw a spread of Byzantine architecture to the west as well as to the east. In Sicily it blossomed forth under the Norman rule. Though in early times a part of the Byzantine Empire, this country had fallen into Saracen hands in the ninth century. Norman conquest found an architecture essentially Byzantine, though with pronounced Saracenic traits. Over this the conquerors imposed their barbaric love of massiveness, though without basically changing the style.
The products of this period are outstanding for the beauty of their interior decoration, but contribute little or nothing in the way of facade design. The Cathedral of Monreale, La Martorana, and the Cappella Palatina, termed "the most exquisitely adorned palace-chapel in the world,"* deserve a top ranking in the Byzantine mosaic art, but never a word does one hear concerning any beauty or originality of their exterior adornment.

The less famous monuments set the mode of external expression. St. John of the Hermits presents an aspect quite new to us. Red plastered domes set on massive, yellowish walls, both utterly devoid of ornament of any kind, present a naive though rare and exotic charm. But any real beauty, any logic of structural expression is utterly lacking. The domes appear to bear no relation to the structure below and sit on the box-like forms much as marbles on a table. The incongruity is further enhanced by the strongly contrasting colours.

S. Cataldo is of the same sort with three

stilted domes, again in red and equally as naked, set in a row on top of the cube of the main structure. A Saracenic pierced battlement trims the top edges of the box just above a procession of window bays outlined in a series of broad, recessed, pointed arches.

The architecture is utterly barren of any contribution to a system of logical facade design, and merely affords a unique phase in the history of its development.

Evidences of Byzantine architecture are by no means lacking in France, though more or less confined to the Aquitaine district. In much earlier times Roman architecture had taken a firm hold in Gaul around Nimes and Arles where there are many notable monuments remaining. Later in Christian times, during the fifth century, we hear of two important basilican churches constructed at Tour and Lyons. But all building activity ceased during the Dark Ages which followed, not to be revived even in part until the ninth century. It was Charlemagne
who, in this century introduced the Byzantine plan into France in his famous royal chapel at Aix-la-Chapelle. Except for an absence of the exedrae protruding into the aisles and galleries, the building is essentially copied after S. Vitale at Ravenna, with its octagonal plan, two stories of aisles and gallery raised central dome masked on the exterior by an octagonal drum and a pyramidal roof. Quite lacking, however, is the sophisticated refinement of interior treatment that gives S. Vitale its chief claim to fame.

Of the same century is the church of Germigny des Prés showing even stronger Byzantine affinities. Its cross-in-square plan, with a central dome, barrel-vaulted arms, and low angle chambers, is that of the later churches of Constantinople. In the apses, added to the cross arms, Strzygowski* sees a remaining influence of the Armenian niche buttresses. Most remarkable is the use of mosaic decoration, so essentially alien to normal French art. The exterior has little to commend it. It

*Origin of Christian Church Art.
simply exhibits the crudity of form and ornament that befell the lot of the Byzantine style in a country as yet essentially barbaric. The structure is pyramidal, with the dome hidden under a wooden roof.

It was in Aquitaine that the dome found its strongest adherents and a more established usage. Most famous is the five-domed church of S. Front at Périgueux (eleventh century), copied from S. Mark’s, Venice, in size as well as form. Variations in the construction of the domes and pendentives, which give the former an ovoid form and the latter a double curvature rather than a spherical section, indicate native workmanship and an acceptance of the Byzantine scheme without a close adherence to its structural principals. This is typical of all domical buildings in France. Sculptured ornament likewise exhibits a barbaric crudity which at once denies its execution by Greek hands.

The interior treatment of the church shows the wide departure of the French work from the customary Byzantine splendour. All surfaces are faced with
ashlar masonry, with no colour and no more than a very few mouldings to enrich it. The effect is one of simple, severe massiveness. The domes are treated in a very architectural manner outside. Their pointed, stilted form is retained in an ashlar covering, and crowned with finials. These strange, steep ovoid forms were to be retained much later in the Church of the Sacre Coeur in Paris. It provides one means of giving the dome its proper importance in the exterior composition without the need of a partial separation from structural compactness by the imposition of a drum. And yet the equal size of the five domes utterly destroys the pyramidal composition which gives the customary Byzantine structure such forceful expression. The massive piers of the interior are raised above the exterior roof in the form of towers crowned by finials set on truncated pyramids. The enormous western tower, built independent of the main body of the structure, is topped by an even steeper conical dome. The facades are rather steeply gabled with a group of three round-arched windows arranged in a triangle.
in the upper part of each.

Successive examples show an even farther departure from Byzantine construction and an utter abandonment of Byzantine plan. The domes gradually lost their domical structure and took on more of the aspect of mere vaults. The final step was taken at Loche where the bays were covered with corbelled pyramids. What is more, the domes were no longer given an external expression, being covered with pyramidal roofs, often rising in spires, and in more extreme cases entirely covered by a single nave roof. Over the more native longitudinal plan, they were arranged in a single row rather than composed over a cross or square. The facades in general were severely plain, sculpture being more or less confined to capitals and the construction to stone without the colourful addition of brick. Gradually all traces of Byzantine influence were eliminated.

And so it is alone in the domical forms of S. Front that we find any worthy contribution to logical facade design. What further use they
could be put to is well illustrated in the Church of the Sacre Coeur, which will engage our attention a little farther along in this paper.

It is once more to Italy that we now turn, and to the city of Venice which gave Byzantine ideas their ultimate expression in the cathedral of S. Mark's. There are a number of domed churches in southern Italy built during the Norman invasion. The Baptistry of Soter at Naples is of a much earlier date (fifth century) and most interesting for its mosaic decoration. It is an apsed square covered by a dome on broad squinches. Characteristic of the early date there is no attention given its exterior treatment. The later churches show a greater dependence on Western elements just as in Sicily. S. Mark's at Rossano and the Catolica at Stilo are cross-in-square churches with five domes. In the latter example the domes are raised on high cylindrical drums decorated with tiles arranged in diamond pattern, but outside of this there is a little that might interest us on either exterior.
More typical of the Italian manner is the three-domed elongated plan of the twelfth century Cathedral of Molfetta. The narrow cross-arms and angle-spaces are roofed all at the same level with a sloping roof outside. Two tall Lombardic-featured towers stand at the west end and the exterior of the church has little of Byzantine appearance about it.

The builders of the churches imitated Byzantine models, but as in France, retained their own system of domical construction in stone laid in horizontal beds. These domical vaults generally were covered with low pyramidal roofs.

Except for Venice, the break with Byzantine art and architecture in central and northern Italy was complete after the Lombard conquest. The architecture of Tuscany and Lombardy developed quite free of any Byzantine tutelage. Only in details do we find a resemblance between the two. The sculptured ornament applied to mouldings was hardly more a crude imitation of the Byzantine than of the Classic. It must be remembered that a pro-
nounced use of patterning in brick, the adoption of the brick and stone combinations in facade design, and the employment of arched corbel-tables, occasionally connected to the ground by slender shafts, did not occur until late in Byzantine architecture and could hardly have formed the basis of their development in the Lombard style.

The existence of exceptional examples in Italy we have acknowledged. One of these is the ninth century church of S. Lorenzo at Milan, whose central square, opening into four flat niches, suggests an affinity with the Armenian quatrefoil square. Largely rebuilt in the sixteenth century, its Byzantine traits now go no further than this centralized plan.

A sixth century basilican church at Parenzo in Istria has preserved its Byzantine decorations on the inside and shows some evidence of mosaics having been used on the outside in the preceding atrium. A similar church of the same century is to be found at Grado in the lagoons north of Venice. Here there is evidence of interesting tracery being
used in the broad round-arched window opening.

Other Byzantine monuments of a later date remain in the country around Venice and probably derive something of their character from that city. The Cathedral of Torcello, founded originally in the seventh century, is Byzantine in its decoration though basilican in plan. Next to it sits the unusual little church of S. Fosca (1008). It is literally a cross-in-octagon plan, with a wooden roof on the drum raised over the crossing in place of the originally-intended dome. The exterior is in plain brickwork, surrounded on five sides of the octagon by a handsome arcade of stilted arches on Byzantine columns and capitals. The apse, very much elongated, is decorated in recessed brick arches in several orders arranged in two stories. Below the cornice is a vandyked brick course. All this is seemingly inconsistent with the utter simplicity of the remaining wall surfaces. A somewhat later church at Murano displays the richness of apsidal decoration. Here the arcades with multiple arch rings rest on doubled columns, freed
from the wall in the upper level so as to form a
gallery and engaged below, separating the niches
cut in the wall. The upper gallery is surrounded
by a rather typical Byzantine balustrade, below
which occurs a double row of vandyked brickwork
with the lower triangular panels decorated by
carved marble slabs. The saw-tooth course is used
to advantage in defining the upper arches and cor-
nices.

In Venice we find an isolated example of the
East transplanted in the West, receiving a luxur-
iant growth in a very fertile soil—a dazzling
apparition of a city so splendid and cultured in
an age and among nations so rude and barbarous.
In a hatred for those Northern invaders who had
swept through Italy and crushed her civilization,
and in a contempt of their uncouth way of life,
Venice disowned the West as her parent, isolated
herself from it, severed all connections, and
turned her gaze eastward to the Byzantine capital
as the stronghold of civilization, the most high-
ly cultured spot in the world of that time. It
was by a treaty, early in the ninth century, incorporating her in the Eastern Empire, that Venice signalized this attachment.

But, in spite of the Eastern garb of ideas and customs that she had assumed, Venice had not lost that strong, verile quality that characterized the new born nations of the Western world. Her subjugation to Constantinople in a political sense was merely nominal and her independence as a republic remained intact. Through a widespread trade and commerce her wealth grew, and the time soon came when she felt the need of expressing her pride and glory and her importance as a world power in a monument whose magnificence would rival that of the greatest that Constantinople had to offer.

Having turned directly to Constantinople for all aspects of her cultured life, it was only natural that Venice should look there not only for architectural inspiration but for the very architects themselves. It was just this opportunity for which the Byzantine Greek had so long been waiting--the chance to embody in a structure of an appropriately monumental size all the new ideas
that his artistic genius had accumulated since its last great expression in S. Sophia. The Byzantine capital itself had Justinian's work before it ever to remind the world of its proud position, and so felt no need for further expression of its greatness through the architectural medium. The provinces of the Empire had not the proper wealth to place at the disposal of the architect, and no incentive to do so were that condition fulfilled. It must be remembered that the Byzantine was not an architecture that formed the same integral part of the lives of the people as did the Gothic. There existed no such communal effort among the countries of the East; hence, unless the Emperor and his autocratic court took the matter in hand, there could be no such expression except on a very intimate scale. Though the very character of the Western People—full of youthful vigour, instilling in their art, crude though it might be, this same energetic nature—provided the necessary material, they would not grant the Byzantine Greek the freedom necessary
to the complete expression of his aesthetic ideals. They had ideals of their own quite foreign to the Byzantine, and when they employed him to construct a building for their use, they demanded that these ideals should be embodied in the finished structure. The effect of this restriction we have seen quite clearly in these Byzantine monuments of Italy, Sicily, and France that we have already examined.

But in Venice the situation was reversed. The complete immersion of her artistic loves into this Eastern art, with an unreserved placement of her wealth, power, and vigour at the disposal of the Byzantine architect and artist, allow him the free field of operation that should bring forth the greatest that was in him. Now absent is that enslavement of art to the arbitrary ends of an autocratic court.

As it stands today, S. Mark's, built over the ruins of an old church of the same name, is based on the Greek-cross plan with domes over the four arms and the crossing. According to records, this form was adopted from Justinian's Church of the
Holy Apostles in Constantinople, still standing in the eleventh century. Aisles, placed on either side of the domes and within the arms, pierce the great piers of the crossing, and are separated from the nave and transepts by arcades resting on columns with excellently sculptured capitals. The gallery above is, as at S. Irene, left open. The domes pierced by small windows at their base, rest on spherical pendentives and on buttressing barrel vaults, the latter effectively separating the arms from the crossing. The whole is a well worked out scheme of thrusts and counter-thrusts which gives the structure its unquestionable stability. Added in the next century, an elaborate outer narthex surrounds the western arm, while the eastern arm is extended by a large central apse and two small side apses.

Most remarkable is the unearthly beauty of the interior mosaics which seem to flow over the entire inner surface, covering everything that lay in their path. It is here that we see the Byzantine at his greatest, for it is here for the first time that
he was given full freedom in the expression of the medium. No arch rings, cornices, or panel mouldings are allowed to break through the homogeneous covering. Only the columns and capitals are present as evidences of deliberately cut forms, and even in them this characteristic is consciously subordinate: the columns, like the marble panelling of the base, with their luscious colours, and the capitals with the richness of their detailed carving. All other elements of the interior are built in softly modelled curves and blunted edges, the whole, as Phillips implies,* seemingly more a matter of excavation than of construction.

It is here that the Eastern love of sumptuous colour receive its most brilliant expression. The ideal medium of mosaic sets forth the gorgeous richness of designs in blue and crimson against the soft diffusing glow of a golden background, while the gently modelled surfaces of the domes, vaults, and piers allow a sensuous and mystical play of light in the dim interior, resplendent in its

*Form and Colour, 84.*

120
brilliance, on the protrusions and dying away into deep shadow in the cavernous recessions.

On the exterior we find a richness equal in degree only. It has none of the unity and expressive quality of the interior. The original semi-Byzantine facade took the same general form and divisions as the one we see today, but without its enrichment in sculpture, precious marble, and mosaics. The two stages of the facade, divided by a stone balustrade, show a naive attempt to express the vaults of the interior through the use of broad arches thrown across the bays and resting on clustered columns. At the lower level the area enclosed by each of these arches is recessed in a semicircle or with a straight back. The entrance is marked by a greater breadth and height of the bay, further enrichment of the arch rings with elaborated sculpture, and a larger number of clustered columns. These columns on the first stage are arranged in double tiers for a greater decorative effect and possibly for a better sense of absolute scale. Above the dividing balustrade the arches are composed in a gradation
of size from the larger central unit outward. Originally their round form was silhouetted against the sky, but thirteenth and fourteenth century additions have capped these gables with splendid riotous crockettings. In between, over the double columns, rise Gothic finials which, together with the figures crowning the gables and the crocketting above mentioned give the facade an extreme richness of silhouette. The tall metal domes that fill in the background are likewise later additions. The mosaics in the lunettes of the arches, the variegated marble columns and facings, and the elaborate sculpture scattered over the whole surface produce an effect of a sumptuous polychrome decoration on the facade distinctly flavoured with the East and effectively telling the story of the sensuous color art within. No one can question the magnificence of its splendour.

What does lend itself to criticism is the total absence of any intelligent organization. The facade lacks the unity of its richness that the interior so happily achieves. The latter is one harmonious
whole while the former is no more than a splendid jumble. But far more derogatory is the utter lack of structural expression. True, we have noted the presence of the Byzantine practice of expressing the vaults by exterior arches on their face, but, occurring at the narthex as they do, they give no hint of the form of the main body of the building. Rather than the Greek-cross they suggest a five-aisle longitudinal plan. There is present a great deal of the character of the Baroque facade of a Jesuit church. In the original scheme, the low domes were utterly hidden, and even the false ones subsequently added form little more than a complicated background pattern.

It is then in the structural schemes employed that we see the essential difference between this great monument and S. Sophia. In the latter the arms of the cross are subordinate to the inner square. It is a centralized structure with a mighty dome crowning and predominating all the other elements which cluster about it. In S. Marks the arms take on an importance equal to that
of the crossing, and in its five almost identical domes, there is no one eminent part to unify and define a purpose of the whole. As Phillips has explained,* form, in S. Mark's, is subordinated to use as an adequate field for mosaic treatment. The numerous and low domes are ideally designed for mosaic covering. Even light is in a large part excluded to give the colour of the interior a better opportunity to express its depth and subtlety. But light is essential to a clear definition of form. We find a brilliant use of it in the interior of S. Sophia. Here there are no monotonous repetition of forms, but an intelligent build-up toward a central motive and a well-articulated spatial content. And on the exterior as well, though considerably confused, the importance of this central motive is not ignored or lost.

Venice did not long remain faithful to the style she had adopted. Gothic influence entered and mingled with the Byzantine in her palace facades, and the dawn of the sixteenth century saw an abrupt change to the revived classic traditions of Form and Color.
the Renaissance. Yet that element of the East that seemed to be an indigenous part of her nature remained to give all the architecture and art of Venice a peculiar character that set it apart from that of all other Italian cities and of Western Europe as well.

There are yet other countries in the eastern portion of the continent where the Byzantine style failed to make an appearance until late in its history, though when once established remained as the determining factor in the architecture of the country until the present, or at least until it was blotted out by some factor other than the mere appearance of another style.

Serbia arose as a nation and enjoyed a period of wealth and prosperity for about two and a half centuries until its final absorption in the Ottoman empire in 1459. During this time a number of beautiful churches were erected through royal patronage and the generosity of the powerful nobles.

Serbian exteriors present a striking contrast with all that we have noted as typical of Armenian
design. The profusion of pattern work on Serbian facades is so great that one cannot but suppose them to have arisen out of a more intimate contact with the East. The churches of Lesnovo and Lazaritza will illustrate this characteristic. Patterning in brick and stone and tile, together with horizontal banding in strongly contrasting brick and stone literally cover the entire wall surfaces and give the two churches, particularly Lazaritza, a rich polychrome character. The walls are plentifully panelled with round-headed niches, used in purely decorative sense as against an occasional more expressive purpose in Constantinople, that is to indicate the vault behind.

Likewise outstanding is the further importance attached to the central dome-tower, following out of a tendency to lessen the breadth and emphasize the height of the structure. The Church of Manasiya is a more extreme example of this phase, where the popular intricate surface decoration was abandoned toward a more direct means of accomplishing this vertical accent. Lines of the desired nature were
provided in the tall slender shafts imposed on the walls in the blind arcading. This church well illustrates the contrast existing between the Byzantine architecture of Serbia and that of Greece and Constantinople. In the former the dome gathers the clustering elements of the structure around it, whereas in the latter it abandons them and rises to an irrelative height. In effect the prominence resides not so much in the dome itself as in the elongated drum.

Though more directly influenced by the architecture of Constantinople, Bulgaria started on the same road toward copious brick ornamentation as did Serbia. The cross-in-square church of S. Clement (1295) well illustrates this phase. Here, however, the decorative treatment is far more handsome. The glare of the severe contrasts of tones is not present as at Lazaritza, and the delightful patterns are formed in bands tastefully arranged to produce a rich but undisturbing surface texture over the walls without impairing their apparent solidity. Saw-tooth courses give
rich accents in light and shadow around the arches and along the cornices.

With the advent of Turkish rule, the Christians were required to simplify their church exteriors in order to render them less imposing in the presence of another and different faith. This resulted in the abandonment of the ornamental profusion and any prominent exterior expression of the dome.

Roumanian architectural history evinces a beginning with Byzantine and a progressive absorption of Gothic features. Most illustrative are the churches of Moldavia. The facades are gayly, though rather naively, decorated with coloured brick and plaques carved with fantastic monsters. Later a unique and essentially beautiful external aspect was attained through the use of colourful frescoes executed in the Byzantine manner. Gothic features appear in steep roofs over the central towers, doors recessed in Gothic orders, pointed windows, and stepped buttresses.

Russian architecture, though a manifestation
of the Byzantine in a restricted sense and worthy of individual study for its own native value, bears little relation to our thesis. A quick general survey of this field will suffice. Failure to develop a great style of its own is readily explainable in a diffusion of population and difficulty of communication between urban centers, an adoption of the Greek church with a consequent isolation from the general stream of cultural evolution running throughout Western Catholic Europe, and disturbing influences within the nation which saw the rise of an architectural center immediately followed by a destruction and abandonment of it. Later, the Russian Church itself hindered any free and natural development through a hostility to new indigenously developed features. This was climaxd finally by Peter the Great's prohibiting the erection of any stone structures outside of St. Petersburg, which center he built up as a superficial imitation of a West European city. And so nowhere does that steady, uninterrupted development, traceable in most western countries, have a counterpart.
in Russian architectural history. Monuments of all periods are not widely spread over the nation. Rather one sees in restricted areas and for brief periods outbursts of building activity, only to be succeeded by long periods of decay.

The earliest center of culture was the principality of Kiev where the typical Byzantine architecture of Constantinople was largely adopted upon the advent of Christianity in that district (late tenth century). From here it spread to Novgorod and Vladimir. During the fourteenth and fifteenth centuries, a new period of building, centered at Moscow, developed a truly national and original style, compounded of various elements but rooted in the Byzantine tradition of Constantinople, much modified by the school at Vladimir, and the wooden tradition of north Russia which gave it its most distinct characteristics. The sixteenth and seventeenth centuries saw a more wide-spread acceptance of this style.

The buildings are characteristically small, being the products of individual endeavour and per-
sonal competition rather than of cooperative community effort. Picturesque grouping became common with a resulting clustering of many towers and cupolas along the interesting sky-line of each city. Directly from the Byzantine they took their orthodox plan—the cross-in-square type—from which they never departed. The four additional domes, when used, were placed over the angle-chambers. The Russians, like the Serbians, tended to accentuate the vertical dimension of their churches, raising them to far greater proportionate heights than those of the Byzantine style proper. Bell towers were introduced in the same spirit. Again varying from the Byzantine ideal, obscure interiors were suppressed to a concentration of interest on exterior effect. Their choice governed largely by a scarcity of proper materials, the Russians abandoned mosaics for fresco and stone for brick, which they covered with plaster and lavishly colored externally as well as internally. Small windows and large wall areas were inherited from Byzantine traditions and preserved by climatic conditions. Ornament was
diffused over wide surfaces without any intelligent concentration for sake of emphasis. That characteristic feature, the bulbous "onion" dome is a native creation, adopted first in the twelfth century buildings of Novgorod, and possibly arising out of a desire to emphasize the essentially curved nature of the form, relatively unapparent in a simple hemisphere at any reasonable height.

We have seen the difficulties that prevented Russia's development of a coherent style, but a feeling for the weird, the fantastic, the eccentric that the buildings stir up in the average person is not explainable in these terms alone. The architecture is the fruit of a different type of mind with a different set of principles. It suggests a flavor of the East. True, the Byzantine architect had drunk deeply of Eastern ideas, but he had never lost sight of that reasoned quality so firmly implanted in the Western mind that insisted on clarity and logic of formal expression. He had accepted the sumptuous colour of the East, but had organized its principles into an intelli-
gible system, quite foreign to Eastern practice. This capacity of the intellect the Russian seems to have lost. What he did retain of the Byzantine style he used in a purely superficial manner. Expression of the cross-in-square plan was obscured in the final product. The dome no longer formed such an intimate part of the structure. Instead, Russia seems to have reverted to the Eastern manner of formal expression—as Phillips terms it, "a decorative use of form"*—as well as retaining the Eastern love of colour. Thus we see "monstrous protuberances and excrescences, surfaces that rot with ornament, indeterminate sculpture that ramifies and spawns in every corner, eating the stone, moth-like, to rags and tatters."** No logical relation between structure and ornament and no intelligent organization of either, no "pursuit of a well-conceived end" is apparent in Russian architecture. Could we then expect the Western mind, accustomed to a functional use of form and a discriminating

*Form and Colour.
use of decoration, to understand and accept principles so foreign to it as those of the East? Should we wonder that the churches strike us as strange and incomprehensible?

We have thus gone through a general history of the Byzantine architecture without finding a solution of what we are seeking—an appropriate expression of the magnificent interior and the logical structure in facade design. S. Sophia provided the centralized scheme but did not reach perfection in the ordering of its masses, and utterly failing as to a proper solution of window design. Moreover, not even a feeble attempt was made to express the splendour and colour of the interior decoration. S. Mark's on the other hand neglected making so much as a pretense at structural definition. The contribution of this monument was an enrichment of the facade that might reflect the magnificence of its mosaic-covered interior. It was only in the smaller edifices that we found any combination of the two expressions, though none of them quite adequate and obviously unfitted for
reproduction at an appropriately large scale.

And now, before offering our own suggestions for a solution such as we are seeking, let us turn to an examination of certain attempts such as were made in the nineteenth century when the Renaissance had grown cold and architects were engaged in revivals of all sorts, in imitative and eclectic practices, and some in search of new ideas. Attempts to adapt as well as adopt, to "modernize" the various historic styles were everywhere evident. Though, for the large part, utter failures as regards any valuable contribution to architecture, some offered at least in part logical and appropriate solutions of the problems with which they were faced. What concerns us is that some of these were in the Byzantine style.

During this period in architectural history when buildings were for the large part designed in whatever style happened to be in vogue or please the fancy of the architect or his client,
it is no more logical that we look to France, the cultural and fashion center of the world in that age, for the initial impulse leading to a revived interest in Byzantine architecture and to attempts to adapt its principles to modern usage. Most influential in this respect was the famous Ecole des Beaux-Arts. Its designs were, of course, of a theoretical nature with no opportunity for practical application, but the solutions of this school were often looked to when such an opportunity presented itself. It was, after all, the training school for the architects of France (and later other countries as well.)

In the competitions for the Grand Prix de Rome, offered by the school, the vivid interest in Byzantine traditions is early evidenced in M. Leclere's design for a Calvary (1868). On the church accompanying the group and the arcades connecting its parts is evident a consistent application of the Frenchman's idea of Byzantine detail—the stilted arches of the window openings, the ovoid domes that we noticed at Perigueux capping the western
buttresses, miniature corbelled arcing, alternating brick and stone voussoirs, and occasional spots of surface patterning. Even the great tower and spire over the west front, so foreign to Byzantine usage, is yet Byzantine in its ornament. The great rose window set in the nave and transept ends, though without historical precedent, are quite in harmony with the surrounding detail. The plan and structure are as yet essentially Romanesque.

Less pronounced are the Byzantine traits of M. Dauphin's cathedral design submitted in 1878. Though evident in horizontal banding in two materials and a certain amount of pattern work, there is considerably more intermingling of Romanesque forms, with a purely Renaissance dome and a Gothic floor plan. Of like nature is M. Blavette's entry in the same competition. Here the conical domes are again reverted to for use on the west front towers, though the great dome over the crossing retains its Renaissance traits with ribs springing from buttresses on the drum. There is considerable feeling for the Byzantine in the design of the win-
dow openings, even around the central drum, and
the arcading on the interior around the three apses
radiating from the crossing is distinctly in the
manner of the style.

It was not until 1897 that Byzantine elements
again appeared in the designs submitted in the
school's competitions. M. Duquesne's votive church
is a strange conglomeration of the characteristics
of three styles, composed of a Gothic shrine adja¬
cent to the main structure and a direct and obvious
copy of Brunelleschi's cathedral dome in Florence.
Byzantine influence is evident particularly in the
entrance bay, recalling S. Mark's in its multiple
columns and colourful enrichment of the arch rings
and lunette in mosaics and variegated marble. The
typical manner in which the French employ the arched
order under a low gable lined with a dentil-coursed
cornice distinctly suggest the Eastern style, though
no prototype can readily be discovered. Horizontal
banding again appears, in this instance confined to
the base courses. The plan is centralized under
the dome with only slight projections beyond the
Greek cross in the form of a narthex and apse.

Byzantine characteristics were seldom considered appropriate for other than religious edifices, for a perusal of the remaining competitions, most of which were of a purely secular character, will fail to disclose any evidence of the style. This seemed generally true of the architecture in both its historical and eclectic phrases. Few of the older monuments remain to testify of any pronounced, or at least noteworthy, application to the more immediate needs of mankind. The tradition, once established, was strictly adhered to during the period of its revival.

Most remarkable of all French designs in the Byzantine manner and particularly of those actually constructed, is the great Church of the Sacre-Coeur, built by the architect Paul Abadie. Though begun in 1876, the building was not consecrated until 1919.

The main body of the plan represents a reversion to the cross-in-square of the old orthodox plan, with a large central dome, buttressing
barrel vaults over the four arms, and smaller domes over the angle chambers. Added to the east end is the typical French chevet, adopted from Gothic usage. The narthex is confined to the width of the nave and represents an elongation of it in facade. Beyond this is a much lower entrance porch.

On the exterior the central ashlar-covered ovoid dome with its crowning finial, adopted with little change from the dome type of S. Front at Perigueux, is raised on an unusually high drum encircled by a series of round-headed windows just above its base and by a miniature arcade below the base of the dome. The two stages are divided by a heavy encircling cornice, the projection supported by large modillions more in the manner of the Renaissance than of the Byzantine. The four smaller domes are externally exact copies of the central unit, though their supporting drum is not as elongated and is octagonal in plan. Piers are carried up at the angles with corbelled arcades forming the cor-

140
nice between them. Over the central chapel radiating from the chevet is a tower carried to the full height of the central dome and capped by a conical roof supporting a finial. As we have noted the narthex is expressed in the west facade at the height of the nave vaults, though no suggestion of the arm or even the existence of these interior vaults is made. The arm is capped by a pedimented gable flanked by raised buttresses with domical heads. The area below the pediment is divided into three bays in receding round arches, the central bay projected and raised in another story above the crown of the pediment by a figure-filled canopy.

The site is a most impressive one. Placed on the very crest of Montmartre, the church, with its great height and its homogeneous covering of white stone, overlooks Paris with all the aspect of a guardian angel. Its approach is likewise impressive with long flights of steps in a series of stages up the steeply ascending slope. We are left without a doubt as to the desirability and appropriateness of the site for this central-type church-central.
that is, if we can ignore the eastern addition with its obtrusive tower.

The pyramidal form of the structure is enhanced by the receding stages of the triple-arched entrance porch, the gabled narthex, and finally the crowning dome, but is considerably confused by the towering domes over the angle chambers. Everywhere, particularly on the west facade, the masses are so broken and complicated with buttresses, cornices, pinnacles, and the like that they lose the greater part of their monumental character and fail to achieve that simplicity of expression which should characterize the style.

One thing with which we must credit the architect is his cleverness in both meeting the demand of the Western Church for a long nave and retaining a design that is essentially of the central type—at least if viewed from the front. Yet this is not the solution which we are seeking. Not only does it lack colour and simplicity of mass, but a directness and clarity of expression are absent as well.
Other attempts were made in France to build in the Byzantine manner, though generally on a smaller scale. The church of the Saint-Esprit (1935) shows a conscious imitation of the nave of S. Sophia with its great central square and east and west semi-circular arms, pierced by exedrae. In place of barrel vaults, shallow semi-domes buttress the sides of the central cupola. In an attempt to further enhance the aerial quality of the crowning dome, the architect has almost obliterated any sense of support between the windows of the encircling band. Interior decorations are inferior, and the exterior, faced with brick and occasional figure sculpture and crowned by a central tower, is unworthy of consideration.

Another small church St. Dominic (1921), reflects the centralized unit of Sacre-Coeur with domes over the crossing and the four angle chambers. The interior design is utterly crude, but the exterior rather clearly expresses the structure of the church. The angle chambers are lowered and their domes subordinated. The roofs of the arms
follow the contour of the slightly pointed barrel vaults within, and the central dome is raised to a position of proper importance. But this is as far as the merit of the church goes. Exterior decoration is definitely inferior and ill-adapted.

The Roman Catholic cathedral at Westminster, London, illustrates the unhappy results that invariably arise out of attempts to adapt Byzantine construction too closely to the needs of a Gothic plan. The structure was begun in 1894, following the plans and under the supervision of John Francis Bentley. The choice of the Byzantine style among such a wealth of Gothic tradition was more than likely due to a desire of the Catholic congregation for a visible manifestation of its independence of the Protestantism that surrounded it.

The plan is formed on a long axis, with four domes on square bays along its length, two over the nave proper, one over the crossing, and one over the sanctuary. In place of the customary single barrel-vault buttresses on each face of the dome, the bays over the aisles are divided between
two such vaults for the professed purpose of providing pier abutment at the critical point of tangency of the dome with the square. At a lower level the divisions are further increased by arcades on columns screening the aisle from the nave, while the gallery above is left open, as in S. Mark's, Venice. The long axis of the church terminates in a narthex and entrance porch at the west and in a semi-circular apse at the east.

The interior of the church has, in a large part, been patterned after that of the Venetian church, though as yet lacking the mosaic covering on anything more than the two chapels on either side of the sanctuary. But these small areas are sufficient to show the utter futility of an attempt on the part of a Westerner to assimilate and apply the Eastern ideas of colour design. The colours either clash or lack the proper contrast. There is none of the subtle arrangement for sensuous effect. The at present barren nave is pleasingly impressive in plain brick piers and arches and concrete domes.
It is the exterior that is far removed from Byzantine design. It is hardly more than an application of Byzantine motifs to a body of Gothic form. The four domes, only two-thirds of a hemisphere inside, are given no further height outside, and so are not at all apparent above the parapet surrounding the nave. The west facade, though fully as complicated by superfluous forms as that of Sacre-Coeur in Paris, is more pleasingly composed. The entrance is recessed in an enormously broad and deep set of arch rings, much as Romanesque portals. Though surrounded by incongruous treatment, the feature is impressive in its sturdy strength. Rising in two successive stages above the porch through a need of clerestory lighting are the narthex and the nave walls, the former with three window bays and the latter with one great arch divided by two vertical mullions and filled with geometrical terra-cotta tracery. In each case the interior vaults are expressively defined on the facade, a method that the architect has consciously practiced throughout the exterior
with the obvious exception of the domes.

Commonly used in the design are turrets arising from buttresses or placed over stairwells, the latter generally many-sided in plan and roofed with domes. Inconsistency is to be noticed in the twin gables over the doubled barrel vaults of each transept among forms otherwise either square or domical. Furthermore, the towers flanking these gables are of square section topped by pyramidal roofs. The campanile placed to the left in the west facade is impressive in its height but ill-proportioned in its extreme slenderness. We have noticed before the unsatisfactory results that arise out of the use of a tower of any kind in conjunction with a dome, but since the latter form is unapparent in structure, the campanile cannot be criticized in this light. Still, even here, when there are no such objections, its poorly designed proportions deny it a proper place with the sturdier structure beside it.

Perhaps the most remarkable thing about the structure is Bentley's unsuccessful attempt to
use the horizontal banding in stone in a field of pink brick that we found characteristic of the later churches of the Byzantine age. He reversed the normal procedure by giving the broader dimension to the brick. The result is a glaring contrast, more pronounced, however, in photographs than in the building itself. Moreover, he uses this treatment indiscriminately over the entire structure, without an allotment of certain portions of the wall space to coverings of brick patterning and simple stone facing, as well as the banding in the combined materials, as was customary in the more refined Byzantine facade design. Combined with the existing confusion in the complicated arrangement of the forms themselves and the lack of a central feature to which all subordinate parts might be related, this robs the cathedral of any true Byzantine feeling and suggests an inability or unwillingness on the part of the architect to probe beyond the mere superficial aspects of the style.

Without doubt the pleasing warmth of colour
that resides the abundantly used brick is superior in effect and expression to the cold white stone of the Sacre-Coeur, but the latter's obvious delineation of a centralized structure makes the French church more typically Byzantine and provides a closer approach to a proper expression of the ideals of the style. One should realize that nothing truly Byzantine can result out of an attempt to adapt the style's characteristic forms to the basilican plan required by the Western Church; no truth and beauty of expression can rise out of a compromise.

Of the competitive designs submitted for the Cathedral of St. John the Divine, in New York, (1891), that of W.H. Wood was based in part on Byzantine elements. The architect himself acknowledged an eclectic approach,* advancing the theory that, with the importance of the structure and the nature of the site, a crowning dome tower of immense proportions was a most appropriate feature, and that the plastic nature of Gothic allowed the in-

*American Architect and Building News, May 9, 1891, p. 81.
roduction of characteristics of another style. The dome was raised to a tremendous height by an octagonal tower, placed over the crossing and embellished with turrets of all sorts. The transition between the two units was by a series of miniature arcades in successive stages. The height was further increased through the use of a Gothic finial atop the dome. Though occasional detail is of Byzantine precedent, there is no single part that is employed with any more than a superficial relation to its original usage. Needless to say, this design was not selected for execution, being too foreign to American taste. Even the winning design, that of Heins and Lafarge, was eventually shorn of all that did not distinctly flavor of Romanesque or Gothic and was remodelled by Cram and Ferguson years later.

Far more refined and intelligent is Bertram Goodhue's use of design elements taken from Byzantine architecture in his Church of S. Bartholomew, New York, rebuilt with a retention of the famous Romanesque portals of the original structure.
Characteristic of this great architect, there is nothing imitative in his method. He designs rather in the spirit of the styles in which he works. Most successful is his adoption of a scheme of gradation in the two materials of stone and brick, the former more abundantly used at the base of the building to achieve a feeling of strength and stability and the latter for more colour and less weight in the upper portions, while the two in combination give the walls a decided interest of texture and tone. Though suggestive of Romanesque in its general character, the church contains much of the Byzantine in the broad conception of its masses and openings. In the transepts are large handsome rose windows appropriate to either style, and in the great arch of the west facade are a series of slender round arched windows with tracery in the lunetted above, a unit that might well be retained in a church of purely Byzantine character. Inside, the crossing is covered with a dome on pendentives, though unexpressed on the exterior by more than a low tower. The barrel vault of the nave is pierced by transverse vaults
over the aisle bays, providing proper illumination from the side windows in the characteristic Byzantine manner without need of a clerestory for the purpose.

An outstanding American monument, based more completely on Byzantine principles, is the National Shrine of the Immaculate Conception at Washington, D.C. The professed purpose of the architects, Maginnis and Walsh, was to give the style a modern treatment without limiting themselves to any restrictions that might be imposed by an archeological approach. Begun in the last decade, the shrine has not as yet been entirely completed.

The plan, as we might expect is still essentially that of the medieval Gothic church. Two domed bays form the nave proper, with one apiece assigned to the presbytery and the sanctuary. Narrow aisles occur on either side, but end at the crossing which is broadened out to include them in the span of its much larger dome. The strongly defined transepts are covered with barrel vaults forming buttresses for the central cupola. The aisle bays, after the
manner of S. Mark's, are separated from the nave by a series of five arches on inner columns and outer piers, while the gallery above is left open beneath the shallow barrel vaults, spanning between the great piers of the nave. The interior presents the same beautiful vista along its main axis as does S. Mark's and Westminster Cathedral, though the mosaic decorations proposed will have more of the restrained character of those of S. Sophia, instead of allowing them to obliterate any crisp clarity of formal delineation as they do on the interior of the Venetian church.

The exterior is characterized by the utter simplicity and frankness of its design. Rather than emphasize the low domes of the nave, presbytery, and sanctuary, by raising a false shell above them or by hiding them behind a parapet wall as was done at Westminster Cathedral, they are confined beneath a single low-pitched roof expressed in west facade by a simple gable and over the semi-circular apse of the east end in the manner of the French chevet. Unity is achieved through a repeti-
tion of the gabled form at the two transepts. The facades of these arms are kept simple relative to the front end which is enriched in form by an arched recession, adequately expressing the vault behind. At all three points a handsome rose window is employed in the lunette of the vault, providing for the first time a fully appropriate window treatment of these great arched bays. The form used at the London cathedral was undoubtedly adequate but definitely lacking in any beauty of design. Though we should like to see a single great portal, the three arched bays of the entrance porch, occurring at the front and two transepts, form a pleasing unit in themselves. The wall above the openings terminates in a horizontal line to prevent any infringement on the interest of the facade above. The gallery level is expressed by a series of small round-headed triple light windows in three groups, reflecting the entrance portals just below. Along the side walls above the projecting chapels, the bays formed by the buttressing barrel vaults
are given the simplest possible form, their roofs following the contour of the vaults beneath and the three windows of each grouped with the central one broader and higher to more effectively compose beneath the curve of the roof. As we know this latter form had extensive use in Byzantine times and is by no means an improper treatment. While we feel that the rose window is a far more brilliant solution, a repeated use of it in all these bays might very well produce an unpleasant monotony.

The central dome, is raised to its proper position of prominence by a drum, and yet not so far removed from its buttressing vaults. The drum, decagonal on the exterior, is pierced in each face by a group of three arched windows and capped by a cornice of but slight projection. The dome is covered with mosaic patterning at an appropriate scale. Thus we see what enrichment there is concentrated at points of interest: colour and flat pattern decoration on the crowning cupola, and a rose window surrounded by restrained bits of sculptural ornament on the
west facade and in a lesser degree on the outer faces of the transepts.

One feels that here, in spite of the elongated east and west ends, is the nearest approach to the ideal solution of the Byzantine exterior design that has been made to the present day. Could we reduce the length of these arms to that of the transepts, and by all means eliminate the disturbingly slender campanile that accompanies the building, it is easily conceivable that the resulting pile would meet all the requirements we might impose—except that warmth of colour lacking in its uniform stone finish. It may be that a prejudice for a more modern conception of form in simple monumental masses forms too large a part of the basis of this criticism, but we cannot deny the structure a fitting place in modern architecture.

We have noticed frequent attempts, particularly in the revived phrase of the style, at a combined use of the dome and the tower, but none of them successful. This can hardly be, for the nor-
mal tendency is for each to lessen the effectiveness of the other. The tower exaggerates the squatness of the dome, which in turn destroys any strength of line the tower might have, and weakening its apparent stability. Nor can any compromise be reached between the two forms, such as making the dome less squat and the tower less slender, for each implies—in fact demands—a position as the center of interest, and two centers of interest of course are irreconcilable to any unity of design. The nearest approach to a successful combination was at S. Sophia, where towers are mere bounding minarets isolated with no pretense made at composing them in the major structure with the dome.

Possibly the most successful modern adaptation of the Byzantine to secular architecture is to be found right here on the Rice Institute campus. Executed according to the designs of the firm of Cram and Ferguson with Wm. Ward Watkin, present Professor of Architecture at the Institute, acting as
an associate, the buildings exhibit a quality of colour and breadth of line that most admirably befits their use in the brilliant sunshine and broad plains of the locality. An interesting variety without loss of harmony is achieved through the introduction of features from Lombard Romanesque in conjunction with the Byzantine element. The inadaptability of a purely Eastern structural system is frankly admitted and functional modern construction substituted. The long line of cloisters, all to be grouped in courts in the final plan, was probably inspired by their frequent use in Lombard architecture and most certainly is ideally fitted to climatic conditions where the need is for circulatory units providing shelter only from rain and the hot sun. Moreover, they provide a brilliant play of light and shade over the lower portions of the buildings, with a most inviting quality in the cool depth of their shadows. Predominant as a decorative feature is a wide range of handsome brick patterns.
often used in conjunction with areas or spots of coloured tile or marble. The beautiful pink of the brick and the soft white of the stone are combined not so much in a scheme of horizontal banding as to accomplish the same sort of gradation of tone that we noted in Goodhue's S. Bartholomew.

The Administration Building is the richest of the existing structures in colour and form. Through its center on the main axis of the campus is opened a great sallyport surrounded by a series of appropriately carved arch rings in stone. The facades of the building abound in Byzantine motives of all sorts. The stone balconies and balustrades and the porches of the east front, recessed behind slender arcades with stilted heads resting on tall columns, recall the characteristic motifs of Venetian palaces.

The broad, heavy arcades resting on massive granite columns, again with a Venetian prototype in Doges' Palace, and the delicately coloured marble shafts imposed on and contrasting with the
two stories of brick wall above give the west facade a richness surpassing even that of the east front. On the fourth floor of the raised central portion is a very handsome series of smaller arches on columns screening a deep loggia behind. The wall immediately above these is covered with marble panelling in a soft, delicate green. The building is formally arranged in general mass but more interestingly varied in detail.

The adjacent Physics Building, more restricted in design because of its position of secondary importance and the more exacting nature of its laboratory needs, retains much of the decorative beauty of the main structure. Here the arches of the outer face of the first-floor cloister spring from piers, which in turn, determine the bays of the window groups above. The bricks planted in the joints of the broader stones add colour to the base of the structure. Small stone arcading with tile medallions inserted beneath, appears as a decorative motive beneath the projec-
ting eaves of the red tile roof, adding considerable life within the shadow. In order that the skyline might not appear dull along side that of the Administration Building, the eaves are broken by projecting masses supporting light and delicate finials of a distinctly Venetian character. The end facade of the attached amphitheatre is a masterpiece in the handling of simple massive solids.

The Chemistry Building required further sacrifice of the exterior design through its need of an abundance of windows. These, however, are skillfully treated on the facades by grouping two or three under a single enclosing arch, in the manner of the Byzantine churches of Athens. The lunettes of these arches are generally filled with patterning in brick and tile. Romanesque features are more noticeable in the three entrance porches, the one leading into the main lecture hall reflects the Lombard entrance as it occurs in the church of S. Zeno at Verona. The dominant feature of the building is the ventilating shaft designed in the form of a late Byzantine dome tower, though with a
pyramidal tile roof replacing the domical form. The miniature corbelled arcading in stone, just below the eave line, rests at intervals on slender Lombard shafts imposed on the angles of the octagon that forms the upper stage.

The Engineering Building is much simpler in design. By reason of its height, the central smoke stack, designed as a North Italian campanile, forms an interesting and dominant feature of the campus, terminating one of its major cross axes.

The dormitory group is accented by low towers, often with an open loggia in the top story. Cloisters with low broad arches on ample columns or piers line the first floors of the buildings. Detail is naturally not so elaborate, but is well designed and tastefully placed. The red roofs, pink brick, grey stucco, white stone, and the blue, green, and gold tile, placed around the towers for accent, give the buildings a warmth of colour that constitutes a large part of their charm.

Only a small part of the building group for the campus has been completed. Sketches have
been prepared by the office of Cram and Ferguson. For a classroom building to go opposite the Physics Laboratory and to be built from alumni funds. The design is quite similar to that of this latter building but with the same interesting freedom in variety of detail that characterize the present group.

Of the buildings yet to be constructed, the one most nearly akin to the old Byzantine form will be the auditorium or commencement hall. According to the sketch (frontispiece) prepared by myself under Mr. Watkin's supervision, the building will be a central type with a crowning dome. The octagon planned for the interior will be brought into a square externally through the aid of octagonal stair wells placed on the four oblique faces. A ninety-foot dome will be placed over the central octagon allowing a broad surrounding aisle. The entrance porch, corresponding to the Byzantine narthex, will be rather high and approached by a broad flight of steps. The three arched openings in its face will be of a size and
a design corresponding to the sallyport of the Administration Building which faces it across the academic court. A rich polychrome decoration in marble, limestone, and brick will cover the facades, especially around the central drum. The dome in turn will be embellished in coloured tile patterns easily discernable from the ground and of a richness appropriate to it as the dominant feature.

The other buildings are designed (or to be designed) with characteristics proper to their use: the stadium and gymnasium a bit more modern in their broadness of treatment, the students' union building and the women's dormitory with a more pronounced feeling of intimacy, the remainder of the engineering quadrangle to harmonize with the simplicity of the existing structure, and the architecture building in a slightly more classical manner.

We have now completed our survey of Byzantine architecture—a survey that has covered many of the larger and outstanding monuments of the style, a considerable amount of the lesser ones, a more
limited number in which elements of the style have been merged with those of some other period or country, and a few modern attempts to recreate in the Byzantine manner. I trust you will agree that we have discovered no single instance in which the exterior of the building contained at once an amount and character of colour and decoration that would adequately express the magnificence of the mosaic and marble-covered interior and a clarity of form, unity of composition, and breadth of treatment that might fully represent the logically conceived and brilliantly executed structural scheme. In other words, we have seen no single solution of the problem we have set for ourselves. It remains for us to assimilate those elements of individual buildings selected as being definite contributions toward a more appropriate facade design into a scheme of our own.

Our initial concern is with the dome—the feature of paramount importance and the key to the whole solution. Once it is given its proper significance of position and decoration and the remain-
der of the structure related to it, there is no need to go farther; in fact, there is no farther to go.

First of all structural clarity should be preserved. The whole system should build about the dome, meeting its needs and no more. The Roman solution as seen in the Pantheon had been the circular plan with walls thick enough to take up the thrusts of the dome within themselves. Not only was the floor plan uneconomical but there was a considerable waste of material as well. Moreover, the use of windows in the supporting walls—literally the drum—was excluded by reason of a consequent weakening of the structure, and confined to the crown of the dome itself, which, if correctly built with each ring self supporting (the Romans, however, used concrete), should involve no structural difficulties. The Byzantine solution, on the other hand, placed the dome over a square with the transition made by spherical pendentives. This scheme was, without doubt, one of the most brilliant contributions of all time.
to the science of architectural construction. As in Gothic architecture, it provided structural voids in which windows of large area, if desirable, might logically be placed, and a localization of thrusts that permitted a concentration of resisting masses and a consequent economy of material. We shall not pause to consider the dome-over-octagon combination, for it lacked many of the merits of the broader scheme with very few additional advantages.

In reverse order of construction though in direct sequence of importance, we begin with the dome (fig. 1) over a square. The pendentives are cut from a hemisphere circumscribed about the square by the horizontal plane of the base of the dome and the vertical planes through the sides of the square, the latter sections having the form of arches. Barrel vaults are then extended from these arches to receive the thrusts of the dome, which occur directly at the points of tangency and through the pendentives on either side. However, the major part of the thrust along each pen-
dentive is concentrated at its lower corner and is along a diagonal of the square. This necessitates the use of piers, of sufficient mass at these four points. The piers likewise serve to resist the lateral forces of the barrel vaults along their (the piers) breadth, but should these arms extend beyond, additional thicknesses of wall in the form of buttresses along this extension would be necessary to preserve the equilibrium. And so we have, in its simplest form, a perfectly sound and balanced Byzantine structural system.

S. Sophia initiates the use of pendentives and employs the heavy corner pier. The north and south barrel vaults are comparatively shallow and the great flanking pier buttresses are elongated in such a direction as to receive along their outer expanse neither the lateral forces of the barrel vaults nor the diagonal thrust of the pendentives. What forces are taken up in their length are supplied by terminal points of east and west half-domes, and are of a magnitude quite meager by comparison. In S. Theodore the
Tiro, the piers are replaced by insignificant columns and the thrusts of the pendentives and barrel vaults as well are transferred to the outer walls of the angle chambers. Though undoubtedly more characteristic of the style in general, this scheme involves additional units that complicate and in part obscure an otherwise supremely simple structure. A closer approach is in S. Theodosia (Constantinople) when the massive piers were retained, though given an unwarranted irregularity of form.

Additional elements aid in the determination of the interior proportions. Thus the vertical dimension of the structure is more or less set by the need of at least a one and a half diameter height in the arched bays of the vaulted arms to avoid a sense of squatness. (fig. 2). It is a disregard for this limiting principle with the resulting unpleasant proportions that has subjected S. Sophia to a considerable degree of adverse criticism for its interior design. On the other hand, S. Mark's, in utilizing this dimension of one and
a half diameters, achieves a far better effect, eliminating any undue broadness and yet retaining a sense of structural solidity.

What primarily concerns us is the external treatment of this ideal structural form. Obeying the principle of truth of expression, we eliminate the possibility of the use of a false outer dome to give the feature a greater elevation. Though widely accepted and generally quite effectively employed as a Renaissance treatment, it could have no place in the Byzantine system which demands an ideal clarity of construction. But should the additional height be gained through the use of a drum, internally as well as externally, structural logic would again be sacrificed, though not in the sense of a falsehood. In such a system the vaulted arms and four great piers no longer have any direct value as resisting masses for the dome thrusts. These would emerge along the spring line of the dome, which, being raised, is no longer in line with these buttressing units. And so it is either up to the drum in some manner to
transfer the thrusts to these units or to resist them in its own weight. The former it cannot accomplish by reason of the lateral nature of the forces as against its own vertical dimension, and the other alternate would eliminate a large part of the structural significance of the buttressing vaults and piers. There is no questioning the elegant beauty of the dome towers of the later Byzantine period nor their value as a decorative motif, but in these two factors lies their total worth. They certainly convey no impression of a dome significantly crowning and dominating the structure; the tall drum isolates the dome covering from the major part of the structure both internally and externally. In effect the features are no more than towers or lanterns, and hence no essential part of the Byzantine system.

The normal conclusion is that the dome should rest directly on pendentives and the arches of the arms, as at S. Sophia and S. Marks, and that its exterior profile should rather closely follow the contour of its interior curve. However, since its
thrust is not entirely concentrated at its spring line but rather is in part distributed over the area just above (known as its haunch), we would be justified in adding masonry along this area in the form of an exterior drum carried up between a quarter and a third of the total height of the dome. This buttressing drum we have seen used in the Salonican S. Sophia and many of the other Byzantine churches. At S. Sophia in Constantinople, the abutment took the form of vertical masses placed between the windows which pierced the dome along its haunch. In a normal structure this ring of windows would dangerously weaken the dome, but here a ribbed construction carries the major part of the thrusts between the openings. If we are to vigorously follow the logic of the system, we must limit window openings to structural voids rather than employing any such makeshift to allow their use elsewhere.

Not only does this narrow exterior drum meet a structural need but it gives the exterior contour of the dome a more gentle and refined curve as
well as a more appropriate appearance of solidity than would accompany the use of a full hemisphere as on the interior (fig. 3). This hemisphere, of course, could have been reduced to as little as two-thirds of its height internally and a similar curvature to be formed on the exterior; but this would considerably lessen the height of the dome and thus be defeating our purpose of giving it a proper position of prominence.

There are two specific reasons why the barrel vaulted arms of the structure should be relatively shallow. In the first place, any considerable projection would entirely or in a large part exclude the dome from the perspectives taken at points along or near the major axis of the buildings. We found this to be the case in Maginnis' Byzantine church at Washington and to have been avoided in the later work of the Byzantine era only by the imposition of high drums beneath the domes. The second reason resides in a need of proper lighting. The structural voids to which window openings should be confined occur only in the ends of these
barrel vaults. If deep, the light admitted by the windows, regardless of their size, would fail to retain an intensity sufficient to properly illumine the central cupola. A third or a half of the diameter of the dome would meet these requirements and yet supply a weight and depth in the vault sufficient for its use as a buttress.

It is difficult to say just what the exterior covering of these vaults should be. The uncompromising purist might demand a strict semicircular contour of the vault itself, but this is almost totally irreconcilable with any beauty of form. Maginnis' use of this curve is made in the Catholic Shrine at Washington but in a less conspicuous position along the sides of the nave. Here the vaulted bays occur between the horizontally roofed masses of the buttresses, involving a pleasing rhythm of line rather than the softening and weakening effect of the more indeterminate form. In the earlier facade of S. Mark's, Venice, we saw the utter crudity and the archaic character of a design based entirely on an attempt to express
the interior vaults in this manner. A repetitious and unintelligent use of this form in Russian architecture does much toward arousing a feeling of the grotesque.

A modification of this form is suggested in the use of a refinement similar to that which we have employed for the dome. The unpleasant dropping of the curve near its base might be stopped at some point above the spring-line of the vault by a small reverse curve extending to the outer face of the vertical side walls (fig. 4). This we found employed in occasional Byzantine examples, as the Church of the Chora in Constantinople, though seldom with any degree of success.

A more desirable solution would be the low-pitched gable roof (fig. 3), where the covering is retained as a part of the masonry of the vault and not raised on timbers as the steep Gothic roof. This form is by no means without precedence. We have only to look at such examples as S. Irene, the choir of S. Vitale, and the later Athenian churches to form an idea of
its widespread usage. Possibly the most delight-
ful of all are the pedimented gables of the Maus¬
oleum of Galla Placidia, but it is again to the
National Shrine at Washington that we must turn
for a refinement and scale more akin to our needs.
Goodhue likewise gives us a pleasingly simple
treatment, with considerable Byzantine feeling,
in the front facades and transept ends of S. Bar-
tholomew.

The masonry added under the eaves of this
roof might well serve to absorb by its weight a
considerable part of the outward thrust of the
vault, just as the outer drum would do for the
dome. Additional buttressing would be necessary
near the spring line of the vault to secure the
stability of the wall and might well take a
simple, broad, flat form along the sides, adding
a desirable break in the otherwise severe ver-
tical lines of the arms (fig. 3).

The two modern adaptations mentioned above
likewise give us the best solutions of window
treatments. Both use appropriately scaled and
handsomely designed rose windows, whose center points coincide with those of the interior vaults. These windows are recessed in arch rings which adequately express the vault form behind. We could well adopt these for use in the ideal structure we are consciously evolving. Should additional light be desirable, it might be provided in the form of a series of slender arches on columns on stilted round heads, composing a satisfactory horizontal beneath the circular form of the rose window and adding a note of elegance quite in character with this window.

The entrances occurring in these arms could assume the breadth of dimension and massiveness of feeling that is attained in the portal of Westminster Cathedral. Either slightly projected or placed flush with the outer face of the arm and recessed back to the vertical plane of the rose window by a series of receding arch rings, such an opening would constitute an integral part of the design and retain a feeling of solidity appropriate to its purpose. More typically By-
zantine was the use of a narthex as a supplementary form in plan. This was generally made to extend across the entire length of the facade, as in S. Sophia and in a more exaggerated form in the little church of S. Theodore in Tiro, but preferable for our purpose would be the more confined entrance porch of such a church as Sacre Coeur or that of the Immaculate Conception. If the size of the structure permits, the portals might be tripled without exceeding in total breadth that of the vault-defining exterior arch (fig. 6). These appendages could constitute no integral part of the structure and would simply appear as additions, convenient in plan and contributing toward further securing a pyramidal formulation of the exterior masses. (fig. 6)

The corner piers are of considerable structural importance, supporting all the weight of the dome (the arches transfer their part of it to these piers) and receiving a major part of the thrust through the pendentives. Hence it is only natural that they should be given a deserved significance.
of position in the exterior expression. As their sufficiency is not so much dependent on their height as on their mass, the piers should appear as simple solids with a minimum use of vertical lines which might tend to break up the elementary planes of the four faces. By carrying these units up to a point just below the top of the exterior drum and yet above the spring line of the dome proper, the apparent stability of the structure is increased, although this raised portion is free standing of the dome itself and follows no specific lines of its thrusts. This latter is hardly a subterfuge as it so well serves to emphasize the structural importance of these buttressing and weight-supporting piers. Even the Gothic builders, universally lauded for their structural frankness, often raised the crown of their flying buttresses to points considerably above the line of concentrated thrusts of the vaults within for the singular purpose of enhancing the stability of their frame as seen by the eye. Edgell notes the case at Rheims where the vertical distance between the points of the outward
thrust of the vaults and the inward thrust of the flying buttress was so considerable that additional interior ribs, spanning from one buttress to the opposite one, above the interior vault and independent of it, were required for the stability of the structure. And all this merely because the point at which the thrust of the vault was actually concentrated appeared dangerously low.

Moreover, the added weight of the elongation of the piers actually serves as an aid to the part below where the lateral forces do occur.

S. Sophia is perhaps the only Byzantine example that even suggests this mode of expression, but even here it is not carried to any logical conclusion, and the form that the piers take fails to faithfully embody the forces that exist inside.

There remains the possibility of the use of angle chambers to fill out the corners of the cross and bring it into a square. This in the Second Golden Age became the established plan of the Byzantine church. A dome or domical vault was generally placed.

*The American Architecture of Today, 8.*
over these angle chambers, their regularity of interior form being preserved by a reduction of the corner piers to the status of mere columns. But this sacrifice we should be unwilling to make in our structure, and, if used, the chambers would necessarily remain irregular in plan or be brought into the shape of a Greek cross inside by the addition of masonry at the three remaining corners. (fig. 5)

As in the case of the entrance porches, these additions could have no inherent relation to the major structure itself. Their value would lie principally in an enlargement of the floor area of the building and in the important part they might play in the formation of the pyramidal composition. (fig. 6) In view of this latter purpose, the chambers should be raised to a point near the spring line of the barrel vaults of the arms where in conjunction with the lower solids of the entrance porches, they would serve to begin the base of the pyramid and likewise offset any undesirable effect of verticality that might exist in the inner cor-
ners of the arms. Moreover, in such a position they would eliminate the need of the additional thickness of wall along the sides of the arms that we found necessary to add in their absence for buttressing purposes.

S. Sophia presents a horrible example of the use of such addition forms at the base of the main structure. We have previously described the utter confusion and incoherent jumble that is the resulting effect. On the other hand, in the little Athenian churches the subordinate units are used far more in the manner in which we should wish to employ them—to fill out the otherwise rather awkward interior angles of the cross and to aid in the pyramidal composition.

Another and more radical alternative that presents itself is the use of semicircular half-domed arms in place of the rectangular barrel-vaulted forms (fig. 7). In such case we should no doubt prefer the larger units as used for the east and west buttresses of the dome of S. Sophia, rather than the small niche forms commonly employed in Ar-
menia. These latter did not take in the whole breadth of the dome and hence could not as efficiently serve as buttresses. The difficulty in plan would be the lack of an adequate area for entrances without too great an imposition upon the curve of the apse.

The advantage of this scheme on the exterior would be a better perspective of the central cupola provided by the receding height of the semi-domes (fig. 8). However, this advantage would be more than offset by a total absence of structural voids with a consequent lack of logical area for windows. Any position that might be selected for such a purpose—the base of the dome or semi-domes (as at S. Sophia) or the walls of the apses—would involve the need of additional buttressing: otherwise unnecessary. Moreover, the semi-domes themselves imply a buttressing scheme as used for the central dome, and our logical induction falls short if we deny them such a system and restrict the thrust-resisting masses to a single heavy wall following the line of half-dome's
base. But should we accept such additional units, as the exedrae employed at S. Sophia, the result would be a complication and confusion that would go far toward destroying the simple unity we are striving to achieve. Assuming the use of the plain half-cylindrical walls to receive the thrusts (fig. 8), we are still faced with the doubtful aesthetic value of the numerous curves in the perspective. Normally they would apparently tend to weaken the structure, giving it the same sort of indeterminate character that we found true of the semi-circular coverings for the barrel-vaults, only in a more pronounced degree. The final effect would probably be that of a number of mushrooms clustered together (particularly if the buttressing exedrae were added), with a pronounced absence of the solidity and strength so desirable in the expression of a permanent structure.

In our selection of a decorative scheme for the exterior surfaces that will logically reflect that of the interior, we would normally begin with
a consideration of that most important feature, the covering of the central dome. There can be little doubt but what this should be the gayest, richest, and most splendid part of the whole scheme. However, in this respect we speak with little or no precedence. The dome of S. Sophia retains to this day its simple broad expanse of lead, painted white, while all other domes of the Byzantine era either used this same lead covering, often with ribs springing from the angles of the drum (SS. Sergius and Bacchus), or employed roofing tile in radiating joints, more noticeable in the later churches. Goodhue's dome on his building for the San Diego Exposition, though Spanish Baroque in character, is more nearly akin to what we are seeking in its lavish use of colourful mosaic patterns, while Maginnis indicates the same sort of treatment in his Byzantine church. The dome for the commencement hall of Rice Institute, illustrated in the frontispiece, is an attempt at just the solution we should require.

In the first place, whatever the decoration
might be, it should closely adhere to the curve of the dome itself, with a careful avoidance of any projecting ribs, raised panels or crowning finials. Combined with a positive need of colour, this points directly to mosaic patterning in coloured tile as the most appropriate medium. We shall not attempt to describe any form that this design might take other than to suggest that the scale of the patterns be large enough to be readily discernable from the ground and that no designs be used that might run contrary to the shape of the dome itself and tend to obscure its form.

This rich embellishment of the central feature is by no means incongruous with the nature of its use. Unlike other members of the structure, it has nothing above to support, and hence there could hardly be any feeling of over-softening or weakening resulting from such a decorative treatment. It is only in the structural voids in the ends of the barrel-vaulted arms that ornament of comparable richness could again be employed. This would consist of the handsome geo-
metrical designs in the stone tracery of the rose (or plate) windows and in a possible use of low relief carving of a similar nature on the surface below the circular opening and around the portal. Again, this space might be covered with coloured mosaic as on the dome, though we feel that such a repetition of its use might in some degree detract from the added prominence it gives the central cupola.

Except for the roofs of the arms which are relatively unapparent from the ground and so need not be considered in this respect, the remaining surfaces serve a definite structural purpose and should be allowed to retain an appearance of solidity. Probably the best scheme of surface treatment that we could adopt would be a gradation in brick and stone such as we noticed in part in the later Byzantine churches of Constantinople and more definitely in S. Bartholomew and the building of the Rice Institute.

Beginning with a slightly darker marble to accent the horizontal plane of the base of the
building, the procession would be through a certain area of solid stone, preferably white with a slight cream or gray tinge, followed by stone with brick set in the joints, and thence to a certain amount of banding in brick and stone, finally with a more occasional use of stone, and ending in handsome expanses of brick. Of course this scheme should retain an interesting variety with a specific attention to the nature of the solids behind. Thus on the corner piers the stone could well be carried up considerably higher to emphasize the structural importance of these members.

The handsome brick patterning that was so frequently and so successfully used in the later churches of Constantinople and Salonica, and particularly in S. Clement of Ohrida in Bulgaria, should be utilized to enliven the broad areas of brick wall. Because of the uniform nature of the material and the flatness of the treatment, this would in no way tend to lessen the sense of solidity and strength produced by the simple and rather severe planes of the walls themselves, but would
add considerable refinement and elegance to the whole design, offsetting the sharpness and even hardness of line that characterized the exterior surfaces of the austere Armenian churches.

To this interesting texture of line might be added occasional spots of colour, carefully placed and limited in number with a careful avoidance of the glaring contrasts of value evident in the Serbian churches. Thus the desirable polychrome nature of the facades would be based for the large part on the subtle pink (or orange) of the brick intermingled with the soft white of the stone, with the greater brilliance of deeper colours concentrated at the dome and possibly apparent in a lesser degree within the arched ends of the arms.

It is my opinion that a building designed in the manner above described would embody to a greater extent an expression of those ideals that we have noted as outstanding in Byzantine architecture and decoration, and that the exterior would provide a more adequate reflection of the splendour of colour
and pattern composing the interior design and a
greater clarity and more appropriate simplicity
of structural delineation. The requirements
set down as necessary to a perfect expression of
the principles of the style preclude its use for
anything but a central type building. Wherever
in its architectural history this tenet was not
followed the result was either a complete failure
or an inadequate compromise. To see this we have
only to look at the unpleasant irregularity of the
exterior of S. Sophia, at the awkward form that
follows the addition of a nave dome at S. Irene,
at the totally un-Byzantine nature of the general
mass of Westminster, with its string of domes
hidden behind a parapet wall, or at Maginnis' bril-
liant yet unsuccessful attempt to give a central dome
a proper position of importance over a long nave.
Even in S. Mark's, where the symmetry about a cen-
ter point was largely retained, the elongation of
the arms to a point when they would provide a
total length necessary for the nave and allow the
imposition of an addition dome over each, utterly
destroyed the effect of a centralized structure and any unity of composition as well. It was in a large degree the demand of the Western Church for a long-naved building that made it so difficult for Byzantine design to find any proper place in Western architecture.

We may thus conclude that the value of the Byzantine style in modern architecture lies not in any adaptation that might be made of it to the traditional church plan, but rather in a broader use for any centralized building of the memorial type demanding a monumental treatment, or in a use of its handsome decorative features, frankly divorced from its compact structural system, in such a manner as we see in the buildings of the Rice Institute campus. Of prime importance in a modern usage of the Byzantine principles of design would be a careful avoidance of an archeological approach. The architect would do best to catch the spirit of the style along with a thorough knowledge of its colourful nature and structural integrity and then proceed to give his own ideas expression.
BIBLIOGRAPHY


Architectural Forum, Rogers & Hanson Co., New York; vol. XXXII, no. 5; photographs and drawings of St. Bartholomew's, New York.


Dumolin, Maurice, and Outardel, George, Les Eglises de France; Librairie Letouzey et Anc, 1936; "Paris et la Seine."


Grand Prix de Rome d'Architecture, Auguste Vincent, Paris; vols. I, II, & IV.


Outardel, George. See Dumolin, Maurice.


Ruskin, John, *The Seven Lamps of Architecture*; George Allen, Orpington, Kent, 1889.


