A History of Byzantine Architecture.

with special reference to

problems of origin and evolution of plan.

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The writer has visited the churches in Athens and other parts of Greece, in Tusculum, Ravenna, and Venice.

In the naming of directions no account is taken of orientation, but to avoid confusion, east always refers to the direction of the sanctuary.

Two books of tracings are added for convenience. They are taken from plans in the next books mentioned in the Bibliography. They are merely intended to show the general features of the building and to explain the descriptions in the text. While only rough tracings, endeavour has been made to have them accurate as far as all essential features and relative positions are concerned.

With the thesis are two pamphlets by the writer. It is not intended that they should be considered as part of the thesis, but are shown as evidence of previous study in the same subject.
I. The Characteristic Features of the Byzantine Church.

Byzantine Architecture is that style of architecture which, having evolved slowly during preceding centuries, finally took on its definite form and peculiar characteristics in Constantinople in the sixth century after the Birth of Christ. It is doubtless true that developed examples of the style are to be found at an earlier date in other places in the East, but it is safe to say that its special features became finally established and became thoroughly popularised at that place and at that time.

The influences which helped to mould the style were diverse and they proceeded from different quarters. There has been much discussion as to whence the predominating influences came and different theories have been adduced to account for its formation.

Older views have been abandoned; new explanations have been brought forward: a tangled mass of evidence lies before the student.

Complications arise through the fact that the dating of the churches is often very uncertain. New discoveries and researches on the part of archaeologists have been continually tending to modify former theories. It must, moreover, be remembered that innumerable churches have been destroyed and if a solitary or remote example appears which reveals any special feature, it must not necessarily on that account be dismissed as singular.

The latest theories would push its origin farther and farther east.


In 1901, Shyqyrovski wrote: "Für die christliche Kunst aber sind meines Erachtens schon in den ersten drittel des Jahrhunderts gerade die alten orientalischen Großstädte des hellenistischen Kreises, vor allem Alexandria, Antiochia und Ephesos die Ausgangspunkte - nicht Rom oder eine von Rom ausgehende Reichskunst."

In 1916 he wrote: "Der große Aufschwung, den die altchristliche Gewölbearchitektur durch Einführung des Pendentifs in Konstantinopel genommen hat, libt sich nur verstehen, wenn man den verschiedensten Jüngen von Iran aus auf ihrem Wege durch Westasien bis zum Mittelmeere folgt."

In 1918 he wrote: "...I held that at first initiative belonged solely to the great Mediterranean cities and to Rome, which together embodied all the creative power given to Christianity in its cradle. These views were expressed in my book 'Orient oder Rom' published in 1901. But the experience gained later in Egypt, Syria, and Asia Minor put me on the track of other centres independent both of Hellenistic and of Roman influence: in these was developed an art which became the nursery of Christian architecture and of its original decoration. The first of these centres was Persia..."

And again

"The bear again and again of the boldness and freedom of Hellenistic Architecture in connection with S. Lorenzo at Milan, S. Vitalis at Ravenna or S. Sophia at Constantinople. But it would be far more to the point were it recognized that these churches really represent the expansion of Iranian art on European soil, an expansion only..."
rendered possible by the complete surrender of the leading Hellenistic architects to East-Phrygian and Armenian influences.

Its origins, however, must be said that it was the capital of the Eastern Empire which finally organised its main features and set upon Byzantine Architecture its stamp and seal. It was, moreover, in Constantinople that it reached the height of its glory; it that city stood its most splendid monuments. Hagia Sophia pre-eminent among them all.

Examples of Byzantine Architecture are to be found in widely separated regions, and its influence transcended the frontiers of that Empire which was its native place. Constantinople, Anatolia, Macedonia, Serbia, Roumania, Russia, Greece, Calabria, Sicily, Northern Italy, Gaul, Armenia—these are among the regions where it may be found in complete or partial manifestation.

It is necessary, however, to make a distinction between buildings which are essentially Byzantine in construction and plan and buildings which are Byzantine only as regards decoration and minor detail. Churches of the latter type have often—but wrongly—been grouped under the heading of "Byzantine Architecture." Such churches exist in both the Eastern and Western parts of the Empire, but they must be excluded from the Byzantine series. It is necessary to apply the term "Byzantine Architecture" with reference to churches only of the former type.

Basilicas often show marked Byzantine influence, as in the capitals of their columns or in the mosaics which gleam upon their walls.
St. Demetrius, Salonica (towards the end of the 6th century) is a basilica, the columns separating nave and aisles having arches resting on their capitals by means of pilasters. The capitals are of the finest Byzantine work and the splendid mosaics of the church are also Byzantine in type.

In Constantinople is St. John of Studion (A.D. 463) it is a basilica. The sole remaining church of the type in the city; but the sculpture on the façade displays underside Byzantine foliage.

In the West, there stand at Ravenna the two magnificent basilicas of St. Apollinare Nuovo and St. Apollinare in Classe. In the capitals of these churches both these churches show strong Byzantine influence.

A remarkable series of ruined churches in Syria was first investigated last century. They date from the fourth to the seventh century. The majority are basilicas, and though they were situated in the Eastern Empire, their connection with Byzantine Architecture is but slight. Basilicas are also to be found in Asia Minor, Greece and other parts of the Eastern Empire.

The basilica, however, whether of the wooden-roofed or barrel-vaulted type, whether with one aisle or three, whether with architraves or arches on the nave columns, is not to be classified under the heading ‘Byzantine’ even though a basilica may show Byzantine features and be found within the area which at one time may have formed the Eastern Empire.

Nevertheless, it will be necessary in this thesis to touch upon certain early Eastern basilicas inasmuch as they are forerunners of another type of building—the domed
A pendentive is formed in the following fashion.

The four pairs of columns which stand at the corners of the square are tied together by arches. It is obvious that between each pair of arches there is a vacant space; this, if we imagine a dome resting on the apex of the arches, is of triangular shape. Now, when these triangular spaces are treated as parts of this dome, pendentives are formed. They are in other words, portions of a hemisphere touching the corners of the square. Portions formed by the walls of the square, so to speak, being carried up and cutting off portions of the hemisphere, which itself is too big.

The pendentives, wedged in between the arches
basilica. - a type which falls under the category of Byzantine.

Wherein, then, do the peculiar characteristics of Byzantine Architecture lie and by what criterion must the style be fixed? The pre-eminent feature of Byzantine Architecture is the dome or cupola and it was the special method employed by the Byzantine builders in the arrangement of the dome which gave the whole building its peculiar and distinctive features.

The dome was, of course, employed by the Romans, but with them it was used to cover a circular space. This was a simple matter. The dome rested on the exterior wall of the building or upon an interior circle of columns.

The problem which the Byzantine builders faced and solved was a much more complex one. It was the problem of covering a square space with a dome. The problem was how to make the transition from the square on the ground level and on the level of the top of the pillars, friezes, or walls, at the corners of the square to the circle which was formed by the base of the dome.

Broadly speaking, three kinds of expedient were adopted to solve the difficulty.

By far the most common and important way was by means of "pendentives." A pendentive is the curved-triangular portion of a hemisphere, cut off by two mutually perpendicular perpendiculars whose diameter is equal to the diagonal of the square, which the dome has to cover, and whose centre is in the centre of that square at the level of the springing of the arches. If one were to imagine a dome resting on the summit of the finest arches, which form...
and carried up to meet their apex from a complete circle within the limits of the space.

In this case the pendentiage and the actual dome form part of the same hemisphere and may be entitled "continuous pendentiage."

Much more important is the true "independent" pendentive. The independent pendentive is the great characteristic feature of Byzantine architecture. Its use became widespread and is exemplified both in great churches like S. Sophia, Constantinople, and in innumerable churches of small dimensions in Greece and elsewhere. The independent pendentive (or briefly the "pendentive" - for the word is usually applied to this second type) is composed in this wise. In order to obtain greater internal height let the upper part of the dome which touches the corners of the square be cut off by a horizontal plane resting upon the highest points in the lines of intersection between the walls and dome. Upon the horizontal circle thus given a dome of smaller radius than the preceding dome can be constructed. The portions of the large lower dome remaining between the four vertical arches and the horizontal plane are the pendentiage.

See p. 22 for definition of the squinch.
the supports at the corners of a square, it would be seen that four vacant spaces were left between the arches. Into these spaces which are filled in by the pendentes.

Sometimes the dome has the same centre as the pendentes. Domes and pendentes are all of one piece. In such case, the pendentes might be called "continuous pendentes." More often the pendentes form the only remaining portions (or rather existing portions) of a different sphere, the centre of the actual dome being at a higher level. In this case true "independent pendentes" are formed. The continuous pendentive as will be seen later is a forerunner of the independent pendentive.

Sometimes a drum is intercalated between the dome and the base formed by the pendentes and arches. In any case, the pendentes make the transition from the square to the circle on which rests the circular base of the dome or drum.

This characteristically Byzantine expedient is exemplified in innumerable churches from Hagia Sophia, with its great pendentes (said to be the largest in the world) to the diminutive country churches of Greece.

The second kind of expedient shows itself under different forms. These may be divided roughly under the headings of corbelled and squinch-arches. They occur in churches of the earlier period though later examples are also to be found.

A third method of bringing the square to a circle was by the use of pseudo-pendentives. In churches where these are employed
The central square is bounded by twelve supports, four at the angles and two between on each side. Across the angles are flung semi-domes reducing the square to an octagon; these semi-domes are called pseudo-pendentives. From the octagonal plan formed at the summit it was easy to proceed to the circle by means of squinches or pendentives placed between the arches. The church with pseudo-pendentives was common in Greece, the larger church of the Monastery of St. Luke of Stiris in Phocis being an excellent example of the type.

The typical Greek church of the established style has its ground-plan in the form of a square or rectangle with the addition of three aires. In the centre of the church rises a drum, circular internally and polygonal externally. On this drum rests the dome or cupola. The drum rests on the circle formed by the pendentives, which pendentives rest on the extrados of four semi-circular arches. These arches are supported by four columns or piers at the angles of the central square.

The arches are prolonged as barrel-vaults to the exterior walls. They may be of equal length, thus forming a Greek cross, or the eastern and western vaults may be slightly longer than those of the north and south. The angles of the cross are filled in, and so the ground-plan of the square or rectangle is obtained. But these angle-spaces are roofed at a lower level than the arms of the cross and therefore, a cruciform appearance is preserved both internally and externally. These angle-spaces are vaulted with
1 Μελετανος. “Η Εκκλησία μια.” p. 11


3 Maughan “Liturgy of the Eastern Orthodox Church” p. 2
dome, cross, or domical vaults.

At the east end of the church project three apses, round in the inside and (usually) polygonal on the outside, (shewing several sides of a polygon).

In the central apse there stands, away from the wall, the Holy Table. The northern apse is known as the Prothesis. Within it there takes place the "preparation" of the Sacred Elements, which forms the first part of the Holy Liturgy. The southern apse is called the Schemaophylaxion or Diaconicon and serves the purpose of a vestry. Sometimes the Prothesis and diaconicon are only niches let into the thickness of the eastern wall.

Liturgically, each Greek Church is divided into two parts. The Bema or Hieron, where the mysteries are celebrated, and the Nave, properly speaking, where the daily assemblage. The Bema comprises all the three apses and a richly adorned screen, into which icons are inserted, divides it from the Nave. This screen is called the Econostasion or Iconostasis.

Along the whole west end of the church the Narthex extends. It is separated from the main body of the church by an inside wall pierced by three openings which give access from the narthex to the western cross-arm and angle-spaces. In old days it was used for catechumenon or penitents. "It has lost most of its liturgical significance. Since there are now no catechumenon, it is sometimes used for Baphtisms and for motions of the funeral rites." In monastic churches it was often used by the monks for the recital of certain prayers and for periods of meditation.
The narthex is often of a later date than the rest of the church. In Naisariani, Attica, the main part of the church is built of fine squared stones and tiles and the later narthex is of random rubble.

In front of the narthex there occasionally extends an exo-narthex, which usually takes the form of an open porch. Examples are to be found at Mt. Athos, Lesbos, the Peloponnese, etc.

Side-chapels — parecclesia — are often found attached to the church. In Naisariani, a parecclesion — of later date than the church — abuts on the south wall of the latter.

The developed type of church is best known as the “Cross-in-Square” type, though the addition of the narthex converts the square of the ground plan externally into a rectangle, or even although, the prolongation of the western cross-arm or the intercession of an additional bay between eastern cross arm and apse converts the main body of the church into a rectangle.

In the cross-in-square church, the whole main building is closely tied together and forms a compact whole. The thrust of the dome is carried through the pendentives and arches down to the ground by the piers and along the barrel vaults to the exterior walls. The arms of the cross are buttressed by the vaults and walls of the angle-compartments. The building in short shows a series of internal buttresses, thrusts and counter-thrusts reciprocally annul one another and each part of the building plays its essential part in the maintenance of
The equilibrium.

The cross-arms are covered with low roofs of tile which terminate as gables on the exterior walls. Sometimes the roofs are curved, thus corresponding to the interior form of the vaults.

The also cover the dome.

Vaults were built of thin bricks (tiles) laid in vertical beds; thus the use of centering was obviated. Other expedients were adopted for the same purpose.

The walls were constructed of rubble, or squared stone with a tile in each vertical and horizontal joint, or courses of stone and brick, etc.

Many Anatolian churches were constructed entirely of stone.

The windows in a Byzantine church are usually small and narrow and have arched heads. Two or three are often grouped together.

Double windows, with a shaft, sometimes of marble, dividing the two lights are much in evidence. This shaft is surmounted by a small capital supporting.

Common positions for the windows are the sides of the drum, the gables of the cross-arms, and the apses. A triple light in the east wall of the central apse is a common feature.

The walls of the church are sometimes relieved by niches with semi-circular heads. These niches are either round or flat, and if flat, are occasionally recessed in two or more orders.

Arcades are also found on the outside of the walls.

Much use was made of brick design to ornament the exterior of the church.
The most usual design was obtained in the following way. Thin bricks were laid horizontally with one corner flush with the wall-face so as to form a band of saw-tooth pattern. Such a band runs right along the wall. It may be carried up the sides and over the head of the windows which it meets in its course.

A very common method of decoration was to employ thin bricks and arrange them in radiating fashion over window-heads. In the case of double windows a semi-circle of radiating bricks was placed over each light and a further semi-circle over both. The space between being filled with a brick design.

Cased slabs, pieces of stone or marble with ornamentation, are often found built into the walls or used as lintels for doors.

The subject of Byzantine painting and mosaic work does not concern this thesis.

Suffice it to say that ancient Byzantine churches owe no little of their charm to the mosaics which gleam resplendent on their walls or to the fading frescoes which in their own strange fashion depict scenes from sacred story or portray austere Eastern saints.

Painted in an unreal way, they seem the representations of scenes and saints from some remote and unknown world.

Such a church as that of Daphni, between Athens and Eleusis, its walls clad with mosaics of many a hue, adds the beauty of these mosaics to that of its spacious architectural form.

The little country churches of Greece lost—and isolated on hillside and plain
fascinate both by the quaint charm of their design and by the mysterious loveliness of their frescoed walls, rudely painted though these frescoes often be and dim and faded with age.
'as Leclercq "Byzantin (Art)" in Dictionnaire d'Arch. chrétienne de " Vol. II. 1486 " first attempts to use pendentives to support a cupola.
II. The Pendentive.

Reference will be made later to the pseudo-pendentive in connection with those Greek churches in which it occurs. In the meantime it is necessary to examine the early development of the two other methods by means of which there was formed the circle of the base on which the dome rested: (a) the pendentive, (b) the squinch, corbel, etc. Care must be taken to distinguish clearly between the two methods. The squinch etc. have been described as "first attempts to use pendentives to support a cupola," but the two methods are very different one from the other. Squinches, corbels, etc. bear no necessary relation to the vaults which support the dome. Often a square tower rested on the four arches and at a distance above the level of the vaults the square was brought to an approximately circular form by means of squinches. The pendentive on the other hand filled naturally into the spaces between the arches and formed a logical part of the construction.

It is probably not right even to say that the pendentive "developed out of" the squinch, etc. The two methods are quite distinct.

This is revealed by a consideration of the buildings of an early date in which expedients other than the pendentive were used. Such are the Kalybê (or Posthouse) at Qum-es-Zitoum (A.D. 382) and that at Chaqqa (4th century A.D.) and the more notable example of the ancient Cathedral of St. George at Eyn in Northern Syria (A.D. 515).
Dichl. "Manuel d'Art byzantin." p. 35

Pirroia. "Lombardic Architecture." p. 35


Diehl "Manuel d'Art byzantin." p. 34.


The method adopted in these buildings was very different from that of the Fendentive. The Church at Egra has its dome covering, not a square, but an octagon. The octagon was reduced to a sixteen-sided figure by means of a flat slab placed across each angle: the sixteen-sided figure was in the same way reduced to a thirty-two-sided figure; thus by after stages an approximate circle was obtained which formed a base for the dome.

The Kalybe at Omm-es-Zeitoun was a square structure with projecting wings. The dome covering the square. The same method of using a series of flat slabs was used in order to bring the square to a circle.

The Kalybe at Chagga is essentially similar to that of Omm-es-Zeitoun, with flat slabs placed across the angles of the square.

The Tomb of Zigges at Ruweika is of a much later date (sixth century.) It is one of the most important funeral monuments in North Syria owing to the fact that it is the "only ancient structure in Syria that preserves in completeness an example of a rectangular building with a domical roof." In plan it is a Greek cross within a square with four deep arches. The angles between the arches were all built up to the level of the crowns of the arches to form a square. A system of flat slabs brings the square to a circle for the dome.

Mention will later be made of other buildings with such slabs. Enough has been said to show the difference between such a method and that of the Fendentive. By way of
Mention may also be made of somewhat similar "fendentes" in the Baths of Caracalla, in the angles of an octagon. They start with two straight lines at an L of 135° which lessen as they rise to the surface becomes curved obliterating the L by merging into an arc of 45° at the top. (Stucchi (Baccolini) Diet. of Arch. III 89)

Choisy "L'art de bâtir chez les Byzantins" p. 88.

5 Choisy "L'art de bâtir chez les Byzantins" p. 90.

6 Stotham "Short Critical History of Architecture" p. 303
Rivieria "Lombardic Architecture" p. 34
introduction to a discussion on the pendentive.

It has been suggested that the pendentive arose in the West. Rivoira classes as pendentives what might rather be called corbels and which occur in second century Roman tombs on the Via Nomentana. The beds are however, horizontal instead of being of inclined plane like the true pendentive.

In the so-called Temple of Minerva Medica at Rome — probably part of a thermae — the transition was only from a decagon to a circle and the "pendentives" are "small and unimportant."

M. Choisy states that according to his knowledge, the first appearance of a spherical vault with pendentives is to be found in a hall among the ruins of Djerach. The date of the building is uncertain but the style of masonry and the general appearance of the structure points to Roman hands expressing Eastern ideas. It is to be noted that the Djerach pendentives differ from the true Byzantine pendentives inasmuch as their surface is flat in their lower courses; they are not fully, triangular curved portions of a hemisphere.

Yet they are really forerunners of the true pendentive. If they are as early as has been supposed.

These pendentives are "continuous." So also are the pendentives of the vault of a gate situated beneath the Mosque of El-Astå in Jerusalem. This gate belongs to the sixth century A.D.

Close by is another gate called the "Golden Gate," and attributed to Justinian. It consists of six bays vaulted with cupolas on pendentives. Though Byzantine in construction, the Golden Gate shows much classic detail.
'Choisy "L'Art de bâtir chez les byzantins" p. 100
Bühl "Manuel d'art byzantin" p. 34
Lecereq. "Manuel d'archéologie chrétienne" p. 60

"La voûte sphérique est une voûte
atteinte à son maximum de flèche."
These pendentives are all built of stone.

M. Choisy would however trace the ultimate source of the pendentive to the Persian habit of building vaults of brick in vertical courses without centering. This system passed over to the Christian builders in Anatolia in the fourth century. From the cross-vault it would be an easy step to the spherical vault. When the height of the vault from the center of the axis at the springing is equal to half the diameter of the diagonal of the square covered by the vault, then the vault becomes a hemisphere. The simple raising of the conical vault gives the dome with continuous pendentives.

It is suggested that the pendentive thus arose in Anatolia, though an adaptation of Eastern methods. It must be noted that it is not suggested that the pendentive arose in the Middle East. The Sassanian builders of Persia used the squinch, and not the pendentive, as in the Palaces of Siburistan and Firus-abad.

The earliest extant churches in which the pendentive was used seems to be a group in Asia Minor. From Asia Minor the pendentive passed over to Constantinople. These Anatolian churches have been supposed to be of a very early date. Strzygowski would date them to the fourth century. Piell would assign them to the same century, because their pendentives are continuous. This alone is perhaps not a sufficient reason for giving them so early a date, but the general plan of most of them would make it likely that they were built before the reign of Justinian and so before the date of the erection of Santa Sophia.
1 Choisy, "L'art de bâtir," p. 158.
This appears to be the western portion of the double-church. There is confusion in the nomenclature of this building vide infra p.

2 Choisy, "op. cit." p. 159.

3 Choisy "op. cit." p. 159
It is probably safe to affirm that the continuous pendentive was in widespread use in Asia Minor in the fifth century of the Christian era, and that Asiatic architects adopted it at Byzantium and transformed it into the independent pendentive.

At Ala-shehr (Philadelphia) the body of the church was covered by two cupolas which rested hyppenous of continuous pendentives on massive piers forming part of the outer walls.

Praes. IV. XIX. The Church of the Trinity at Ephesus is also rectangular in plan. The centre of the building was surrounded by a dome which rested by means of pendentives on piers engaged into the outside walls. In plan and the arrangement of thrusts this building bears a relationship to the Basilica of Constantine and the large halls of the great Roman baths.

The Church of the Seven Sleepers at Ephesus ² while Roman in appearance is entirely Byzantine in structure. Choisy calls it "Roman in date."

A large building on the site of Magnesia formerly several domes on pendentives. From the evidence of bas-reliefs in Choisy attributed it the reign of Constantine.

Pendentives are found in the Church of St. Nicholas, Myra. Wulff however dates this church to the seventh or eighth century. Wulff includes it among the group which he dates to the fourth and fifth centuries.

Among the ruins of Bin-bir kilise, a vast collection of churches on the Anatolian plateau which Styppati has felt to be of paramount importance in the history of Byzantine Architecture, there is to be found a small church which has a dome set on
vide infra  p. 63

Ramsay & Bell "1001 Churches" p. 122.


3 Choisy. "L'art de bâtir etc." p. 158.
Fendentives: It has been called No. 12 and is situated on the North side of No. 21, a basilica.

No. 12 is a small cruciform building. An early date has been assigned by some to the churches of Bin-bir kilise; but this assignment has been much disputed. No. 12 is later than No. 21 and little evidence on the question at issue can be adduced from the fact of its existence.

It seems probable as has been already stated, that the fendentive passed over to Constantinople from Anatolia. There is one Western Christian building of the West in which something like the fendentive occurs. This is the celebrated Tomb of Gala Placidia at Ravenna. But as has been said what is found here is "in reality...the opposition of four barrel-vaults on four sides of a square with the roof space between them "flanked" into a kind of approximate domical form."

With reference to the Anatolian hypothesis, it is to be noted that the architects of Santa Sophia, Anthemius of Tralles and Isidore of Miletum, both came from Anatolia.

It is true that the fendentive does occur in Constantinopolitan buildings which antedate the great church of Justinian. Namely, the cisterns or reservoirs of Gelé-batan Senai and Bin-bir-ducek! But these buildings antedate Santa Sophia only by a short period. The Cistern of Bin-bir-ducek dates from A.D. 528.

Santa Sophia itself is the earliest example of a building to which a certain date can be assigned, in which the indefin
Hamlin in Stugie "Dictionary of Architecture" col. 413.
dent pendentive is used. The step from the con-
tinuous to the independent pendentive was of
great importance and had far-reaching effects.
The pendentive now becomes a separate
entity instead of being merely a part of the dome,
and becomes one of the leading features of Byzantine
Architecture.

The problem as to whether the architects
of Santa Sophia were the first to take this
step—that is, were the discoverers of the
independent pendentive—is an interesting one,
but it is not yet feasible of solution. It is
at least within the grounds of possibility that
they were.

So far the passage of the pendentive from
Asia Minor to Constantinople and its development
in Constantinople has been traced.

There is, however, another problem to be
discussed. Did the pendentive (continuous)
arise in Asia Minor? Was it first-used in
Anatolia? As has been stated above (p. 16)
Chomsky considered this to have been the case
and believed that the pendentive arose through
the Anatolian architects adopting the Persian
method of building vaults without centering.
in brick.

Yet it seems that this theory is not
by means proved. One feels that the
builders of churches may have adopted the
pendentive of the dome from a consideration
of the small domed tombs which must
have been very common in Syria and
Anatolia in Roman times. Indeed there
is an excellent example of a tomb with
a dome on pendentives, still in existence.
"Corder "Survey of Eastern Palestine" I p. 372

Other types of tomb, such as the "Tomb of Absalom" or the "Tomb of Zechariah" near Jerusalem, do survive.

and this example dates almost certainly, as early as the second century A.D. It is called Kist-e-en-Rueijis (the Palace of the Princes) and is situated in Eastern Palestine. It is an admirable example of the mausolea or tomb-towers of the district.

In plan, it is a square forty feet in width and has a small chamber in each corner. It is roofed with a cupola resting on continuous pententives, these being buttressed by arches joined to the outer walls.

The masonry of the dome and pententives is excellent. While the building possesses features which are accustomed to be considered as typically Byzantine, it contains others which are markedly classical. The outer wall is adorned with corner pilasters having Ionic capitals, and these carry a regular entablature.

The appearance of the pententive in this building may be of greater significance than has been supposed. It is not possible to believe that there may have been many other such tombs, built in Roman times in the East—tombs covered with a dome resting on continuous pententives? Imnumerable buildings have been destroyed in these parts in the course of the centuries, and what Ferguson says of the tomb of Mylana in Cacia "that we are forced to conclude that it belongs to a style once prevalent and long fixed in these lands, though this one now stands as the sole remaining representative of its class" might equally well be applied to Kistor-en-Rueijis.

Mention might be made of a sixth-century tomb at Tass, "with four deep arches built about
a square as if to support a dome."

The Tomb of Hvor-en-Nuejja is in Palestine. but when it is considered that it was built in the period of the Empire, it is not difficult to suppose that the type may have existed in Anatolia also, it too being under the Empire.

If such tombs existed at Ephesus and other centres, it is quite reasonable to imagine that the builders of churches borrowed the idea of the dome and pendentives from such tombs.

The very idea of the pendentive may have been in such tombs. These small buildings, with arcostyles along the sides, would readily suggest the idea. At first, a rough filling-in of the spaces between the arches would form a sort of primitive pendentive. In course of time this would be succeeded by a better-constructed pendentive. Then, the method would be borrowed for use on a larger scale in churches, and finally, in Constantinople, the idea was taken which resulted in the formation of the pendentive in its true and independent form.
The Corbel and the Squinch.

Mention has already been made of the Kalâbêts at Omâr-i-e. Zeitoun and Chaqqa, and of the Tomb of Bâyâz at Rumeîha, and of how the method adopted to support the dome in these buildings was to place flat slabs across the angles of the square. The method of using a series of slabs has been described in connection with the Church at Egâr.

The expedient of using flat slabs was also adopted in a chapel at Maidjelalâûnd, Syria (6th c.), where the ground-plan is polygonal, in a tomb at Ammân, where the ground-plan is square.

Much more important than the flat slab, or the series of flat slabs forming a sort of corbel or the squinch-arch. This consists of a series of corbelled out one above the other and projecting diagonal arches thrown across the angles of a square. The four squinches reduce the square to an octagon and the transition from the octagon to the circle is then made by placing slabs across the angles. It seems certain that the Byzantine builders borrowed the squinch-arch from the Sassanid buildings of Persia. It is found in the Palaces of Sûbûz-i-khâ and throughout the former of which dates from the fourth and the latter of which dates from the fifth century A.D. In each, square compartments are covered with high painted domes, whose sections approach the elliptical. The square is brought to a circle by means of deeply penetrating squinch-arches, built over the angles of the square.

The squinch is found in Christian building in Mesopotamia, e.g. in the Baptistery of the Church of the Monastery of Rabban Hormizd.
1. vide infra p. 74
2. vide infra p. 38
3. vide infra p. 36

4. It is however thought that these are not original work. vide infra p.
and in the Church of the Virgin at Yhristh.  

From the Mesopotamian basin it penetrated to the plateau of Asia Minor, and directly or indirectly to many other regions. It is to be found in the domed basilica of St. Clement at Amegia in Spalata a building similar to the sixth, seventh of the eighth century. Squinches also appear in the fifth century Church of Kidja-Tekwini in Syria. They are to be found in the churches of the White and Red Convents at Sohag in Egypt. There, the walls above the arches are high and the squinches thrust across the angles of the square formed by these walls are at a much higher level than the summit of the arches.

Such buildings strikingly exemplify the differences between the form of construction in which the squinch is used and that in which the pendentive is used; the pendentive being wedged between the arches, the squinch being placed at a much higher level.

In Palestine, the squinch seems to have been used in the destroyed Church at Gaza as described by Choricius.

It spread at an early date to the West and occurs in the Baptistery of Naples.

A famous example is the beautiful Church of San Vitale, Ravenna, where the dome rests on the summit of eight recessed arches and eight squinch arches. These are supported on eight strong piers between each pair of which are two marble columns, forming semi-circular recesses or exedrae. San Vitale dates from the fifth century A.D.

Returning to Anatolia, the cradle of Byzantine Architecture, the corbel and the squinch...
Ramsey and Bell.  1001 Churches  p. 442.
and not the pendentive were the types of dome-
support used in the oldest churches on the interior
plateau.

On the summit of Mahaleth, the highest
point of the Kauadagh mountain, about fifty miles
south-east of Iconium, stands a large church
dedicated to St. Michael. It is well-constructed
from massive blocks of dressed stone. It is
cruciform in plan and terminates in a vaulted
semi-circular apse. The western angles of the
cross are occupied by rectangular rooms, cut off
by walls from the main body. Four barrel-
vaults spring from the centre of the church to
the outer walls. Above the arches which
terminate these barrel-vaults at the centre,
walls are carried up to the height of six
courses; in the seventh course a stone is
laid across each angle, forming an octagon;
in the eighth course the circle is formed, the
masonry being carried back slightly behind
the original lines of the side of the square
so as to produce a circle.

This is simply the flat slab method
of forming the transition, differing from the
method used at Omm en-Reitoun and Eyrus,
in that the passage is made directly from
the octagon to a circle by the bellying back
of the masonry and not through a sixteen-

sided and thirty-two sided figure.

A further variation of the method is
to be found at Bin-bin-Tulain (Anatolia) in a
small cruciform chapel with a hipped apse,

which has been called No. 9. A stone is
thrown transversely across each angle of
the central square, turning it into an octagon.
"Miss Bell calls it "a very elementary pendentive," and "at once a corbel and pendentive."

I.e. each block forms a corbel across the angle and a small pendentive filling up the angle below the corbel. (1001 Churches, p. 74)

vide infra p. 49
But this transverse stone is not simply a flat slab. It is roughly triangular in shape, wedging itself into the course beneath and having its apex surface diagonal.

The more thoughtful method of the squinch-arch is found used in the Church of Siviri Stinna, a village close to Gelvera, the ancient Barabula.

Siviri Stinna is a cross-shaped church with a barrel-vaulted aisle filling up one of the angles of the cross. The central space is covered with a dome supported on three engaged piers and one free-standing pier. Above the arches at the centre, walls are carried up for one and a half courses. A moulded string-course runs round them at this point, and immediately above the string-course squinches slung across the angles bring the square to an octagon. The octagon is brought to a circle by means of a flat stone placed across each angle and by the stones of the dome being carried slightly back behind the faces of the octagon walls.

The squinch is of infinitely less moment in the history of Byzantine Architecture than the pendente. Nevertheless, it continued to be used down to a late date. The twelfth-century Church of Santa Tessa, Torcello, near Venice, has a triple series of squinches, obviously intended for a dome, which was however never built. The pseudo-pendente which occurs in a series of late Greek churches afterwards to be described may be said to be a form of squinch.

Millet says of the squinch and corbel that they were Persian in origin. This is
line of the squinch. Perhaps it is scarcely necessary to speak of the "origin" of the corbel, a simple expedient which would readily suggest itself to one who wished to place a stone over a small square space.

IV Churches in Anatolia.

(i) Single-chambered churches.

It is now necessary to consider the development of the ground plan and of the general structure of the Byzantine Church. It is to Anatolia that the attention must first be directed, for it seems right to give this region the credit of being the cradle of Byzantine Architecture. It used to be thought that Byzantine Architecture sprang from Roman and this theory has still been maintained in recent years. "The Byzantine and Romanesque styles of architecture are the phases into which the art passed from the decay of the styles of ancient Rome: and in order to understand them it is necessary to understand first the character of that art from which they sprang."

On the other hand, as has been already stated, and as will be later discussed, Strzygowski would place its origins further East. Nevertheless, it still seems possible to maintain that in Anatolia that early development took place which led to its definite formation in Constantinople. This does not mean that Roman or Eastern influences were absent, they commingled on the Anatolian soil.

Byzantine Architecture represents Asiatic elements combined with Roman elements under Greek influence, and such combination took place in Anatolia and especially in the great Hellenistic centres, such as Ephesus, where Asia, Rome, and Hellenism met.

The churches of Anatolia show diverse types. The oblong (single chambered church), the basilica, domed basilica, cross-in-square, etc.
   Sztygowski. "Kleinasiu." p. 65

They are scattered about in widely separated regions and are of far apart dates. The dating is a most important matter, for it makes all the difference for the argument whether an Anatolian church which possesses distinctively Byzantine features is before or after the time of the erection of Santa Sophia in Constantinople. Unfortunately the question of date is often very uncertain.

The largest extant group of churches in Anatolia has been found at Bin-bir-kilisse (The Thousand and One Churches.) "the remains of a typical provincial town of the early Byzantine age" situated in a high position on the Karam Dagh mountain to the south-east of Yeniç (Izmir).

A small Turkish village occupies a portion of the site and its name, Bin-bir-kilisse, indicates the vast number of churches whose ruins exist in its neighbourhood. Some of these are simple oblongs terminated by an aisle at the Eastern end.

Such is Church No. XVII (A), a monastery chapel with a horse-shoe apse, flanked by two small niches.

It is a small building about thirty feet long and twenty feet broad and is situated on the north side of the monastic enclosure. The type - the simple oblong - is rare in Binbir-kilisse and is explained in this case that only a small place of worship was needed, as the monastery was a small one. "Ringnum Ruinen vielleicht eines kleinen Klosters."

The reference in Bin-bir-kilisse was for the basilica.

Another monastic oblong church stands ruined at Asamede. (B) to the East of Mahalutek.


³ Ramsey and Bell. "1001 Churches." p. 229

⁴ Ramsey and Bell. "1001 Churches." p. 176
It has however a narrow narthex at its western end and the apse is round, not horse-shoe-shaped.

At the monastery of Tihalicheh, outside the walls, are the ruins of a small oblong chapel, beside an ancient Hittite shrine. In this example, the corners at the east end have been rounded off, so that the side walls are continued directly as the walls of the apse.

On Maden-daft there is a small oblong chapel terminated by a semi-circular apse and built of massive blocks of squared stone.

It adjoins three parallel oblong churches.

A few other oblong churches — they are at Binlubilibe — are simply little oratories connected with tombs, as the one at Deqhilie (No XLVI) beside the burial-place of the Abbot Peter.

Not so is No XXXVI which stands in the middle of a monastery court and presents some features of interest. The oblong is terminated by an apse which in the interior forms a skilful semi-circle, and on the outside shows seven sides of a polygon. In the interior a series of three arches bays runs along the northern southern walls of the nave. The arches resting on piers engaged to these walls.

This marks an advance from the simplicity of the oblong. Yet, even if the church were of very early date — of which there is no evidence — it could not be described as a step from oblong to basilica. The basilica arose from the need of increased accommodation. The arched bays of No XXXVI simply strengthen the walls of similar nature is a church at Gelves, with three flat arched niches in each side wall.
1. Ramsay and Bell "1001 Churches." p. 325

2. Ramsay and Bell "1001 Churches." p. 331


4. Cowfoot in Shaymoski "Kleinasien" p. 28
   Ramsay and Bell, "1001 Churches." p. 325.
At Viran Sheher, near Halwa Dere, on the northern slopes of Harzan Dagh is another oblong church built of massive blocks of stone. This terminated by an aper. Five sided externally, and horse-shoe shaped internally. The entrance is in the south wall.

Others are at Ana Jeshvei and Bag Dagh on Halwa Dere.

The church at Sarigul has a narthex and an arched porch on the north.

Finally mention may be made of Jeditaphlu (the "Seven-doored") an aisleless church situated on a hill overlooking the River Halys. Marzouk, who visited it, says it is in the usual ruined state.

There was no inscription to be found. But the masonry is extremely good. The door is in the south wall, a feature of many of these churches.

All the above churches were roofed with barrel vaults.

These aisleless churches race little in common with the developed type of Byzantine church. As however they are types of very early churches (though not necessarily themselves early) they are worthy of note.

They are the first stage in the road along which Christian Architecture proceeded.

The basilica, answering the demand for increased accommodation followed.

The feature of the aper (round or horse-shoe shaped in the inside) is one which is essential in later Byzantine buildings and is also to be found in these oblong churches.
'Strzypowski "Kleinasiun"
Ramsay / Bell "The 1001 Churches"
Basilicas.

The Near East is able to boast of the remains of many early Christian basilicas, some in a ruined condition, some still in use. It is true that these are not to be strictly classified as examples of Byzantine Architecture, though many of them have Byzantine decorative features. Nevertheless, as, according to one theory, the basilica was a stage in the development of the Byzantine plan and as it certainly was a forerunner of the Byzantine domed basilica, a summary is given of the Anatolian basilicas.

The basiliicas of Bin-bir-kilise, are with nave and two aisles. The number of supports on either side separating nave from aisles varying from nine to two. These supports often take the form of rectangular piers having engaged semi-columns at both ends. Some churches have plain rectangular piers. The semi-columns may be a later addition.

A single apse terminates the church. The absence of side-apses would appear to point to an early date.

The apse is often internally of horse-shoe plan : sometimes it is semi-circular; sometimes it shows a tilted semi-circle.

Single or double round-headed windows pierce the apse walls, a feature which has continued right through the history of Byzantine Architecture.

The apse shows a semi-circular plan externally, differing in this respect from the usual Byzantine apse which is almost invariably polygonal on the outside.
1. Statham "A Short History of Architectural Development. Chronological Appendix to Chapter III.


3. Stzygowski "Kleinasion" p. 158.


The apse of Church III at Bin-bir-kilesi has five sides of a polygon on the outside.

The masonry of the churches is of squared stone laid in courses, and the churches are roofed with barrel-vaults in stone. The walls of the nave rise above the aisle roofs.

What is perhaps the most noteworthy feature is the entrance. Immediately in front of the nave lies a square or rectangular portico, entered from the outside through one or two pillars. On either side of the portico lies a side-room, in line with the corresponding aisle. These side-rooms are a rule communicat only with the aisles.

The churches of Bin-bir-kilesi have been the theme of much discussion. Their importance depends upon their date. This Strzygowski would place well before the time of Justinian. Stratton on the other hand places it as late as the ninth or tenth century, and says that "the importance and interest of these very dilapidated fragments of local churches seem to have been rather exaggerated; at all events the subject has little or no bearing on the main history of architectural development."

None of the churches, with which the rock-churches Strzygowski deals—except Sawborsa—have a dated inscription. He bases his theories regarding date on plan and structure.

As Diehl says: 'this is always a delicate matter.' Though he admits the early date to be possible for the undomed basilicas and the octagon at Bin-bir-kilesi. He does not agree with Strzygowski's dating of the domed basilicas.
2. Stryjewski; Kleinassian. p. 160


Sir William Ramsay says that "the thousand and one churches" belong to different dates. The construction of new churches continued down to the eleventh century, but the question as to the time to which the beginning of the existing churches should be assigned is as difficult and obscure as it is important. Until regard to the situation of the church in an enclosed space, he feels there is continuity between the earliest churches of Binbintulisse and the third and fourth centuries.

Skythii, who as has been stated, places the churches in a period before the time of Justinian, says there is no ground against dating individual churches in the fourth century and their type in the third century. He bases his assumptions on the extreme simplicity of the ground-plans and especially on the fact that the rows of pillars end immediately before the apse, there being no choir-space between nave and apse. This points to a time of undeveloped ritual. He also mentions the almost entire absence of side-apses.

The absence of a prothesis seems surely to point to an early date. Before the sixth century the entry of the celebrants was already an imposing ceremony. This place, the prothesis is mentioned under the term "acarium," as early as the third century. (IV Council of Carthage, Can. 93.) The office of the Prothesis, an addition to the original liturgy, was part of the latter before the sixth century.

The absence of the prothesis alone at Binbintulisse does not mean the churches were built before the prothesis service was introduced for a side-table, would have served its purpose...
'In No. II grooves have been found in the inner side of the two end pieces which points to a door frame extended across the nave.

2 Shgygowskii "Kleinasion" p. 49
    Roll "Kleinasięsche Denkmäler." p. 15.

3 Shgygowskii "Kleinasion" p. 49

4 Shgygowskii "Kleinasion." p. 47
    Roll "Kleinasięsche Denkmäler." p. 316.

5 Hamilton "Researches in Asia Minor" II. p. 294
    Roll "Kleinasięsche Denkmäler." p. 186.
    Shgygowskii "Kleinasion." p. 67

6 Bell "Journey thru Cilicia" Revue Arch. 1906 p. 5 ff.

Lycaonia

7 Shgygowskii "Kleinasion" p. 51
    Langlois "Voyage dans la Cilicie" p. 224.

8 Bent "A Journey in Cilicia Trachea" in the
    Journal of Hellenic Studies Vol XXI. p. 214

9 Bell "Journey thru Cilicia" p. 29
with an iconostasis extending from north to south wall to include a space to right and left of the central aisle a little distance before it.

Yet the absence of the Prothesis apse would seem to point to a time before the Prothesis apses became especially elaborate.

Further reference will be made to the dating of these churches in the general discussion of the place of Anatolia in the history of the development of Byzantine Architecture.

Basilicas are found in Anatolia in other places than Bin-bir-kilisses. There are two at Sagalassos, near Kremna, in Pisidia. They have strongly marked transepts, but single apses.

There is another at Gül-bagtsche, on the Gulf of Smyrna, which building has Prothesis and Diaconicon formed by carrying forward the side-walls to meet at right angles another wall which forms a tangent to the apse.

It is not necessary to describe other Anatolian basilicas in detail, inasmuch as they are not of Byzantine plan as defined.

To show the prevalence of the type, mention may be made of the basilicas at Aladoscha-Kilikse, (North of Myra); Andaval, "a ruined church dedicated to Agios Constantinos."; Hierapolis; Kara Kodscha; Fatagan; Diner; Manaz; Kandili, "where there are two of which Langois wrote, "les deux églises byzantines sont construites dans la style des anciennes basiliques et paraissent remonter aux VIIIe et IXe siècles." At Coryces a temple was converted into a basilica, an apse being fitted on to the antae. There are other basilicas at Coryces."
Finally it should be mentioned that broadly speaking, the basilicas in the interior are of stone, those on the coast of brick.

The Bin-bi-riliné basilicas have strong Syrian traits about them. Those on the coast lands have Western traits. "They are still Roman constructions in spite of the cachet put on them." Yet the Byzantine builders were not satisfied with the wooden roof, and though Procopius says that Justinian built some wooden-roofed basilicas in Constantinople, they preferred the vault.

A further step was taken when they broke the cradle of the vault by the insertion of a dome, and the domed basilica was formed.
Headlam "Ecclesiastical Sites in Isauria"
Diehl "Manuel d'Art byzantin" p. 91
Wulff "Altkrömliche und Byzantinische Kunst" p. 255
Ramsay and Bell "1001 Churches" p. 322
(iii) Domed Basilicas.

High up on the north-easterly slope of the Colpycadus valley, five hours to the north of the town of Mut—the ancient Cleopatra's—stands a group of ruins—consisting mainly of a church and monastery—called Khodja Kaleesi. The monastery is much ruined but the church is in excellent preservation. The church was built of good masonry, consisting of ashlar courses of closely fitted stone. It is basilical in plan with a nave and two aisles. The nave terminates in an apse, but as the ground-plan of the outer walls is rectangular, the apse is enclosed within a rectangle. In this way, side-chambers are formed, but the aisles themselves terminate in small apses connected with these side-chambers. The nave is separated from each aisle by a double tier of columns. Galleries ran along the aisles. (Galleries are an important feature in Byzantine churches, and persisted even in the cross-arms of cross-in-square churches.)

Khodja Kaleesi is thus of basilical plan but the space in the nave between the second bay on the west and the "choir" in front of the apse forms a square and this square is surmounted by a tower supported by arches resting on four large columns. The importance of Khodja Kaleesi depends partly on the date and partly on whether this tower carried a dome or not. Haddam, who has visited and described the church, thinks it must only have foreseen a wooden roof.
Clarkie "Christian Antiquities in the Nile Valley." p. 154

Clarkie. ib. p. 153
If that had been the case, the building is not a true domed basilica.

Szygowski maintains that it was a domed basilica. He asked what the object of this solid tower construction was for if it was not for a stone roof. He considers that a stone roof was probable on "a priori" grounds, and the reasons which Headlam adduces for his views - the lack of fallen material and a belief that the collapse of a stone dome would have carried some of the tower away with it - have little weight with him.

Szygowski compares the tower with that of the Church of the Red Monastery at Sohag, in Egypt, but a recent investigator has stated that in both the Red and White Monasteries, these square spaces were originally covered with a timber roof. In the Red Monastery, "that there was a timber roof and not a dome over the place has occupied by the principal dome of the church seems beyond question." The walls and arches both here and in the next bay west were not strong enough to bear a masonry covering. So too with the White Monastery Church, which "from the lightness of its construction" "must have been roofed with wood." Tower Tower fires are not original.

At, Khadja Kalasi however, it seems that the construction is solid. Sohag cannot be brought to support the theory that "Khadja Kalasi was domed. but, leaving Sohag out of the question it appears that much may be said for Szygowski's views. Headlam says that "the applied angles are not structural from den lives leading up to a dome."

Crouwert. "Notes upon Late Anatolian Art"
 Might they not be the beginning of squinchess, to bring the square to a circle for a dome?

As regards date, it seems certain from an inscription that the church stood here before A.D. 461. Headlam dates it to the first half of the fifth century, Strzygowski, arguing from the decoration to the beginning of the same century, and Wulff to the second half.

In any case, Khodja Kalesî marks a distinct advance on the basilica. In place of the unbroken line of supports, there is the square place with its four strong piers.

There is the tower rising above the main roof.

The same type is found at Ansegra, in the Church of St. Clement, except that the squinchess are placed between the arches and not at a higher level. The church is built of brick. The dome rests on a drum. The aisles were vaulted with barrel vaults parallel to the main axis. Strzygowski lays considerable stress on the nature of the ornamentation to be found inside this church. It is of an ancient type and "schön der altherrischen Kunst bekannt." He places it before Justinian's day.

The Church of Gümê in Galatia is a stone building with nave and four aisles. It has a narthex and a façade of the Binbirkilisse type. The centre of the church has fallen, but on the south side an angle is visible which points to it having had a tower or dome. The aisles were galleried and appear to have been at the same height as the nave. Crozfort, on the evidence of an inscription (not actually dated however) puts the church in the first decade of the 5th c.
Roth "Kleinaisiatische Denkmaler" p. 325
Shyropostis "Kleinasién" p. 132
Diehl "Manuel d'art byzantin. " p. 91, 93
In the Church of St. Nicholas, Myra, the dome rested on pendentives. The church seems to have had galleries. Diehl groups this church with the early buildings which are the Anatolian forerunners of the Byzantine Architecture of Constantinople, but Rott dates it as late as 1042, on the evidence of an inscription which lies at Demre, but which used to lie at Myra, and which, he says, can refer only to the Church of St. Nicholas. This inscription refers to the renewal of a building in that year, during the reign of Constantine Monomachus. Myra was destroyed by the Arabs a few years before.

Part of the building - the so-called Tomb of St. Nicholas - is at a different level from the rest. The plan is a complicated and irregular one. Everything seems to point to rebuilding.

St. Nicholas is however an excellent example of a domed basilica and has an additional feature in the shape of a curious extra south aisle. It is remarkable for the variety of its domes and vaults. It has a narthex and a modern exo-narthex. The Russians, under Salzmann began a restoration in 1862, but were stopped by the Turks. Salzmann placed a cross-vault over the centre of the nave where the dome originally stood. In the middle of the church stands a great double ambo, with two flights of steps, leading up to it. Rott's view of the apse gives a rather fine impression of spaciousness and nobility, stripped of all beauty though the walls are, and though the half-dome of the apse is restored in brick.
Rolli, "Kleinasiatische Denkmäler," p. 311
Dietl, "Manuel d'art byzantin," p. 91
Strzygowski, "Kleinasiern" p. 132
In the sea-coast province of Lycia stands the domed basilica of Cassaba or Dére-Ahsy. It is described by Spratt and Forbes as "a large Christian cathedral of early Byzantine Architecture, one of the most interesting and picturesque as well as best-preserved ruins in Lycia." Rott places the date of the erection of Dére-Ahsy in the eighth century; Strzygowski says it is after 500.

The former calls it a "Kuppelbasilika in Kreuz," the latter a "Kreuzkuppel Kirche."

Strong piers (pillars at the center) divide the nave from the two aisles. Barrel-vaults extend from the central dome on four sides.

The dome over the central space rested on pendentives. The aisles are two-storied and both stories are roofed with a series of cross-vaults, except in the upper story where the vaults from the central space open out.

The aisles terminate in square rooms and beyond these are prothesis and diaconicon. These latter have an approximately quatrefoil plan. The apses internally show a semi-circle and externally three sides of a polygon. Along the west front lay a narthex, which opened into an exo-narthex by five doors. So the north and south of the church lay two octagonal buildings each with an apse. These buildings were connected to the church with barrel-vaulted passages. Rott considers that a church at Constantinople—destroyed or transformed—must have served as a prototype for the builder of Dére-Ahsy. He compares it with the Panachrantos and Pantepoptes Churches in the capital and may the architect, must-
Wood: "Discoveries at Ephesus." p. 60
Wood: "ib." p. 12
be sought in Constantinople or Salonica.

It certainly does bear resemblances to churches in Constantinople— the hollowing-out of the walls of the side-chambers with niches and the widespread use of the cross-vault. It shares the same mixture of the domed basilica and cross-in-square types as is found in the capital, being basilical on the ground floor and cross-in-square above. The arms of the cross extending to the outer walls.

In this respect one would rather compare it with S. Irene and S. Theodora than with the two churches Rott mentions, which have no galleries in the cross-arms.

It is perhaps going too far to say that Dēō-Ahsy had a prototype in the capital, but Constantinopolitan influence must have been widespread by the time it was built. Rott places it in the eighth century on the ground that the Arabs invaded the south coast of Asia Minor in the last decades of the seventh. This alone is no sufficient reason. But the above-mentioned resemblances to the Constantinopolitan churches would incline one to put it in that century. (St. Irene dates from 740 A.D.)

The remains of domed basilicas have been found at Ephesus, remains of great interest because they have been supposed to date from an early period.

Wood mentions a building which appeared to have been a basilica and probably became a church which he thinks may have been dedicated to St. Luke, as it was situated near his tomb. Christian churches must have been built in the city before 260

2 Shzygowski: "Kleinasien." p. 142


"J. Knoll, quoted by R. Heberdey in "Jahreshefte des österreichischen Arch. Inst. in Wien" Vol. VIII Beilage p. 78


Wulff. op.cit. p. 256.
He mentions the famous Double Church. "It was probably one of the earliest Christian Churches at Ephesus and may have been built soon after the destruction of the temple." He dates it to the second half of the third century. The eastern church built of stone was a basilica. The western one, built of brick had a central dome supported on four massive piers. Hübsch gave a reconstruction of the church and assumed from vaults in the aisles. Strogasovski says that these were not cross-vaults, but states that it is not clear whether the church was a domed basilica or a cruciform square. The most recent investigator of the building writes "Über der Mitleh wölbbte sich auf massiven Pfahln aus gutes Ziegelmaurer-
-werk aufrichend vermutlich eine Kuppel von etwa 12 Durchmesser an die nach Ost und West wohl Sonnenwölbte anschloessen, während die Apsis mit einer Waltrumpf
überdacht war."  

Before the western church extended an atrium.

The double-church at Ephesus seems to have been built not later than the reign of Justinian.

Wulff compares the western church with "a fully-developed domed basilica" at Meriamlik which dates from the second half of the fifth century. There, is also to be found the central space flanked with barrel-vaulted aisles. It also has an atrium. He says that the Ephesus Church cannot be much after Meriamlik.
Choisy. "L'Art de bâtir chez les Byzantins" p. 158


3 Choisy. "L'Art de bâtir chez les Byzantins" p. 158.

Leclercq. "Manuel d'archéologie chypriote" p. 78

4 Lethaby. "The Church of S. Sophia." p. 204
Attention should be directed to the rectangular side-rooms of the apses in both churches. The form of plan here makes one think of Egyptian influence.

M. Choisy calls this the Church of the Trinity. He says it resembles to the Bath Halls of the Romans. Mr. Lethaby supposed it to have been the building in the beginning of the fifth century.

At Ephesus, there also stood a church dedicated to St. John. It is mentioned by Procopius as having been rebuilt on the plan of the Holy Apostles at Constantinople. There was also a church dedicated to the Seven Sisters which Choisy mentions as being Roman in aspect but Byzantine in structure constructed "pour tranches et sans cintrage."

Ephesus has been felt to have played an important part in the formation of Byzantine Architecture. It "was one of the centres of the transformation of the Art of building, and it was from the neighbouring cities of Tralles and Nidus than Anthenius and Soisone came to Constantinople." At such a centre, a wealthy and fabulous town, where a meeting-place between East and West, divers artistic elements would meet together, and could well be fused into a new style.

It is true that Shogyrovski now minimizes the importance of Ephesus and other Hellenistic cities as creative centres. He says now. "There was a time when we believed these cities were creative centres of Christian Art." It advance of Knowledge.
"Diehl. "Les origines asiatiques d'art byzantin."
In Journal des Savants p. 243

Diehl op. cit. p. 248
with regard to the East has wrought a fundamental change in these beliefs." He maintains even that Jacks and Anthemions studied their architecture on the borders of Armenia and Persia. Yet his new theories seem to rest mainly on the à priori evidence that in Persia Christianity was a tolerated religion in early days. The buildings which he mentions are nearly all late, and if they are assumed to be copies of earlier prototypes, the same might equally be said of Anatolian churches.

Examining more closely the question of the domed basilica, it must be frankly admitted that evidence in favour of the type having existed in Anatolia before the time of Justinian is but scanty. Dietz considers that we cannot put back the type to an earlier period than that of Justinian. He speaks of the "common artistic influence all over the East, from which came the great artistic impulse of the sixth century."

It seems probable that Khodja Kalesi, Juwe, and the Double-church at Ephesus were built before the date of Santa Sophia.

Finally, how did the domed basilica come about? It has been suggested that it had some connection with the great halls of Roman baths in Hellenistic centres, but it seems simpler to think that it developed out of the basilica and that the idea of the dome came from the circular churches or tombs of the district.
2 Ramsey & Bell, "1001 Churches." p. 266. 897.

3 Ramsey & Bell "1001 Churches." p. 183. 897.
(iv) Cross-in-Square Churches.

Whether the cross-in-square church developed out of the domed basilica or whether it arose otherwise is a matter about which there has been difference of opinion. The question will be discussed later. Now it is necessary to detail the examples of the cross-in-square type which exist in Anatolia.

"The history of the cruciform type is even more obscure than that of the basilica."

It is necessary to draw a distinction between the simple cruciform church and the cross-in-square church. The former is a simple cross.

The latter is the special type of church above described, with its component parts closely tied together and with its angle-vaults forming a compact whole with the cross-arms. Owing to the usual uncertainty with regard to some of the dates, it is impossible to detail the cross-in-square churches of Anatolia in strictly chronological order.

The whole geographical field, as far as possible may be gone over, and attention directed to the period to which the various churches belong.

On the summit of Jebel Dagh to the north of Maden Shakir is a church which was of this type. It is now a huddled mass of masonry, but the ground-plan is clear.

More noteworthy is the church in Bin-bir-nilimé numbered XXXV. Only the north and west-walls remain standing but the foundations can be traced.

2. Ramsay & Bell. "1001 Churches." p. 400

It was probably roofed with a dome "flanked by barrel-vaults. It is believed by Sir W. Ramsay to have been local work both in design and execution.

No xxxix. 'Bin-bir-kilise' shows a regular closed cross-in-square plan. Twenty years ago the radiating barrel-vaults still stood.

On Ali Summani Dagh stand the ruins of a church called Ala Kilise.² Only the walls are left and the piers are hidden with fallen masonry, but as there are returns for arches on north-west and south it appears that the Church was a cross-in-square. Noteworthy is the narthex, extending all along the west end and the characteristically Anatolian horseshoe form of the interior of the apse. The general plan of the building is rectangular and it is interesting to contrast it with the developed square type. In the latter, the barrel-vaults which radiate from the centre are of equal length, but in Ali Kilise this is far from being the case. In fact the space to be covered by the vaults extending to north and south is very small indeed thus giving a basilical appearance to the ground-plan. Though the church really falls under the category of the cross-in-square.

A clearly defined example of the cross-in-square type is to be found in what was the church at the village of Tlisan.³ Though the ground-plan is complicated by reason of the church having been turned into a mosque. It shows four central piers and round ailes. Niches in the east wall to north and south of aile to the place of side-altar. The church may be 9th century.
It should be noted that on the Anatolian plateau the corbel and the squinch and not the pendentive are commonest.
More important than any of these is the beautiful and comparatively well-preserved church of Yschauly-Kilise (Yshangli-Kilise) situated on a hill-slope near Aksevai and discovered by Smirnov.

Along the west front runs a narthex which had an upper story. In the upper part of its wall is a series of large horse-shoe shaped windows. The dome of the church rests on a polygonal drum supported by means of pendentives on four central columns. The sides of the drum are decorated with semi-circular arched niches recessed in several orders, some of the niches being filled with windows.

The interior of the building had its walls covered with frescoes, some of which are still visible.

The church has three apses, semi-circular on the inside and polygonal on the outside. The angles of the cross are roofed with barrel-vaults.

On the south side there is a fine example of surface-decoration, the wall being enlivened with a series of four niches recessed in three orders. The semi-circular heads of these niches are composed of radiating tiles. Bands of tile run across the niches at a lower level and the spandrels of the arches of the niches are also filled in with tile-decoration.

All this is very typical of the medieval Byzantine style. Smirnov dates Yshangli-Kilise to the tenth or eleventh century and the whole general appearance of the building makes this opinion seem correct. A view given in "The 1001 Churches" is very impressive. In the background tower the feathery spires of the mountains; in the centre extends the rolling plain; in the foreground stands the Byzantine Church.
Rott "Kleinasiatische Denkmaler." p. 274.

The church is called by Rott "Karadjatik Velissi".

Ramsay and Bell "1001 Churches." p. 418.

2 Rott "Kleinasiatische Denkmaler." p. 274.

3 Ramsay and Bell "1001 Churches." p. 421.
in all the boldness and firm beauty of its architectural style.

Along the north wall of the church runs a narthex, a kind of later date with a barrel-vaulted roof, and a strongly marked horseshoe apse.

Some little distance from Ischauly Kilisse stands another church which has an important variation. This is Kilise Kilise — the "Snailie Church." The church had three apses, and the central dome rested probably on pendentives.

At the north-west angle an interesting and unusual feature is the continuation of the angle piers by walls to the exterior walls to form a tiny apsidal chapel.

The important variation above-mentioned consists in the introduction of an extra pair of piers with an additional bay between the eastern dome supports and the apse. This variation is common in churches in Greece as it is to be described. It of course transforms the ground-plan from a square to a rectangle, though for convenience the term "cross-in-square" will be applied to all such churches.

The angle-apses of the cross in Kilise Kilise were barrel-vaulted. The round, not the horseshoe arch is used, one of the few cases in which it is to be found in Cappadocia. A gallery ran along the west end — doubtless the gynaeceum. A narthex extended along the west wall. The church was adorned with frescoes, traces of which are still visible.

At Gelvera, in Cappadocia, stands a much restored cross-in-square church, dedicated to St. Gregory of Nazianzos.
"Roth "Kleinasiatische Denkmäler" p. 276
Ramsay und Bell "1001 Churches" p. 376
Wulff "Altkristliche und Byzanthische Kunst" Vol. II p. 391

"Ainsworth "Studies & Researches in Asia Minor" Vol. I p. 208"
It has three apses. A noticeable feature - common in many Byzantine churches - is a large semi-circular-headed flat niche in the gable of the transept, marking on the exterior, the interior line of the vault. (This is seen later in Servia)

An old inscription, now destroyed, gave information that the Church of St. Gregory of Nazianzos at Gelieve was built in "the cruciform shape," at the expense of the Emperor Theodosius.

One of the most interesting churches in Cappadocia is to be found in the village of Sivri Hisar, near Gelieve. It is not actually a cross-in-square church, but as it marks a stage in the evolution of the type, it may be dealt with here.

Ainworth visited the church and thus describes his visit in the first half of last century.

"The ascent over the next low range of hills brought us to another of these secluded and rocky spots, but what surprised us not a little was a rather elegantly-built Greek church standing in its centre, but with no habitations near it and gradually falling into ruins. So regular and handsome an edifice, isolated in the midst of such savage scenery, naturally interested our feelings very much. It is a simple cruciform church, but has one of its angle-apses - the north-west - filled up with an aisle. This aisle is entered from the western arm of the cross through three arches supported on two double columns with heavy impostes. It also opens directly into the northern arm of the cross. It seems that this north aisle is of the same date as the rest of
the church. The eastern cross-arm is formed simply by the aisle.

Now this church appears to be intermediate between the cruciform and the cross-in-square.

Were the eastern cross-arm prolonged by the insertion of a barrel-vaulted area between aisle and central space and were the three remaining angle-spaces to be filled up, the cross-in-square type would be obtained.

Did not the cross-in-square develop out of the cruciform? M. Millet has maintained that the cross-in-square developed out of the domed basilica. He says that it arose in this way. The pendentive was badly adapted for the domed basilica; its thrusts were too great.

So the arches supporting the dome on north and south were made deeper and deeper until they were transformed into actual barrel-vaults prolonged to the outer walls. This being done, the cross-in-square type was obtained.

Apart from the fact that the squinch may have been most common in the domed basilica, is it not possible to think it may have developed from the cruciform?

It would be natural to use one of the vacant angles, if increased room was needed, as for the tomb of a martyr (e.g. in the Siuvi-Nicosia). Then the openings would be so raised and widened that the angle-chamber became a necessary part of the construction.

Then the other angle spaces at the west would be filled up. The idea of the three apses would come from the basilica. The eastern vault would follow and the eastern angle chambers of the cross-in-square be formed.
"Lethaby "Medieval Art" p. 85

-a the dome rests on an octagonal drum supported on squinches.

- Ramsey & Bell "1001 Churches" p. 382
Sivri Hisar is not necessarily an early church; though its actual date is unknown. But cruciform churches were common in early days. "We surely might have been safely certain that from the time when the cross-shafted was well-developed churches of that form would be especially delighted in and of this there is overwhelming proof."

One feels that churches of the Sivri Hisar type would not be long in following on the cruciform, the first-stage being an addition of an aisle-chamber to an actual cruciform, then the erection of fresh churches of the Sivri Hisar type. Prototypes of Sivri Hisar may have existed in Asia Minor in the fifth century.

Sivri Hisar was called Yiğil Kilise (the Red Church) from the colour of the stones which compose it. It also gets the name of St. Pankleimon. A narthex now destroyed was added at a later date.

A ruined church strongly resembling Sivri Hisar is to be found at Schulturkün near the Hanfan Dagh. Here the aisle was roofed with a parallel vault the same height as the vault of the western arm of the cross instead of with a lean-to roof as in Sivri-Hissar. The northern wall of the cross-arm projects beyond the north wall of the aisle.

The same sort of series of arches as at Sivri Hisar leads from aisle to western arm. An open arch leads from aisle to northern arm.

At the last end is a single apse round outside, and horseshoe shaped inside. The dome has fallen. The church was
1. Ramsay & Bell. "1001 Churches" p. iv0


3. Bell. in Rev. Arch. 1907, p. 20

4. Bell. in Rev. Arch. 1904, p. 26
beautifully built of fine squared masonry, but the windows have been filled in with rubble and the building converted into sheds.

At Konia (Scornium) there is situated an extraordinary looking building which is now a mosque, but which was once a church dedicated to St. Amphibolius. It has been very considerably altered in Mohammedan times. The dome rests on two isolated piers and two fiers engaged to the east wall. The dome has a drum. There is a central affine and a smaller one to the south.

It seems to have been not a cross-in-square type but a cruciform with the western angles filled in.

It has been dated as late as the Macedonian period. Sir. W.M. Ramsay mentions the church as "architecturally the oldest and most interesting in the city."

In Silleh, twelve miles north of Konia is a Church of the cross-in-square type. The church is dedicated to St. Michael. A modern Greek inscription unearths its foundation to the year 327. (The present building cannot date from then)

Its plan bears strong resemblance to that of Tirsandyn. The church has in the centre four rectangular piers on which the drum and dome rest.

This drum is not circular, but is a rectangle with rounded angles. There are a number of decorated fragments built into the walls.

Near Silleh is a rock-hewn church.
Bell.
in Rev. Arch. 1907. p. 27.

Bent "A Journey Through Cilicia Trachea"
in Journal of Hellenic Studies Vol. XIII
called the Kyriacon. It is of the cross-in-square type with a narthex and three apses. It has a central dome and four other domes over the angles of the cross. In free-standing churches this is a late feature. The narthex is decorated with blind arcades of strongly-marked horse-shoe arches.

Of greater interest is the Church of St. Eustathios in the village of Miram, three miles south of Konia. It is of the plan intermediate between the cruciform and the cross-in-square but it is an advance on the type of Divri Gümüs (v.s.p. 49) in so much as the eastern arm of the cross is not a mere aisle but a barrel-vaulted rectangle with a semi-circular aisle at the end. The dome rests on two piers and on the angles formed by the walls of the eastern arm and the northern and southern arms. The western angle spaces are filled up but not the eastern. A fairly broad narthex runs along the west end of the Church.

J. S. Bent mentions a number of churches in Licicia Iathea. He does not describe them but his remarks are of value as indicating the great number of churches which existed in the area. At Chati Ören he finds an inscription cut on a stone "set into an arch of what was presumably a small Christian Church." "During the late Roman Period [N.B.] and under the Byzantine Emperors this district was most densely populated. For each village had a large Christian church." At Utkirlikütü "there is a fine early Christian church."
Hasluck *Bithynica* in the Annual of the British School at Athens. vol. XIII. p. 288.

2 Hasluck *Bithynica*. B.S.A. Vol. XIII. p. 291
In the village of Siggilia, near the shore of the Sea of Marmora, stands the Church of St. Stephen. It is of the fully developed cross-in-square type and from an inscription seems very probably to be of about the date 800. It is now a mosque.

Four central columns support the dome, which is intermediate in form between the early flat dome and the later type with a high polygonal drum.

Along the west front extends a narthex and also an exo-narthex which is an open portico with side-walls and fine columns facing the street.

The church had three apses - the southern one has been destroyed. They are of curious plan.

In the first place an additional bay — roofed at a lower level than the eastern cross-arm — appears between eastern cross-arm and the actual apse.

This lower roofed bay is not in itself unusual but in characteristic of the Constantinopolitan churches of the cross-in-square type. (as opposed to the Greek) The side-apses are however unusual. They project beyond the central apse, and their north and south walls also project beyond the lines of the north and south walls of the church.

The Panagia Pantokratoros, also in Siggilia, is also of the cross-in-square type, but the side-apses are on a level with the central and the walls do not project. The additional bay appears but here it seems to be vaulted at the same level as the eastern cross-arm.

It is noteworthy that in both these churches, the side-apses are round, both internally and externally, while the central apse is round internally and polygonal externally.
Skzykowski "Kleinasién" p. 145.

2. Skzykowski "Kleinasién" p. 149
Rott "Kleinasiatische Denkmale" p. 112-148
Hamilton "Researches in Asia Minor, Pontus, and Armenia" Vol. II. p. 286.
In a class by themselves are the numerous churches in Asia Minor which have been hewn out of the solid rock. One of these, the Tigrinon at Silkeh, has already been mentioned.

The plan of many of them is similar to that of the built cross-in-square church and additional interest is lent by the fact that they can be dated.

The Church of Ajasin' in Phrygia was partially cut out of the upstanding rock. The three apses and the dome resting on its octagonal drum have been built. The dome is supported on four columns, and from the central space four barrel vaults extend to the surrounding "walls." The angle spaces are filled up and vaulted at a lower level. Ajasin is in fact a true cross-in-square church.

It has been dated before the end of the sixth century.

A group of rock-churches exists in Soanlykert, in Cappadocia. Some of these have been cut completely out of the solid rock; others are partially cut out and partially stand free.

One of them is in the typical style of the cross-in-square church with a dome on four pillars. At the end is an aedicule from which four tiny side aedicia. A small vestibule, also cut out of the solid rock, led into the church.

With regard to the dating of these churches, it may be mentioned that the chapel of St. Barbara has an inscription over the door: ἐνί Βασίλιος Κω(νοτο)ντίνου (καὶ Β)ασίλει(ων) οὐ. This would date the church

Shyrgewski "Kleinasi" p. 152.

Hamilton "Researches in Asia Minor etc. Chap. XLIIV
In the end of the tenth or beginning of the eleventh century. On the other hand the date may refer to a restoration of the original excavation.

There is also a rock-church in Sarukhane which Rott calls a burial-chapel. It shows the usual cross-in-square plan, with dome supported by four short strong pillars. All is hollowed out of the living rock. There are three apses of almost circular shape. In them stand rough altars of rock. A comice, which was painted runs around the church at the height of the springing of the vaults. The church was decorated with frescoes.

At Geröme, near Burqah is a rock church of the cross-in-square plan, connected with a whole series of rock-cut chambers, the entrances into which are in a façade built on to the wall. The façade, which is of a characteristic type is decorated with a series of arcades. The arches being of horse-shoe shape. The church is in the left corner, and has "nine domed compartments." The three apses are of horse-shoe shaped plan, the side apses being very much smaller than the central one.

There are other rock-cut churches in Geröme, notable for the number of inscriptions they show and for the frescoes which adorn them. These latter are of the style of the eleventh to the thirteenth centuries, but as traces of an older style beneath, the date of the rock-churches is put much further back than that.

Another cross-in-square rock-hewn church is that of Saradchatilane'
It presents some interesting features. The north and south arms of the cross terminate in semi-circular apses—a rare feature in Anatolia though a common one on Mt. Athos. The central apse has the almost-circular shape above mentioned. The central columns support a drum decorated with arched niches, above which is the cupola.

Not only Cappadocia, but Phrygia also show a number of rock-churches. They are in the mountains above the Sangarius Valley. Numerous churches, chapels, tombs, and at least one large wall-painting exist in the rocks side by side with the monuments of the old Phrygian religion. It is not improbable that these are the works of the hermits.
' Rott "Kleinasiatische Denkmäler" p. 266

2 Hamilton "Researches in Asia Minor etc." II. p. 228

3 Hamilton "Researches in Asia Minor." Vol II. p. 181
Rott "Kleinasiatische Denkmäler" p. 162
(v) Cruciform Churches.

It has been suggested that the cross-in-square church developed out of the cruciform. Of the latter type there are a considerable number in Anatolia. One exists at Halvades. Hamilton's description going back as it does to is not without interest. Among these ancient tombs were the ruins of a large church in the old Byzantine style, built in the form of a Greek cross: the arches which spring from the four pilasters were still entire, but the stones of which the walls are built are very small, although fitted with great accuracy. This church is evidently more recent than the other buildings, and, as I am inclined to believe that they mark the site of Nangianzn, it may be the church said to have been built by Gregory, the father of Gregory Nangianzn, in the beginning of the fourth century.

All that would support such an early date is contained in the above remarks.

It has an aisle of hewn-stone shape in the interior and shows five sides of a polygon outside. The dome appears to have rested on corbels or squinches. The western arms are shorter, and the entrance is on the north side of the north arm. These peculiarities seem to be due to the exigencies of the site.

Another cruciform church visited by Hamilton is at Gereme. He says: "We descended by our former path to near the 'yula' above mentioned. When striding off to the west, we descended a steep and sandy ravine of fumice stone and asked to
"Rott" "Kleinasiatische Denkmäler" p. 320
Shkypyrowski "Kleinasien" p. 139
Wulff "Altertümliche und Byzaninische Kunst" p. 391
visit some ancient remains at Gerameh. After proceeding about a mile in this direction, we reached a Byzantine Church in ruins, standing by itself away from the village, built in a plain and severe style and constructed of brown trachyte filled together without cement. [but Rott "Die Umfassungsmauern ... sind nur im Innern mit einer dünnen Mörtschicht gefüllt"] The bema was quite perfect, as well as parts of the sides and the arches which supported the central dome. The length of the whole building was not more than forty feet, the Greek cross being considerably lengthened out.

Only the western cross-arm and the dome-arches now remain standing. A strongly-projecting moulding runs along the walls and over the round-headed windows and doors. The floor was horseshoe-shaped internally and flat-sided on the outside.

Rott considers that the building was originally a basilica. The general impression of the appearance suggests a comparatively early date.

Adjoining the basilica of Aladja Gaila' in Asia is a small cruciform memorial chapel with rooms in the eastern angles of the cross. These are also rooms in the western angles but these are later additions. There is another building which is a transition between cruciform and cross-in-square plan.

Yet constructively it is of the cruciform type as the eastern rooms, walled off as they are, are not essential for the support of the equilibrium. Rott, basing his opinion on the technique and treatment of the ornament would place this chapel in the
Rott "Kleinasiatische Denkmäler" p. 193
fifth century. Both the central of the building and the eastern side-rooms were roofed with domes. This little building thus presents interesting features.

Shagyrzyski quotes R.v. Scheidler's opinion that it was a baptismal: "das Gebäude war ein Baphtisterium und in seiner Mitte steht nach der Taufbrunnen von der Form eines viereckigen Prisms." but Rott says: "Von einem Taufbecken ist in Ermangelung Spuren zu sehen. Was im österreichischen Reisewerte als solches erwähnt wird, war den Brunnen aufsatz über einer Kisterne wenige Schritte südlich von der Kapelle." He pronounces it to be a memorial-chapel.

In this connection one would here suggest that the use of the cruciform shape for churches was borrowed from the use of that shape first for memorial-chapels, to which symbolically it was especially appropriate. It has been suggested above that in this way the pendentive came to be used for churches, the domed non-Chinese tombs already giving the idea of pendentive - and possibly dome also - for the Chinese memorial chapels.

The Church of the Forty Martyrs at Skupi is a larger example of the cruciform type. The round-headed windows, the mouldings running over them, and the fine squared stone remind one of Jeronym. The building is shaped like a Latin cross, with a long western arm. The apse, however, shaped internally is five sided on the outside.
1 Rott "Kleinasiatische Denkmäler" p. 191

2 Rott "Kleinasiatische Denkmäler" p. 188

3 Rott "Kleinasiatische Denkmäler" p. 182

Wulff "Altkoptische und Byzantinische Kunst" Vol. II p. 391
It is noteworthy that the church had originally only one aphi. At a later date side-rooms with apses were built to north and south of the bema.

Doors cut in the dividing walls give entrance to those from the central aphi.

One would suggest from the original plan, that the church was built well before the sixth century. This suggestion would appear to be strengthened by Rosti conjectures as to the roofing of the church. He thinks the nave was originally roofed with beams. Later it was vaulted and a dome placed over the intersection of nave and transepts. The transepts are at a much lower level than the nave. There are eight encaustic piers of a later date on the sides of the nave.

At Ichonoccephyl was another cruciform church, "eine vom Kreuz durchsetzte tonnengewölbte Basilika." It had a drum and cupola at the crossing.

The Church of the Virgin at Bursac-Tesetı is also of the cruciform type with central dome. There are no side-apses.

She aphi always five sides on the exterior, and in the shape of a horse-shoe in the interior. There is also a moulding running along the wall and over the windows. It is noteworthy how the same features appear in these Cappadociam Churches.

They appear again in the Church of the Virgin at Soñarza, the same type of aphi, with even the same number of sides on the outside. Pilasters on the side walls and triangular pilasters at the angles, at the sides of the aphi also
Somarza and the larger churches show a lengthening of the west-arm which does not appear in the smaller. (Wulff *Alt. und Bp. Kunst.* p. 391)

Ramsay and Bell. *1001 Churches* p. 99
Shyppowski *Kleinasién* p. 23, 140

2 Ramsay & Bell *1001 Churches.* p. 189.
(Much the same type of plan is found in a group of churches in Servia, on the River Sava. They date for the 14th century. There are of course differences—which are considerable—but the triobabled form, dome & semi-domes are common to both.)
appear both at Stupi and Somarza.

A considerable part of the walls of this church remain standing. The carved ornament as seen on lintel and capital is noteworthy.

So much for the Cappadocian cruciforms.

The Church at Bin-bir-tulmā is called No. 8, is a cruciform, though of a very different plan. Roughly it might be called a Greek-cross superimposed upon an octagon. The building is small. Each arm of the cross is only about ten feet long and the eastern one forms an apse—a stilted semicircle within and five sides of a polygon without. De la Borde drew this church ninety-eight years ago, when the dome was still standing, but unfortunately his drawings of it are not defensible.

Strzygowski describes No. 8 as "The Octagon".

No. 9 at Bin-bir-tulmā is also a cruciform building of an interesting type of plan.

Three of the cross-arms are rounded both externally and internally; the fourth is pro-longed and finishes off square. The west end was roofed with three semi-domes and a central dome. The method by which the square was brought to an octagon for the dome in this church has been described on page twenty-four. It will show how the idea of the pendentive may have been discovered through its primitive form in this fashion in a small building. No. 9, late though it itself is, is of interest as showing us what could easily have taken place long before in pagan tombs.

Another cruciform church is No. 11 at Bin-bir-tulmā. The eastern arm consists
'Skogensch ' Kleinaniin;' p. 139.
only of the semicircular apse. The Church is much ruined and possesses no special features of interest.

The small chapel called No. 12 has already been mentioned on page 18. The dome rests on pendentives, but each pendentive is composed of a single stone hollowed out to the requisite curve. This is an advance on the corbel- pendentive of No. 9, and still further shows us how, in early prototypes, the idea of the pendentive may have been gradually evolved.

The next step would be the pendentive accurately formed through a series of stones in beds. (or of holes in beds.)

The east arm of No. 12 finishes off in a semi-circular apse. Entrance to the church is gained by a porch which fills up the north-west angle of the apse.

There is another cruciform at Hayyat on Ali Summani Dagh. The eastern arm is simply the round apse. The western arm was much prolonged by a narthex at the end.

Another cruciform of the same general type as Hayyat has been found at the Monastery of Kustundju on the Karadja Dagh. It lay at the north-east corner of the monastic precincts.

On the Haman Dagh are three cruciform churches. That at Uagdelbash is of a somewhat peculiar plan. The north and south cross arms, are long and narrow disproportionately to the others. The apse is deep, and has a rectangular space before it. At the east end of the transepts are little niches.
Another church on the Karhan Dağh—the Siit Kiliças or "Milk Church"—is of the same plan.

The third, which stands on the very top of the mountain and is much ruined. It—is in the shape of a Greek cross. The eastern arm ends square. Internally this arm is very peculiar.

Two rectangular chambers, separated from one another, lay before an aisle whose curve was broken by a shallow rectangular niche.

Mention may finally be made of a cruciform rock-church, Slampoch at Kyzyl Ören, to the west of Konia.

In thinking over the cruciform churches of Asia Minor, one is struck by the prevalence and popularity of this type. Others doubtless exist—which have not yet been investigated. This Bell, for example, speaks of a ruined one said to be in Konia. Many others must have been destroyed.

It seems quite likely that some of the cruciform churches, whose ruins still stand, were built before the sixth century.

Their absence of side-aisles seem to indicate an early date. (In the larger ones at least.)

It is also highly improbable that, for symbolic reasons, the cruciform plan was early popular.

A testimony to the early fondness for the plan and to the affiliation of the symbolism is found in an inscription in the Church of the Apostles, Milan. (A.D. 382) which runs as follows:
"Leclercq. Manuel d'Archéol. chrétique." 1. pse
Like No.8. Bubink. It was a cross superimposed on an octopus.
2 See Appendix.
Condedit Ambrosius templum Dominique sacrae
Nomine Apostolico munere reliquiis
Torna crucis templum est templum victoriae Christi
Sacra triumphalis signat immago locum.

A letter of Gregory of Nyssa and statements
regarding the proposed erection of a church by
Porphyry, Bishop of Gaza (A.D. 401) are also
evidence for the early use of the cruciform
plan.

Everything points to the widespread
popularity of the type in Anatolia, before
the sixth century. It is reasonable to
think that as time went on, it developed
in Anatolia into the cross-in-square.
'except through the "ambulatory church" of Constantinople, which led on to the "pseudo-Pondentive" type of Greece.
(vi) Rotondas and Octagons.

The Rotonda and Octagon do not enter so directly into the evolution of Byzantine Architecture. The problem of covering a square space with a dome has not to be solved in them. In the octagon the dome may be directly superimposed on the octagonal base by a setting-back of the dome-walls, or the octagon may be brought to an approximately circular form by means of slabs across the angles.

The Rotonda presents no difficulty. A circular space has to be covered by the dome. It carries on the Roman tradition. The Pantheon is the classic example of the Rotonda in Rome and circular temples were common in the Roman Empire. The construction of the dome in Rome was different from that in the East: in the former case it was a solid mass and in the latter it was built of separate stones or bricks.

The rotondas and the octagons of Anatolia, even if they do not enter so directly into the evolution of Byzantine Architecture, at least testify to the popularity of the dome, and it may have been the sight of rotunda-domes which made the Anatolian builders think how the dome also might be placed over the centre of a cruciform building. The thought of the dome might come partly from the rotonda. The solution by means of the pendentive would come from the small mausoleum. One feels that the rotunda and octagon cannot have been without some influence on their mind.
1. Skzykowski "Kleinasi.en." p. 90
Rott "Kleinasialische Denkmäler." p. 250.

2. Skzykowski "Kleinasi.en." p. 92

3. Skzykowski "Kleinasi.en." p. 93


5. Ramsay / Bell "1001 Churches." p. 99
The octagon is found at Seasa, in Cappadocia. A choir, now destroyed, consisting of a rectangular space, and an apse, projected from one of the sides of the octagon. The building had an ambulatory, now destroyed.

It rose to a height a little below a series of windows in the central portion.

Eight strong piers held together with massive horse-shoe arches supported the walls of the central portion with its dome. Rohl places "this excellent building" indubitably in the fifth century.

Of much the same plan is the octagon at Ible Bunai (Isauria.) Each side is here pierced with four windows, which have round heads resting on double columns.

In a ravine at Hierapolis, what was once described as "the ruin of a large Christian church of octagonal form" is now supposed to be a pre-Christian building. The plan of the outer walls was circular. An inner range of piers carrying dome and central walls formed an octagon.

The "Church at Derbe" had a central octagon of piers but showed a circular plan in the walls of the ambulatory in the inside only. It has a small semi-circular apse on the side opposite the entrance.

This "Church at Derbe" appears to be the same building as No. 10 at Binburtuliye. It was probably roofed with an oval-shaped dome.

The extant rotundas and octagons of Anatolia were scanty in number, but it is probable that a considerable number once existed.
Carotti "A History of Art" Vol II. p. 36
One is said to have existed in Nile in the fourth century.

The Emperor Constantine built a round church over the Holy Sepulchre at Jerusalem and it is highly probable that the erection of this church lent sanctity and popularity to the type. Just as the later church of the Holy Sepulchre was copied at San Stefano, Bologna, and elsewhere in the Middle Ages, so too the Constantinian Church, famous by reason of the holiness of the place where it was erected, must have been copied in different regions. The octagonal church is probably due to Oriental influence. It is very popular in Armenia. An Oriental origin has also been claimed for the rotunda, but when its use in Rome is considered, it seems reasonable to admit Roman influence in connection with its use in Christian circular buildings were erected in Rome in the Constantinian period, as baptisteries and sepulchral monuments. Circular Christian temples were also adapted for use as churches.

Regarding the influence of the rotunda and octagon on Byzantine Architecture, all can say is that the use of the dome and the right of it on such buildings may have helped to contribute to the desire to use the dome in the domed basilicas and cruciform churches.

The octagon also formed the pattern out of which developed the ambulatory churches of Constantinople, etc., of which SS. Sergius & Bacchus and San Vitale, Ravenna are leading examples.
(vii) Summary and Conclusions

The number of churches, ruined or otherwise, which exist in Anatolia is seen to be considerable. With the material thus given, the question now arises as to what part Asia Minor actually played in the formation of Byzantine Architecture. As has been already stated, the question of dating is very uncertain and therefore, much remains within the realm of conjecture.

Szygowski assigned an early date to most of the Anatolian Churches. Others have adduced the fact of the Arab invasions in the century to declare that they must have been as late as after that time. The invasions, however, do not necessarily prove the late date. The fact of a country being ravaged by an invader does not mean that every building is of necessity levelled to the ground. There are a hundred reasons why the walls of many an edifice may have remained largely intact. Moreover, even though partial destruction took place, it is probable that the restorers and rebuilders followed the earlier plan. This would be more particularly the case in an Eastern land. In Greece, to-day, new churches are built with general features of plan resembling those of centuries ago.

It may well be conjectured that, though an existing Anatolian church date from a particular year, its prototype may well have been built three or more hundreds of years before. This conjecture is supported by a significant piece of evidence, namely the letter from Gregory of Nyssa to Amphilochius.
of Scionum. In the fourth century he dictates for the building of a church. The plan he describes is found in a building hundreds of years later in date. The Church at Bin-bir-kilînî, called No. 8, is the only remaining example. It was noted of the actual type.

It has persisted down the centuries and survived in this one example.

As far as Bin-bir-kilînî is concerned, it was an old site, but being exposed to the full fury of the Saracenic raids (from A.D. 660) it is likely to have suffered much destruction. It belongs mainly to the ninth–eleventh centuries. Yet the types of plan give an impression of early date for some of the churches and Sir. W. Ramsay speaks of "the nearly two score churches, belonging to all ages from the fourth or fifth century to the eleventh."

With regard to the general rôle played by Anatolia in the formation of Byzantine Architecture the following conclusions may be suggested.

(a) The continuous pendentive appears at an early date. There is no evidence for the independent pendentive before S. Sophia, Constantinople. It may have first been used in Anatolia or Constantinople.

(b) The crossed basilica appears to have existed in Anatolia before the date of S. Sophia. It doubtless had a great influence on the plan of S. Sophia. The architects of S. Sophia came from Asia Minor and would know the crossed basilicas there.
i.e. as far as the main type of Byzantine Architecture is concerned. As has been noted above, they led to the "ambulatory church" of Constantinople and the latter combined with influences from the cross-in-square led to the "pseudo-Byzantine church" of Greece (Daphni etc).
These domed basilicas in Anatolia which antedate S. Sophia, may it is true have had squinches, not fendentives. Yet we have in them the placing of the dome over the basilica as in S. Sophia. The genius of the architects of the latter made use of the independent fendentive.

(c) Cruciform churches early existed in Anatolia, it seems in great numbers. From them the cross-in-square type developed.

(d) It is possible that the cross-in-square type may have existed in Anatolia in the eighth century. St. Stephen, Iuiglia, dates from the end of the eighth or beginning of the ninth. If the development from the cruciform to the cross-in-square is admitted, by the filling up of the angle spaces for tombs, etc., it is hardly possible to refuse admitting the existence of cross-in-square churches by the eighth century at latest in Anatolia. Now it appears that the cross-in-square type is not known in Constantinople till the middle of the ninth century. One would suggest that it was in Anatolia that this classic Byzantine type had its origin. The theory that it came from Armenia will be noticed later.

(e) Rotundas and octagons probably existed between the reigns of Constantine and Justinian. All that can be said of their influence is that they had a share in making the Byzantine builders wish to continue the use of the dome, though over different kinds of building supported in a different way.

IV. Churches in Mesopotamia and Armenia

According to the most recent theories, a very definite - indeed a preponderating - role in the formation of Byzantine Architecture was played by that part of the world that lies between the Caucasus Mountains and the Persian Gulf.

It had of course been long recognized that the vault in brick and the dome were in common use there at an early period, and it had been maintained that the vaulted and domical system of construction spread over from the Middle East to Asia Minor and was used and further developed there.

Recent theories would however assign to this area a still more profound part in the formation of the style. The whole characteristic Byzantine plan of the cross-in-square church is now alleged to have had its origin in this region.

Christianity spread to Armenia at a very early period. It is historically certain that the bulk of the Armenian people under Tiridates accepted Christianity at the hands of St. Gregory the Illuminator at the end of the third century. It became the state religion of Armenia some twenty years before it was adopted by Constantine as the state religion of the Roman Empire. and it is certain that Christian Churches were erected on Armenian soil at this early date.

After a period of relative, Christianity about 345 was again revived throughout the country.


In Northern Mesopotamia, the cities of Edessa, Nisibis, and Amida formed an Aramean centre round which the Semites gathered. Northern Mesopotamia became the centre of an Arameaeo-Armenian-North Iranian world united by the bond of Christianity against the Persian.

"Everything justifies the assumption that fixed types in Church building were here developed before the fourth century, a time when in the Roman Empire Christianity was barely tolerated or had only just begun to make itself felt. The supersession of the Greek style of the Mediterranean by the vaulted architecture of the Syrian and Armenian area is only intelligible on the theory that this had already reached maturity."

A considerable number of churches still exist in the Mesopotamian Armenian region. One of the oldest churches in the world is to be found there. It is the Church of St. James at Nisibis on the Armenian frontier. Shlykovski mentions the square baptismery dated A.D. 359 in this church "probably on the site of the grave of S. James." (d. A.D. 338).

The author of a recent book of travel has given a short description of this church.

It actually consisted of three rooms, placed side by side. The southern one is entirely destroyed. The northern one has been much damaged and restored. But the central one is perfect, almost as high as the cornice. The main room of each part was square and at the end of each, there was hollowed out a small semi-circular recess in the eastern wall. At the west end of each
"It seems clear that what he calls the "Baptistry in the Church," is the central portion of the Church. It is not another building


Bell "Amurath to Amurath," p. 258

fart there was a rectangular narthex and between
 narthex and square area was a narrow rectangular
 room. The tomb of the saint is in a crypt
 below the central church.

The central church is "roofed with a
 modern dome and pendentives and has nothing
 to indicate conclusively the form of the original
 roof." Stajnyanski (whose theories are not mentioned
 by Uigam) did not seem to be aware that the
dome was modern and the fact that it is
 no disfavors of his statement that this is the
 earliest example of the free-standing church
 with a single dome. The church might easily
 have been barrel-vaulted originally.

The Church of St. James at Ninibis is
 of great interest because of its undoubtedly
 early date. But the above fact shows that
 it cannot be brought forward as evidence
 in the matter of the origins of Byzantine
 Architecture.

"Nestorian churches, as a rule, it has
 been said, consisted of three parallel rooms,
 that on the south serving as a baptistry."

Examples are Mar Abd Yeshua, three miles
 east of Amadiya (traditionally 300 years before
 Mahomet) and Mar Ghoorghees at Esteghan.

Another example is Mar Ahatdani at
 Mosul, which has been much added to, and
 now shows a curiously irregular plan.

Its original feature is the series of three
 parallel barrel-vaults of equal height. The
 centre is broken by a dome. (This may not
 have been original). There are no aisles.

The Church of Mar B'tshu in a
 valley leading to the plain of Urmi
Bell "Amurath to Amurath, p. 316"
one of the most famous shrines of the Nestorian Church," has "three vaulted naves, separated by walls, a mud roof-covering the whole." The Sanctuary occupies the end of the north central nave and the Sacristy the end of the south nave.

This, but for the dome, is the same type as St. James, Nisibis, and St. James may have originally been roofed in this way.

The aisled aisles of the church is found at Ba Sebrina. They vaulted nave has an aisle at the eastern end. A narthex, however, extends along the southern wall of the Church.

At Mar 'Aggįyeh, Kefr Yeh, the aisle is square externally and semicircular internally. There are chambers to east and south of the aisle and the narthex runs along the south wall in front of a spacious court.

The single-chambered church with a dome is exemplified at Itarish (A.D. 688).

The basilica proper, with nave rising above aisles, is found at Everuki in Armenia. "Everuki ranks among the most-consummate examples of the vaulted basilica in existence."

It dates from the fifth century. Square chambers at the western end on either side of an open portico, rectangular chambers on either side of the aisle, and the straight wall of the eastern end remind one of the Syrian churches.

A very curious type of church to be found in Mesopotamia is that in which the nave, instead of running from east to west, runs cross-wise, from north to south. Such is the Church of Mar Yaktub, at Salah.
At the east end of the nave are the three parts of the sanctuary. The apse is semicircular and preceded by an almost square space. Walls separate this from prothesis and diaconicon, which are simple barrel-vaulted rectangular rooms.

The three parts of the sanctuary are separated from the nave not by a simple partition but by an actual wall. On the west another wall separates the nave from a narrow narthex.

It is interesting to note how much all the component parts of the church are cut off from one another.

It has been suggested that this type of plan is derived from the Babylonian temple and palace hall through the Assyrian palaces.

What place does this type hold in the history of the origins of Byzantine Architecture?

In fact it has a superficial resemblance to the cross-in-square plan. The barrel-vaulted nave from north to south reminds one of the corresponding cross-arm in the Byzantine type, broken though the type is in the latter type by the dome. The triple sanctuary is common to both types of church, different in plan, though it is in each.

There, however, the resemblance ends. In other respects Nac Yatub has nothing in common with the Byzantine type, and one seems justified in saying that they have no connection one with another.

The abandonment of this type is worthy of note. If Northern Mesopotamia had as profound an influence on Byzantine Architecture as has been alleged it is curious that this type did not penetrate further west.
Bell "Amur to Amur" p. 318
Shyamappa "Origins" p. 68

Bell "Amurath to Amurath" pp. 315-6.
Of the transverse-nave type is also the Church of the Virgin, which stands almost intact among the ruins of Khâsh. Here, however, a dome covers the centre of the nave. This dome is buttressed by semi-domes to north and south and rests on an octagon formed by squinches in the angles of the square. The wall between nave and narthex is pierced by three doors instead of one door.

Miss Bell states that this church "points a way to the solution of many a problem in Byzantine Architecture."

The fact of the dome and the fact that the church is more 'opened out' than Mâr Yâkuub, certainly give a greater approximation to the Byzantine cross-in-square plan.

Yet here again it would seem that the resemblance is only superficial, and of a chance nature. The central dome with the four radiating barrel-vaults forming a cross is very different from the system at Khâsh with the two semi-domes to north and south and a mere arch in the west. The divisions of the narthex and the side rooms are very different from the angle chambers of a Byzantine Church. It surely seems simpler and more natural to derive the cross-in-square from the cruciform than from such a building as this.

The Mâr Yâkuub type appears also in the Church of Mâr Gâbdîel in the Suq 'Abdân, a church which Miss Bell dates to be early ninth century.
The square type with the dome over the centre is represented in Mesopotamia at Deir ez-Zor, Ga'afaran, "the Monastery of the Yellow Rocks." which is situated five miles east of Mardin and is the residence of the Patriarch of the Jacobites.

It has semicircular apses projecting from the sides of the square, giving a quadrifoil plan. The monastery was founded in the fifth or sixth century, but, though Strzygowski does not mention the fact, it has passed through many trials and has been frequently destroyed and rebuilt. Only fragments of the original work remain in the present edifice. Those fragments bear a strong resemblance to work in the Church of St. James at Misisibis.

Of the same general type as Deir ez-Zor, Ga'afaran is the Church of Mastara. Midway in each side of the square project large apses, the plan of each of which shows five sides of a polygon. Above the centre of the square towers a high octagonal drum, capped with a conical roof. So too the Church of St. Gregory in the Haritscha Monastery, Armenia "which perhaps dates from the sixth century." The ruined Cathedral of Artisti in Armenia also shows the plan. The projections from the square are all round internally.

The northern one is also round externally. The western and southern ones five sides of a polygon outside. The dome of the church is fallen. Right and left of the eastern apse are side chambers. The north and south walls of the square are fire-lozoned to form them, and these meet walls at right angles. which extend from the apses.
Szyzgowski "Origins" p.63. [Nok - I am not clear as to this chest. Szyzgowski says it is the only representative of the "dome over square bays with axial niche buttresses and central supports." But Etchmiadzin Cathedral is of this type. So Bagravan Cathedral the Cathedral of Etchmiadzin under another name? It speaks of the "dome now fallen in" but this may refer to the destruction of a original dome. Or the dome Lynch 1600 may have fallen since his time.
On the east the quatrefoil appearance is thus concealed externally. Blind arcades run round the walls of this church, which is constructed of fine squared masonry.

This type of church is of importance for certain theories regarding the rise of the typical Byzantine cross-in-square plan.

A development of the Artik type was that in which apses project from the sides of the square but in which the angles of the square are replaced by round projections. Examples are Awan (A.D. 570), Achikaran (10th century), and S. Hripsimeh, in Armenia. On the last, exterior walls in square plan conceal the quatrefoil. Examples in Georgia are Aleni (A.D. 1000) and Mtskheta (A.D. 600). Stavrovani does not mention that that Cathedral of Mtskheta was rebuilt in its present form by the Georgian King, Alexander I, in the fifteenth century. A photograph by Leslie shows it to have the apses much higher than the portions of building between them. The exterior shows blind arcade decoration. St. has a high cylindrical drum and a pointed roof. The Church of the Convent of Samtavr "one of the best specimens of medieval Georgian architecture extant" appears to be of much the same style.

The Cathedral of Bagaran, built in the seventeenth century, differs from Artik in having central piers on which the dome rested. Barrel vaults, bulwarking the dome extended from these piers to the apses on the sides of the square.

I can find no other references to this Cathedral of Bagaran.
Lynch "Armenia." Vol I. p.262

The Cathedral of Etchmiadzin shows the same type. There have been several additions to the church—a chamber for relics at the east end in 1881—a western portion of the seventeenth century—bellfries on the afores in the same century. The original building was square.

From the centre of each side of the square projects an afose, allowing five sides of a polygon on the outside and a skilful semi-circle on the inside. Ranking the eastern afose are two small rectangular rooms.

In the centre of the church are four piers on which rests a dome with a polygonal drum. It is believed to have replaced a former dome of wood in the 17th century. From the dome spring four barrel-vaults which meet the semi-domes of the afores.

The angles of the square are roofed with cross-vaults at the level of the cross-arms.

A church was founded here at an early date. A restoration was undertaken in A.D. 483 and another in 618. The leading features of the present building are probably due to the latter restoration.

The Cathedral of Etchmiadzin is a building of great importance in the consideration of Byzantine Architecture. Shoghovorti makes Armenia the home of the cross-in-square type and points to such a building as this.

Even more striking in its resemblance to the Byzantine plan is the little Church of St. Gaiane, Etchmiadzin. Here there are no projecting afores, the eastern sanctuary being internal and the other afores given up.
'Lynch,' Armonia. I. 371.
Lethaby, Medieval Art. p. 78.
Four central piers support the drum, which is polygonal externally. The dome is covered according to the Armenian fashion, with a conical roof. Barrel-vaults extend from the centre to the outside walls. The angle-spaces are roofed at a lower level than the cross-arms. The sanctuary is a shallow semi-circular recess. It has rectangular side-rooms, separated from the sanctuary and the main body of the church by walls.

The church is said to date from A.D. 630. The narthex is a later addition.

One of the most remarkable examples of Armenian architecture is the Cathedral of the deserted and ruined city of Ani. The ground-plan is of extreme simplicity as viewed from without, being a rectangle without projections the position of the apse being indicated by two V-shaped recesses in the eastern wall. There are also similar recesses in the north and south walls.

Four massive piers with clustered columns form a large interior square: on these rest pointed arches supporting the dome. A spacious and lofty semi-circular apse with a pointed triumphal arch terminates the church. Side-chambers, separated by walls from apse and narthex, flank the apse. They have semi-circular niches to the east. From the central dome spring vaults to the exterior walls. These are roofed higher than the angle-spaces, and on the outside terminate as triangular pediments on the exterior walls. The north and south cross-arms are extremely short, so that
Lynch: Armenia, I, p. 574
The angle-spaces are not squares, but narrow oblongs. Travellers have all been struck by the Gothic appearance of the interior, with its pointed arches clustered columns and long nave. Except, however, for the short cross-arms to north and south and the internal sanctuary the ground-plan approximates to the Byzantine cross-in-square. The external view presents also marked features of difference: e.g., the height at which the conical roof over the clover is roofed.

An inscription on the south wall records that the Cathedral was completed by Katronideh, Queen of Armenia, in A.D. 1010.

The questions which arise in connection with the 'Gothic' features of Ani Cathedral need not here concern us. Its ground-plan is noteworthy as broadly Byzantine.

Resembling Ani Cathedral in plan and style is the Church of St. Gregory the Illuminator at Ani. The lofty circular drum was ornamented with blind arcades. As in the Cathedral, a blind arcade runs along the outside of the walls of the church. St. Gregory Church dates from 1210, during the period of the Georgian occupation.

The interior has the main features of the Cathedral. Two chapels on the banks of the Arpa Chai, outside Ani, appear from a whole of the outside to be of the cross-in-square plan. One has an inscription stating it was built in 1011.

The Church of the monastery of Khosla Vanti, close by, appears to date from
the early thirteenth century. It is of the cross-in-square type, with short north and south arms. The dome rests on a massive circular drum and is capped with a conical roof.

The church has a remarkable frunaco with massive bound pillars and vaulted roof. Over the centre of this frunaco rises a curious dome merging at the base into a belfry with open sides.

Other examples of the cross-in-square church have been found at Mren (where the nave is slightly lengthened) at Tetar, and Anahat.

At Dighour near Ani is a cross-in-square church which has been suggested is the oldest in Armenia. It has been dated from the seventh century, but this is not certain. It has the same north and south arms characteristic of so many Armenian churches of the type. The sides of the church are ornamented by three-quarter columns of debased classical design. They support an architrave of the type to be seen in Syrian churches of the sixth century. The doorways are ornamented with horse-shoe arches. The dome is an ellipse "tightly constructed with far more than the requisite amount of abutment."

The west front is adorned with buttresses.

These features in this church are of much interest. The horse-shoe arch seems to suggest a connection with Anatolia, while Syrian influence evidently appears also,

A church at 'Ibounlur' is said to date from the eighth century. It is of the same plan but the building is very much longer from east to west than from north to south.

An additional pair of friezes is placed in the west arm. The sanctuary and side-rooms are internal, a straight wall bounding the church on the east. A low veranda surrounds the building on three sides.

The church of Ktsoundsa, which may be tenth or eleventh century is of the cross-in-square plan. It has three apses around both outside and inside and a narthex. The dome is supported on two columns and the antae of the apse. (That method of supporting the dome is common in Greek churches.) The eastern cross-arm thus forms part of the sanctuary.

An additional pair of columns appears in the western cross-arm.

It is noteworthy that the dome is round on the outside as in Greek churches and not covered with a conical roof in the usual Armenian fashion.

A church practically similar in plan appears at Redochwinta. It may be a medieval copy.

The Convent Church of Gelati, near Kutais, in the Caucasus, is built on the cross-in-square plan. It has three apses. The dome rests on a tall cylindrical drum and is covered with a conical roof.

Cross-in-square churches were therefore numerous in Armenia. It is true that
'Origine de Ch. Ch. Art' p. 71

Dietl "Manuel d'Art byzantin" p. 319.
They differ in some features— the very short north and south arms, in some, the internal sanctuary in others—from the classic Byzantine plan.

Yet in its essentials, the cross-in-square plan with its barrel vaults radiating from the central dome and with its angle spaces roofed at a lower level, appears widespread on Armenian soil.

What is the relation between these Armenian churches and the cross-in-square type almost universal in Greece from the tenth century onwards? Shwyzowski claims it as originally a purely Armenian type, developing from the square church with apses on each side (as Bagaran— and also Etschmiadzin Cathedral) through a dressing of the apses, or through an addition of a dome to the hall-church with piers. The cross-in-square type, having risen and been formed in Armenia, passed to Constantinople in the ninth century and thereafter became dominant in Byzantine Architecture. Such is Shwyzowski’s theory.

Regarding this, Diehl merely says: “Dans tout cela, il reste, il faut d’abord, une forte part d’incertitude et d’hypothèse.”

At certain times in the history of the Empire, Armenian influence was great and this seems to hold weight to the evidence contained in the resemblance of the plans. The Emperor Leo V (813-820) was an Armenian noble and his elevation "though mainly due to his military ability was also a sign of the great Armenian influence in the Empire."

During the Iconoclastic period the
Predominant political power was in the hands of Armenians. "Oriental influence had eclipsed Roman and Greek in the government of the Empire." Such facts would seem to support the contention that the typical Byzantine plan came from Armenia.

Nevertheless, a consideration of the different churches make one doubtful of the theories in question.

Many of the cross-in-square churches of Armenia are of admittedly late date. Such are the Cathedral of Ani and St. Gregory, Ani (eleventh century). Of others, such as Mren and Bagaran, the date is uncertain.

Only St. Gaiane, Etchmiadzin, the Cathedral, Etchmiadzin and possibly Digho, of the cross-in-square churches, appear to be able to be dated to the seventh century. Even then, while of the cross-in-square plan show features which are altogether absent in the classic Byzantine type. Such are the conical dome-roof, at St. Gaiane and the Cathedral, and the short north and south cross-arms in St. Gaiane and Digho; such also are the lofty proportions of the Armenian churches and the facings of stone. The apses at the end of the north and south cross-arms do not appear in Greece. Though they are to be found in Mt. Athos, perhaps as a result of direct Armenian influence through the presence of Armenian monks on the Holy Mountain.

If the Armenian influence had been so pronounced as has been maintained...
one might have expected that some of these other traits would have appeared, as common features, in the churches of Greece and Constantinople. One still feels it more reasonable to think that the cross-in-square evolved out of the cruciform in Anatolia and thence found its way to Constantinople and Greece.

If that be so, what is to be said regarding the origin of St. Gayane itself? Is this cross-in-square an independent development on Armenian soil, or is it due to influence coming from the West? The latter theory must not be ruled out of consideration.

Byzantium did affect Armenia. Procopius speaks of churches having been built in Western Armenia by Jushnian. It has been stated above that the cross-in-square may have existed in Anatolia in the eighth century at least. May it not have existed even in the beginning of the seventh and be carried thence to Armenia? The prevalence of the simple cruciform type in early days in Anatolia makes it quite possible that the passage to the cross-in-square took place as early as that.

If it be not due to influence, coming from the West, then it developed on Armenian soil. But there is no evidence as to how this came about. Strzygowski suggests it developed out of the square church with four projecting afores (the "niche buttressed square"). The first step was the insertion of piers as dome-supports, with vaults extending to the afores. (Bagaran: Etschmiadzin.)
The second step was the dropping of the north, west, and south afores.

But there is no proof that the square church with afores was any earlier than the Etchmiadzin cross-in-square.

Armenian, Alborz, and Mykthei, (churches with projections at the angles) are certainly later. Deir-el Qaiseran has been many times restored. A sixth-century date for S. Gregory in Harichafe and for Atshik is conjectural.

There is really no definite proof as to how the Etchmiadzin cross-in-square of St. Gaiane arose.

Mention may be made of one or two other churches in Armenia and Mesopotamia of different plan. There is a ruined church at Shahin with afores projecting from three of the sides. On the west side the arch of the square buttress is prolonged to form a barrel-vault which covers a long western arm.

Strzygowski dates Shahin to the sixth or seventh century, but an inscription points to the Bagratid dynasty which ruled from the ninth to the eleventh.

In Armenia several churches have been found of polygonal ground-plan. Strzygowski calls these churches, "buildings composed of niche-buttresses only," because though they have a polygonal plan externally, internally, every second side is built round to form a semi-circle. The dome rests on fists at the junction of the sides of each semi-circular niche.

"Lynch. "op. cit."

"Lynch. "op. cit."
The most remarkable of these churches are in Ani. The Chapel of St. Gregory stands on a cliff overhanging the River Alajin in view of Ani. It has twelve sides, six of these being recessed to form niches. V-shaped niches in the exterior wall correspond to the niches.

The circular drum rising from the centre is decorated with a blind arcade and capped with a conical roof. The church dates from the eleventh century.

The Chapel of the Redeemer at Ani, of the same date, presents similar features, but it is 16-sided externally and there are no V-shaped niches. The drum, which is broader, is also decorated with blind arcades.

The Church of the Apostles at Ani dates from before 1031 as an inscription testifies that an endowment was bestowed on the church in that year. It is of a curiously complex plan: the dome is buttressed by four semi-circular apses preceded by arches and the four spaces between the apses are filled up with irregularly shaped rooms. The frieze on which the dome rested are connected with the outside walls. It bears somewhat of a resemblance to the Church of Holy Ripsime, Etchmiadzin.

Finally, at Mirmangh in Northern Mesopotamia stand the ruins of a circular building which Shzyrovitski dates to the sixth century. The outside wall is circular. At the end projects a long choir with an apse; at the west is a vestibule and at the north and south square chambers.
The dome, oval in shape, rested on eight central piers. An ambulatory, probably with a gallery above, being formed.

These buildings further testify to the popularity of the dome in the regions in question.