

The orientation of Byzantine Churches in eastern Macedonia and Thrace

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Abstract

From perhaps the mid-4th century onwards it became customary to give the sanctuary apses of churches an eastern orientation. In most churches, however, the main axis runs in a SE or NE direction and only in a few cases does it follow the rule. From the research carried out so far in the churches of Constantinople and Thessaloniki it has been found that the main axis of these buildings has a SE orientation. Particularly in the case of Hagia Sophia in Constantinople, the view has been expressed that this particular orientation is connected with the system used to control the natural lighting in its interior. No similar study has yet been carried out for the churches in Thessaloniki, except for that on the Rotunda and Panagia Kosmosoteira at Pherai (Vira). This fact, together with the fact that many churches which lie around the Thessaloniki-Constantinople axis have the same orientation, prompted us to extend our research to the churches situated in Eastern Macedonia and Thrace. The study includes churches – early Christian, Byzantine and post-Byzantine – that are built on either side of the Thessaloniki-Constantinople axis, between the latitudes of $40^{\circ} 43' N$ and $41^{\circ} 2' N$.

Keywords: Orientation, Byzantine churches, Eastern Macedonia, Thrace.

Introduction

From perhaps about the mid-4th century onwards it became customary for the sanctuary apses of churches to be given an eastern orientation, either because of the principles of Christian teaching or in imitation of the Temple of Solomon, in which the Holy of Holies faced east.

The first reason is the likelier of the two, since in

Christian belief the sun, which gives light, motion and life to the whole world, is a symbol of Christ, the intelligible sun of righteousness (Sotiriou 1978; Orlandos 1951). In practice, however, the main axis of most churches has a SE or NE orientation, and only in a few cases does it follow the rule.

In the research so far conducted in the churches of Constantinople and Thessaloniki (Lavass 1980, Ban-



Fig. 1: Eastern Macedonia and Thrace. Locations of the Byzantine churches.

dellas et al. 1983), the main axes of the churches examined have been found to have a SE orientation. In the case of Hagia Sophia in Constantinople (Potamianos 2000) in particular, it has been noted that the church's orientation is linked to the way in which natural lighting is managed in the interior.

Research on this last point – the connection between a church's orientation and the way in which natural lighting is managed in the interior – has not yet been carried out in the churches of Thessaloniki, except in the case of the Rotunda and Panagia Kosmosoteira (Iliadis 2001; 2005 a, b).

However, the fact that the churches in Thessaloniki (Bandellas et al 1983), which were built within the city's particular urban fabric, possess virtually the same orientation as Hagia Sophia, Hagia Irene and other churches in Constantinople, as well as the Early Christian churches at Philippi, prompted us to extend our research to the churches of Eastern Macedonia and Thrace, and particularly those lying on either side of the Thessaloniki-Constantinople axis.

This study includes churches of Early Christian, Byzantine and post-Byzantine date lying on either side of a line between Thessaloniki and Constantinople, which are situated at $40^{\circ} 43' N$ and $41^{\circ} 2' N$ respectively. Between these two cities evolved a number of other cities, such as Amphipolis, Serrai, Drama, Philippi, Thasos, Abdera, Maroneia, Makri, Pherrai (Vira), Dydimoteicho and etc. in which a considerable number of churches were established (Fig. 1).

Archaeological site of Philippi

The first Christian church at the city of Philippi built beside a pagan heroon of the Hellenistic period (Collart 1937; Lemerle 1945; Koukouli-Bakirtzis 1997; Provost and Boyd 2004) was dedicated to St. Paul (313-342). Later, on the same site, was built a large octagonal church (5th) to contain the baptistry and other annexes, becoming the cathedral church of the city. Excavations within the city have uncovered three large Early Christian basilicas dating to the 5th and 6th c.: Basilica A (end of the 5th c.), Basilica B (550 A.D) and Basilica C (6th). Outside the city, in the East Cemetery (4th.), two aisled cemetery basilicas has been excavated.

As the city of Philippi evolved the Via Egnatia and the diagonal street, which run south-east and east respectively, remained unaltered. Basilicas A and C were founded to the north-east of the Via Egnatia, while



Fig. 2: Philippi. Basilica A. The sun in relation to central axis of the church (Winter, 8.10 am).

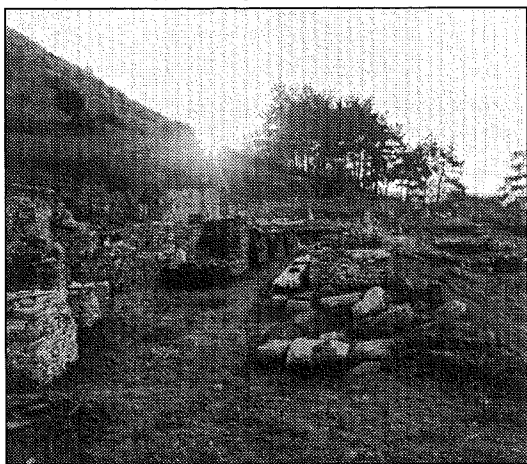


Fig. 3: Philippi. Basilica C. The sun in relation to central axis of the church (Winter, 8.10 am).



Fig. 4: Philippi. Basilica B. The sun in relation to central axis of the church (Winter, 9.00am).

Basilica B and the Octagon were established to the south-west. The central axes of these buildings have the same orientation – with a deviation of 2-3° – as that of Hagia Sophia in Constantinople and also generally coincide with the axes of other churches, such as Hagia Irene, St. Andrew in Krisei and SS. Peter and Mark. The same degree of deviation from east is displayed by the central axes of the churches in Thessaloniki, particularly those built on the preexisting urban fabric, such as Hagia Sophia, Hagios Demetrios, Panagia Chalkeon, the Rotunda, Panagia Acheiropoietos and Hagios Panteleimon.

If the orientation of the basilicas at Philippi is examined, the following may be observed:

The central axes of Basilicas A and C, which have

an orientation of 38° SE, run towards the lowest point of Mt. Symvolon, i.e. the Hagios Silas area. This is the point at which the sun rises in winter (Höpfner 1967) (winter solstice). Because of the height of the mountain the sun's rays take about half an hour longer to reach the Philippi area. When they do (8 a.m.) the sun is in line with the central axes of Basilicas A and C (Fig. 2 & 3).

An hour later, at 9.00 a.m, the sun is in line with the central axis (40° SE) of Basilica B (Fig. 4), the Octagon and the Via Egnatia (Martin 1974).

The orientation of the central axis of the basilica in the eastern cemetery outside the walls which now lies within the settlement of Krenides was found to be 10° NE. This orientation coincides with the point at which the sun rises in spring (Fig. 3). In winter the sun lies at an angle of 45° to the main axis of the church (SE inclination – January 8.20 a.m.). As for the orientation of the central axis of the basilica that lies to the south of the above settlement, this follows the rule.

Thasos

Limenas: Early-6th-c. cruciform basilica

The ruins of this church are situated in the central square of the modern town of Limenas, very close to the seafront. It was not a small insignificant basilica but a large-scale work. The basilica was built outside the circuit wall of the ancient city on top of a large Roman residence. Its central axis displays a SE deviation of 67.30 (Orlandos 1951).

In order to explain this great deviation, it was necessary to take into account the results of excavations carried out so far and to examine the position of the basilica in relation to the surrounding area. In the topographical diagram (Yves Grandjean 2000) the ancient vertical roads have a South orientation. The same direction, approximately, have the central axis of the church. Perhaps, the church may have built parallel to the axis of the existing roads.

A recent examination of the orientation of the sanctuary in relation to the positions of the sun revealed that in winter the sun's rays reach the eastern side of the sanctuary apse half an hour after sunrise (08.10

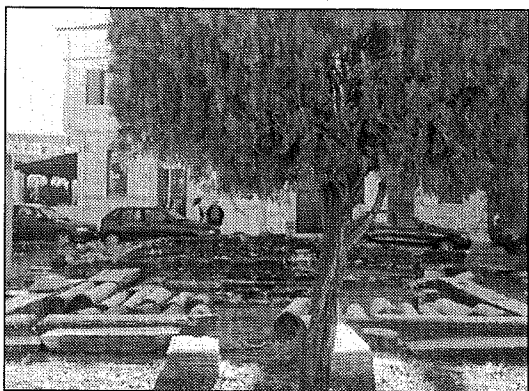


Fig. 5: Thasos. Limenas. Cruciform basilica. The sun in relation to central axis of the church (Winter, 10.30am).

a.m.), while at 10.30 a.m. the sun is in line with the church's main axis and quite high – approx. 35° – above the horizon (Fig. 5). If this is combined with the fact that this is the time at which the Divine Liturgy reaches its climax, then this could be an acceptable interpretation.

Post-Byzantine Churches

The sanctuary apses of all the post-Byzantine churches face east except for Hagia Paraskevi in Thelogos (20° NE) and the Church of the Taxiarchs in Maries (20° NE).

The deviation from the rule displayed by these two churches is due to the lie of the land. The Church of Hagia Paraskevi is built on the slope of a hill, while the Church of the Taxiarchs faces the point at which Mounts Hypsarion and Kastron meet: this is the lowest point in the area.

In the case of the Church of the Taxiarchs, it was observed that in summer the sun's rays reach the sanctuary apse shortly after sunrise. This is possibly connected with the feast-day of the Taxiarchs (July).

Apart from a few exceptions, the post-Byzantine churches in the region follow the rule, i.e. their central axis faces East. One possible reason for this is that during the period in which they were built – the period of Turkish rule – religious feeling was much more intense and so Christians were much stricter in following the rules when founding their places of worship.

Amphipolis

Amphipolis was one of the most important cities of Macedonia in antiquity. A short distance away from the modern village of Amphipolis, in a flat area on top of the hill overlooking the village, four Early Christian basilicas have been excavated, together with a central plan church (Rotunda), which date from the 5th and 6th c. (Zikos 1989 ; Bakirtzis 1995).

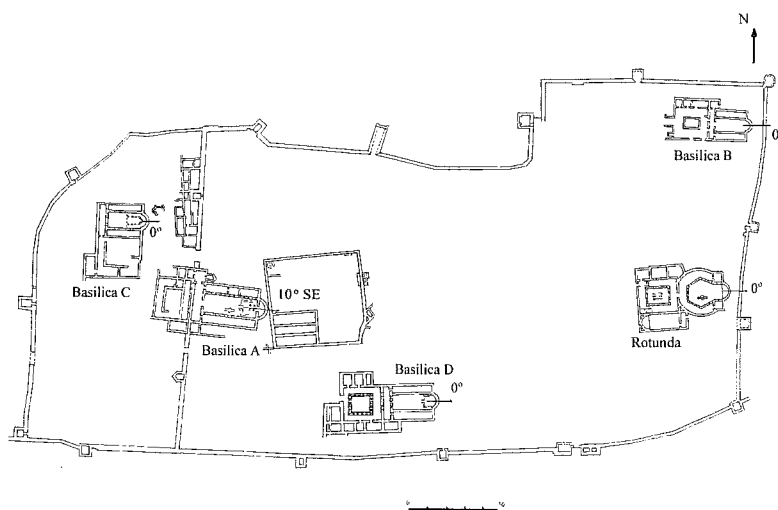


Fig. 6: Topographical map of Amphipolis. The orientation of the churches.

The central axes of these churches have been found to follow the rule (00), except for that of Basilica A, which has an orientation of 100 SE.

The orientations of these churches coincide with the point on the horizon at which the sun rises in spring (Fig. 6).

What, then, caused the sanctuary apses of these churches to be given these particular orientations when the buildings were laid out?

In answer to the question whether these churches were founded in the spring, we believe it is difficult to say this is true in all cases.

The churches were built on top of the ruins of Classical and Roman buildings. More specifically, Basilica A was erected on top of a Roman bath-house, while Basilica C was built on top of a Classical building. In addition, alongside Basilica A lay a road running E-W.

On the basis of the existing archaeological evidence, two possible interpretations may be put forward: either the churches were laid out strictly in accordance with the rule, or they were laid out parallel to the axis of the pre-existing road.

Conclusions

The foregoing study shows that the main axes of the churches in Eastern Macedonia and Thrace possess an orientation within the range 32° NE to 40° SE, regardless of their date of foundation. An exception is the great SE deviation of the cruciform basilica at Limenas in Thasos.

The factors that appear to have influenced the orientations of the churches in Eastern Macedonia and Thrace can only be determined in a few cases, namely the churches at Philippi, certain churches on Thasos and those churches where a study has been made of the distribution of natural light in the interior. More specifically:

- a) The churches whose axes are near parallel to the old road network of the town, it can be seen that their azimuth are the same with the sunrise at the date of winter solstice. This orientation of the town roads network provides the maximum effective sunshine duration which was the main

criterion for town planning.

- b) Regarding the churches whose orientation is much greater than the azimuth of the sunrise position at the date of winter solstice we have to research the connection between the church's orientation and the way in which natural lighting is managed in the interior.
- c) The studies that have been made of the distribution of natural light in the interiors of the Panagia Kosmosoteira and the Rotunda in Thessaloniki show that the particular pattern of light distribution in each case is a result of the combined effect of the architectural design and the orientation of the building's central axis.
- d) Apart from a few exceptions, the post-Byzantine churches in the region follow the rule, i.e. their central axis faces east. One possible reason for this is that during the period in which they were built – the period of Turkish rule – religious feeling was much more intense and so Christians were much stricter in following the rules when founding their places of worship.

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