

## A special kind of dome in Late Byzantine Chios: Type and building Techniques, Tradition and Innovation

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On the southern part of the island Chios in the Aegean Sea, there is a group of five churches which belong to a similar architectonic variation<sup>1</sup> (Fig.1). Four of the five were first noticed by Professor Charalambos Bouras, who discerned their similarities and referred to them as a group with common characteristics<sup>2</sup>.

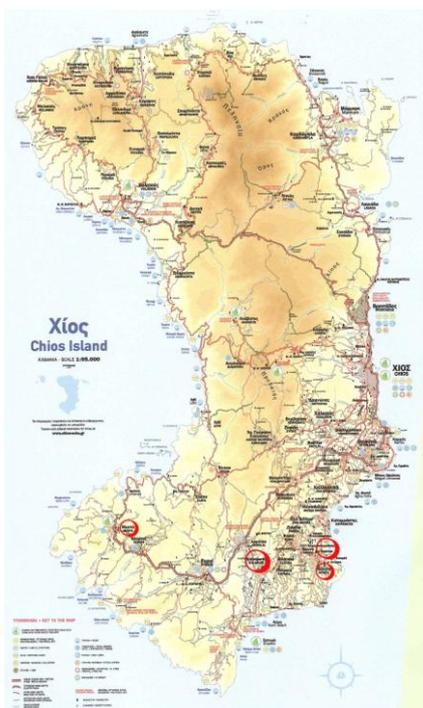


Fig.1. Map of Chios island.

In red circle the place of the five churches.

Fig.2. Kalamoti. Church of Panayia Agrelopousena.

From NW.

The first church to be examined is that of the Panayia Agrelopousena<sup>3</sup> on the outskirts of the village Kalamoti, which comprises all the fully developed characteristics of this group (fig.2). It can be dated securely by its donor inscription, according to which it was built at the

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<sup>1</sup> Vassi 2012, 13-294.

<sup>2</sup> Bouras 1958-1960, 133.

<sup>3</sup> Ibid, 129-144; Mouriki 1978, 78; Bouras 1992, 12-130, fig. 38; id. 2001, 225-226.

turn of the 13th to the 14th century, during the reign of Andronicus II Palaeologos, and between the years 1295 and 1317<sup>4</sup>. The naos is a single-nave, barrel-vaulted church articulated inside and outside with blind arcades (fig.3-4). The square narthex is covered with a blind dome supported by four corner pilasters. The extrados is not obvious, because of its raised saddle-back roof (fig.5-6).



Fig.3-4. Kalamoti. Church of Panayia Agrelopousena. North and south façade.

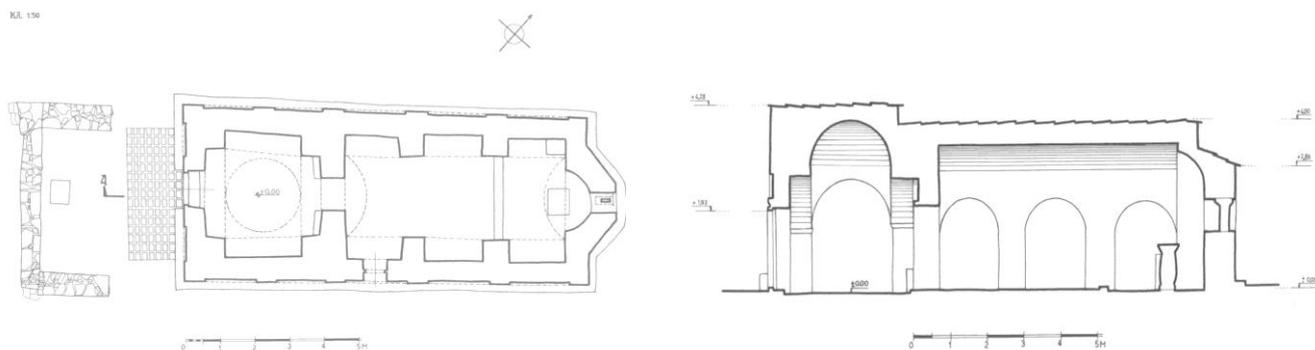


Fig. 5-6. Kalamoti. Church of Panayia Agrelopousena.. Ground plan and section.

<sup>4</sup> Vassi 2006, 463-470.

The second church, that of Ayios Yeoryios at Poro<sup>5</sup>, also outside Kalamoti, is close by and within visual distance with the first church of our group. It does not provide us with any first-hand knowledge on the date of its construction, since it is completely plastered inside and out (fig.7-8). The naos is again a single-nave barrel-vaulted church, but without blind arcades, and the narthex is covered with a blind parabolic dome supported by corner piers. Externally, at the roof level, the extrados of the blind dome is again covered by a raised saddle-back construction, which once bore tiling (fig.9-10). Its many similarities with the Panayia Agrelopousena, which seems to have served as its model, suggests that the church of Ayios Yeoryios was also built in the first half of the 14th century.



Fig.7-8. Kalamoti. Church of Ayios Georyios. View from NW and SW.

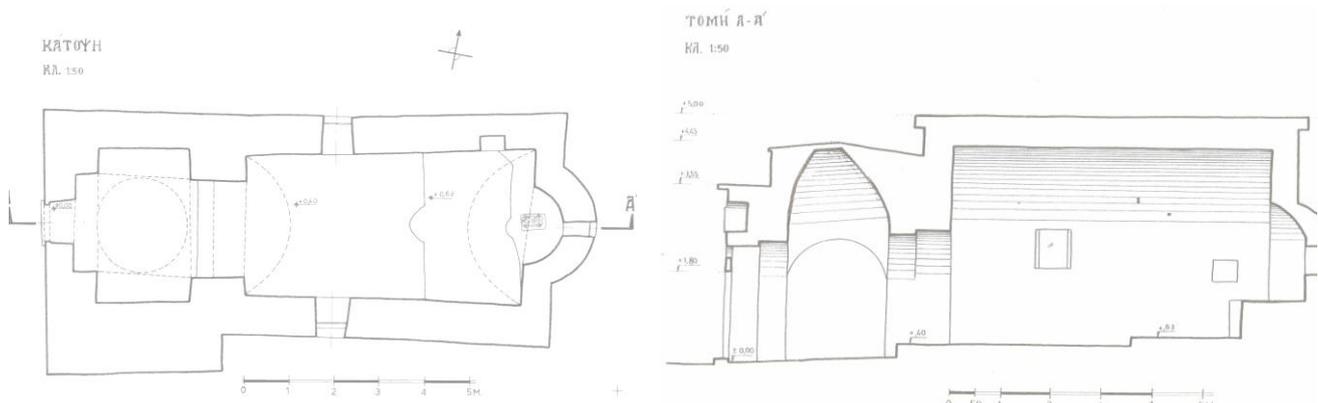


Fig.9-10. Kalamoti. Church of Ayios Georyios. Ground plan and section

<sup>5</sup> Unpublished.

Ayios Ioannis Argenti, in the area surrounding the deserted settlement of Paleos Katarraktis<sup>6</sup>, provides us with many elements that date it, also, to the late Byzantine period. A graffito once visible on the south wall of the narthex contained the date 1467<sup>7</sup>, thus, bearing witness to the existence and use of the church in the middle of the 15th century. The wall-painting of the founders -which is not extant today- and the style of the fragmentary wall-paintings throughout the narthex restrict its dating to the second half of the 14th century<sup>8</sup>.

The history of this church appears to be the following: the main church and narthex were originally built in the 14th century. In the 18th century, however the naos was torn down and rebuilt<sup>9</sup>. For some reason it was decided that the square narthex of the church was to be preserved. In this manner the church of Ayios Ioannis Prodromos, who is also known as “Argenti”, survived to the 21st century (fig.11). It should be noted here that “Argenti” is not an attribute of the saint, but the family name of its owner<sup>10</sup>.

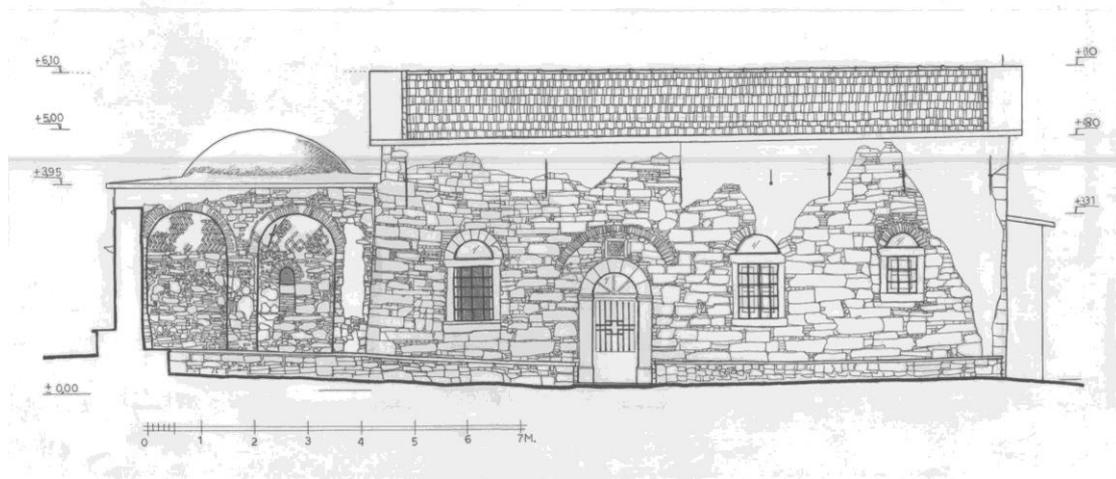


Fig.11. Paleos Katarraktis. Church of Ayios Ioannis Argenti. South façade.

<sup>6</sup> Sarou-Zolota 1911, 117-123; Smith 1962, 85, pl. 165, 171, 187.10, 194, 201.2.; Bouras 1974, 28-29; id.2001, 225-226.

<sup>7</sup> Sarou 1931, 294.

<sup>8</sup> Vassi 2015, 153-162.

<sup>9</sup> Mavropoulos 1920, 14-16, n.19.

<sup>10</sup> Argenti 1955, 52.

The church is composed of two non-contemporary parts; the narthex, which belongs to the 14th century, and the main church, which was built in the 18th, and bears all the morphological characteristics of this century, while retaining its original single-nave, barrel-vaulted form. The older section, the narthex, is square and covered with a blind hemispherical dome supported on four protruding pilasters (fig.12-13). The dome is visible externally and was covered up until the period between World War I and World War II with large trapezoid tiles.

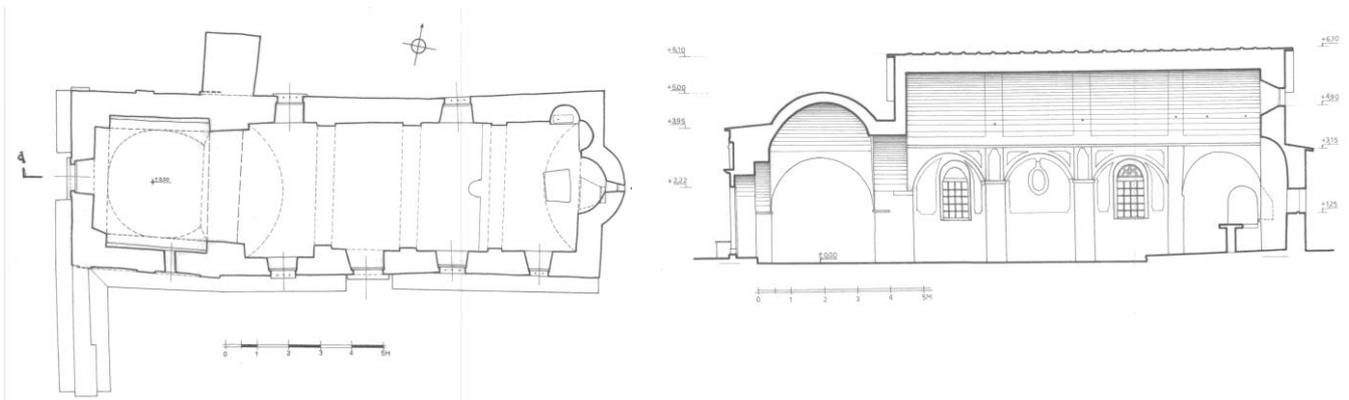


Fig. 12-13. Paleos Katarraktis. Church of Ayios Ioannis Argenti. Ground plan and section

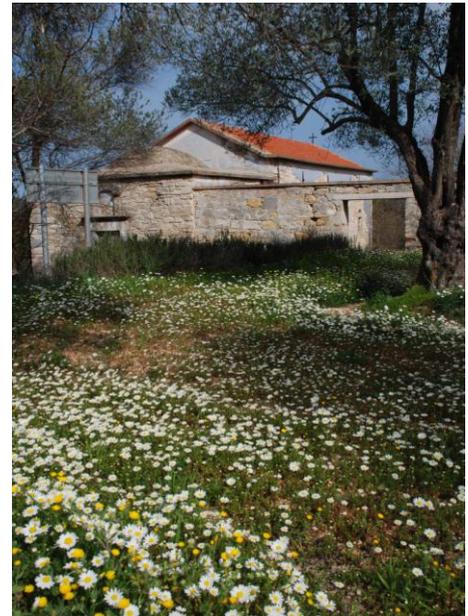


Fig. 14-15. Paleos Katarraktis. Church of Ayios Ioannis Argenti. View from SE and SW.

The next church of this group is fairly remote, on the opposite end of Chios. Ayios Ioannis Prodromos near Mesta<sup>11</sup> (fig. 16) had a similar course in time with Ayios Ioannis Argenti. According to an inscription on the lintel, the single-nave, barrel-vaulted naos completely replaced an older one in 1704 for unknown to us reasons. The narthex, which was on the west side of the nave, remained in place and was connected with the main church. It is also square with a blind elliptical dome on four monolithic heavy imposts. The extrados of the blind dome is not visible, since it is covered externally by a raised saddle-back structure, which retains its original tile (fig.17-18). The narthex, according to its typological and morphological features, has been dated between the 14th and 16th centuries<sup>12</sup>.



Fig. 16. Mesta. Church of Ayios Ioannis Prodromos. View from SW.

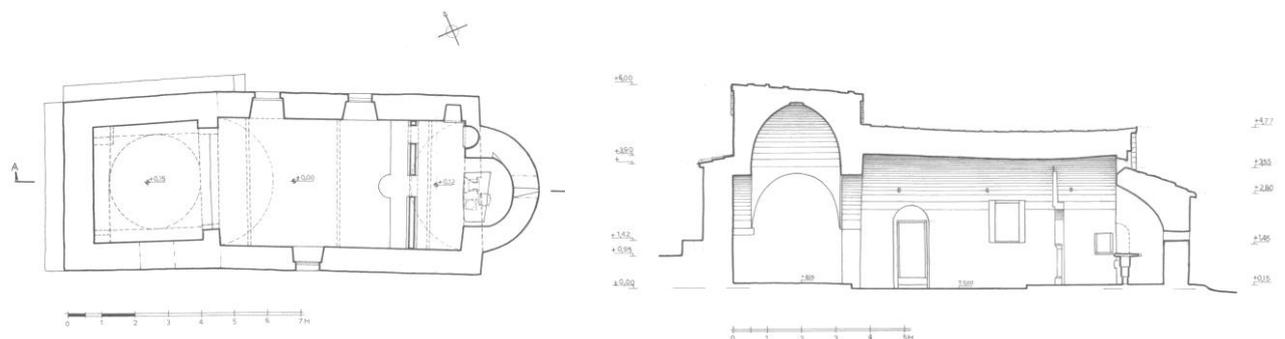


Fig. 17-18. Mesta. Church of Ayios Ioannis. Ground plan and section.

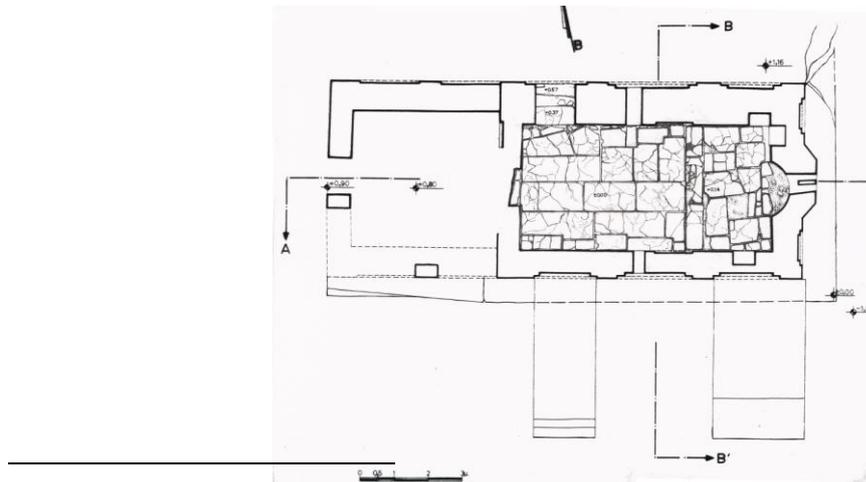
<sup>11</sup> Faitaki 2012, 1-14.

<sup>12</sup> Bouras 1974, 60.

The last church of this group, Panayia Keravlidena outside Nenita<sup>13</sup>, was probably built some years later, in the 15th century. The dating is based on the once extant patrons wall-painting, which portrayed them wearing apparel<sup>14</sup>, whose elements and style were fashionable at the end of the 15th and the beginning of the 16th centuries<sup>15</sup>. The square narthex which is now in ruinous state, was added on the single nave, barrel-vaulted naos at a later date (fig.19-20). This is ascertained by the existence of a vertical joint. The time span between the construction of the two buildings was short, because they share many common features between them. They were both destroyed by the earthquake of 1881, a fateful date for many churches of south and central Chios<sup>16</sup>.



Fig.19-20. Nenita. Church of Panayia Keravlidena. South side. Ground plan.



<sup>13</sup> Sotiriou 1917, 150 ; Zolotas 1921, 536, 610, 612; Bouras 1974, 29, fig. 61 ; Koilakou 1979, 361, pl.165b.

<sup>14</sup> Argenti 1953, 126-127, pl.35.

<sup>15</sup> Mylopotamitaki 1986, 50; id. 2002, 23-24; Bitha 2002, 48.

<sup>16</sup> Delopoulos 1983.

The most interesting elements of the vaulting of the churches under consideration are found in the narthexes. All have square narthexes, which are covered or, perhaps, may have been covered, as in the case of the ruined Panayia Keravlidena by blind domes. In Ayios Ioannis Argenti the wall-paintings have fallen and allow us to observe and study the construction of the vaulting, since the structure is visible in its entirety (fig.21). One may clearly discern the manner and stages of the construction of the semispherical dome as it is known from studies on Byzantine architecture<sup>17</sup>.



Fig.21. Paleos Katarraktis. Ayios Ioannis Argenti. The dome of the narthex.

The semispherical domes, such as those of the two churches of the Chian group, that is of Panayia Agreloupousena and of Ayios Ioannis Argenti, as a mode of vaulting was quite widespread and popular in the countries of the Mediterranean, which saw its peak in the Roman era<sup>18</sup>. The roofing of a square in ground plan space by a semispherical vault, with the interposition of pendentives, became possible during the reign of Justinian in the 6th century.

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<sup>17</sup> Choisy 1883, 96; Sotiriou 1942, 345; Bouras 1993, 111-119; Mylonas 2005, 25-30; Ousterhout 2008, 218-233.

<sup>18</sup> Sanpaolesi 1971, 4.

At that time the transition from the square to the circle was solved on the basis of the geometric principle of solid geometry on the circumscribed sphere<sup>19</sup>.

A different technique, and, therefore, a different profile is observed in the parabolic blind dome in the third church of this group, Ayios Yeorgios. Its almost conical shape suggests that it was build using the technique of horizontal layers of brick in the corbelling manner<sup>20</sup> (fig.22).

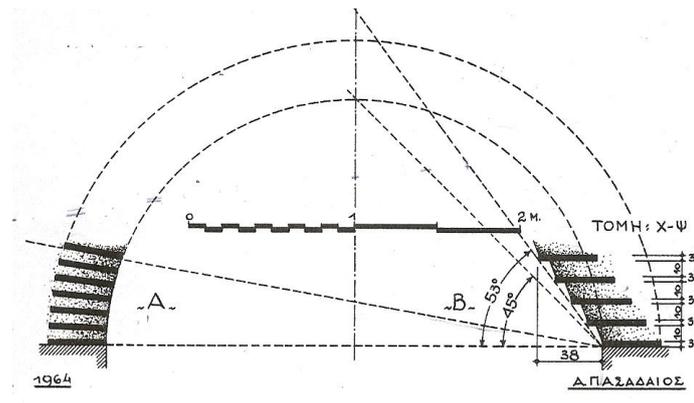


Fig.23. Section of building brick domes, semispherical (A) and corbelling (B) (Pasadaios 1965, III)

Parabolic domes were in use in the east ever since the second millennium B.C. In the first centuries of the Byzantine era, they were the only type of dome built in Syrian ecclesiastical architecture as its heritage from western Asia<sup>21</sup>. In Greece, and particularly in the islands of the Aegean, we find churches with parabolic domes from the 6th and 7th centuries to the 10th century<sup>22</sup>.

In the other church of this group, Ayios Ioannis at Mesta, the blind dome differs in that it is elliptical. It is constructed exclusively with flat stone slabs, which have been built with a slight inclination towards the center. The support of the dome, however, is different:

<sup>19</sup> Sotiriou 1942, 346; Bouras 1993, 111-199; Mylonas 2005, 22.

<sup>20</sup> Pasadaios 1965, 187-192.

<sup>21</sup> Butler 1969, 121, 122-127, pl. 123b, 125.

<sup>22</sup> Moutsopoulos 1975-1977, 296-399; Drandakis 1988.

there are no corner piers, as we find in the previous churches, but in their place we find four impost, which protrude from the walls to some height from the floor of the narthex. The arches, which hold up the dome, are based precisely on these horizontal projections, on monolithic abutments (Fig. 24).



Fig.24. Mesta. Church of Ayios Ioannis Prodromos. Supports of the elliptical dome in the narthex.

The semielliptical form of the small blind dome is in direct relationship with the choice of its support on four corbels. In this way, the raised domes exert less lateral pressure and do not, therefore, have need of massive supporting structures<sup>23</sup>. The elliptical dome despite its advantage of presenting lesser impulses was not favoured by Byzantine architects, who clearly indicated their preference for the semispherical dome. This persistence has been interpreted as an aesthetic perception derived from ancient Greek tradition, which considered the semispherical form as ideal. Nevertheless, we do find elliptic domes both in Constantinople<sup>24</sup> and in the rest of the Empire<sup>25</sup>.

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<sup>23</sup> Pasadaios 1972, 170, 172.

<sup>24</sup> Demangel – Mamboury 1939, 24-26, fig. 24-26, 28, pl.4; *ibid*, 171.

As evident from the above, the forms, techniques and materials used to construct domes were well-known for centuries and passed down as traditional building craft. The churches of the group under consideration are works of Late-Byzantine period and of the 14th and 15th centuries in particular. Shortly before the middle of the 14th century, in 1346, Chios was no longer part of the Byzantine Empire. The island was conquered by the Genoese and was subject to the Democracy of Genoa. This situation lasted until the year 1566, when the island passed into the hands of the Ottoman Turks<sup>26</sup>. Despite the presence of sovereigns of Italian origin, who were also followers of the Roman Catholic faith, church building on the island continued in the forms and manners known from its Byzantine past and does not indicate a break with Byzantine architectural tradition.

The singularly distinguishing feature of this group is the type of its roofing of the narthex. The extrados of the little dome is covered by a long rectangular structure, which rises above the roofs in an East to West direction. The tallest such structure we find in Ayios Ioannis of Mesta, which in addition has decorative brickwork on its long sides (fig.25-26).



Fig. 25-26. Mesta. Church of Ayios Ioannis Prodomos. Side walls of raised structure on the roof.

The long pedimental structure would refer more to the extrados of a barrel-vault rather than of a semispherical dome; it is not consistent with the round shape of the small

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<sup>25</sup> Stikas 1951, 24, fn.3; Orlandos 1916, 16, fn.1; Boura-Bouras 2002, 34-36, 64-65, 71-73, 310-312, 169-171, 320-323, 368, 514.

<sup>26</sup> Argenti 1958, I; Balard 1978, I, II.

dome, but is rectangular, as it housed a barrel-vault. The closest parallel to this is the tripartite narthex of Ayios Myron on the island of Crete. The main church has been dated to the turn of the 13th toward the 14th century, and the narthex added to its west to the 14th or 15th century<sup>27</sup> (fig.27-28). An older parallel of the type can be traced in a church in mainland Greece, in Laconia, the church of Agios Nikolaos in the stream of Sofroni. The central dome was covered with a raised saddle – back roof ; the church has been dated to the second half of the 11<sup>th</sup> century or in the beginning of the 12<sup>th</sup> century<sup>28</sup> (fig. 29).

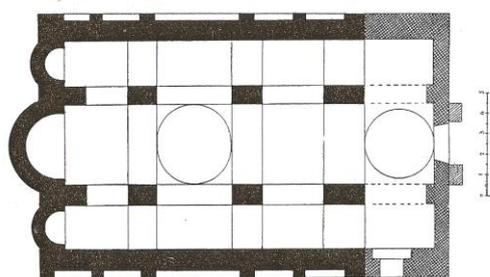


Fig. 27-28. Crete. Church of Ayios Myron. Plan and old photo (Gerola 1908, fig. 45-46)



Fig. 29. Laconia. Church of Ayios Nikolaos in Sofroni stream. Axonometric sketch (Kappas 2011, 13)

<sup>27</sup> Gerola 1908, 83-83 ; Gallas 1982, 311-312; Gallas-Wessel-Borboudakis 1983, 356-358, pl. 315,316; Gratziou 2010, 234-237.

<sup>28</sup> Kappas 2011, 255-337.

Parallels to the peculiarity of the rectangular saddle-back structures on the roofs of the churches of Chios, one could claim are, first the cubic form constructions, which cover semispherical domes, and second, the raised central bays in transverse barrel-vault acting as domes of the churches of mainland Greece, which are known as troullokamares. Cubic structures, which are derived from Late-Roman tradition<sup>29</sup> and cover blind domes, appear on church-building in both island and mainland Greece (fig. 30-31) during the second half of the 12th and in the 13th centuries as scattered examples<sup>30</sup>.

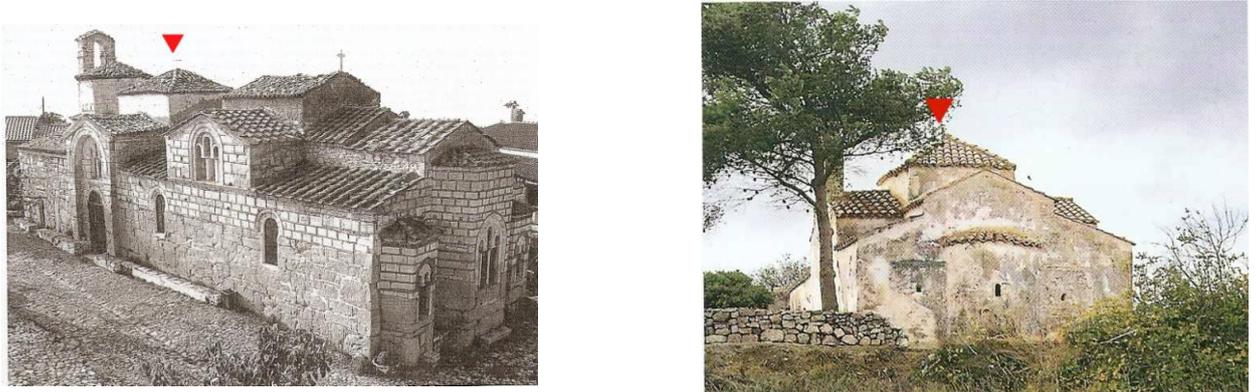


Fig. 30-31. Moni Sagmata, Boetia and Ayios Andreas in Livadi, Kythira

Although troullokamares<sup>31</sup> outwardly resemble the raised rectangular structures of the churches of Chios, they differ in two essential points: first they encase a barrel vault rather than a semispherical dome without a drum and, second, their direction is a determinative contribution to the shaping of a cross on the roofs of the churches where they are found, an attribute unrelated to the churches of Chios (fig.32).

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<sup>29</sup> As in the known as mausoleum of Galla Placidia in Ravenna.

<sup>30</sup> As in the monastery of Sagmata in Boetia or in Ayios Andreas in Livadhi on the island of Kythera. See Voyadjis 1998, 51-52, 68, fig. 1,3,4,5,6 ; Chatzidakis-Bitha 1997, 65-74.

<sup>31</sup> For the term meaning "a small transverse barrel vault which has the place of a dome" see Orlandos 1935, 51-53. Also, id. 1929-1930, 577-582; Kuepper 1996; Passali 1996-1997, 369-394.



Fig. 31. Epirus. Paramythia. Church of Megali Panayia. Troullokamara on the roof.

The above related modes that appear in the late Middle-Byzantine architecture of Greece seem to be three different answers to the same problem: builders did not wish, or were unable to build a normal dome with a tall drum, cylindrical or multifaceted, because of the additional expense, the technical demands, or the time entailed in such an undertaking.

The solution differed according to the region and the inspiration of the master-builder. In Chios they chose to place the semicircular calotte on the base of the dome and then to cover it with a pedimental rectangular structure. This would indicate in most cases a desire to renovate and innovate. The simplest solution would have been to cover the extrados of the blind dome with tiles, as in the case of one of the churches of our group, Ayios Ioannis Argenti (fig.33)

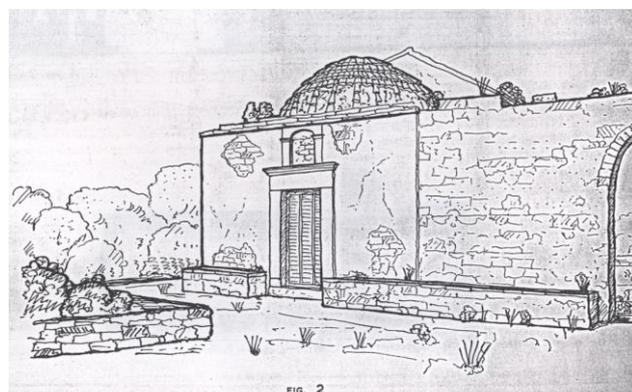


Fig.33. Paleos Katarraktis. Church of Ayios Ioannis Argenti with tiles on the dome

(in the years 1918-1940, Smith 1962, pl.171.2)

Morphologically this group of churches exists within the framework of Byzantine church-building of the later centuries, but analysis shows a complete lack of homogeneity with the church architecture of mainland Greece, the Helladic School, even with the architecture of the churches of Macedonia, or with the other islands of the Aegean, with the exception of Crete. This group of churches from the countryside of south Chios does not display morphological elation. It incorporates aesthetic values from Constantinople and neighbouring Asia Minor, to whose environment it belongs geographically, such as rows of blind arcades, their order in the structure of the building, their execution, the themes of the brick decoration or the exclusive preference for domes of all types in roofing<sup>32</sup>. The Katholikon of the Nea Moni of Chios, which was established with an imperial grant by Constantine IX Monomachos in the middle of the 11th century, was obviously the source of inspiration for these various morphological details<sup>33</sup> (fig.34). From this lofty prototype, those features that were easy to copy and to transfer to more humble buildings, were isolated.



Fig. 34 Chios. Nea Moni. The katholikon from NW.

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<sup>32</sup> Vocotopoulos 1982, 557- 573; Velenis 1984; Krautheimer 1998, 107, 228-229 ; Curcic 1978, 17-28; Buchwald 1979, 277-293; Bouras 1984, 50.

<sup>33</sup> Bouras 1981.

A different starting point for research was the investigation of church types. This showed that a square in ground plan narthex was a common construction in Greece and existed with various types of main churches such as single-nave, barrel-vaulted, with cross-in-square, aisless domed, cross-vaulted, or triconch. The square narthex had a variety of domes: vaults, groin-vaults, or cupolas. In Chios the donors and building crew preferred to cover them with a semispherical dome or its variations.

Research on the existence of types parallel to that of Chios yielded vary poor results. Only two examples were found in combination with an aisless, barrel-vaulted naos: one in Athens, which is now not extant (Panayia in Petra)<sup>34</sup>, and the other on the island of Kythira, in a small church of the Late-Byzantine era (Ayios Philippos)<sup>35</sup> (fig. 35).

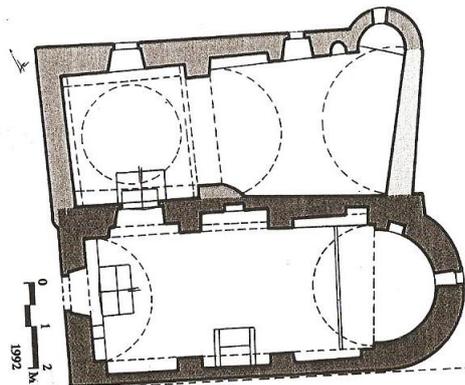


Fig. 35. Kythira. Messa Bourgo. Church of Ayios Philippos (Chatzidakis-Bitha 1997, 212, fig. 4)

The square chamber building type has its origin in mausoleums or martyria of the Early Christian centuries, and its earliest examples survive in tombs in Syria, most prominent of which is the mausoleum of Vizzos at Ruweiha<sup>36</sup>. According to the two prevailing theories, the first Christians received this type from the Hellenistic and Roman heroa, or from the

<sup>34</sup> Sotiriou 1927, 50; Orlandos 1933, 148, no5; Pallas 1989, 146; Ghiolos 2005, 58

<sup>35</sup> Chatzidakis-Bitha 1997, 210-213.

<sup>36</sup> Jalabert-Mouterde 1939, 368, no. 673; Tchalenko 1953, 256, II, pl. 85; Butler 1969, 145-147, pl. 155; Grabar 1972, 77-81, 85-86; Pena 1997, 88, 207-213, 220.

more ancient civilizations of Persia, and they were later adopted by the Islamic world<sup>37</sup>. Tracing in this way its development, the square, domed chamber passed from the Hellenistic and Roman eras to that of Early Byzantium and later to the Arabic Caliphates.

Semispherical domes are often found in the architectural tradition of Constantinople in a specific location during the middle-Byzantine era. The location of the semisphere on the narthex, immediately past the entrance, is known from churches of Constantinople of the 10th and 11th centuries, as well as from churches of the Balkans directly influenced by the architectural tradition of the Capital<sup>38</sup>.

The blind semispherical dome in the middle bay of the roofing was a successful solution, because it added variety to the articulation of the space, without greatly increasing the height of the roof and discreetly emphasized the vertical axis in front of the central entrance of the main church. At the same time it offered the opportunity to develop a complex iconographical program in the narthex. The previous example of the blind semispherical dome appears in Chios in the middle of the 11th century in the esonarthex of the Katholikon of Nea Moni. Domes of the same type, without drums, were discovered recently in another section of the Katholikon of Nea Moni, the exonarthex; built in the 11th century, there are three, of which one was posed again centrally so as to emphasize the vertical axis of the entrance<sup>39</sup> (fig. 36.

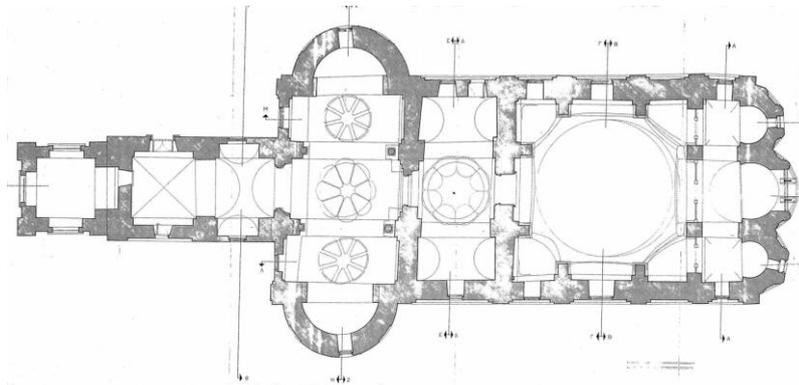


Fig.36. Chios. Katholikon of Nea Moni. Ground plan (Bouras 1981, 27)

<sup>37</sup> Grabar 1972, 1985-86; Pena 1997, 220.

<sup>38</sup> Bouras 1981, 150-151; Mathews 1978, 209-219 (Myrelaion), 386-401 (Vefa Kilisse Camii), 71-101 (Pantokratoros).

<sup>39</sup> Voyadjis 2009, 239-240.

Therefore, in the case of the churches of Chios, which are here presented, it is probable that the Katholikon of Nea Moni served as their prototype. The donors and master builders created a compact version of the tripartite esonarthex limiting it to the central part, which bore the blind dome. The economical potential of the populace of the countryside, such as the founders of our five churches, did not allow the construction of ambitious buildings. The influence of the Katholikon of Nea Moni exerted on church – building in the Chios has been noted many times and was quite diverse: it sometimes influenced the architectural style, sometimes the morphology of the facades, and sometimes the decorative brick-work and its themes<sup>40</sup>.

All five churches emulated an architectonic idiom dear, it would seem, to the region of southern Chios, where the population had always been agrarian. They are buildings without lofty artistic pretensions, but they do imply a flourishing population. Their founders belonged to a milieu of farmers who lived in small country villages far removed from the centre of the political, social and financial life of the island, which was the city of Chios. They belonged to the lower classes of the (untitled) rural aristocracy, which, as has been noted, flourished in many regions of the Byzantine empire in the second half of the 13<sup>th</sup> century and the beginning of the 14<sup>th</sup><sup>41</sup> (fig. 36-37) As is hinted by the wall – paintings of the

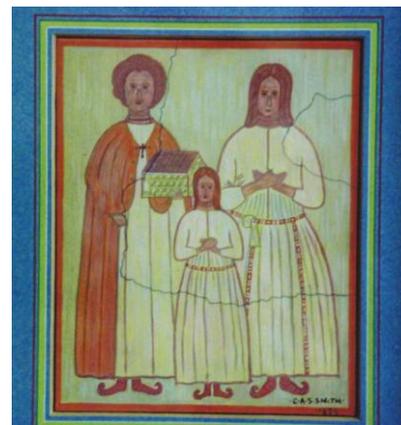


Fig.36-37. Church of Panayia Agreloupousena and Panayia Keravlidena. The founders.

<sup>40</sup> Bouras 1977-1979, 21-32; id. 1982, 241-248.

<sup>41</sup> Laiou 2006, 516, 550, 568, 574; Lefort 2006, 422, 444.

patrons and their historical context, they were landed gentry of modest means, who chose to build a family church on their land, not totally simple and humble, but in forms which betray a desire to project themselves. It is a justifiable hypothesis that the churches were erected to house the sepulchres of the family. They were intended to be used as tombs for the founders and their descendents, as is indicated by the burial vaults, which are extant on the floor of one church (of Ayios Ioannis Argenti) and by the iconographic programs of the wall-paintings, which adorn them. The funerary aspect of the narthexes may have been the reason that the semispherical dome without windows was chosen for their roofing. This, it has been suggested, is the interpretation of the little dome in the Chora monastery on the west bay of the parecclesion, since that section contains the tomb of Theodore Metochites, the arcosolium of the ktetor<sup>42</sup>.

The composite, which combines a single nave barrel-vaulted main naos with a square narthex covered by a blind semispherical dome, was fully articulated by the beginning of the 14<sup>th</sup> century. It was invented by a local building team and was well received in the area of southern Chios, which led to the building of a series of similar churches. It is an original creation by local builders, who drew on elements from various architectural traditions. This new creation combined the high models of the Capital's architecture, morphological elements from the tradition of Asia Minor, implementational techniques from local tradition and types from Aegean island church building.

The regional idiom found in the five churches of southern Chios is a combination of single components: the main church is the very common single nave barrel-vaulted naos and the narthex follows known forms and familiar techniques since the early Christian era. Furthermore, blind domes were not unknown in the Aegean. On the contrary, on some islands they were commonplace<sup>43</sup>. The value of the synthesis lies in the utilization of known forms to create new combinations.

In the Late Byzantine period there is a noticeable trend towards autonomy of various local "schools" and / or "workshops". Thus we find different movements and solutions in

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<sup>42</sup> Ousterhout 1988, 59, 100, 110-113.

<sup>43</sup> Kollias 1994, 32-44; id. 2004, 143-146; Kappas 2009, 63-64.

Epirus and western Crete, others in Macedonia, different ones in southern Greece and often in the islands. The importance of those local crews has been stressed often in the last few years of research and they are credited with an increasingly important role as the conveyors of new architectural ideas<sup>44</sup>.

Hans Buchwald called the new architectural types derived from the selective combination of elements of diverse models into a new synthesis "an architectural collage"<sup>45</sup>. Eclecticism, in the sense of the gathering of morphological and typological elements from various traditions, contemporary or older, is a characteristic component of Palaeologan architecture. A similar process, it seems, occurred in the case of this idiom, which began with the artistic initiative of a local building team and then was active on the island in the 14th century. It erected an ingenious series of churches until the end of the 15th or the beginning of the 16th century in a type that was never repeated in the centuries that followed. It was an innovation of limited range, which appeared in Chios in the Late - Byzantine centuries and faded away shortly after the end of the Palaeologan era.

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<sup>44</sup> Ousterhout 1988, 142; Bouras 1993, 145; Bakirtzis-Ousterhout 2007, 182.

<sup>45</sup> Buchwald 2000, 43, 47.

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