

***The use of the corbelling technique on the Aegean islands  
during the middle ages.  
Examples from the Cyclades and the Dodecanese<sup>1</sup>***

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***Abstract***

Το εκφορικό σύστημα δόμησης έχει χρησιμοποιηθεί σε όλον τον κόσμο και σε όλες τις εποχές. Στο Αιγαίο, μέχρι πρότινος, ήταν γνωστό από τάφους των προϊστορικών χρόνων και, κυρίως, από εκκλησάκια και καλύβες των μεταβυζαντινών χρόνων στις Κυκλάδες, με ένα-δυο παραδείγματα γεωμετρικών και ελληνιστικών κατασκευών ενδιάμεσα. Τα τελευταία χρόνια, ωστόσο, ταπεινά εκκλησάκια στην Τήνο, κτίσματα στη Σαρία, πατητήρια στη Σύμη κτισμένα με το εκφορικό σύστημα χρονολογήθηκαν στους μεσαιωνικούς χρόνους. Σε αυτά προστέθηκαν περί τις 200 κύφες, πέτρινες καλύβες στη Χάλκη, που χρονολογήθηκαν από το 1000 μέχρι το 1500 περίπου, με βάση τη γειτνίασή τους με βυζαντινά εκκλησάκια, με τα οποία σε λίγες περιπτώσεις παρουσιάζουν και μεσοτοιχία. Επίσης, λιγοστές στέρνες που στεγάζονται με τρούλους στο ίδιο νησί. Η χρονολόγηση των κυφών στους μεσαιωνικούς χρόνους μας αναγκάζει να ερευνήσουμε με μεγαλύτερη προσοχή τις πέτρινες καλύβες και σε άλλα νησιά για πιθανή αναθεώρηση της χρονολόγησής τους. Η μελέτη των μεσαιωνικών μνημείων που είναι κτισμένα με το εκφορικό σύστημα στα νησιά του Αιγαίου, έδειξε πως η τεχνική αυτή χρησιμοποιήθηκε από τους απλούς, φτωχούς κατοίκους τους, αγρότες και ποιμένες, κυρίως για τη στέγαση των ίδιων και των ζώων τους, αλλά όταν η ανέχεια περίσσευε, ακόμα και για τους ναούς, τις κατοικίες Θεού και των αγίων.

Corbelling<sup>2</sup> is the technique of building so that each course of stones or other material projects a little inward from the course below, gradually diverging from the vertical, resulting in a narrow opening at the top, easily spanned by a stone slab. The technique applies both to barrelvaults (sometimes forming so called pseudo-vaults) and domes. The roof of the buildings constructed in this way can be either flat or vaulted.

The corbelling technique is found all over the world, from Ireland to India and South America (Mayan Civilization)<sup>3</sup> in buildings dating from the Neolithic period<sup>4</sup> to the present.<sup>5</sup> In the Aegean, the oldest dated buildings are the Late Neolithic round tombs in the cemetery at Kephala on Kea,<sup>6</sup>

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1. I owe thanks to K. Dellaporta, former director of the 2nd Ephorate of Byzantine Antiquities, for encouraging my research on Naxos and Tenos.

2. For a brief history of the corbelling technique, see Orlandos (1959/60), pp. 287-325.

3. [https://en.wikipedia.org/wiki/Corbel\\_arch](https://en.wikipedia.org/wiki/Corbel_arch)

4. Like the LN round tombs in the cemetery at Kephala on Kea. Kanta (1997), p. 230; Doumas, (1977), pp. 47-49.

5. On Kea, single nave chapels with flat roofs in the corbelling technique continued to be built until the middle of the 20th century. Dimitropoulos (1982/3), pp. 33, 45. On Tenos in 2014, Antonis Philipoussis from the village Agapi, an 80-year old shepherd, told us that his stable was built in the corbelling technique by a local Tenian mason.

6. Kanta (1997), p. 230; Dumas (1977), p. 69.

the Early Minoan tombs of Messara and Nea Roumata on Crete,<sup>7</sup> and the Early Cycladic II very small corbelled tombs of Kastri on Syros.<sup>8</sup> On the Greek mainland, the technique is represented by the Mycenaean tholos tombs and other structures dating from 1500-1400 BC.<sup>9</sup> The latest published examples belong mainly to churches in the Cyclades, especially Tenos,<sup>10</sup> Kea,<sup>11</sup> Andros<sup>12</sup> and Kythnos,<sup>13</sup> islands where apart from churches, 'kellia' that is, stone huts and furnaces<sup>14</sup> built in the corbelling technique are also found. All of these are dated to the post-Byzantine period.<sup>15</sup> In between the prehistoric and post-Byzantine periods, a few monuments, such as the Geometric tomb 'ton Agion Paraskion' in Herakleion on Crete<sup>16</sup> and the dragon houses in Euboea<sup>17</sup> have been dated to the Classical and Late Hellenistic periods.

Up to twenty years ago,<sup>18</sup> no medieval monuments using the corbelling technique were known on the Aegean islands. Thus, it was thought that the technique was a characteristic of the flat roofed post-Byzantine churches mainly in the Cyclades.<sup>19</sup> But examples from the Byzantine period have in the meantime been identified, even though they are scattered, and have not as yet been systematically published.

The earliest dated published examples from the medieval period in the Dodecanese –if the dating is right– and amongst the earliest in the Aegean seem to be the little 'houses' in the settlement of Palatia (Palaces) on Saria, the islet north of Karpathos.<sup>20</sup> There are three types of house in this settlement. The most common type is the one-aisled house,<sup>21</sup> with a slightly pointed barrel-vault built in the corbelling technique, and with a kind of porch in front of its entrance. The second type has a square plan (**fig. 1, fig. 24**), the same kind of porch as the first type, but with a conical vault which makes them look very much like the beehive huts in Syria (Halep, Neirab, Djibrin) and Turkey (Harran). One building, which according to Moutsopoulos, the architect who first studied them, looks like a Mycenaean tholos tomb, is built in the shape of a corbelled conical vault in the inside, but on the outside it looks like a stepped cylinder, that is the diameter of the exterior cylinder gradually becomes narrower following the decrease in the opening of the dome inside. This building, the type of which is unique on the site, dominates the place. Moutsopoulos dates all the buildings of Palatia on Saria to the 9th-10th century, before the liberation of Crete from the Arabs by Nikephoros II Phocas (961 AD).<sup>22</sup>

A secure *terminus ante quem* for the buildings on Saria is given by the chapel of Agios Mamas in Exeles (**fig. 2**) near the village of Menetes on the neighbouring island of Karpathos. Agios Mamas seems to have initially been a structure belonging to the second type on Saria, that is, with a square

7. Branigan (2012), pp. 7-14, especially p. 9; Kanta (1997), pp. 229, 230.

8. Kanta (1997), p. 230; Doumas (1977), pp. 47-49. There is a possibility that similar EC II corbelled tombs were found on Mykonos, Marinatos (1929), pp. 137-38.

9. Vasilikou (1995), pp. 106, 112, 165, 190.

10. See Agios Michael at Gdas, in the district of Smardakito, Agios Panteleimon at Tzados. Dimitrokallis (2004), pp. 14 fig. 2, 18 fig. 22-24, 17 fig. 17-21. For general information on the use of the corbelling technique on Tenos, see Dimitrokallis (2004), p. 15. See, also, the church of Timios Stavros (Honorable Cross) in the monastery of Theotokos. Douka, Sari (1999), pp. 47, 49 fig. 29a.

11. Dimitropoulos (1982/3), pp. 33-49.

12. Megas (1967/8), pp. 84, 85, 115 fig. 42, 43.

13. See Panagia tou Psoma at Chora, with a slight corbelling. Vassiliades (1962), p. 334 fig. 1.

14. Makryonitis (2005), pp. 112, 172, 247.

15. For examples everywhere on the Aegean islands, see Dimitrokallis (2004), p. 25.

16. Platon (1949), p. 47.

17. Carpenter, Boyd (1976).

18. Bouras, in 2001 (Bouras (2001), p. 258), describing two 17th century churches from Paros, refers to the corbelling technique as being unknown in earlier church building. Yet, in 2000 Dimitrokallis claims that the Cycladic pseudotholos was known to the Byzantine architect. Dimitrokallis (2000), p. 65.

19. There are also some referred to in the Dodecanese, on Crete, as well as on the islands of the North Aegean. Dimitrokallis (2004), p. 25; Dimitrokallis (1996), p. 301.

20. Moutsopoulos (1978), pp. 345-60.

21. Deligiannakis recently suggested that these one-aisled structures are in fact Late Roman tombs. Deligiannakis (2015).

22. Moutsopoulos (1978), p. 360.

ground plan and a corbelled conical vault, and was turned, later on, into a chapel. It bears wall paintings which have been dated around 1300, but it could have become a chapel much earlier.<sup>23</sup>

The technique is found in Byzantine churches on Naxos as well: the flat roofed narthex of Agios Isidoros in Tragaia (**fig. 3**)<sup>24</sup> is probably the best-known example. The church is an Early Christian basilica (6th-7th century), which was restored most probably in the Latin period.<sup>25</sup> The narthex has two phases; the second, to which the corbelled pseudo-vault belongs, dates to the Late Byzantine period or even much later.<sup>26</sup> The corbelling starts quite high in the walls of the narthex (**fig. 4**), at a height of 3 m, over the lintel of the door leading from the narthex to the main church, since the builder obviously had to adapt to the remains of the narthex he found on the spot.

The same technique is found used in the church of Panagia Kera dedicated to the Dormition of the Virgin in a place called Ammomaxi near the village of Atsipapi, in the broader region of Koronos. It is a cross-in-square church, but the early rare transitional type in which the dome is supported not by piers but by parts of walls. It has been dated to the 9th or 10th centuries.<sup>27</sup> The corbelling technique was used in the roofing of the northwest corner bay (**fig. 5**) and in the north cross arm, during some later, but most probably Byzantine, repairs.<sup>28</sup>

To these two churches one can add Panagia Chrysopigi (**fig. 6**),<sup>29</sup> a half-ruined chapel in the Korakia district, situated on a barren rocky hill at some distance south of Apeiranthos. It looks like a 'mitatos' on the outside, that is, one of the corbelled stone-huts of Naxos, and it creates a complex with another structure, also like a mitatos,<sup>30</sup> lying next to it on its south. Mastoropoulos published the chapel, arguing that it was probably initially built as a Mycenaean tomb and later turned into a Christian chapel. The Mycenaean phase of the structure is more than obvious on the east and north walls, on the inside (**fig. 7**). Some of the sherds found on the spot could also be Mycenaean or sub-Mycenaean.<sup>31</sup> The whole structure, from what can be discerned in the debris around the complex, seems once to have been surrounded by a circular wall, an element which confirms Mastoropoulos' suggestion about the Mycenaean origin of the chapel.<sup>32</sup> The chapel is a small one-aisled building (in plan 2.75 m x 1.48 m, and 1.66 m high) with a narthex at its west (1.65 m x 1.50 m). It has incorporated the Mycenaean structure, which explains why the east wall is flat and there is no apse. Most probably when the Mycenaean structure, whatever its use was, was turned into a medieval chapel, the south wall, which by then was partly missing, was completed and covered with plaster, in which a sub-Mycenaean sherd can still be seen incorporated. The narthex seems to be a later addition, built at the same time as the mitatos next to the chapel. In all the three phases of the building, the corbelling technique has been used. The divergence from the vertical is more pronounced in the Mycenaean phase, in which the stone blocks used are very large and well worked. In the medieval phase, when quite small but again well-worked stones were used, the corbelling is less pronounced. Finally, in the last phase, when the narthex and the mitatos on

23. Moutsopoulos suggests that Agios Mamas was initially a 'mescit', a place of prayer for the Arab conquerors of Karpathos. Moutsopoulos (1978), pp. 388-99 and 358. For the dating of the wall paintings, see Katsioti (2000), p. 291.

24. Dimitrokallis (1996), pp. 247-305; Mastoropoulos (2007), p. 174.

25. Aslanidis (2014), p. 26-28. Dimitrokallis, who first published the monument, claims that the initial 6th-7th century three aisled timber-roofed basilica was turned into a barrel-vaulted basilica in the 10th or 11th century. Dimitrokallis (1996), pp. 380-81.

26. Aslanidis (2014), p. 26-28. According to Dimitrokallis, though, the narthex belongs to the third structural phase of the monument, and is dated to the Middle Byzantine period, to the 11th century or even earlier. Dimitrokallis (1996), pp. 282, 298, 300.

27. Mastoropoulos (2007), p. 238-40; Aslanidis (2014), pp. 187-89.

28. Aslanidis claims again that the repair in the corbelling technique is post-Byzantine. Aslanidis (2014), p. 188.

29. Mastoropoulos (2003).

30. For 'mitati' see, Mastoropoulos (2003), p. 149.

31. The date has been suggested by L. Platon.

32. Mycenaean tombs, or better, groups of Mycenaean tombs, are usually surrounded by a circular enclosure.

the south were built of small rubble stones, the corbelling is very shallow. This last phase could have been early post-Byzantine.

There are some more unpublished churches on Naxos which use the corbelling technique, pointed out to me by Naxian colleagues,<sup>33</sup> such as Agios Georgios at Engares, which I visited and I think is post-Byzantine, and Taxiarches tou Bafou, which I have not yet visited.

Dimitrokallis published two churches on Tenos built in the corbelling technique that can be dated to the 13th or 14th century on the basis of the remnants of wall paintings. They are one-aisled chapels with a corbelled pseudo-vault which at the very top leaves a narrow opening spanned with flat stone slabs almost one metre long. A thick layer of earth, added on top, creates a flat roof and an oblong box-like effect. These are Agios Georgios ton Loutron (**fig. 8, 9, 10**) surviving in quite good condition, and an anonymous chapel on the outskirts of the village Smardakito, in a place called Syrrohoi, half ruined today but bearing Byzantine wall paintings at the time when Dimitrokallis visited it.<sup>34</sup>

Dimitrokallis adds to his list three more chapels built in the same technique which are mentioned in documents of the Catholic Archbishopric of Tenos dated 1456: the Catholic church of Agios Geogios at Xylomachairi in the area of Smardakito, the Orthodox church of Agios Niketas in Chatzeradou, and the now fully restored church of the Transfiguration in Smourdia (Metamorphosis).<sup>35</sup> To these, I think, two more chapels in the area of Falatado on the same island might be added, namely, Agios Georgios in Falatado (**fig. 11, 12**) and Agios Petros in Falatado on the road leading from Falatado to the village of Agape.<sup>36</sup> The first bears remnants of post-Byzantine wall paintings but it looks as if there are traces of earlier ones underneath.<sup>37</sup> The second, Agios Petros, is fully restored and there are no paintings to support a date. Still, the three chapels, which I myself have visited, that is the two in Falatado and Agios Georgios ton Loutron, which is dated in the Byzantine period, have many characteristics in common. They are quite small (4.50 to 6.50 m long) and narrow (1.80 to 2.40 m wide),<sup>38</sup> especially at the very top where they are roofed by stone slabs,<sup>39</sup> with flat roofs on the outside and a flat east wall or a slightly semicircular apse. The two in Falatado are very similar to each other; apart from everything else, they both have a window at the west end of the south wall.<sup>40</sup> Even though one cannot be absolutely certain that the churches in Falatado are medieval, they are so similar to the medieval chapels, those of Smardakito and Loutron, that they have to be at least very early post-Byzantine, 15th or 16th century.

There are also some chapels built in the corbelling technique on the island of Mykonos. One of them, the Kato Naos (**fig. 13, 14**) in a place called Agies Marines in the district of Lino, is a half-ruined chapel, where the surviving remnants of illegible wall paintings suggest a medieval date. For the other three chapels, one in the same area and two more in the area of Paspari (Panagia Chosti and Agios Ioannis) it is not possible to be absolutely sure whether they are medieval or early post-Byzantine.<sup>41</sup>

On Paros, near the village of Prodomos, the unpublished chapel of Koimesis (the Dormition of Virgin Mary), the southern of the twin chapels Agia Anna and Koimesis, is also built in the corbelling technique. It is certainly dated after the Middle Byzantine period since Middle Byzantine architectural sculpture is incorporated in its masonry, but it seems to be Late Byzantine rather than post-Byzantine in date.

33. G. Mastoropoulos, M. Tsafou and K. Verykokkos, to whom I owe my thanks.

34. Dimitrokallis (2004), pp. 20-24.

35. Dimitrokallis (2004), p. 24.

36. The first lies on the left side of the road, the second on the right side of the same road a bit further down.

37. There have not yet been any stratigraphic cross-sections taken of the plaster.

38. Agios Georgios Falatadou: 6.50 m x 1.85 m; Agios Petros: 4.727 m x 1.826 m and Agios Georgios ton Loutron: 4.50 m (the original nave, since a later extension was added to the west) x 2.40 m.

39. These slabs are mostly 1 m long.

40. In Agios Georgios ton Loutron, the window opens at the west end of the extension of the church. This could perhaps mean that the extension of Agios Georgios ton Loutron and the chapels of Falatado are of the same age.

41. All these chapels are unpublished. The ones in the district of Lino I have visited myself; I became acquainted with the ones at Paspari through the Photographic Archive of the Ephorate of Antiquities of the Cyclades.

Surviving in the Dodecanese, on the island of Symi, are some wine presses built of dry stone masonry in the corbelling technique. These round structures, generally with an inner diameter measuring 1.70 - 2.20 m, are built with vertical stones covered with impermeable (hydraulic) mortar at the base, and a bit further up, the corbelling technique creates a kind of a vault.<sup>42</sup> Kritikos, who studied them, has dated them to the medieval period because Christoforo Buondelmonti, who visited the island before 1420, mentions the famous wine of Symi in his *Liber Insularum*, the Book of the Islands.<sup>43</sup> He also believes that certain chapels in the area where the wine presses are found could actually be directly connected with them, that is, they might have been built there because of the wine presses. These are the chapels of Ais Yiannis tis Neras (Agios Ioannis) in the district of Ampeliou (that is, the district of Vineyard), Ais Yiannis tis Tsagria in the district of Pano Krasokellia (Upper Wine-cellars) and Potiou (Drinking?) and Ais Yiannis o Stafylas (Saint John the Grape Owner) at Pedi.<sup>44</sup> One of these chapels, Ais Yiannis tis Tsagrias, is certainly Byzantine, since it bears remnants of wall paintings dating to the middle of the 13th century.<sup>45</sup>

A few years ago, on the little island of Chalke in the Dodecanese group of islands, which lies six miles off the western coast of Rhodes, I came across 'kyphe',<sup>46</sup> little huts spread all over the island (**fig. 15**), forming the main characteristic of its agricultural landscape. Their plans are elliptical or almost elliptical on the inside, while on the outside they are mostly circular, but a few of them are elliptical or almost rectangular. They are 3 to 8 m long, and 1.50 to 2.50 m wide. They are made of big rough blocks of pieces of rocks, sometimes incorporating rocks in situ, in the corbelling technique, without the use of any mortar (dry masonry) (**fig. 16**). The top of the vaults thus created is also spanned by rough blocks, oblong, around 1 m long, which are used as keystones. In one case, I noticed stone slabs as keystones. On the outside, the rock-made structure is covered by small rough stones, in two layers, in the dry masonry technique. The exterior of the roof, covered with a layer of stones and earth, becomes flat. Kyphe have one opening, often using large ancient worked stone blocks as pilasters and lintels. There were no doors blocking the openings and the floors were of natural earth.

There are more than two hundred kyphe on the island of Chalke, which is only 32 square kilometres in area.

Studying kyphe, along with all the Christian monuments on the little island of Chalke, dating from the Early Christian period (5th century) to the year 1523,<sup>47</sup> when most of the Dodecanese islands passed from the Knights of St John to the hands of the Turks, as part of my doctoral thesis, I came to the conclusion that kyphe are roughly dated between 1000 and 1500.

Corbelled huts, like kyphe, are in fact not at all rare. They occur everywhere where there is an abundance of stone. It seems that apart from providing a simple, easily-made house, they gather together excess field stones to provide more fertile land for cultivation.<sup>48</sup> In the Aegean, they occur frequently in the Cyclades, mostly under the name 'kellia', such as on Tenos (**fig. 17**), Kythnos, Kea and Andros, but also as 'mitata' in Crete<sup>49</sup> and 'mitati'<sup>50</sup> on Naxos (**fig. 18**). The same kind of huts are found on Samothrace and Chios.<sup>51</sup> We stick to examples from the Aegean, although one can mention exam-

42. Kritikos (1997), pp. 17, 39 fig. 6, 40 fig. 7, 20.

43. Buondelmonti, p. 30.

44. Kritikos (1997), p. 24.

45. Katsioti (2000), p. 281, pl. 96b.

46. Sigala (2011), part I, pp. 186-201. Sigala (2012).

47. Sigala (2011).

48. Löbbecke (2012), p. 10.

49. Warren (2007), pp. 12-15, 16; Vassiliades (1976), p. 34 pl. 23, 39 pl. 29; Warren (1973), pp. 451-56.

Vassiliades (1976), pp. 110-15, 207 pl. 249, 250, 112 pl. 132, 133.

50. Mastoropoulos (2003), p. 149.

51. Vassiliades (1975), pp. 55-57, plan 25.

ples from the mainland of Greece, as well as the islands of the Ionian Sea (Lefkada and Kephallonia) and from all over the Mediterranean (Italy, France, Spain, Morocco) and even the Balkans and further North, Ireland and Switzerland.<sup>52</sup>

Many of these stone huts have been in use ever since they were built. On Chalke, kyphe were in use until the middle of the 20th century, and one or two are still in use. Generally, they were considered to be 19th century structures, although no local resident knows, or knew at the beginning of the 20th century, anyone who had ever made one. The same story applies to other islands, although in some other cases, for example Tenos, the technique is still in use.<sup>53</sup>

Unlike other corbelled huts, the kyphe of Chalke were lucky enough to be related to Byzantine chapels nearby, and, in a few cases, even to share a common wall with them. Some of these chapels still bear wall paintings preserved well enough to be able to be dated and thus give a rough date for the kyphe as well.

The 'key monument' for the dating of kyphe is certainly Panagia Hodegetria or Enniameritissa (**fig. 19, fig. 24 2a, b**).<sup>54</sup> It bears all its initial decoration, all its wall paintings survive, dated precisely by a dedicatory inscription to 1367. It is built next to a kyphe with which it shares its north wall. But more important still, it is obvious from the inside that it was initially a kyphe itself. It is built in the corbelling technique, with large rough rocks which project and create curves on the surface of the wall paintings. Most probably when it was turned into a church, a second wall of roughly worked stones was added on the outside, as well as a semicircular apse in the east wall. Studying Enniameritissa in depth made it obvious that at least some of the kyphe were earlier than 1367.

Moutsopoulos, the architect who first seriously considered kyphe,<sup>55</sup> argues that they are much earlier than the Dragon Houses in Euboea which have been dated to the Hellenistic and Roman periods.<sup>56</sup> In fact, their rough and clumsy masonry does not differ much from the Early Minoan tholos tomb in the village of Kراسi in Pediada, Crete.<sup>57</sup> Still, kyphe have to be later than the Classical or Hellenistic period since Classical architectural members (*spolia*) and parts of Hellenistic walls have been incorporated in their masonry and give them a *terminus post quem*. One kyphe<sup>58</sup> is built on top of a ruined Early Christian basilica giving thus an even later *terminus post quem* of the 7th century AD, when the basilicas were destroyed.<sup>59</sup>

Generally, kyphe are found near medieval chapels and they form either small agricultural hamlets, made up of around ten huts (kyphe) to each chapel, plus a few more facilities (cisterns, threshing floors and wheat pits), or they form small pastoral settlements composed of two or three kyphe, a chapel and a few cisterns. In some cases, kyphe must have even served as cells in small monastic settlements. I have argued elsewhere that on Chalke this kind of hut must have stopped being produced at the end of the period of the Knights (1523).<sup>60</sup>

There are also two interesting cisterns on Chalke, covered with conical domes built in the corbelling technique. They are called 'tourlotes'<sup>61</sup> and can be dated to the Middle Ages because they are built in the same technique as the kyphe and they are found at medieval sites: one is found near a chapel,

52. Examples from various places have been gathered by Renate Löbbecke in her book *Corbelled Domes*, Löbbecke (2012).

53. Or it was a few years ago, as is mentioned above (footnote 5).

54. Sigala (2004).

55. Moutsopoulos (1989), pp. 157-67.

56. Moutsopoulos, (1989), p. 167.

57. Marinatos (1929).

58. 'I kyphe tou Patli' (Patli's kyphe), Sigala (2011), Part II, p. 34.

59. Kollias (2000), p. 303.

60. My presentation on 'The "Kyphe" of Chalke. A primitive type of medieval housing on the small island of the Dodecanese' will be published in a volume dedicated to Sophia Kalopissi-Verti.

61. 'Tourlos' comes from 'troulos', which means 'tholos'. Sigala (2011), Part I, p. 205-206.

the Anonymous Monastery at Chroussoi, and the other at a crossroad joining medieval hamlets and settlements (**fig. 20**). Moreover, they differ dramatically from the ancient cisterns still in use during the Middle Ages. The openings of the latter are made of well-worked stones and the area around them is often surrounded by worked stones which serve as stools.

Returning to the kyphe, they increase the number of medieval corbelled buildings in the Aegean significantly, giving rise to the following question: if kyphe are medieval, why cannot other corbelled huts found on other islands of the Aegean be medieval as well? The technique was known and it was in use, as the few examples of ecclesiastical architecture, plus the kyphe and a few more, prove. One must also bear in mind that corbelling was an easy way to build in places where there was an abundance of stone and a lack or shortage of wood.

The mitata on Crete, mainly shelters for pastoralists, offer a good example. According to Warren, “The shepherds of Nidha affirm that the mitata represent a very long tradition, but how long is unknown”.<sup>62</sup> Renate Löbbecke, in her book on *Corbelled Domes*, dates them to the 19th century.<sup>63</sup> Vassiliades, who studied the Cretan house, dates them to the post-Byzantine period.<sup>64</sup> Yet the word ‘mitata’, which comes from the Latin ‘castra mitata’, occurs as early as the 6th century AD.<sup>65</sup> Last but not least, the written sources speak of flourishing pastoralism on Crete during the Middle Ages.<sup>66</sup> So if kyphe are medieval, then why not at least some of the round mitata of Nidha as well, since they are undeniably connected with pastoralism and there are no factors to oppose such a theory?<sup>67</sup>

The same could apply to some of the ‘mitati’ of Naxos as well. At first glance, one can see that there are mitati of different types and certainly some of them could be medieval. Recently, I came across what I first thought was a mitatos, south of the Cave Monastery of Kaloritisa,<sup>68</sup> and which turned out to be a chapel (or a chapel-like hermit’s cell) with remnants of wall paintings dating most probably to medieval or early post-Byzantine times (**fig. 21**).

Some of the kellia on Tenos look exactly like the chapels found close to them.<sup>69</sup> We can compare Agios Georgios at Falatado with a kelli nearby to the northwest (**fig. 22, 23, 11**). It has the same kind of pseudo-vault spanned with the same kind of stone slabs, which create a flat roof.

So, although certainly one must be really careful when trying to date corbelled huts, which generally have been dated to the 18th or 19th century and some even to the 20th century, some could have been in existence since the Middle Ages. Therefore, one must treat them with much respect, because even if they were still in use some years ago, they may be much older in date.

The technique was known and it was in use according to the archaeological and art historical data, even if few churches built in this technique survive. It was the easiest way to build humble houses and it suited rural people very well, since they had the material on hand and the use of it, the gathering of stones in one place, in one structure, offered them more free land for cultivation.

Still, in order to be able to date corbelled huts, outside Chalke, and even on Chalke more precisely, architectural projects and of course field surveys and excavations should be undertaken, which would supplement the evidence with ceramic and other datable findings.

62. Warren (2007), p. 15.

63. Löbbecke (2012), p. 310.

64. Vassiliades (1976), p. 114.

65. Warren (2007), p. 15.

66. Gasparis (2002), p. 226 n. 4; Sigala (2011), p. 334.

67. Vassiliades (Vassiliades (1976), p. 114) claims that the circular structures like ‘mitata’ are earlier than the elliptical, such as kyphe in the inside. Also, Warren claims that the first mitata could have been Hellenistic or Roman, a period when the prehistoric circular tombs of Crete were still visible, Warren (2007), p. 15.

68. Panayotidi (1995).

69. According to Vassiliades, in post-Byzantine Aegean ecclesiastical architecture, the phenomenon of churches and houses influencing each other, well known in the history of architecture, is repeated. Vassiliades (1962), p. 321.

In 2004, Dimitrokallis stressed the importance of the discovery of two corbelled Byzantine chapels on Tenos and two Byzantine churches on Naxos in which the corbelling technique was used for repairs, for the history of architecture.<sup>70</sup> However, he had no idea how much that mattered for the dating of the rest of the humble corbelled buildings, since up to that time the technique was thought to apply only to post-Byzantine churches. Now we can appreciate the significance of the corbelling technique for the Middle Ages: a building technique for the humble and the poor, for farmers and peasants, modest monks and ascetics. The two churches on Naxos, Agios Isidoros at Tragaia and Panagia Kera, were built by good craftsmen in the first place, who most probably were brought from a centre, even if that centre was just the capital of the island, Chora of Naxos. But their restoration, many a year later, when the initial donors no longer existed, seems to be the work of untrained workers, locals from that same area, peasants, accustomed only to building humble huts and chapels for themselves in the corbelling technique. On Chalke, vaults built on wooden forms and in the corbelling technique go side by side. For example, the churches of Ai Savas and Ai Niketas were built at the same time as the kyphes near them, the churches having proper vaults, made on wooden forms, the kyphes corbelled ones. Since vaults on wooden forms needed wood and skill, they were reserved for the sacred buildings only and not for everyday dwellings. And when there was too much hardship, even the saints had to go without proper vaults and domes, even though this part of the church, the vault, represented Heaven.

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70. Dimitrokallis (2004), p. 25.



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### **Abbreviations:**

- AAA= Αρχαιολογικά Ανάλεκτα εξ Αθηνών  
 ΑΔ= Αρχαιολογικόν Δελτίον  
 -ΕΕΚΜ= Επετηρίς Εταιρείας Κυκλαδικών Μελετών



*Figure 1.*  
Saria. Building of Type B'.  
Photographic Archive of the Ephorate of Antiquities of the Dodecanese.



*Figure 2.*  
Karpathos. Agios Mamas at Menetes.



*Figure 3.*  
Naxos. Agios Isidoros Tragaias.  
View of the church from the SW.



*Figure 4.* Naxos. Agios Isidoros Tragaias.  
The pseudo-vault of the narthex built in the corbelling technique.



*Figure 5.* Naxos. Panagia I Kera.  
The north-west corner bay.



*Figure 6.*  
Naxos. Panagia Chrisopigi.  
View from the SW.



*Figure 7.*  
Naxos. Panagia Chrisopigi.  
The interior from the west.



*Figure 8.*  
Tenos. Agios Georgios ton Loutron.  
View from the NW.



*Figure 9.*  
Tenos. Agios Georgios ton Loutron.  
The interior from the west.



*Figure 10.*  
Tenos. Agios Georgios ton Loutron.  
Detail from the Deisis in the conch of the apse.



*Figure 11.*  
Tenos. Agios Georgios Falatadou.  
View from the SW.



Figure 12. Tenos. Agios Georgios Falatadou.  
The interior from the west.



Figure 13. Mykonos. Kato Naos in Agies Marines.



Figure 14. Mykonos. Kato Naos in Agies Marines.



Figure 15. Chalke. Kyphe at Kephali.



Figure 16. Chalke. Kyphe. Interior.



Figure 17. Tenos. Kelli near Agios Georgios Falatadou.



Figure 18. Naxos. Mitatos at Korakia, near Chrisopigi. The interior.



Figure 19. Chalke. Enniameritissa. View from the SE.



Figure 21. Naxos. Mitatos like chapel south of Kaloritsa.



Figure 20. Chalke. Tourloti cistern and kyphe in the background.



Figure 22. Tenos. Kelli NW of Agios Georgios Falatadon.



Figure 23. Tenos. Kelli NW of Agios Georgios Falatadon. Interior.

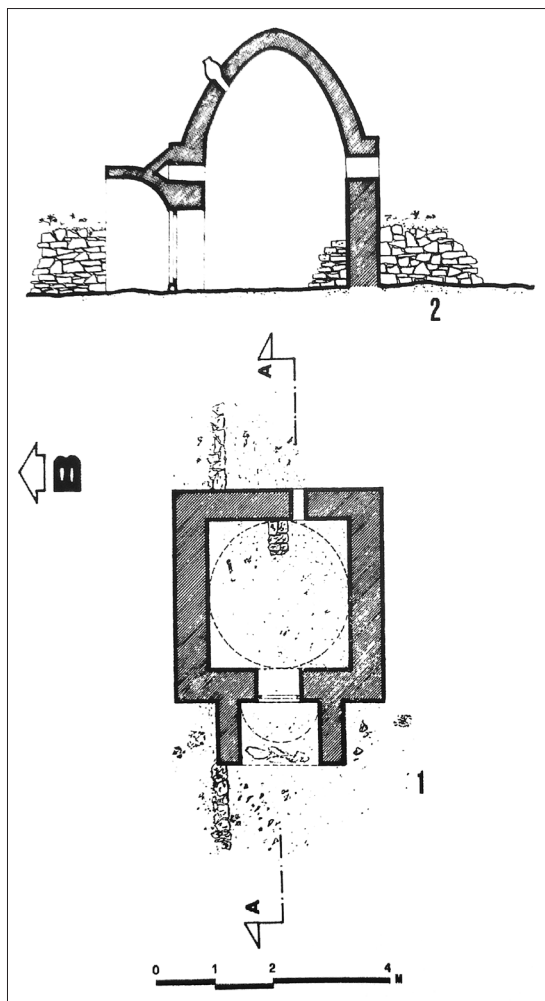


Figure 24. Saria. Plan and section of building type B'. Moutsopoulos (1978), p. 354

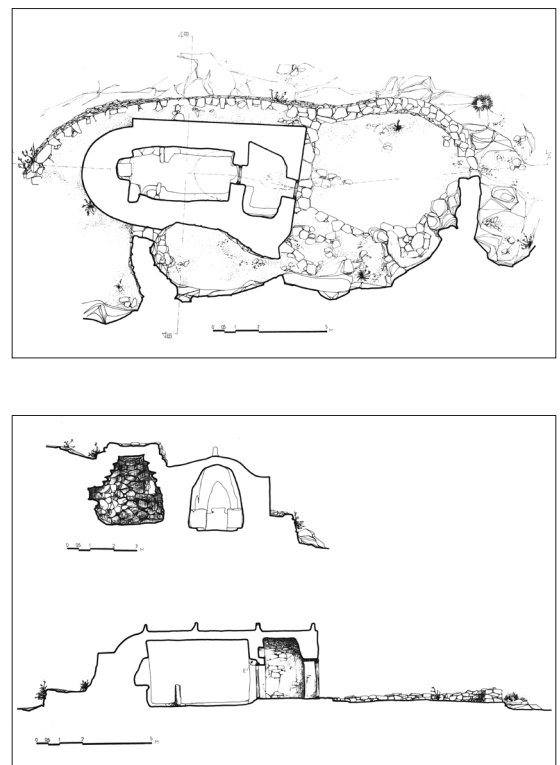


Figure 25. Chalke. Enniameritissa. a. b. Plan and section by Pl. Theocharides, made in 1968, as part of a project of the Aristotelian Polytechnique School of Thessaloniki, under his then professor N. Moutsopoulos. Pl. Theocharides' personal archive.