

# Roman and Early Byzantine Sarcophagi of Calcitic Marble from Thasos in Italy: Ostia and Siracusa

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**Attanasio, Donato; Herrmann, John J.; Tykot, Robert H.; van den Hoek, Annewies**

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# ROMAN AND EARLY BYZANTINE SARCOPHAGI OF CALCITIC MARBLE FROM THASOS IN ITALY: OSTIA AND SIRACUSA

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## Abstract

Four sarcophagi in Ostia and one in Siracusa are made of marble that appears macroscopically to be from the island of Thasos. Samples were analyzed with stable isotope ratios of carbon and oxygen. In addition, the Siracusa sarcophagus was analyzed with electron paramagnetic resonance spectroscopy (EPR), and the maximum grain size (MGS) and color were measured. The analyses confirm that the sarcophagi were made of marble from Aliko on Thasos. The Ostian pieces date from the third century, and the Early Byzantine example in Siracusa can be dated to between 590-620 CE.

## Keywords

stable isotopes, EPR, maximum grain size, Thasos, Aliko, sarcophagi, third century, post-Justinianic

## Thasian calcitic sarcophagi in the West: previous research

Sarcophagi made of calcitic marble from Thasos were frequently exported to nearby Thessaloniki,<sup>1</sup> but in Italy they seem to be rarities. So far the only examples identified are unfinished chests in a cargo that sank around 200 CE off Torre Sgarrata near Taranto.<sup>2</sup> The cargo contained sarcophagi that came from both the calcitic marble quarries of Cape Fanari and the dolomitic marble quarries of the Cape Vathy-Saliara area on Thasos; the latter are well known as a source of sarcophagi for the Italian market.<sup>3</sup> The only other previously confirmation of a calcitic Thasian marble sarcophagus in the western Mediterranean, however, is a lid from the quarries of Aliko, Thasos in Arles.<sup>4</sup> Now, however, sarcophagi of

calcitic marble from Thasos can be identified in north Italy at Milan and Ravenna<sup>5</sup> and on the western side of the peninsula at Ostia and in Siracusa, Sicily. It will be these latter two sites that will occupy us here.

## Thasian calcitic sarcophagi at Ostia

Four sarcophagi at Ostia appeared to be of the grayish, very coarse-grained streaked and spotted calcitic marble of Thasos. One, inscribed for a Julius Tannonius Donatus, was complete to its lid (Fig. 1), while the others were fragmentary (Figs. 2-4). Samples from each sarcophagus, including the lid, were analyzed at the University of South Florida (USF), and the ratios of stable isotopes of carbon and oxygen proved to be compatible with the quarries at Aliko on Thasos (Table 1). Non-destructive pXRF analysis revealed no magnesium (Mg) and relatively low concentrations of manganese (Mn) and strontium (Sr). These data support the isotopic and other data assigning these objects to a large-grained, calcitic, Thasos-Aliko marble source.

## A Thasian calcitic sarcophagus in Sicily

A Christian sarcophagus in the Galleria Regionale di Palazzo Bellomo in Siracusa<sup>8</sup> is also made of a grayish marble with very large grain that appears macroscopically

1 STEFANIDOU-TIVERIOU, 2009; MANIATIS *et al.* 2010.

2 GABELLONE 2009; CALIA 2009.

3 HERRMANN 1999; HERRMANN 2014, 1289-1291.

4 HERRMANN *et al.* 2002, 345, Table 1, no. 48 (lid with masks, Cloister of S. Trophime).

5 HERRMANN *et al.*, in this volume.

6 AGNOLI 1953, 230, B29, PL. 97.

7 MAZZOLENI 1979, 81-83, Nr. 1; fig. 1; AE 1983: from the excavations of S. Ippolito, Isola Sacra. Translation: To the Manes. Iulius Tannonius Donatus has put a sarcophagus in this grave monument with the place being granted to him. But if someone puts in another body, he will pay to the treasury of the Roman people 50,000 sestertii.

8 Inv. 23545: Height 79, length 202, width 83 cm; from the chapel of San Rocco at the Civic Hospital of Siracusa, where it was used as an altar: TUSA 1995, 106, cat. no. 117, pl. 166.

USF #	location	identification	$\delta^{13}\text{C}$	$\delta^{18}\text{O}$	Mn	Sr
6145 (powder)	Ostia, Piccolo Mercato inv. SBAO46853 from Basilica of Pianabella <sup>6</sup>	Strigillated sarcophagus with corner column	3.1	0.2	--	--
27859 (chip)	"	"	2.9	-0.2	low	low
6146 (powder)	Ostia, Piccolo Mercato, unnumbered	Sarcophagus with crossed legs (Cupid? Season?) and (now missing) basket	3.5	-0.1	--	--
27860 (chip)	"	"	3.5	-0.1	low	low
27856 (chip)	Piazzale dei Marmi, chest, inv. P85	Strigillated sarcophagus of Julius Tannonius Donatus <sup>7</sup>	2.6	-1.7	--	--
27857 (chip)	Piazzale dei Marmi, lid, inv. P85A	Lid of preceding	3.0	-0.3	low	low
27858 (chip)	Near Porta Romana	Strigillated sarcophagus with pilasters	3.2	-0.0	low	low

Table 1. Sarcophagi at Ostia with marble from Aliki, Thasos



Fig. 1. Sarcophagus of Julius Tannonius Donatus. Ostia, Piazzale dei Marmi, P85, P85A (lid). Marble from Aliki, Thasos, 2<sup>nd</sup> half of 3<sup>rd</sup> century

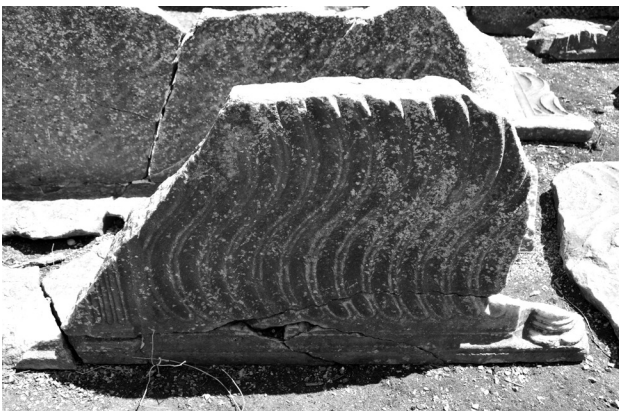


Fig. 2. Fragmentary strigillated sarcophagus, from Pianabella, Isola Sacra. Ostia, Piccolo Mercato, inv. SBAO46853. Marble from Aliki, Thasos, 3<sup>rd</sup> century



Fig. 3. Fragmentary sarcophagus with Eros or Season with crossed legs. Ostia, Piccolo Mercato, unnumbered. Marble from Aliki, Thasos, 3<sup>rd</sup> century





Fig. 4. Strigillated sarcophagus, Ostia, Via delle Tombe, unnumbered. Marble from Aliko, Thasos, 3<sup>rd</sup> century

to come from the island of Thasos (Figs. 5-6). Two small chip samples were taken and were analyzed at the Istituto di Struttura della Materia, CNR, Roma (ISM) with multiple techniques: paramagnetic resonance spectroscopy (EPR), stable isotope ratios of carbon and oxygen, maximum grain size (MGS), and color. The analyses confirmed that this sarcophagus was also made of marble from the quarries of Aliko on Thasos (Table 2, Figs. 7-8).

#### Probable quarry of origin for the Siracusa sarcophagus

Analysis by linear discriminant function of the 6 variables in Table 2 are shown graphically in Fig. 8. Distance represents the distance of the sample from the center point of a field. Relative probability assumes that the sample belongs to one of the groups in the selection.

Description	Site	Distance a.u.	Rel. prob.	Abs. prob.
			%	%
Sample O	Th Aliko	7.5	84	27
Sample U	Th Aliko	8.2	85	22

Table 2. Shown graphically in Fig. 8. Distance represents the distance of the sample from the center point of a field

Even if not especially high, the absolute probability is well above the threshold and confirms, in agreement with the isotopic results, that the provenance of the marble from Thasos is clear and unquestionable. The rate of success of the method is 77%. This means that 77% of the database samples are correctly re-assigned to their true quarries of provenance using the statistical classification rule. The unknown sample is assigned to the most probable quarry of

provenance and the results are deemed to be statistically reliable if the probability values are above their thresholds.

#### Discussion, chronology, and historical significance

The chests of the four sarcophagi in Ostia (Figs. 1-4) were clearly decorated in Ostia or Rome, probably in the 3<sup>rd</sup> century.<sup>9</sup> The inscription of Tannonius has been dated to the second half of the third century. In three cases the front of the chest is strigillated, and one is carved with a pair of legs and a basket, probably from a harvest or Bacchic scene. All these motifs are Western and alien to northern Greece. The lid of the sarcophagus of Tannonius (Fig. 1), on the other hand, is very similar to lids in the north Aegean. In Thessaloniki and on Thasos, Thasian marble sarcophagi often have double-sloped lids like this one with carefully detailed roof tiles and acroteria decorated with half-palmettes.<sup>10</sup> The Tannonius sarcophagus apparently arrived in Ostia with a finished lid and an undecorated chest; the combination is also known from Thasos itself.<sup>11</sup>

In the late second and the third century, Rome imported many unfinished marble chests from the Proconnesian quarries. Thasian calcitic marble resembles Proconnesian, and the Thasian sarcophagi may represent an attempt to capture a part of the trade in low-cost,

9 On local workshops near the cemetery, see AGNOLI 2008, 203; TORRES 2008, 167.

10 STEFANIDOU-TIVERIOU, 2009, fig. 4; MANIATIS *et al.* 2010, fig. 4.

11 STEFANIDOU-TIVERIOU, 2009, fig. 4.

ISMNo.	Description, Dating	MGS mm	$\delta^{18}\text{O}$ ‰	$\delta^{13}\text{C}$ ‰	EPR Intensity %	EPR Linewidth %	Color %
<b>1</b>	<b>Pal. Bellomo inv. 23545, sample O</b>	<b>1.7</b>	<b>0.07</b>	<b>3.18</b>	<b>65.9</b>	<b>56.8</b>	<b>78</b>
<b>2</b>	<b>Pal. Bellomo inv. 23545, sample U</b>	<b>1.7</b>	<b>--</b>	<b>--</b>	<b>79.5</b>	<b>54.8</b>	<b>82</b>
1	Aphrodisias 102 samples	2.1 0.1/4	-3.53 -6.5/-2	1.36 -2.7/2.6	43.6 3/276	53.8 37/72	82 52/95
2	Ephesos 1 88 samples	1.74 0.4/4.6	-4.42 -8.3/-2.2	3.81 -0.6/5	60.0 15/51	56.4 42/73	75 41/91
3	Ephesos 2 38 samples	1.71 1.3/2.4	-3.14 -4.3/-2.6	0.35 -0.8/1.5	41.8 23/69	45.5 39/60	76 62/87
4	Herakleia 51 samples	1.62 0.4/3.5	-2.59 -3.4/-1.2	1.74 -0.1/2.9	22.6 2/123	53.2 41/74	70 39/90
5	Miletos 56 samples	1.49 1/2.5	-2.56 -4/-1	2.05 1.2/2.6	17.7 3/129	53.2 41/71	82 64/93
6	Naxos Apollonas 10 samples	3.47 2/5	-11.7 -14/-9	2.28 1.9/2.6	71.1 35/126	60.2 41/81	85 83/92
7	Naxos Melanes 33 samples	5.15 3.5/8	-5.13 -10/-2.6	1.86 1.4/2.3	113 18/599	49.4 38/73	78 69/89
8	Paros I 41 samples	1.7 1/3.1	-3.25 -4/-2.6	4.27 3/5.1	8.6 3.6/23	48.6 41/59	85 64/95
9	Paros II Cho 62 samples	2.07 0.9/3	-1.11 -2.6/-0.6	1.79 0.5/2.2	19.5 2/37	47.9 40/57	84 71/96
10	Paros II Ma 28 samples	2.11 1/3	-2.59 -4.2/-1.9	1.97 -0.6/3.4	9.8 4/50	52.0 42/59	80 68/930
11	Pentelicon 154 samples	0.96 0.6/1.8	-7.00 -9/-3.8	2.63 1.9/4.1	226.3 13/1009	58.2 38/100	90 68/97
12	Proconnesos 1 380 samples	1.72 0.4/3.5	-2.08 -5.2/-0.3	2.65 -0.9/3.9	6.0 0.8/46.4	57.8 37/87	77 54/95
13	Thasos Aliko 76 samples	3.84 2.4/7.5	-0.73 -4.7/0.5	2.98 1.5/3.6	131 4/523	55.7 46/69	79 59/871

Table 2. Analytical data for the two samples of the Siracusa sarcophagus inv. 23545 compared with a selection of marble groups considered to be possible provenances. Group properties include the mean and extreme values.



Fig. 5-6. Sarcophagus with three crosses, Galleria Regionale di Palazzo Bellomo, Siracusa, inv. 23545. Marble from Aliko, Thasos, ca. 600 CE

grayish marble between the Proconnesus and the West. The rather dark color of the Tannonius sarcophagus and its coarse grain, which makes reading its inscription rather difficult, may have contributed to making the Thasian less popular than the Proconnesian sarcophagi.

The sarcophagus in Siracusa (Figs. 5-6) has a Christian decoration and is much later in date than the Ostian pieces. Its front is decorated with three crosses, each mounted on two steps. Between the crosses appear disks, which were probably intended to be carved as stars or rosettes. The back of the sarcophagus has three crosses without steps or intervening disks.

The sarcophagus has been dated to the eighth century,<sup>12</sup> and the general composition of three Latin crosses can be paralleled on several sarcophagi of the eighth and ninth centuries in Ravenna.<sup>13</sup> If eighth century in date, the decoration would have been applied long after the chest in Siracusa was shipped from Thasos; there are no indications that the marble trade between the Aegean and Italy continued at such a late date. Thasos itself was

apparently devastated by Slavic invaders around 620,<sup>14</sup> presumably putting an end to the island's marble trade.

Both the chest and its decoration, however, appear to be before the eighth century. The chest does not appear to be reused or recut; close inspection reveals no trace of earlier carving. The decoration is rather irregular, but so is the shape of the chest. Everything seems tilted, both the crosses and the contours of the chest, so that the sarcophagus seems intended to be placed on a slope. Sarcophagi decorated with three Latin crosses also appear in Early Byzantine times; there are examples in southern Italy, at Capri<sup>15</sup> and Messina (Fig. 9)<sup>16</sup> that may be of the late sixth or early seventh century, and crosses are enclosed in niches and/or accompanied by lambs or peacocks in late fifth and early sixth century sarcophagi at Ravenna (Fig. 10).<sup>17</sup> Three crosses appear sporadically in the East, but much more common is a variant with a cross or christogram in a roundel flanked by Latin crosses.<sup>18</sup> The three-cross motif, however, is known on Thasos itself: the composition appears on an Ionic impost capital of the mid-sixth century found at the Aliko quarries (Fig. 11).<sup>19</sup> In general, the simple crosses on the Palazzo Bellomo sarcophagus resemble Early Byzantine rather than Carolingian crosses, whose ends are usually embellished with curls.

It is likely that the Bellomo sarcophagus dates from late in the Early Byzantine period. A cross on a stepped podium seems to be a relatively late motif. The earliest example seems to be on a sarcophagus in Ravenna dated to the late fifth century (Fig. 12).<sup>20</sup> The Ravenna example is quite different from that in Siracusa; there are five steps instead of two, and two rivers of paradise flow from them. On an ambo, apparently of Proconnesian marble, in the Church of Al Mo'allaqa, Cairo a cross stands on three steps (Fig. 13).<sup>21</sup> The ambo is also decorated with a shell niche that resembles niches on sarcophagi

12 TUSA 1995, 106, cat. no. 117.

13 LAWRENCE 1945, figs. 71-73; VALENTI ZUCCHINI, BUCCI 1968, cat. nos. 60, 61, 65, 66.

14 METCALF 1962; HOLTZMANN 1994, 92; GRANDJEAN, SALVIA *et al.* 2000, 33.

15 BOVINI, BRANDENBURG 1967, cat. 813. The curling ends and the outlined borders of the crosses seem post-Justinianic.

16 TUSA 1995, cat. no. 42-43, pls. 62-64; SODINI 2012, p. 82 for the 6<sup>th</sup> – 7<sup>th</sup> century date.

17 VALENTI ZUCCHINI, BUCCI 1968, cat. nos. 30, 31b, 37b.

18 KOCH 1996.

19 SODINI, KOLOKOTSAS 1984, 4, pl 2b.; VEMI 1989, cat. no. 215.

20 LAWRENCE 1945, 32, 36, 37, fig. 57; VALENTI ZUCCHINI, BUCCI 1968, cat. no. 27; KOLLWITZ, HERDEJURGEN 1979, 71-72, cat. no. B 21, pl. 8.1.

21 ATALLA 1989, 32-33.

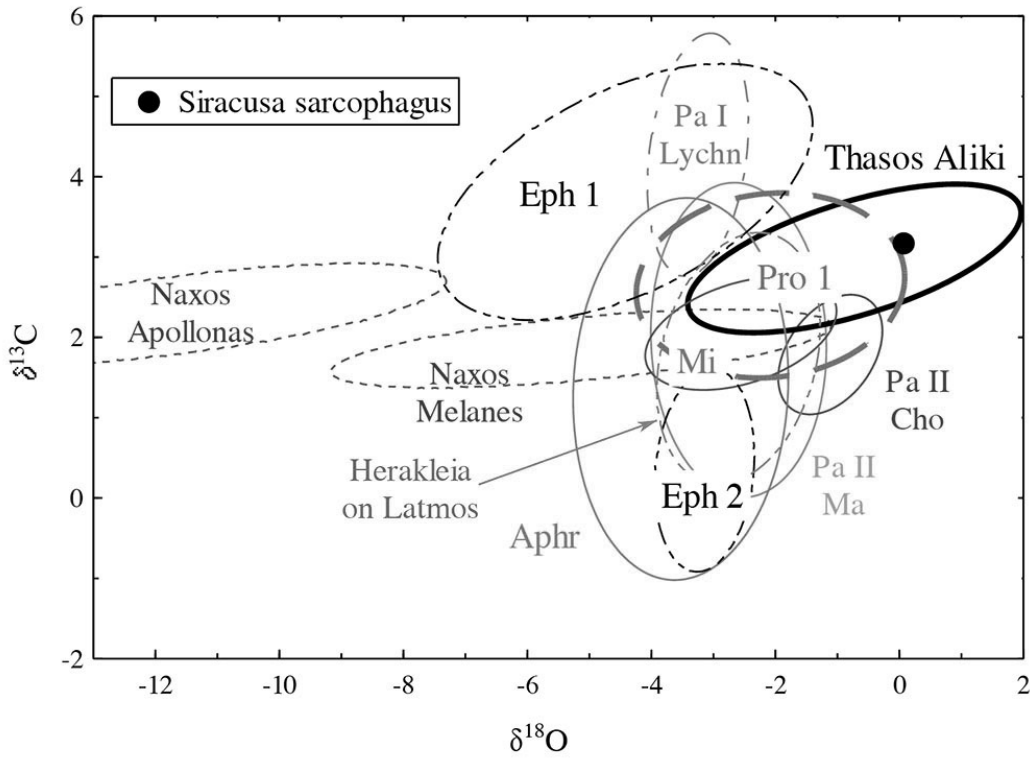


Fig. 7. Isotopic diagram for the Sarcophagus with three crosses, Palazzo Bellomo

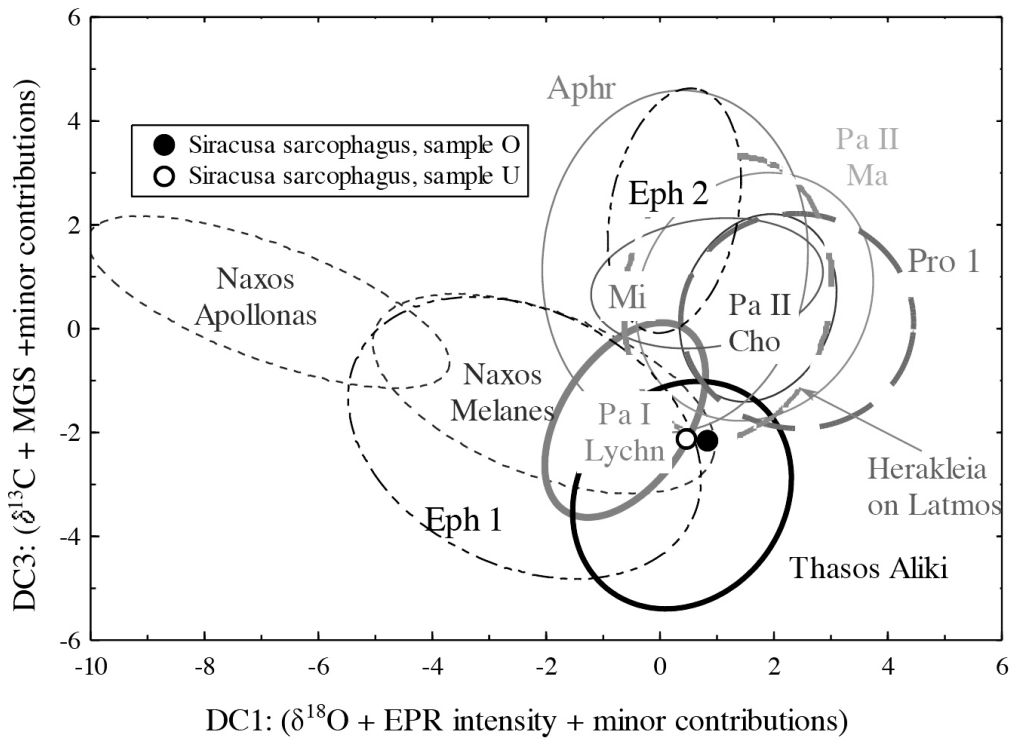


Fig. 8. Diagram of 6 variables for the Sarcophagus with three crosses, Palazzo Bellomo

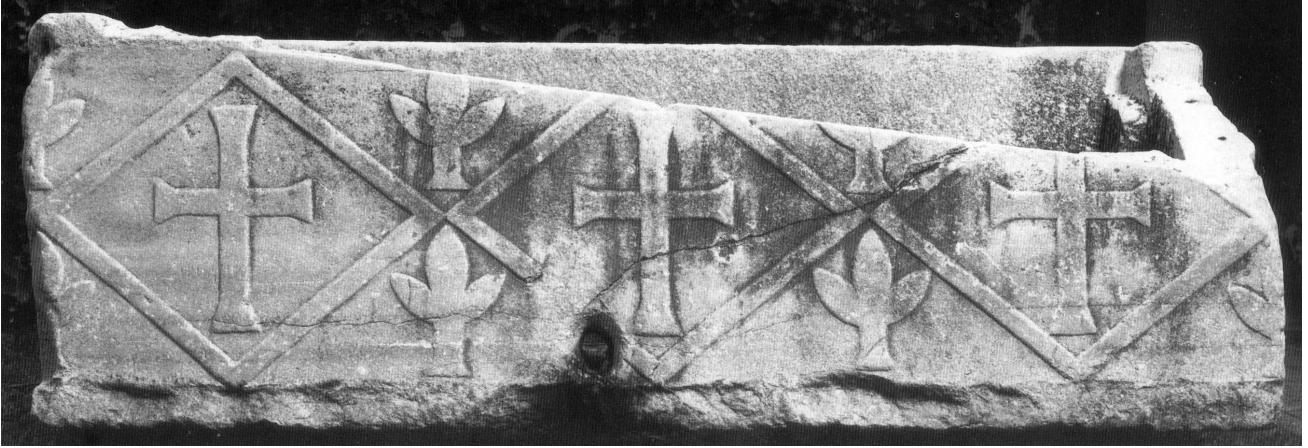


Fig. 9. Sarcophagus with three crosses in diamonds, unknown marble, reworked for Christian use, 6<sup>th</sup> or early 7<sup>th</sup> century, Messina, Museo Regionale (photo: TUSA 1995, cat. 42)



Fig. 10. Sarcophagus with three crosses in niches, probably Proconnesian marble, 500-525 CE, S. Apollinare in Classe, Ravenna



Fig. 12. Cross on steps with rivers of paradise, probably Proconnesian marble, sarcophagus of 3<sup>rd</sup> century, recut with Christian imagery, ca. 480-500 CE, S. Francesco, Ravenna



Fig. 11. Ionic Impost capital, probably Aliko marble, Aliko, Thasos, second half 6<sup>th</sup> century CE



Fig. 13. Ambo platform, probably Proconnesian marble, 500-525 CE, Al Mo'allaqa, Cairo

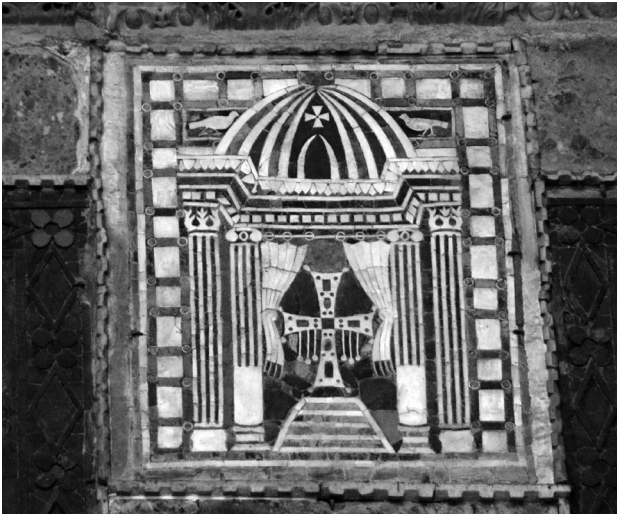


Fig. 14. Marble inlay with cross on staircase, 527-563 CE, Hagia Sophia, Istanbul

in Ravenna of the late fifth and early sixth centuries.<sup>22</sup> A cross on steps, this time four in number, appears in an inlaid marble panel in Hagia Sophia, Constantinople, built and repaired by Justinian (527-565) (Fig. 14).<sup>23</sup> The main period of use of the stepped cross motif is in post-Justinianic times; a cross on four steps became a standard motif on Byzantine gold coins (solidi) from time of Tiberius II (578-82)<sup>24</sup> well into the eighth century (Fig. 15). Crosses on steps appear on ambos on Paros that have been dated around 600 (Fig. 16).<sup>25</sup> A cross on a globe above three steps appears on Byzantine silver coins (hexagrams) from 610-685 (Fig. 17) and on a 7<sup>th</sup> or 8<sup>th</sup> century Proconnesian marble parapet from Alacam on the Black Sea coast of Turkey (Fig. 18).<sup>26</sup> A cross on three steps appears in the apse mosaic of Hagia Irene, Constantinople, shortly after 753 (Fig. 19).<sup>27</sup> Stepped crosses are incised in the quarries of Proconnesus,<sup>28</sup> and



Fig. 15. Gold solidus of Constans II, Syracuse mint, 641/2 CE. Classical Numismatic Group, Triton IX, lot 1635 (photo: Coinarchives.com)

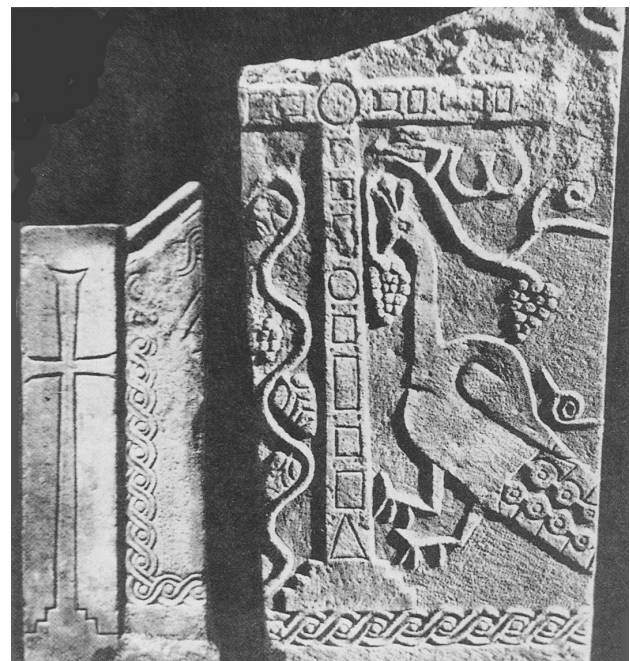


Fig. 16. Ambo fragments, probably Parian marble, 7<sup>th</sup> century, Katapoliani, Paros (photo: ALIPRANTIS 1993, Fig. 101)

several are accompanied by inscriptions and abbreviations typical of the ninth century and later.

The modest level of workmanship of the Siracusa sarcophagus probably indicates that it is not an especially early example of the cross on steps motif. Its “reduced” arrangement with only two steps also suggests a relatively late date; a two-step arrangement is seen in one of the ambo panels from Paros of ca. 600 (Fig. 12) and the chancel barrier from Alacam (Fig. 14). The Palazzo Bellomo sarcophagus then could well have been both quarried and decorated around 570-610. Since sarcophagi were usually shipped from Thasos in an unfinished state,<sup>29</sup> it is likely that the Palazzo Bellomo example was decorated in Sicily.

22 VALENTI ZUCCHINI, BUCCI 1968, cat. nos. 28-31.  
 23 UNDERWOOD 1960, 206-208, fig. 1. Possibly from the restorations of 558-563. KRAUTHEIMER 1975, 215. See also <http://www.pallasweb.com/deesis/hagia-sophia-inlaid-panels.html> (with additional color illustrations). [https://commons.wikimedia.org/wiki/File:Istanbul.Hagia\\_Sophia023.jpg](https://commons.wikimedia.org/wiki/File:Istanbul.Hagia_Sophia023.jpg).  
 24 WHITTING 1973, 112; BARBER 2002, 83-87; cited in PICKETT.  
 25 ULBERT 1969/70, 344, 356, pl. 69.2, cat. 26; ALIPRANTIS 1993, 134-135, figs. 101-103 114, 115, 140.  
 26 EFFENBERGER 1989, 130, 136, 149.  
 27 OUSTERHOUT 2001, 6, figs. 1-3; [https://commons.wikimedia.org/wiki/File:Hagia\\_Eirene\\_Constantinople\\_2007\\_003.jpg](https://commons.wikimedia.org/wiki/File:Hagia_Eirene_Constantinople_2007_003.jpg).  
 28 ASGARI, DREW-BEAR, 3-4.

29 GABELLONE 2009; CALIA 2009; HERRMANN *et al.*, in this volume.



Fig. 17. Silver hexagram of Heraclius with Heraclius Constantine, Constantinople mint, 610-641 CE. Classical Numismatic Group, Auction 93, lot 1344 (photo: Coinarchives.com)



Fig. 18. Chancel barrier recarved with cross on globe and steps, probably Proconnesian marble, probably 7<sup>th</sup> century, from Alacam, Turkey, Berlin Museum (photo: <http://www.turizmhaberleri.com/haberayrinti.asp?ID=24989>)

## Conclusions

Macroscopic examination led to tentative identifications of sarcophagi in Ostia and Siracusa as Thasian, and isotopic analysis and analysis with EPR have confirmed these conjectures and established the origin of the sarcophagi in the calcitic marble quarries of Aliki. Previously, sarcophagi of calcitic marble from Thasos had been known only from shipwrecked cargoes, and these new identifications add substance to the trade in prefabricated

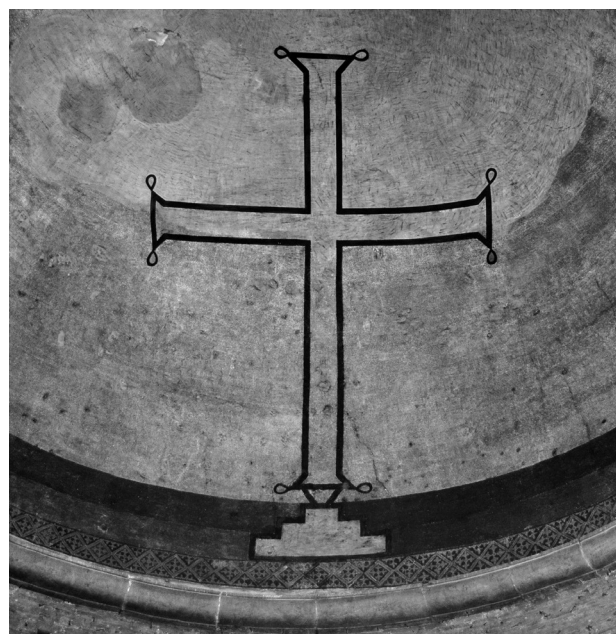


Fig. 19. Mosaic with cross on steps, shortly after 753, Hagia Irene, Istanbul

and semifinished sarcophagi from Thasos in Italy. Art historical study of the decoration and workmanship of the sarcophagi provide chronological markers. The chests in Ostia were decorated locally in the third century, but the lid of one of them seems to have been both extracted and decorated on Thasos. The sarcophagus in Siracusa was extracted and decorated on Thasos in the late sixth or early seventh century. This result is important in establishing that marble products were exported from Thasos to Italy toward the end of the Early Byzantine period and thus at a much later date than previously known.

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## BIBLIOGRAPHY

- AE 1983 = *L'année épigraphique*, 1983, p. 44, no. 135.  
 AGNOLI N. 1953: "I sarcophagi e le lastre di chiusura di loculo," in *Scavi di Ostia 12: La basilica Cristiana di Pianabella*, Roma, 203-302.

- ALIPRANTIS TH. 1993: Η ΕΚΑΤΟΝΤΑΠΥΛΙΑΝΗ ΤΗΣ ΠΑΡΟΥΣΙΑΣ/Paros. Ekatonrapyliani, Thessaloniki.
- ASGARI N., DREW-BEAR T. 2002: "The quarry inscriptions of Proconnesus", in *ASMOSIA V*, 1-19.
- ATALLA N. S. 1989: *Coptic Art/L'art Copte*, Vol. II: Sculpture-Architecture, Cairo.
- BARBER C. 2002: *Figure and Likeness: On the Limits of Representation in Byzantine Iconoclasm*, Princeton.
- BOVINI G., BRANDENBURG H. 1967: "Rom und Ostia", in F. W. DEICHMANN (ed.): *Repertorium der christlich-antiken Sarkophage*, Wiesbaden.
- CALIA A., GIANNOTTA M., LAZZARINI L., QUARTA G., 2009: "The Torre Sgarrata wreck: Characterization and provenance of white marble artefacts in the cargo", in *ASMOSIA VII*, 333-342.
- DRESKEN-WEILAND J. 1998: "Überlegungen zur weströmischen Plastik des späten 5. und 6. Jh.", *Acta XIII Congressus Internationalis Archaeologiae Christianae*, Split-Poreč, 301.
- EFFENBERGER A. 1989: "Studien zu den Bildwerken der Frühchristlich-byzantinischen Sammlung III: Das Petrusrelief von Alaçam", *Forschungen und Berichte* 27, 120-154.
- GABELLONE F., GIANNOTTA M., ALESSIO A., 2009: "The Torre Sgarrata wreck (South Italy): Marble artefacts in the cargo", in *ASMOSIA VII*, 319-331.
- GRANDJEAN Y., SALVIAT F. *et al.* 2000: *Guide de Thasos*, Paris.
- HERRMANN J., 1999: "The Exportation of Dolomitic Marble from Thasos, A Short Overview," in A. MULLER (ed.): *Thasos, Matières premières et Technologie de la préhistoire à nos jours*, 57-74.
- HERRMANN J., BARBIN V., MENTZOS A., REED R., 2002: "Architectural Decoration and Marble from Thasos: Macedonia, Central Greece, Campania, and Provence," in *ASMOSIA VI*, 329-356.
- HERRMANN J., ATTANASIO D., VAN DEN HOEK A. 2014: "Marble from the Fringes and Sculpture at Rome: The Case of Thasian Marble in the Musei Comunali", XVIII CIAC, Center and periphery in the ancient world, Merida.
- HERRMANN J., TYKOT R., VAN DEN HOEK A. in this volume: "Calcitic Marble from Thasos in the North Adriatic Basin: Ravenna, Aquileia, and Milan", in *ASMOSIA XI*.
- HOLTZMANN B. 1994: "La sculpture di Thasos: Corpus des reliefs I: Reliefs à theme divin", *Études thasiennes XV*, Athens and Paris.
- KOCH G. 1996: "Sarkophage des 5. Und 6. Jahrhunderts im Osten des römischen Reiches", *Acta XIII Congressus Internationalis Archaeologiae Christianae*, Split-Poreč, 439-478.
- KOLLWITZ J., HERDEJURGEN H. 1979: *Die Sarkophage der westlichen Gebiete des Imperium Romanum*, 2: Die ravennatischen Sarkophage, Berlin.
- KRAUTHEIMER R. 1975: *Early Christian and Byzantine Architecture*, Harmondsworth, Baltimore, Ringwood.
- LAWRENCE M. 1945: *The Sarcophagi of Ravenna* (*Art Bulletin*, Monographs 2).
- MANIATIS Y., TAMBAKOPOULOS D., DOTSIK. E., STEFANIDOU-TIVERIOU T. 2010: "Marble Provenance Investigation of Roman Sarcophagi from Thessaloniki", *Archaeometry* 52, 1, 45-58.
- MAZZOLENI D. 1979: *Quaderni dell'Istituto di Lingua e Letteratura Latina*, 81-83.
- METCALF W. 1962: "The Aegean Coastlands Under Threat. Some Coins and Coin Hoards from the reign of Heraclius", *Annual of the British School at Athens* 57, 14-23.
- PICKETT J., *Iconoclasm and the Mosaics of Hagia Eirene, Constantinople* [https://www.academia.edu/690187/Iconoclasm\\_and\\_the\\_Mosaics\\_of\\_Hagia\\_Eirene\\_Constantinople](https://www.academia.edu/690187/Iconoclasm_and_the_Mosaics_of_Hagia_Eirene_Constantinople).
- SODINI J.-P., KOLOKOTSAS K. 1984: "Alikii II: La basilique double", *Études thasiennes X*.
- SODINI J.-P. 2012: "Un sarcophage retravaillé du Musée de Messine: remarques sur la date possible de cette réfection," in G. KOCH, F. BARATTE (ed.): *Akten des Symposiums "Sarkophage der Römischen Kaiserzeit: Produktion in den Zentren – Kopien in den Provinzen"* – „Les sarcophages romains: centres et périphéries“, Paris, 2. – 5. Nov. 2005. *Sarkophag-Studien* 6 (Ruhpolding 2012), 79-83.
- STEPHANIDOU-TIVERIOU, T. 2009: "Thasian Marble: A Connection between Thasos and Thessaloniki", in *ASMOSIA VII*.
- TORRES M. L. 2008: *Christian Burial Practices at Ostia Antica: Backgrounds and Contexts with a Case Study of the Pianabella Basilica*.
- TUSA V. 1995: *I sarcofagi romani in Sicilia*, Roma.
- ULBERT T. 1969/70: "Untersuchungen zu den byzantinische Reliefplatten des 6. Bis 8. Jahrhunderts", *Istanbuler Mitteilungen* 19/20, 339-357.
- UNDERWOOD P. 1960: "Hagia Sophia: Inlaid Panels from Above the Royal Door", *Dumbarton Oaks Papers* 14, 205-222.
- VALENTI ZUCCHINI G., BUCCI M. 1968: *Corpus della scultura paleocristiana bizantina ed altomedioevale di Ravenna*, 2: I sarcophagi a figure e a carattere simbolico, Roma.
- VEMI V. 1989: *Les chapiteaux ioniques à imposte de Grèce à l'époque paléochrétienne*, Paris.
- WHITTING P. D. 1973: *Byzantine Coins*.