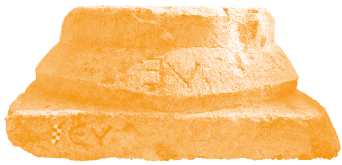
Multiple stonecutters' marks on marble in the Late Antique Mediterranean: distribution, function, and meaning



Abstract: Masons' marks can be seen as informative symbols designed to convey one or more pieces of information from stonemasons or officials to other actors involved in the carving and building process. As such, when evaluated in their respective archaeological contexts, they can shed light on the artisanal and technical dynamics at play at different stages of work on building sites. In Late Antiquity, the alphabetic characters, usually carved on stone elements only once, had the form of single letters, multiple letters in ligature, or monograms. However, the marked objects were often double-numbered or, more rarely, engraved with multiple groups of marks. A thorough study of this phenomenon aims to explain the function of these marks and their significance for the workflow. In some cases, assembly or positioning marks are coupled with workshop marks, indicating the need of different groups of craftsmen to convey specific technical information. In other cases, more than one workshop is recorded on a single piece, providing data on the complexity of the craftsmanship, on the labor effort involved, and thus on the economic dimension of the project. This paper attempts to reassess the phenomenon of multiple masons' marks in its historical and geographical dimensions, with a focus on the building sites of the imperial capital and further reference to other archaeological examples throughout the Mediterranean.

Keywords: Late Antique and Early Byzantine marble furnishings, masons' marks, stonecutters' marks, multiple marks, stone workshops, building sites, Constantinople cisterns, Hagia Sophia

Giulia Marsili

University of Bologna, Department of History and Cultures

Polish Archaeology in the Mediterranean 32/1
Marsili 2023: 31–54
https://doi.org/10.37343/uw.2083-537X.pam32.1.02

INTRODUCTION

In Late Antiquity, the emergence of imposing sites for construction of both civic and religious buildings made the stone industry one of the most dynamically developing production sectors, supplying materials for masonry work and, above all, for furnishings. This progress led to an increase in the number of stone workshops in operation and to the reorganization of their management and work processes. Beginning in the mid-4th century AD, several local, quarry-based workshops began to operate in response to a variety of local architectural needs, and regional stonecutters' workshops flourished in association with them. The activities of these local workshops can be easily identified by investigating the petrographic characteristics of their products and their stylistic features. An example is a marble workshop in Nicopolis ad Nestum in Bulgaria, which was engaged in the production of distinctive architectural furnishings marketed both locally and in the neighboring regions (Vaklinova 1984; Petrova 2012: 338–348). In Ćurlina, Serbia, the study of Ionic impost capitals of an early Christian basilica has allowed the identification of a marble workshop that was active on many contemporary building sites in the province of Niš (Rakocija 2017). In northern Macedonia, a recent archaeometric analysis of marble objects from highland archaeological sites has confirmed the involvement of workshops associated with the Sivec quarries, which adopted the style and repertoire of the Prokonnesos and Dokimeion stone workshops for their products and disseminated them outside the Constantinopolitan and Anatolian marble networks (Niewöhner, Audley-Miller, and Prochaska 2013). In Lykia, in the district of Alacadağ, particular carving techniques identified on artifacts in local limestone from several sacral complexes can be traced to a single workshop that followed the stylistic and formal repertoire of Justinianic sculpture from Constantinople (Harrison 1963; Grossmann and Severin 2003: *passim* and 141–176). The artisanal vitality of the region is also confirmed by the architectural sculpture of the so-called Sun City Basilica in Ölüdeniz, where the presence of numerous unfinished architectural elements in local stone suggests that a dynamic sculpture workshop operating from the neighboring island of Lebissos was active in the coastal cities (Asano 2010). In Apamea, Syria, several residential and ecclesiastical complexes, including the "maison aux colonnes bilobées", the "maison des chapiteaux à consoles", the "église à atrium" and the "cathédrale de l'Est", featured artifacts in local limestone, sometimes painted red, testifying to the creativity of the district's stone workshops, which were not only skilled in carving local stone but also drew on models from other regions (Vanderheyde 2020).

In addition to regional quarries, some of the major extraction sites, such as Thasos (Sodini, Lambraki, and Kozelj 1980; Kozelj and Wurch-Kozelj 1995; Herrmann, Barbin, and Mentzos 1999; Herrmann Jr. and Newman 1999; Mentzos, Barbin, and Hermann 2002; Kozelj and

Wurch-Kozelj 1999; 2005), Dokimeion (Waelkens 1982; Kramer 1994; Herrmann Jr. and Tykot 2009; Niewöhner 2013; 2014), and Prokonnesos, which were active already in Imperial times, continued to be intensively exploited. Worth mentioning in the context of stonecutters' workshops is the emblematic case of the Marmara quarries, which managed to extract an enormous amount of stone during Late Antiquity and operated under a specific management system until at least the 7th century (Marsili 2019: 53–78, with further references) [*Fig. 1*]. In fact, due to their geographical proximity to the imperial capital, the Marmara quarries were exploited on an unprecedented scale from the end of the 4th century AD onwards, yielding products for the adornment of Constantinople as well as provincial cities. The quarries flourished because of their location by the sea and their close relationship with the capital. The same factors probably motivated the Prokonnesian workshops to develop a highly efficient operational chain, characterized by a progressive rationalization of the production technology, as well as an acceleration of the manufacturing process (Marsili 2023; Marsili and Lamanna 2023). In line with these changes, in the same period, marble furnishings began to be increasingly labeled with epigraphic marks that provide insights into the large workforce and the articulated craftsmanship of the marble industry.

STONECUTTERS' MARKS IN LATE ANTIQUITY: MORPHOLOGY, MEANING, AND MULTIPLE OCCURRENCES

Masons' or, rather, stonecutters' marks can be considered an important means of communicating technical information for work sites over long distances. They often consist of single letters, which, depending on the context, can be used as alphabetical or numerical indicators. Carved or painted, these initials, abbreviated names or monograms are used to label a wide range of architectural and liturgical artifacts originating from numerous Mediterranean contexts. Different actors involved in the construction chain, whether in artisanal or administrative tasks, were linked to these coded signs. In this system, the marks were intended to convey one or more pieces of information relevant for building or for accounting purposes. Thus, these marks are unique sources of information on the administrative organization of quarry districts and on the technical procedures used in carving and assembling stone furnishings. In addition, they shed light on the mode of operation of the workshops, their movement, and, on a broader scale, the functioning and economics of the stone industry in early Byzantium. A comparative analysis of the evidence related to the Prokonnesos quarries, amounting to some 3400 marks from several Mediterranean regions, has revealed the logic underlying their use. Essentially, it was possible to divide the marks into different groups based on their presumed purposes (Marsili 2019: 79–184). Marks carved by workers in or near quarry workshops played the following roles: indications related to the quality control carried out by *probatores*

(quality control officers) before export; destination or patrons' marks indicating the terminus or the person responsible for receiving the order; assembly or positioning marks, used as numerical guides for the correct positioning of architectural elements on the site. Workshop marks are closely linked to the activity and identity of artisanal units operating outside the quarries, probably in the vicinity of Constantinople, and primarily responsible for the initial roughing and dressing of the artifacts. Storage marks, which indicate the name of the owner of marble stocks, usually refer to a temporary deposit of artifacts awaiting their shipment to a final destination. In addition, there are disassembly marks, which can be considered as secondary marks, labeling the marble elements of dismantled buildings with the aim of reassembling them in secondary contexts (Marsili 2016: 153–154; Teatini 2019; Barker 2020: 124–142).

Alphabetic marks were usually carved on stone elements only once and had the form of single letters, ligatured characters, or monograms. However, it is noteworthy that many pieces are double-marked or, more rarely, several groups of marks are engraved on the same object. Evaluating them in their proper archaeological context makes it easier to determine the function and significance of these signs in the supply chain, as well as to illuminate the different stages of marble use that they track. To date, about 230 architectural elements in Prokonnesian marble, labeled with double or multiple marks, have been recorded from 34 different archaeological sites throughout the Mediterranean [*Fig. 2*]. Based on the methodological assumptions mentioned above, and taking into account the recognized function of each sign, these double or multiple marks can be divided into three main categories: 1)

Fig. 1. Marmara Adası, Saraylar harbor, semi-finished architectural elements (After Marsili 2019: 21, Fig. 8)

double series of alphanumeric marks; 2) numerals combined with other types of marks (mainly destination or workshop marks); 3) double series of workshop marks.

DOUBLE SERIES OF ALPHANUMERIC MARKS

In contrast to the Classical and Hellenistic periods, when stone carvers often used single letters to identify their workshops, in Late Antiquity isolated characters on stone usually had a numerical meaning. Only in rare cases can they be related to the identity of artisan groups. By and large, they were not used for quantitative purposes, for which stonecutters usually resorted to other strategies, such as the use of vertical tally marks [*Fig. 3*]. Rather, the individual letters served as positioning and assembly marks. This system uniquely embodies the customs deeply rooted in the laboriously developed collective technical knowledge of stonemasons. In earlier centuries, its primary purpose was to guide the assembly of adjacent marble segments, such as column drums or masonry blocks (Klimek 2013; Weber 2013; Kowalewska and Eisenberg 2019, all with references). In Late Antique architecture, the marking system was developed and adapted to fulfill two main technical purposes: when set in a sequence, the numerals were usually intended to assist in the proper spatial positioning of elements belonging to a series, such as components of architectural orders or parts of articulated liturgical furnishings. For example, in the episcopal church of Novae in Moesia Inferior, the pulpit is inscribed with five alphabetical signs set in a sequence, with spaces in between (Α, Δ, Ε, Ζ, Η) (Biernacki 1997: 72–76). In this context, the marks probably served as numerals to guide the assembly of the elements. At Philippi, the Π-shaped templon base in Basilica A, composed of adjoining pieces, bears a sequence of letters from E to Ξ (only Λ is missing) (Lemerle 1945: 396, Pls XXIV, XXXIII). When placed on adjacent

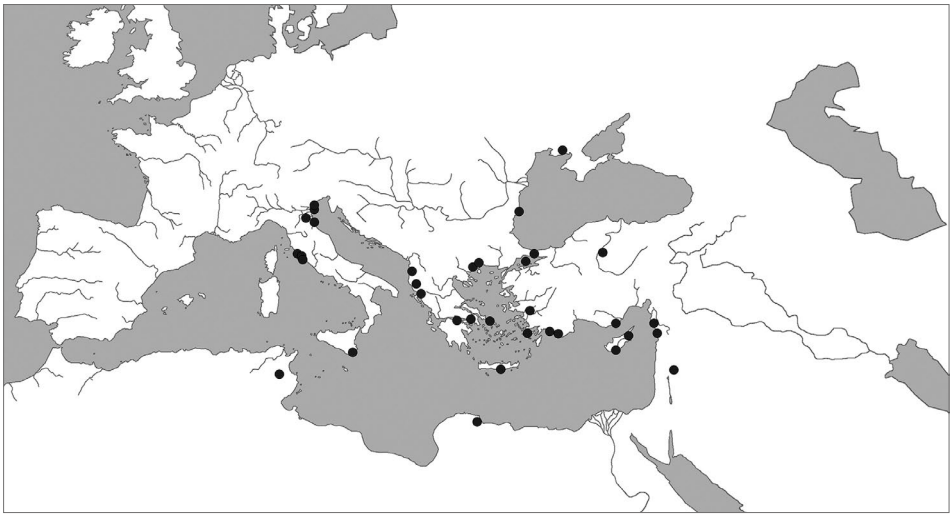


Fig. 2. Distribution of architectural elements inscribed with multiple marks (Processing G. Marsili)

pieces of furnishings to be assembled, the numerals were probably intended to guide the correct sequence of elements, as in the base–column–capital set, both in the nave order and in the mullions, or in segments of arcades and stylobates (for several examples, see Paribeni 2017; Marsili 2019: 100–114; for matching assembly instructions on elements of the order in the West Basilica in el-Atrun, see below, *Table 1*). In Late Antiquity, numerals are attested on more than 500 artifacts in different lithotypes from more than a hundred monuments located in 51 different archaeological contexts, and this number is likely to increase considerably in the future [*Fig. 4*]. Their distribution patterns attest to the existence of artisanal knowledge widely shared across regional boundaries. In addition, their technical characteristics reflect the existence of an organized workflow in quarries and worksites, as well as of an established system of communication between different actors of the construction industry.

Fig. 3. Burgaz Adası, semi-finished impost capital with tally marks (Deutsches Archäologisches Institut, negative No. D-DAI-IST-R8622)

Some information can be derived from the double series of single letters, which are clearly understood as numerals on the basis of their paleographic and epigraphic features. In this case, too, the practice differed from that of the Classical period, when double series of numerals usually reflected different

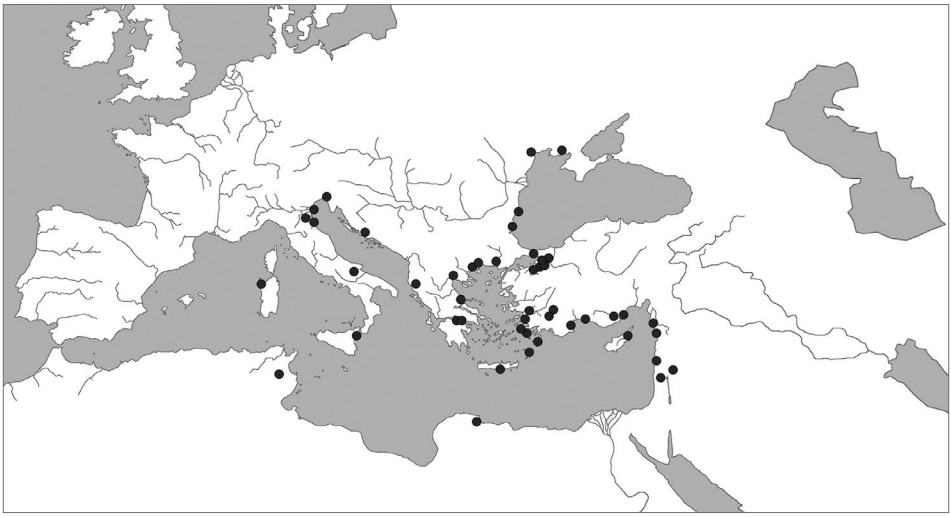


Fig. 4. Distribution of assembly/positioning marks (After Marsili 2019: 263, Pl. 2)

phases of construction and could be often interpreted as assembly and reassembly marks (Weber 2013: 339–349; Lippolis and Vallarino 2018: 179–188). In Late Antiquity, however, double numerals were likely intended to convey information about one construction episode and referred to the assembly and positioning of sets of furnishings. A column base and an Ionic impost capital stored in the "Casa Romana" on Kos, labeled with a lunate E on their upper and lower surfaces, respectively, are cases in point [*Fig. 5*]. The provenance of many of the architectural elements collected there is unknown (Militsi-Kechagia 2017; Baronio 2021). However, given the correspondence of the alphanumeric characters and the consistent sizes of the artifacts, it can be assumed that their assembly was guided by the letter E. Another letter, Γ, is carved on the upper surface of the column base, probably to provide additional guidance as to the exact location of the set, namely the third place in the colonnade.

In Istanbul, urban cisterns offer the second largest corpus of architectural elements bearing masons' marks, after the church of Hagia Sophia. According to a recent estimate, 209 covered cisterns have survived on the historic peninsula, most of them dating from the Late Antique period (Crow 2020). Their high number reflects the vital importance of this water provision system in sustaining the urban population and ensuring its survival with a sufficient water supply in case of siege or threats to the city's hinterland, where springs were located. The architectural features of most cisterns include reused columns, bases, and a variety of capitals, both finished and unfinished, damaged and relatively well preserved. Many of them probably came from old stocks

Fig. 5. Kos, "Casa Romana": a – a column base; and b – an Ionic impost capital inscribed with marks E and Γ (Photo G. Marsili)

and sometimes seem to have been recycled more than once, so only a holistic analysis of architectural sculpture, masonry style, and brick dimensions can provide information reliable enough to date the structures to which they belong (Altuğ 2018). The masons' marks on many of these elements have received little attention in the literature, with only sporadic mentions (Forchheimer and Strzygowski 1893: 247–258; Wulzinger 1913b; Mamboury and Wiegand 1934; Mamboury 1936; Deichmann 1976: 216–219; Marsili 2019: 79–173, *passim*). Nevertheless, they provide a ready means of detecting the different phases and strategies of use and reuse of the inscribed objects, especially when the pieces are marked more than once. A case in point is the Acımusluk Sokak cistern in the Fatih district, which dates from the middle Byzantine period, although it was built with reused materials (Altuğ 2013: 268–269). Partly explored by Ernst Wulzinger in the early 20th century (Wulzinger 1913a: 377–382), it consists of two rows of six columns surmounted by simple imposts of Prokonnesian marble. On the south side, three imposts are marked with the letters A, B, and Γ, probably to indicate their correct place in a sequence, given their corresponding first, second and third places in the row. A second mark, IA, carved upside down on the abacus of the third capital near the character Γ, can also be interpreted as a number (11). Its inverted position may suggest that it belonged to a different phase of the element's use and may have been related to the assembly or positioning of the capital when it was first mounted.

NUMERALS COMBINED WITH OTHER TYPES OF MARKS

The alphanumeric signs were frequently paired with other characters, such as destination or workshop marks. A prime example of the first category comes from the Kalenderhane Camii in Istanbul (Striker and Kuban 1997). The builders of this middle Byzantine church dedicated to the Panagia Kyriotissa made extensive use of materials salvaged from earlier buildings, probably not only from the early Christian church identified under the later structures, but also from neighboring districts. This is clearly indicated by three reused Corinthian capitals in the outer wall of the northern aisle, marked on their lower surfaces by two sets of marks conveying two different pieces of information [*Fig. 6*]. The first group, ΤΟΥ ΑΓΙΟΥ ΠΑΥΛΟΥ, was intended to indicate the final destination of the marbles, namely a church dedicated to St. Paul (for its hypothetical location: Berger 1997: 15–16). The second group consists of the numerals Γ, Δ, Ε, which can be interpreted either as accounting marks or as positioning marks. In the latter case, they may have indicated the exact position of the capitals within the building. Overall, the analysis of the combined groups of marks provides evidence for a single episode of dismantling the marble furnishings of a Late Antique religious complex and their reuse within a later ecclesiastical building, probably after an interval in storage.

A more common pattern is that of numerals combined with workshop marks. The latter consist of one or more letters —sometimes ligatured— and monograms, resolvable as personal names in

the genitive case (Marsili 2019: 120–184, with references). These marks appear with great frequency on Prokonnesian marble objects from the mid-5th century AD onwards, testifying to the impressive activity of the Marmara quarries, the structural organization of craftwork, and the internal management of stonecutters' workshops in Late Antiquity. What these marks meant in terms of the production and distribution dynamics of marble furnishings is still somewhat unclear, especially considering the ratio between marked and unmarked items. Nevertheless, both distribution patterns and comparative evidence suggest that they referred to the name of the chief stonemason, who supervised and vouched for the work of his team (Marsili 2019: 120–170). Thus, when a workshop marked a piece of marble, it can be assumed that the craftsmen of that workshop were involved in its dressing. The purpose of this marking system seems to go beyond the intention of declaring authorship out of concern for preserving the memory of individual involvement or for mere publicity purposes. Indeed, Late Antique stoneworkers achieved these goals in other ways, for example through extensive votive inscriptions (Marsili 2019: 86–87). Rather, the epigraphic, typological, and distributional characteristics of workshop marks allow us to infer more practical purposes, namely those related to record-keeping and production tracking. It goes without saying that these requirements were deeply interwoven with the economic and production background described above. In addition, the combined data on the manufacturing progress, the traces of tools, and the position of the marks suggest that these signs were usually carved after the rough dressing of the blocks. According to Nuşin Asgari's classification, this intermediate stage of processing was the first to be carried out by workshops located away from the quarries (Asgari 1992: Fig. 8II–III; 1995: Fig. 12C).

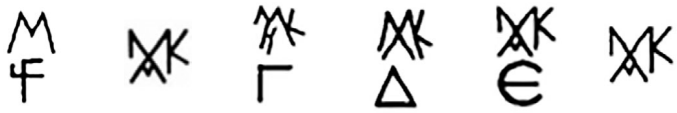
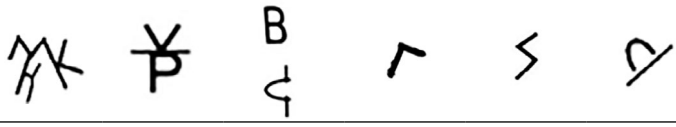
When unearthed in their original context of use, the primary meaning

Fig. 6. Istanbul, Kalenderhane Camii, Corinthian capitals with destination and positioning marks (Photo G. Marsili)

of alphanumeric signs combined with workshop marks is fairly easy to grasp and is usually related to placement. This is the case with some column bases from the upper order of the Western Basilica at El-Atrun, which are marked with the same workshop monogram on the lower band (MAK, in ligature) and the positioning signs Γ, Δ, E, set in sequence, on the upper surface (Ward-Perkins and Goodchild 2003: 29, 254–255) [*Table 1*].

The same pattern is documented in the basilica of St. John in Ephesos, where some column bases, located in the northern and southern aisles, are signed with the workshop mark ΓΕ/ΠΕ together with positioning marks, respectively Α, Δ and Γ, Δ (Marsili 2019: Cat. Nos 1762–1765) [*Fig. 7*]. Worth mentioning again is the case of the Constantinopolitan cisterns, where workshop marks are frequently coupled with numerals. In the cistern discovered in 1936 by Ernst Mamboury in Yeniçeriler Caddesi, Divanı Ali Sokak, four rows of six columns each are topped with roughed-out impost capitals and imposts. In 12 cases they are inscribed with the workshop marks **KY, ΙΩ, TP** (Mamboury 1936; Özgümüş 2008: 154; Altuğ 2013: 364–365) [*Fig. 8*]. Relevant is the instance of the sign **KY**, carved in ligature, which finds close parallels in the basilica of St. Polyeuktos (Mathews 1971: Pl. 39; Harrison 1986: Fig. H, n. 14c; Marsili 2019: Cat. No. 1412) and the church of SS. Sergius and Bacchus (Deichmann 1976: 217; Bardill 2017: 75; Marsili 2019: Cat. Nos 1413–1421). According to these pieces of evidence, the mark can be assigned to a stone workshop operating in the first three decades of the 6th century AD. In the cistern, the signature **KY** on imposts and impost capitals is repeatedly combined with one or two alphanumeric signs in a matching scheme: the numerals on the abacus of the impost capitals

Table 1. El-Atrun, Western Basilica, marks on architectural elements

	Workshop and assembly/positioning marks
Column bases (upper order)	
Column shafts (nave)	
Ionic impost capitals (nave)	
Corinthian capitals, type Kautzsch VII (nave)	

correspond to those on the imposts above them. In this case, then, the signs do not simply indicate the positioning of the object, but are primarily used for assembly purposes: the letters seem to be intended as a guide for the correct fitting of architectural elements inside the cistern, thus revealing clear clues as to the original design of the building, with a planned and calibrated arrangement of marble items. Furthermore, the uniformity of size and type of the marble elements, together with the corresponding stonecutters' marks, suggest that new materials were used in this cistern, as in a few others in the city, such as the Binbirdirek one (Wulzinger 1913b).

In fact, most of the Constantinopolitan water reservoirs were clearly built with reused marble items, as already noted. A good example is the Yerebatan cistern, which was built under the courtyard of the Stoa Basilica around 527, using a variety of heterogeneous materials (Altuğ 2013: 194–195; Marsili 2019: 113, 126–127). In this structure, 93 out of 107 Corinthian capitals belong to the Kautzsch VIII–Pralong III type, and 62 of them bear stonecutters' marks. In six cases, the workshop mark MA is accompanied by alphanumeric characters (A: 1, B: 2, ΛΘ: 39, M: 40, MB: 42, and MΔ: 44), while the workshop mark ZΩ is combined with the numerals ΛS (36) and ΛΘ (39) (Marsili 2019: Cat. Nos 1078–1079, 1539–1546) [*Fig. 9*]. The position theoretically indicated by the marks is not reflected in the actual placement of the capitals inside the cistern. Moreover, given the high numerical value of most of the marks, their relation to the primary use of the elements

Fig. 7. Ephesos, basilica of St. John, column base with assembly/positioning and workshop marks (Photo G. Marsili)

seems unlikely. However, it is precisely the high numerical value that allows the assumption that in this case the numbers were actually used for tallying purposes. Given that the capitals were likely taken from storage areas, it is plausible that the marks were used for counting when sorting *spolia*. This practice, although not very popular, finds further archaeological attestations throughout the Mediterranean, for example in the case of counting marks on two Corinthian capitals from Gortyn in Crete (Gagliano and Marsili 2017).

DOUBLE WORKSHOP MARKS

This category has numerous attestations and can be divided into two different classes: duplication of the same workshop mark, and two or more engraved indicators of different workshops.

The doubling of the same workshop mark on a marble object could be explained either as a simple means of confirming the involvement of an artisanal unit in the workmanship, or as the participation of two different artisans from the same workshop in the rough-dressing process. In this regard, the paleography of the signs, which sometimes leave no doubt as to their execution by the same craftsman, provides clues. The marks on 40 column shafts, 109 drums and 69 impost capitals from the Binbirdirek cistern in Istanbul are emblematic examples of such peculiar epigraphic traits (Wulzinger 1913b). Evidence is also provided by the marks on a Corinthian capital in the Nakilbent cistern (Mamboury and Wiegand 1934: 48–49, Figs 21–22), a column base from the basilica in Lechaion [*Fig. 10*], and a column base from the Tetraconch in

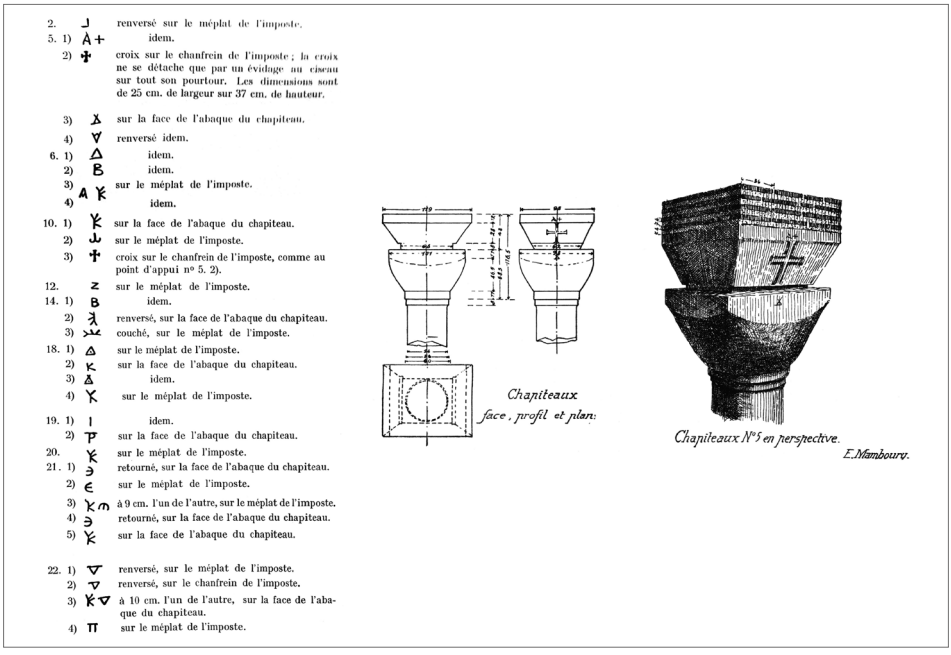


Fig. 8. Istanbul, cistern in Divanı Ali Sokak, stonecutters' marks recorded by Ernst Mamboury (After Mamboury 1936: 175)

Athens (Marsili 2019: Cat. Nos 997, 1080, Fig. 90).

Remarkable insights into the workings of the stone industry are provided by multiple marks of different workshops on the same object. Many examples come from archaeological sites throughout the Mediterranean, such as the Amrit shipwreck (Dennert and Westphalen 2004: 194, Cat. No. 35), the Marzamemi shipwreck (Kapitän 1980: 83–84, Figs 6, 8; Marsili 2015), the basilica of St. John in Ephesos (Deichmann 1976: 213; for inscribed objects collected in the courtyard of the Isa Bey mosque but originally belonging to the basilica of St. John, see Marsili 2019: Cat. No. 2233), the basilica of St. Leonidas in Lechaion (Deichmann 1976: 220; Marsili 2019: Cat. No. 1964); and the basilica of St. Panteleimon in Aphrodisias (Marsili 2019: Cat. No. 1853). In addition, several interesting examples come from the imperial capital. Scattered evidence has been documented in the basilicas of St. Polyeuktos (Marsili 2019: Cat. Nos 226, 307, 1960) and St. Irene (Marsili 2019: Cat. No. 110), the Hebdomon Palace (Marsili 2019: Cat. No. 1914), the *Forum Tauri* (Marsili 2019: Cat. Nos 758, 1400) [*Fig. 11*], Roumeli Hissar (Marsili 2019: Cat. No. 1570), Taşkasap (Marsili 2019: Cat. No. 616), and Çapa districts (Marsili 2019: Cat. No. 617), as well as on artifacts housed in the Archaeological Museum (Marsili 2019: Cat. Nos 121, 135, 433, 1510). In addition, many examples of imposts or Corinthian capitals from the Binbirdirek (Marsili 2019: Cat. Nos 184–186, 1451–1453, 1537) and Yerebatan cisterns (Marsili 2019: Cat. Nos 109, 120, 136, 156, 192–194, 247, 278, 293, 299, 308, 610, 691, 693, 812–813, 1079, 1309, 1383, 1436–1438,

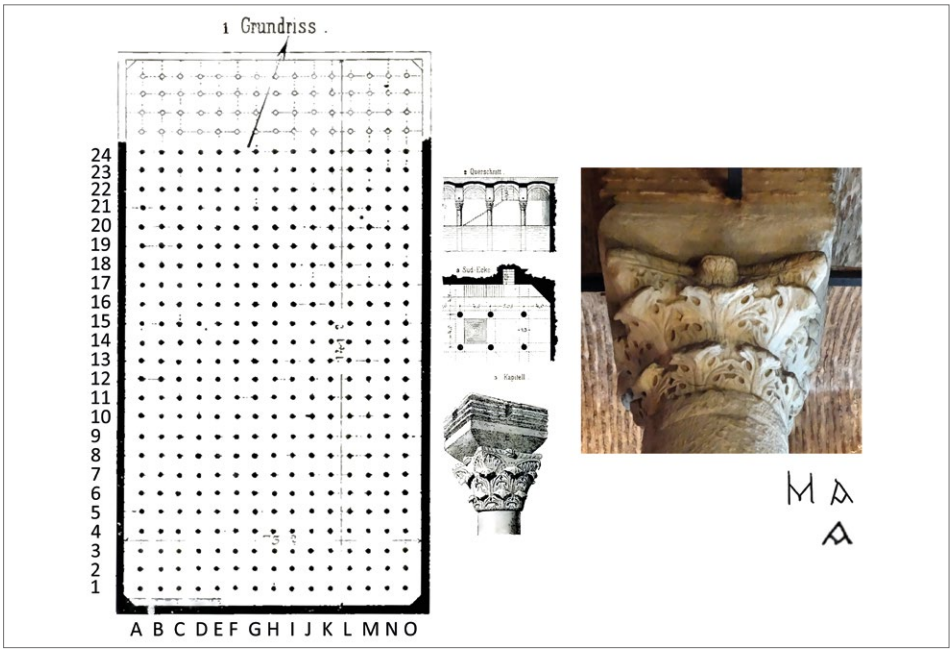


Fig. 9. Istanbul, Yerebatan cistern: left – layout of the cistern (After Marsili 2019: 127, Fig. 66); right – Corinthian capital in position D6 with a workshop mark and a numeric sign (Photo G. Marsili)

1488, 1496, 1545–1547, 1717, 1729, 1738, 1961) bear the signatures of different workshops. Considering that most of these marbles are in rough or semi-finished form, the high frequency of multiple workshop marks testifies to two different phenomena. On the one hand, it suggests that the craftsmen who inscribed their marks were responsible for the preliminary phases of the work. On the other hand, they show that the accounting, counting or sorting information they provided was mainly relevant to the early stages of processing and distribution.

The case of the church of Hagia Sophia, where multiple workshop marks label 47 cornices of the nave at both the ground and gallery levels, as well as 14 conch capitals, is relevant to the study of the dynamics of craftsmanship. With regard to the cornices, it was assumed, based on workmanship features of the blocks, that they went through at least five stages of carving from initial rough-hewing to finishing. They were largely modeled on the ground, and then

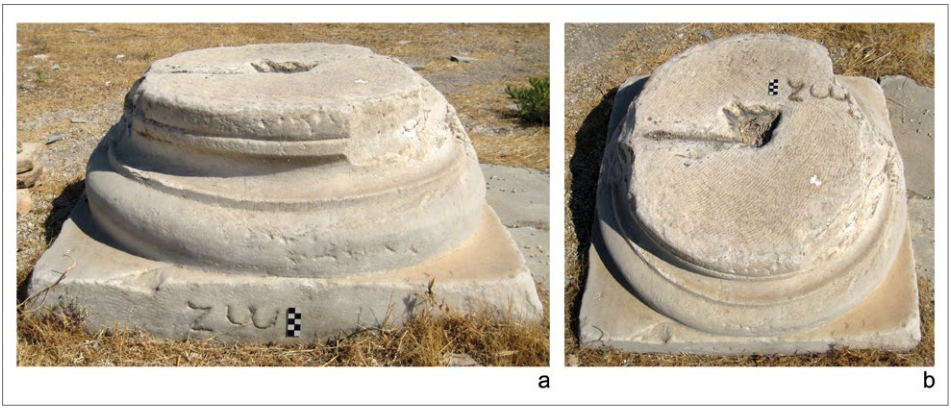


Fig. 10. Lechaion, basilica of St. Leonidas, column base with the very same workshop mark engraved on the plinth and the upper surface (Photo G. Marsili)

Fig. 11. Istanbul, Forum Tauri, multiple workshop marks on a column base (Photo G. Marsili)

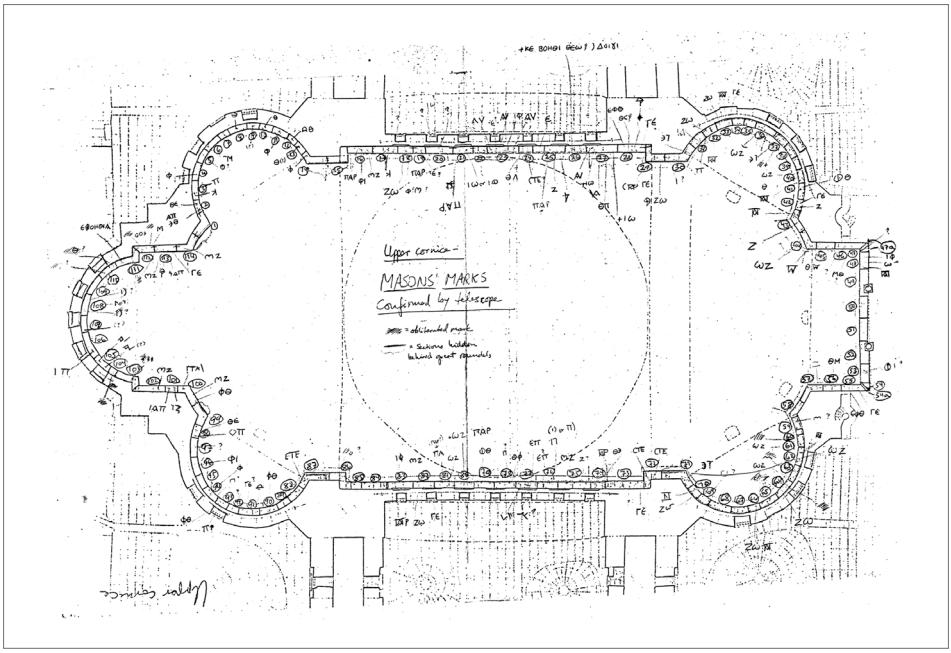


Fig. 12. Istanbul, Hagia Sophia church, distribution of workshop marks on ground cornices in a drawing from R. L. Van Nice's archive in Dumbarton Oaks (Courtesy of Dumbarton Oaks Institute. Robert Van Nice, Robert L. Van Nice records and fieldwork papers, ca. 1936–1989, Dumbarton Oaks, Trustees for Harvard University, Washington, D.C.)

Fig. 13. Istanbul, the church of Hagia Sophia: a – conch capitals in the gallery, southern side (Photo G. Marsili); b – detail of a conch capital from the nave with the mark AN (After Pedone 2022: 225, Fig. 127); c – detail of Van Nice's drawing with annotation of multiple marks on a capital of the north aisle (Courtesy of Dumbarton Oaks Institute. Robert Van Nice, Robert L. Van Nice records and fieldwork papers, ca. 1936–1989, Dumbarton Oaks, Trustees for Harvard University, Washington, D.C.)

the decorative details were finished after assembly. Moreover, the attention paid by the builders to this group of materials can be explained by the fact that these elements were placed in a part of the building that was crucial for static purposes and therefore had to be prepared and placed with special care (Butler 1992). The intervention of several hands, indicated by different signatures (up to four) on the same artifact, is documented for 39 cornice segments. They bear the following marks in various combinations: **ΑΝ, ΓΕ, ΕΦΘ, ΖΩ, ΖΚ, ΘΕ, ΙΩ, ΠΑ/ΠΑΡ, ΠΘ, ΠΙ, CI, CTE, TPY, ΦΘ, ΦΙ,** and **ΦΜ** (Butler 1989: 146–166; Marsili 2019: Cat. Nos 242, 243, 439, 446–458, 973, 974, 1062–1069, 1073–1076, 1155–1158, 1175, 1306, 1716, 1736) [*Fig. 12*]. Sometimes, different abbreviations were variants of the same signature, as in the case of **ΠΑ/ΠΑΡ** with the letters free-standing or ligatured. In some other cases, one or more marks appear upside down, indicating that they were carved by different craftsmen, at different stages of production, and when the block lay in inverted position during the carving process.

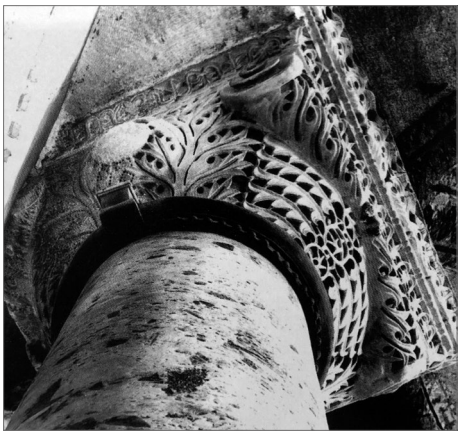


Fig. 14. Istanbul, the church of Hagia Sophia, unfinished detail of a capital in the southern aisle, ground floor (After Russo 2017: Pl. VI, Fig. 11)

On *Kesselkapitelle* (conch capitals), up to four marks from different workshops are recorded on each object (Marsili 2019: 132–136, with references). In this case, the marks were carved on different sides of the abacus, on the edges [*Fig. 13*]. They are often combined with single letters, probably intended as setting, counting or control marks. The reason for the involvement of a larger number of workshops is probably the fact that this type of furnishings was among the most sophisticated and challenging to carve. These pieces were installed in places that made carving difficult. They were intended to be finished after installation, as evidenced by a thorough examination of those left in rough form [*Fig. 14*]. Recent research has shown that these capitals went through five different stages of carving: 1) engraving of decorative motifs, 2) lowering of the background surface to bring out the motifs, 3) trimming of internal details, 4) delineation of motifs by drilling, and 5) removal of background and completion of the drilled details by chiseling (Russo 2017). By matching the data on the workflow with workshop marks, it can be concluded that in most cases these artifacts underwent the first or second stages of production in workshops located near the construction site and arrived on the spot in the form of roughly dressed impost capitals (Asgari 1995: 278, Fig. 12B). Once placed atop columns, they were finely chiseled by different highly skilled craftsmen, most likely working on one item at a time (Marsili 2019: 132).

Moreover, the scrutiny of the marks on the conch capitals and cornices in

Hagia Sophia shows that they often coincide, indicating that at least 18 workshops worked simultaneously and in close cooperation on the preparation of these two types of materials. The high degree of specialization of these workshops is also evidenced by the fact that 11 of the 18 marks used in combination on these objects recur exclusively on them and on no other furnishing element in the Great Church. The multiple marks may, therefore, be linked to highly qualified groups of craftsmen who were hired exclusively for the finishing of these two types of artifacts and who had to be capable of effective collaboration.

CONCLUSIONS

The study of double and multiple marks on marble furnishings confirms that these epigraphic signs always had a precise meaning in the production and construction sequence. In fact, each stonecutter's mark contained information that had to be passed on, either from one craftsman to another, or from the marble workshops to patrons or entrepreneurs. Understanding their meaning depends to a large extent on the possibility of studying them in close connection with their original archaeological contexts. Complementary data on the time of engraving are also provided by paleographic features which allow the identification of different hands, as in the case of the marks from the Binbirdirek cistern, the basilica of St. Leonidas in Lechaion and the Tetraconch basilica in Athens. The direction of writing is also worth noting: the upright or inverted position of several marks on the same object reflects their relevance to a particular stage or stages of construction. In the case of marks on objects in their primary context of use, the detection of different hands or the inverted position of letters makes it possible to trace the involvement of different workers, such as stone carvers responsible for dressing artifacts and craftsmen appointed to communicate information about the positioning and assembly of objects on site, as in the case of the cistern at Divanı Ali Sokak in Istanbul. In the case of marks on reused objects, the abovementioned variations can convey information encoded at different life stages of the objects, as in the case of the Acımusluk Sokak and Yerebatan cisterns. Finally, the case of multiple workshop marks on architectural furnishings is noteworthy, with the church of Hagia Sophia as a case in point. The construction site of the Great Church was exceptional in many respects, both for its impressive dimensions, architectural design solutions and the lavishness of its decorative elements. The analysis of the stonecutters' marks on its marble items reflects the size and complexity of the construction project: 1026 marble elements are inscribed with marks related to an estimated minimum of 142 working units (Marsili 2019: 131–132). The 61 cornices and conch capitals bearing multiple marks provide insights into the innovative and synergistic working techniques used in the carving of the most sophisticated architectural elements. These data further substantiate the idea that the Constantinopolitan

stone workshops, as well as the imposing construction sites opened between the end of the 5th and the first half of the 6th century AD, implemented novel measures to rationalize production and save on processing times, with significant improvements in manufacturing skills and organizational procedures.

Giulia Marsili
https://orcid.org/0000-0003-2732-0605
University of Bologna, Department of History and Cultures
giulia.marsili2@unibo.it

How to cite this article: Marsili, G. (2023). Multiple stonecutters' marks on marble in the Late Antique Mediterranean: Distribution, function, and meaning. In M. Gwiazda, A. Poggio, and D. Wielgosz-Rondolino (eds), *Marble in the Early Byzantine Eastern Mediterranean: Use, Aesthetics, and Social Significance* (=*Polish Archaeology in the Mediterranean,* 32/1) (pp. 31–54). Warsaw: WUW. https://doi.org/10.37343/uw.2083-537X.pam32.1.02

References

Altuğ, K. (2013). *İstanbul'da Bizans Dönemi Sarnıçlarının Mimari Özellikleri Ve Kentin Tarihsel Topografyasındaki Dağılımı* (Ph.D. diss.). Istanbul Technical University

Altuğ, K. (2018). Reconsidering the use of *spolia* in Byzantine Constantinople. In S. Pedone and A. Paribeni (eds), *"Di Bisanzio dirai ciò che è passato, ciò che passa e che sarà": scritti in onore di Alessandra Guiglia* I (pp. 3–16). Rome: Bardi edizioni

Asano, K. (2010). *The Island of St. Nicholas: Excavation and survey of the Gemiler Island area, Lycia, Turkey*. Osaka: Osaka University Press

Asgari, N. (1992). Observations on two types of quarry-items from Proconnesus: Column-shafts and column-bases. In M. Waelkens, N. Herz, and L. Moens, *Ancient stones: Quarrying, trade and provenance. Interdisciplinary studies on stones and stone technology in Europe and Near East from the prehistoric to the early Christian period* (=*Acta Archaeologica Lovaniensia. Monographiae* 4) (pp. 73–80). Leuven: Leuven University Press

Asgari, N. (1995). The Proconnesian production of architectural elements in late antiquity, based on evidence from the marble quarries. In C.A. Mango, G. Dagron, and G. Greatrex, *Constantinople and its hinterland: Papers from the Twenty-seventh Spring Symposium of Byzantine Studies, Oxford, April 1993* (pp. 263–288). Aldershot: Variorum

Bardill, J. (2017). The date, dedication, and design of Sts. Sergius and Bacchus in Constantinople. *Journal of Late Antiquity*, 10(1), 62–130

Barker, S.J. (2020). Reuse of statuary and the recycling habit of late antiquity: An economic perspective. In C.N. Duckworth and A. Wilson (eds), *Recycling and reuse in the Roman economy* (pp. 105–190). Oxford: Oxford University Press

Baronio, P. (2021). Capitelli corinzi a Kos tra V e VI secolo D.C. *Annuario della Scuola Archeologica di Atene e delle missioni italiane in Oriente*, 99(1), 371–403

Berger, A. (1997). Historical topography in the Roman, Byzantine, and Latin periods. In C.L. Striker and Y.D. Kuban (eds), *Kalenderhane in Istanbul: The buildings, their history, architecture, and decoration. Final reports on the archaeological exploration and restoration at Kalenderhane Camii, 1966–1978* (pp. 7–17). Mainz: Philipp von Zabern

Biernacki, A.B. (1997). Remarks on early Christian architectural details made of Proconnesian marble and found in Novae (Moesia Inferior). In A.B. Biernacki and P. Pawlak (eds), *Late Roman and early Byzantine cities on the lower Danube from the 4th to 6th century A.D. International conference, Poznań, Poland, 15–17 November 1995: Studies and materials* (pp. 71–80). Poznań: Instytut Historii Uniwersytetu im. Adama Mickiewicza w Poznaniu

Butler, L.E. (1989). *The nave cornices of Hagia Sophia in Istanbul* (Ph.D. diss.). University of Pennsylvania

Butler, L.E. (1992). Hagia Sophia's nave cornices as elements of its design and structure. In R. Mark and A.Ş. Çakmak (eds), *Hagia Sophia from the age of Justinian to the present* (pp. 57–77). Cambridge: Cambridge University Press

Crow, J. (2020). 'Still waters run deep': Cisterns and the hydraulic infrastructure of Constantinople and Alexandria. *Antiquité Tardive*, 28, 113–125

Deichmann, F.W. (1976). *Ravenna: Hauptstadt des spätantiken Abendlandes* II.2. *Kommentar*. Wiesbaden: Steiner

Dennert, M. and Westphalen, S. (2004). Säulen aus Konstantinopel: Ein Schiffsfund im antiken Hafen von Amrit. *Damaszener Mitteilungen*, 14, 183–195

Forchheimer, P. and Strzygowski, J. (1893). *Die byzantinischen Wasserbehälter von Konstantinopel: Beiträge zur Geschichte der byzantinischen Baukunst und zur Topographie von Konstantinopel* (=*Byzantinische Denkmäler* 2). Vienna: Verlag der Mechitharisten-Congregation

Gagliano, E. and Marsili, G. (2017). Due capitelli corinzio-asiatici dalle terme a sud del pretorio a Gortina di Creta. In P. Pensabene, M. Milella, and F. Caprioli (eds), *Decor: decorazione e architettura nel mondo romano. Atti del Convegno internazionale, Roma, 21–24 maggio 2014* (=*Thiasos Monografie* 9) (pp. 379–390). Rome: Edizioni Quasar

Grossmann, P. and Severin, H.-G. (2003). *Frühchristliche und byzantinische Bauten im südöstlichen Lykien: Ergebnisse zweier Surveys* (=*Istanbuler Forschungen* 46). Tübingen: Wasmuth

Harrison, R.M. (1963). Churches and chapels of central Lycia. *Anatolian Studies*, 13, 117–151

Harrison, R.M. (1986). *Excavations at Saraçhane in Istanbul* I. *The excavations, structures, architectural decoration, small finds, coins, bones and molluscs*. Princeton, NJ–Washington, DC: Princeton University Press; Dumbarton Oaks Research Library and Collection

Herrmann, J., Barbin, V., and Mentzos, A. (1999). The exportation of marble from Thasos in late antiquity: The quarries of Aliki and Cape Fanari. In C. Koukouli-Chrysanthaki, A. Muller, and S. Papadopoulos (eds), *Thasos: matière première et technologie de la préhistoire à nos jours* (pp. 75–90). Athens: École française d'Athènes

Herrmann, J.J., Jr. and Newman, R. (1999). Dolomitic marble from Thasos near and far: Macedonia, Ephesos and the Rhone. In M. Schvoerer (ed.), *Archéomatériaux: marbres et autres roches. Actes de la IV^ème^ Conférence internationale de l'Association pour l'étude des marbres et autres roches utilisés dans le passé, ASMOSIA IV, Bordeaux–Talence, 9–13 octobre 1995* (pp. 293–303). Talence: CRPAA; PUB

Herrmann, J.J., Jr. and Tykot, R.H. (2009). Some products from the Dokimeion quarries. In Y. Maniatis (ed.), *ASMOSIA VII: actes du VII^e^ colloque international de l'ASMOSIA, Thasos, 15–20 septembre 2003* (=*Bulletin de Correspondance Hellénique. Supplément* 51) (pp. 59–75). Athens: École française d'Athènes

Kapitän, G. (1980). Elementi architettonici per una basilica dal relitto navale del VI secolo di Marzamemi (Siracusa). *Corsi di Cultura sull'Arte Ravennate e Bizantina*, 27, 71–136

Klimek, A.U. (2013). A system of stonemason marks applied in columns of the tetrastyle courtyard in the House of Leukaktios in Ptolemais, Cyrenaica. *Światowit*, X(LI)/A, 11–22

Kowalewska, A. and Eisenberg, M. (2019). Masons' marks of Antiochia Hippos. *Tel Aviv*, 46(1), 108–127

Kozelj, T. and Wurch-Kozelj, M. (1995). Dragon-houses of southern Euboea: Military guard-places of the quarries. In Y. Maniatis, N. Herz, and Y. Basiakos (eds), *ASMOSIA 3: The study of marble and other stones used in antiquity* (pp. 17–31). London: Archetype

Kozelj, T. and Wurch-Kozelj, M. (1999). Les traces d'extraction à Thasos de l'Antiquité à nos jours. In C. Koukouli-Chrysanthaki, A. Muller, and S. Papadopoulos (eds), *Thasos: matière première et technologie de la préhistoire à nos jours* (pp. 49–53). Athens: École française d'Athènes

Kozelj, T. and Wurch-Kozelj, M. (2005). Les carrières de marbre à Thasos à l'époque protobyzantine: extraction et production. In F. Baratte, F. Déroche, C. Jolivet-Lévy, and B. Pitarakis (eds), *Mélanges Jean-Pierre Sodini* (=*Travaux et Mémoires* 15) (pp. 465–486). Paris: Association des amis du Centre d'histoire et civilisation de Byzance

Kramer, J. (1994). *Korinthische Pilasterkapitelle in Kleinasien und Konstantinopel: Antike und spätantike Werkstattgruppen* (=*Istanbuler Mitteilungen* 39). Tübingen: E. Wasmuth

Lemerle, P. (1945). *Philippes et la Macédoine orientale à l'époque chrétienne et byzantine: recherches d'histoire et d'archéologie*. Paris: Editions de Boccard

Lippolis, E. and Vallarino, G. (2018). La complessa storia dell'edificio circolare con la 'Grande iscrizione' nell'agorà di Gortina. In F. Camia, L. Del Monaco, and M. Nocita (eds), *Munus Laetitiae: studi miscellanei offerti a Maria Letizia Lazzarini* (pp. 167–203). Rome: Sapienza Università Editrice

Mamboury, E. (1936). La nouvelle citerne byzantine de Tchifté Sérail (Istanbul). *Byzantion*, 11(1), 167–180

Mamboury, E. and Wiegand, T. (1934). *Die Kaiserpaläste von Konstantinopel zwischen Hippodrom und Marmara-Meer*. Berlin: W. de Gruyter & Co.

Marsili, G. (2015). Sigle di lavorazione e atelier marmorari: nuove riflessioni sul relitto di Marzamemi. In R. Martorelli, A. Piras, and P.G. Spanu (eds), *Isole e terraferma nel primo cristianesimo: identità locale ed interscambi culturali, religiosi e produttivi. Atti XI Congresso nazionale di archeologia cristiana, Cagliari, 23–27 settembre 2014* (pp. 369–376). Cagliari: PFTS University Press

Marsili, G. (2016). Il riuso razionale: cantieri di smontaggio e depositi di manufatti marmorei nella documentazione archeologica ed epigrafica di età tardoantica. In M.C. Parello and M.S. Rizzo (eds), *Paesaggi urbani tardoantichi: casi a confronto. Atti delle Giornate gregoriane, VIII edizione (29–30 novembre 2014)* (pp. 149–156). Bari: Edipuglia

Marsili, G. (2019). *Archeologia del cantiere protobizantino: cave, maestranze e committenti attraverso i marchi dei marmorari*. Bologna: Bononia University Press

Marsili, G. (2023). From design to construction: integrated approaches for the study of ecclesiastical building sites in the early Byzantine Mediterranean. In A. Fiorini (ed.), *Archeologia del cantiere edile: temi ed esempi dall'antichità al Medioevo* (=*Archeologia dell'Architettura* 28.1). Sesto Fiorentino: All'insegna del Giglio

Marsili, G. and Lamanna, C. (2023). Digital approaches to ancient metrology: new insights into methods and tools for measuring and designing marble in late antiquity. In *2023 IMEKO TC-4 International Conference on Metrology for Archaeology and Cultural Heritage (Rome, Italy, October 19-21, 2023)* (pp. 376–381). Rome

Mathews, T.F. (1971). *The early churches of Constantinople: Architecture and liturgy*. University Park: Pennsylvania State University Press

Mentzos, A., Barbin, V., and Herrmann, J.J. (2002). Cathodoluminescence and isotopic analysis of Roman and early Byzantine architectural decoration in the Rotunda Museum, Thessaloniki. In J. Herrmann, N. Herz, and R. Newman (eds), *ASMOSIA 5: Interdisciplinary studies on ancient stone. Proceedings of the Fifth International Conference of the Association for the Study of Marble and Other Stones in Antiquity, Museum of Fine Arts, Boston, 1998* (pp. 316–327). London: Archetype

Militsi-Kechagia, E. (2017). Palaiochristianikē glyptikē Kō: symvolē stē meletēs tēs architektonikēs glyptikēs stēn Kō kata tēn palaiochristianikē periodo (40s–70s ai). *Dōdekanēsos: episēmon Deltion tōn en Dōdekanēsō Eparchiōn tou Oikoumenikou Thronou*, 1(9)(17), 17–494

Niewöhner, P. (2013). Phrygian marble and stonemasonry as markers of regional distinctiveness in late antiquity. In P. Thonemann (Ed.), *Roman Phrygia: Culture and society* (pp. 215–248). Cambridge: Cambridge University Press

Niewöhner, P. (2014). Production and distribution of Docimian marble in the Theodosian age. In I. Jacobs (ed.), *Production and prosperity in the Theodosian period* (pp. 251–271). Leuven–Walpole, MA: Peeters

Niewöhner, P., Audley-Miller, L., and Prochaska, W. (2013). Marbles, quarries and workshops on the highlands of northern Macedonia. *Archäologischer Anzeiger*, 2013/1, 95–145

Özgümüş, F. (2008). 2006 İstanbul Suriçi Arkeolojik Yüzey Araştırmaları. In *25. Arastirma Sonuçlari Toplantisi* III (pp. 154–155). Ankara: Kültür ve Turizm Bakanlagi

Paribeni, A. (2017). Modalità di assemblaggio e messa in opera delle membrature architettoniche nei cantieri romani e bizantini (I–VI sec. D.C.): stato della questione e nuovi contributi. In P. Pensabene, M. Milella, and F. Caprioli (eds), *Decor: decorazione e architettura nel mondo romano. Atti del Convegno internazionale, Roma, 21–24 maggio 2014* (pp. 743–752). Rome: Edizioni Quasar

Pedone, S. (2022). *Bisanzio a colori: la policromia nella scultura bizantina*. Rome: Bardi edizioni

Petrova, S. (2012). Nicopolis ad Nestum/Mestum. In R.T. Ivanov (ed.), *Roman cities in Bulgaria* I (pp. 289–361). Sofia: Prof. Marin Drinov Academic Publishing House

Rakocija, M. (2017). Mesto impost kapitela iz bazilike u Ćurlini u evoluciji jonskih impost kapitela i delatnost paleovizantijske skulptorske radionice u Nišu. In M. Rakocija (ed.), *Niš i Vizantija: četrnaesti međunarodni simpozijumh, Niš, 3–5 Jun 2016. Zbornik radova* (pp. 89–104). Niš: Univerzitet u Nišu

Russo, E. (2017). Sulla lavorazione dei capitelli di S. Sofia di Costantinopoli. *Bizantinistica*, 18, 49–113

Sodini, J.-P., Lambraki, A., and Kozelj, T. (1980). *Aliki* I. *Les carrières de marbre à l'époque paléochrétienne* (=*Études Thasiennes* 9). Athens: École française d'Athènes

Striker, C.L. and Kuban, Y.D. (eds). (1997). *Kalenderhane in Istanbul: The buildings, their history, architecture, and decoration. Final reports on the archaeological exploration and restoration at Kalenderhane Camii, 1966–1978*. Mainz: Philipp von Zabern

Teatini, A. (2019). Un cantiere di spoliazione a Thignica in età bizantina: indizi epigrafici e tracce archeologiche. *Cartagine. Studi e Ricerche*, 4. https://doi.org/10.13125/caster/3669

Vaklinova, M. (1984). Ateliers de décoration architecturale au V^{e} et VI^{e} siècle dans la région de Nicopolis ad Nestum (Bulgarie). In *Actes du X^{e} Congrès international d'archéologie chrétienne, Thessalonique, 28 septembre – 4 octobre 1980* (pp. 641–650). Vatican City: Pontificio Istituto di archeologia cristiana

Vanderheyde, C. (2020). Chapiteaux corinthiens inédits d'Apamée (Syrie). In D. Moreau, C.S. Snively, A. Guiglia, I. Baldini, L. Milanović, I. Popović, N. Beaudry, and O. Heinrich-Tamáska (eds), *Archaeology of a world of changes: Late Roman and early Byzantine architecture, sculpture and landscapes. Selected papers from the 23rd International Congress of Byzantine Studies (Belgrade, 22–27 August 2016) in memoriam Claudiae Barsanti* (=*BAR International Series* 2973) (pp. 277–290). Oxford: BAR Publishing

Waelkens, M. (1982). *Dokimeion: Die Werkstatt der repräsentativen kleinasiatischen Sarkophage. Chronologie und Typologie ihrer Produktion* (=*Archäologische Forschungen* 11). Berlin: Mann

Ward-Perkins, J.B. and Goodchild, R.G. (2003). *Christian monuments of Cyrenaica* (J. Reynolds, ed.) (=*Society for Libyan Studies Monograph* 4). London: Society for Libyan Studies

Weber, U. (2013). *Versatzmarken im antiken griechischen Bauwesen*. Wiesbaden: Harrassowitz

Wulzinger, K. (1913a). Byzantinische Substruktionsbauten Konstantinopels. *Jahrbuch des Kaiserlich Deutschen Archäologischen Instituts*, 28, 370–395
Wulzinger, K. (1913b). Die Steinmetzzeichen der Bin-bir-direk. *Byzantinische Zeitschrift*, 22(2), 459–473