

Quarry Marks and Carving Lines on Marble Elements in the Monuments of Roman Athens: Hadrian's Library

Adalberto Ottati

In several of the monuments of Roman Athens, carving lines and quarry marks associated with the manufacture and positioning of marble architectural elements are visible on many artefacts. Of particular note are the carving lines and quarry marks in the Hadrian's Library. They are preserved on a series of marble artefacts that, in addition to their pure architectural significance, retain traces linked to their manufacture and subsequent use. Some are still *in situ* and others were reused in the later stages of the Hadrianic building, when the complex became a Byzantine basilica.

All the cases presented here provide us with an image of different aspects of the tasks carried out in the ancient workshops, in other words, the transfer of knowledge for the manufacture of marble architectural elements. Traces of the production process, either on a large or small scale, show how this information was transmitted to the labourers.

Introduction

The aim of this study is to give visibility to a research project addressed at understanding the quarry marks and carving lines associated with the production of marble artefacts in Greece, in particular in Roman buildings.¹

The design approach in architecture, especially for the production of architectural material, is a broad field that has only partially been debated, and even then never systematically. Only recently has this question begun to be discussed, in an attempt to establish a common methodology and language to facilitate communication and a more detailed discussion among scholars.²

The subject of quarry marks and carving lines in the Roman monuments of Greece acquires particular importance for establishing a connection between typical western Roman building methods and an architectural tradition such as that of Greece, which is characterised by a culture of stone construction of the highest level. This culture produced unique and innovative buildings in which the role of quarry marks and carving lines is fundamental to our understanding of them.

The study began in Athens. For reasons of brevity, in this article we will present only some of the most significant case studies, in particular those from an emblematic monument in Roman Athens, the so-called Hadrian's Library (fig. 1). In the Hadrianic monument it has been possible to detect a series of marks and carving lines on the stone that allow us to advance certain hypotheses on ancient techniques and uses, as well as interpretations concerning the building phases of the monument.³

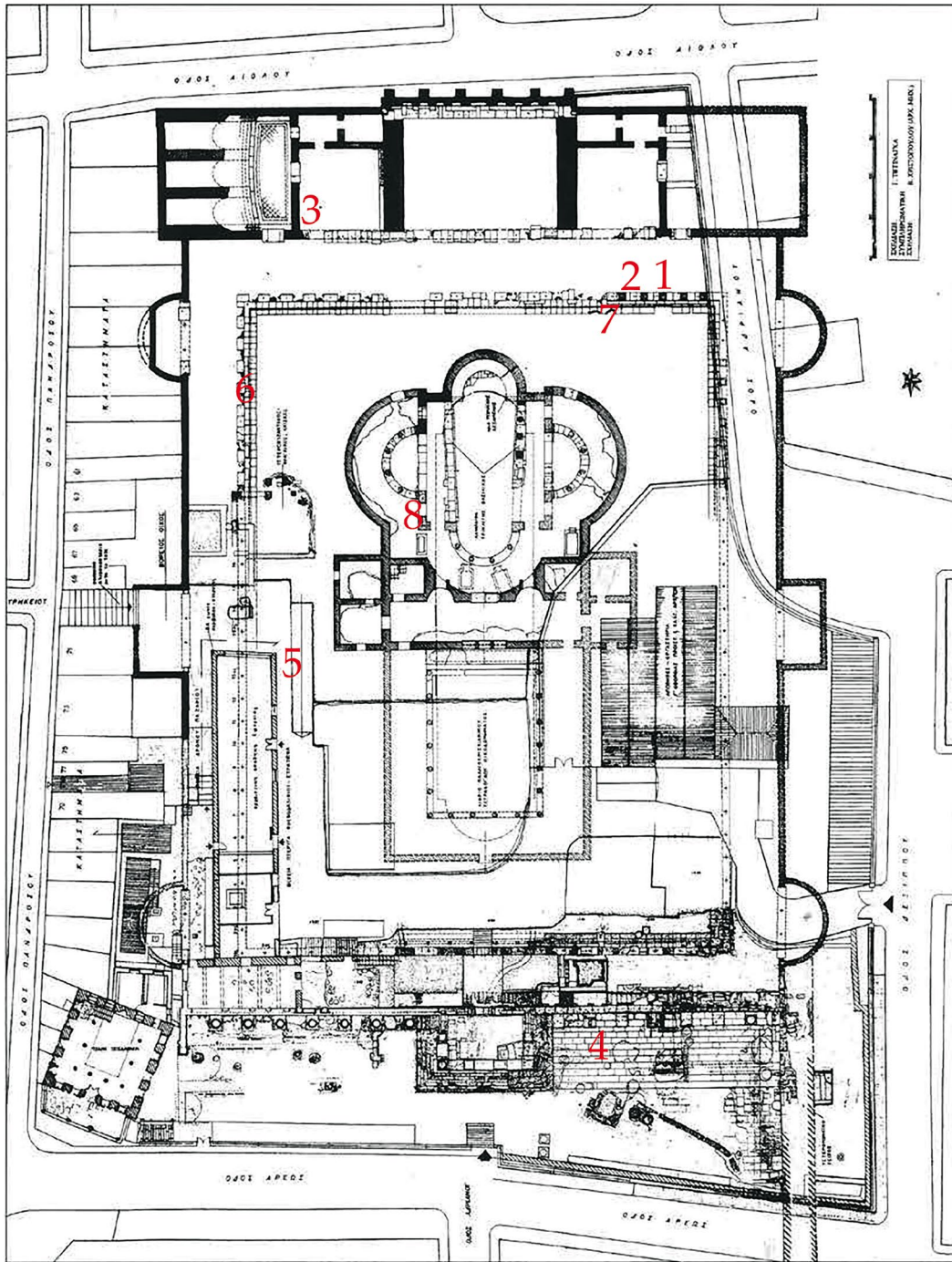


Fig. 1: Athens, Hadrian's Library, planimetry; 1: mark E on a attic base; 2: mark A on a attic base; 3: mark Θ on a capital; 4: mark NK on a cornice; 5: numerals IV-IV on a capital for ancient restoration; 6: carving line on the stylobate; 7: carving line on the stylobate; 8: carving line on Eudocia's Basilica stylobate.

Quarry and Masons' Marks in Hadrian's Library

The presence of quarry or masons' marks is widely attested in Roman times, both in architecture and at the extraction sites. They allow us to begin to understand how they accompanied the building materials during the different working stages: extraction, counting, transportation, storage, control, sale and assembly.⁴

The examples in Hadrian's Library are not numerous and are mostly out of context, so we are unable to propose theories on what roles they played or even their exact chronology. However, they do allow for some considerations. Inside the complex it is possible to observe marks on blocks and architectural and decorative elements.

With regard to marks on blocks, the letters and numerals were engraved on blocks of Pentelic marble and Poros stone to indicate their classification and destination during quarrying and transportation to the building site.⁵ It is extremely interesting to note that both the Latin and Greek numerical and alphabetical systems were used to number the marble elements of the monument.⁶ Examples have been found on the ashlars of the first rows (ΙΛΑΓ), as well as on the upper part of the southern wall (ωΖ: fig. 2a). The Latin numerical system was used to number the Poros blocks in the hidden parts and the building foundations on the southern section of the western wall and on the eastern wall (XXXIII, IXX, MDD etc. fig. 2b).⁷

The fact that the stone surface was left rough-hewn has led to the hypothesis that the marks were made during the early quarrying stages.

Notae lapicidarum of this type and their variants are quite common. The mark "ωΖ" has been found, for example, in the Hagia Sophia in Constantinople. Despite the chronological diversity, the comparison is important in terms of the large number of masons' marks in the Hagia Sophia. A. Paribeni's study highlighted the morphological and typological aspects of the *marmorarii* marks and a privileged link with certain types of architectural elements. This led the scholar to believe that the execution of the Hagia Sophia marbles was based on solid planning and standardised working procedures.⁸

Marks can also be seen on different architectural elements at Hadrian's Library. For example, an "E" is engraved on the flat top surface of two Pentelic marble attic bases (fig. 1, n. 1; fig. 3a). Also in this case, the mark is placed not to be seen and is probably a system for identifying the workshop or to facilitate the counting of and subsequently payment for the products. An example of this is the marks on the basin supports found in the shipwreck of Punta Scifo that were being transported from the Docimium quarries.⁹

Comparisons of this kind are widespread. Examples can also be found in some pieces in the nearby Roman Agora, where the coexistence of several marks can be interpreted as evidence of the different working phases, from extraction at the quarry to delivery at the construction site and the final use and assembly of the materials (fig. 3b).

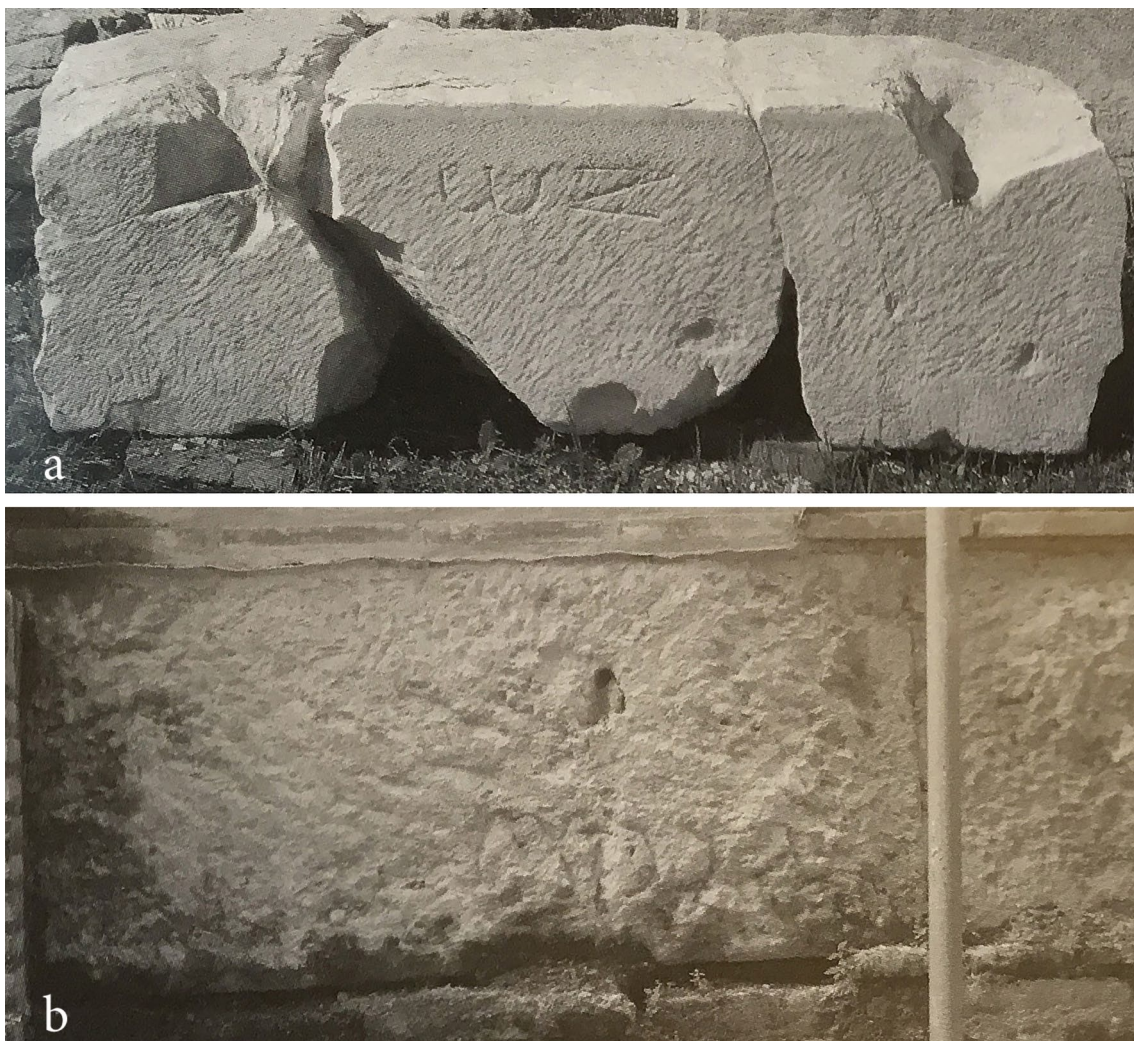


Fig. 2: Athens, Hadrian's Library, quarry marks on blocks; a: Greek quarry mark; b: Latin numerals.

One of the two bases engraved on the top surface with the "E" also has an "A" on the back (fig. 1, n. 2; fig. 3c), engraved on the scotia, in this case presumably to assist with its assembly.

Another mark that could be interpreted as numeral useful for the assembly process is on the band below the abacus of a small Asian Minor-style capital¹⁰ dated to the Hadrianic period¹¹ and perhaps belonging to the building's decoration¹² (fig. 1, n. 3; fig. 3d). It is an "C" with a superimposed horizontal line.¹³

Marks of this type have also been found on a cornice placed outside the propylaeum: "NK" on the *cyma recta* (fig. 1, n. 4; fig. 3e).

Finally, an emblematic case is a small Asian Corinthian capital, also dated to the Hadrianic period (fig. 4a), that was reused in a mediaeval wall¹⁴ and repositioned



Fig. 3: Athens; a: Hadrian's Library, east portico, mark on a base; b: Roman Agora, marks on a block in Pentelic marble; c: Hadrian's Library, east portico, mark on a base; d: Hadrian's Library, northern Auditorium, capital with mark; e: Hadrian's Library, mark on a cornice.



Fig. 4: Athen; a-b: Hadrian's Library, northern side, capital reused in a medieval wall, front and top surface with marks; c: Agia Aikaterini, base of portico with marks.

in modern times (fig. 1, n. 5). On a circular *scamillus* worked on the capital's top surface there are two marks identified as the same Latin number, "VI" (fig. 4b). An explanation of the presence of these numerals is quite obvious, since they are located at the sides of an ancient fracture line and were thus useful for maintaining a link between the two parts of the capital, which had been broken in ancient times, during storage, transportation or use.

Ruling out a modern origin for these numerals which seems unlikely to say the least, it can be noted that also in this case the use of Latin numerals could testify to the collaboration between Greek and Roman workers and uses, which has already been observed for the numerals found on blocks (*supra*).

It should be noted that a similar numeral (in this case IV), although in a more cursive form, is found on a base reused in the portico of Agia Aikaterini, near Hadrian's Gate. In this case the base is also broken and recomposed (fig 4c). On one fragment we see the Latin numeral and on the other the Greek letter "Ε". The two marks, presumably not contemporaneous, could be indicative of two different uses: the Greek letter would fall into the category of quarry and workshop marks, while the Latin one may have referred to its assembly or reassembly.

These examples reveal information of great interest: that the masons' marks and quarry marks at Hadrian's Library show the joint use of the Latin and Greek alphabets. The use of the both alphabets could be linked to the nature of the architecture of this monument, a fusion of Greek and Roman architectural traditions among the Greek construction techniques using *opus isodomum*, local workers and Roman *opus caementicium*. The double alphabet could therefore be traced back to the two traditions used, to different workshops and to the procurement of materials. It can be observed that, while the Greek alphabet predominates on artefacts in Pentelic marble, there seems to be a tendency to use Latin for elements in Poros stone. This may not be random and could denote a link between the workforce and the type of material being worked.

Carving Lines on the Portico Stylobate of Hadrian's Library

There are several carving lines connected to the construction phase and subsequent repairs of the Hadrianic building. Some correspond to the assembly and positioning of the marble elements, for example, the alignments engraved on the stylobate slabs for the placement of the portico columns.

The internal colonnade, which Pausanias described as being composed of a hundred columns of Phrygian marble (I.18.9), had 22 columns on its shortest side and 28 on the longest. Traces of the portico can be seen only thanks to the foundations and some surviving marble slabs from the stylobate that are preserved in the western and eastern parts and on the north-eastern corner.¹⁵



Fig. 5: Athens, Hadrian's Library, northern portico; a: position of one of the surviving stylobate slabs; b: slab of the stylobate with a circular carving.

The stylobate slabs bear the markings for the placement of the columns. We have found two cases:

- The first is on the northern side of the complex (fig. 1, n. 6; fig. 5a). The upper surface presents a circular shape carved with the skilful use of a tooth chisel (fig. 5b).

The system of marking the outline of the upper piece on the lower section is certainly not exceptional in the Greek world.¹⁶ It is not even surprising that the circular incision was used, presumably, for placing the attic bases, therefore with quadrangular plinth. It should be noted that in the propylaeum of Hadrian's Library we find the same use of engraving the stylobate with a circumference on which to place attic bases, an example of which is preserved on the first western column. The presence of the circumference marked on the marble slab of the stylobate may have been used not only to place the elements, but also to manage the building materials at the construction site, which would have arrived in a semi-worked state from the quarries,¹⁷ or, in some cases, for supplying the pieces that had to be of the appropriate size. The dialogue between the quarries and construction site would have been constant in order to ensure that the materials ordered corresponded to the building plan and the frequent changes that would have been made during its course.¹⁸ As pointed out by Y. Tigginaga, this connection is demonstrated by the construction techniques used at Hadrian's Library aimed at producing prefabricated elements that would have improved adherence to the original plan and the speed of execution.¹⁹

- The second case can be detected on the eastern side of the complex (fig. 1, no. 7), in the part towards the south. Here there are five pedestals in Pentelic marble with attic bases above. As we will see later, these pedestals, with a series of similar elements on the southern side, are probably part of a restructuring dating to the early 5th century.

The carving line is located next to the fifth pedestal to the south and therefore does not correspond to the current positioning of the pedestals (fig. 6a).

The stylobate slab, in this case worked in two different blocks, due to a clear act of restoration, does not have any circular-shaped incisions, but signs that delineate the corners of an area on which a square base had to be positioned (fig. 6b). Parallels with incisions marking the positions of pieces are widespread and different examples have been found in Greece and the area of Asia Minor, starting with Hadrian's Library itself. These signs are on the pedestals of the cipollino marble colonnade of the facade.

At this point, we have to point out some considerations. The presence of the column foundation blocks under the stylobate and surviving parts of it with holes for the bronze clamps used to place the bases immediately allowed scholars to hypothetically calculate the original number of columns. However, the conservation of pedestals currently *in situ* at points that do not correspond to the original column placement, an inconsistency already noted in the Dörpfeld plan from the late 19th century,²⁰ has led scholars to hypothesise the existence of two construction phases. However, the archaeological evidence suggests a more complicated situation.

Briefly explained, on the northern stylobate there is a carving line that seems to be arranged for a circular element (fig. 5b), probably a base, while on the eastern



Fig. 6: Athens, Hadrian's Library, western portico; a: position of one of the stylobate slabs with angular carving lines; b: the stylobate slab with engraved the angles for the placement of square-based object; c: a plinth preserved *in situ*.

stylobate there are engraved lines attributable to the positioning of a square base on a slab formed by re-used elements (fig. 6b). Finally there are pedestals in positions that do not correspond to these incised lines (fig. 6c). While the pedestals are attributed to Herculus' restoration (*infra*),²¹ the difference between the carving lines on the northern stylobate and those on the eastern one remains unexplained and even

less clear is the presence of angular layouts for plinths at points where they should not be. An explanation may be sought at a diachronic level, in the archaeological evidence of a building with a very long lifespan that was certainly subjected to several maintenance phases or restructuring over the centuries.

As is well known, Hadrian's Library was extensively damaged in 267 AD during the Herules invasion, especially in its western and south-western sectors, which were then incorporated into the post-Herulian Wall (276–282).²² Also damaged by Alaric's Visigoths in 396 AD, it was restored a few years later by Herculus (407–412), which was commemorated by a statue in the propylon we know of thanks to the epigraphy.²³ As already mentioned, the colonnade on pedestals of the eastern and southern sides was part of these early-5th-century restorations in which the interaxes²⁴ between the columns was restricted and therefore the number of columns was increased.²⁵

The damage caused during the Herules invasion was confirmed by the excavations carried out on the southern part of the internal portico. A significant number of architectural elements were reused in the wall erected following the Herules invasion, including Phrygian marble columns attributable to the internal portico, probably on this same side of the complex that was damaged during the attack.²⁶ However, as already noted by A. Karivieri, it seems unlikely that this destruction put the Hadriatic complex out of action to such an extent that it was not renovated until 150 years later, also taking into account that the monument appears to be integrated into the new wall circuit.²⁷

The use of Hadrian's Library during the 4th century is attested by a portrait head identified as the Emperor Julian.²⁸ It was found in the early 20th century next to the north-western corner of the complex²⁹ and indicates that Hadrian's Library was still an imperial forum in the second half of the 4th century AD.³⁰

Taking into consideration all these data, it is plausible that another restoration was carried out between the original Hadriatic phase, with engraved circular lines for positioning the bases, and the restoration with pedestals by Herculus. We have no epigraphic sources for this phase, but it would justify the angular traces used for placing pedestal at points different to those where pedestals still survive and, moreover, on a slab of reused material. Continuing with this hypothesis, it would therefore have been a first restoration of the internal portico in which the use of columns on pedestals, absent from the Hadriatic phase, would already have been foreseen. That the pedestals belong to a post-Hadriatic phase can be seen from an inscription dedicated to Hadrian (CIL III.1314, N. 7282) and reused as a pedestal, as well as from the style of the pedestals (fig. 6c), which is much more cursive compared to the evidence still visible on the western front, which definitely belongs to the Hadriatic building (fig. 7). According to this hypothesis, the signs that mark the angles forming a quadrangular shape on the eastern stylobate could have been used for an initial



Fig. 7: Athens, Hadrian's Library, western colonnade outside the enclosure with Cipollino marble pedestals.

positioning of the pedestals, which were subsequently moved during Herculius' restoration. It should be noted that in other similar examples where the angles of a square are marked, it is possible to see that they were definitely used for positioning plinths or pedestals supporting colonnades. Examples of this include the lower colonnade of the Library of Celsus in Ephesus, Hadrian's Gate in Ephesus, the Tetraylon of Aphrodisias and the Hadrianic Gates in Phaselis and Antalya, in each case for the placement of pedestals.³¹

Carving Lines on Reused Elements from the Phases Following the Hadrianic Period

At a site that was extensively rebuilt over the time, such as that of Hadrian's Library,³² it is obviously very difficult to establish the chronology and original building context of many of the marble elements. An extremely interesting case is undoubtedly that of a carving line on a block of Imezio marble used as stylobate for the curved colonnade of one of the ambulatories on the northern side of Eudocia's Basilica (fig. 1, n. 8; fig. 8a).³³

The carving line presents a series of curves calculated with a compass (fig. 8b) that were used for the design of a curved element (fig. 8c). Given its reuse as stylobate of the colonnaded apse of the first phase of Eudocia's Basilica (5th century)³⁴ and the incompleteness of the carving line, which must have continued on adjoining blocks, it can be assumed that it is older than the basilica and belonged to a Roman monument, perhaps Hadrian's Library.

It is currently difficult to try and imagine the three-dimensional manifestation of the engraved signs. They could be part of a plan for an apse or the elevation of an arch or a vaulted structure. However, geometric research clearly shows it to be part of the design of the monument, either part of a planimetry or an architectural element.

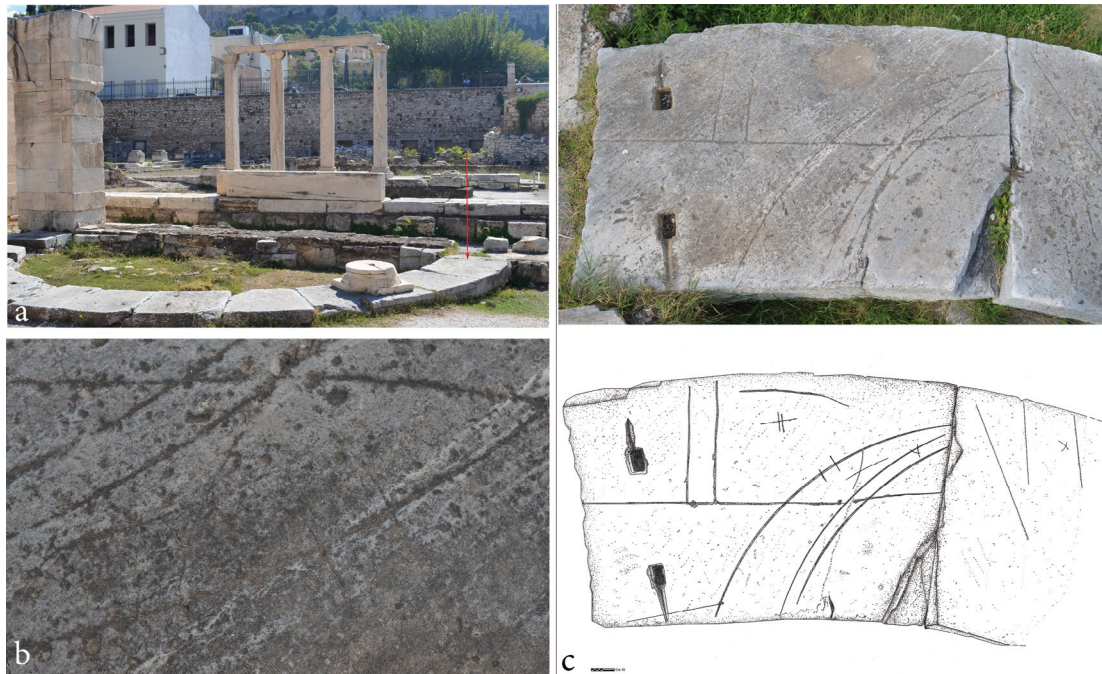


Fig. 8: Athens, Hadrian's Library, northern ambulatory of Eudocia's Basilica; a: position of the stylobate slab with carving line for the creation of a curved element; b: particular; c: stylobate slab with carving line for the creation of a curved element and drawing of the engravings on the slab.

Conclusions

The aim of this contribution has been to provide an introduction to an ongoing research project, offering an example to outline its potential. The archaeological evidence provided offers extremely useful information for our understanding, or rather our attempt to understand, a monument, in this case Hadrian's Library.

If quarry and construction marks provide instructions for the production and assembly of the components of the monument, the difference between the carving lines detected on the library's stylobate slabs opens up new possible interpretative panoramas that allow us to determine a more likely chronological scan for a monument with an extremely elaborate building stratification.

The case of the carving line for the construction of a curved element on a foundation block of Eudocia's Basilica is also of great interest, as it shows us a portion of an extremely complex planning process.

These are fundamental data as, in the same way as they allowed the ancient workers to produce and assemble the different components within the construction system, they allow us to attempt to reassemble them, both as an abstract concept in 2D and 3D drawings and as a restoration project.

Notes

¹It is a part of a wider project: «Carving instructions and mark-guidelines for stone artefacts production in Roman times», in collaboration with Dr. M.S. Vinci (Univ. Bordeaux Montaigne-AUSONIUS).

²For a history of studies: Ottati 2018.

³For a more extensive discussion and a history of studies of Hadrian's Library see Ottati 2018.

⁴Vinci 2018, 141–166; for the first interpretation: Fant 1993a–b; for terminology: Van Belle 2014. For a synthesis about use in Greece: Martin 1965, 225–231.

⁵Tigginaga 2008, 134–135; Ead. 2008, 135.

⁶Ead. 2008, 135. A similar case was found on the blocks of the Eleusis aqueduct: Kokkou 1970, 173; Travlos 1950, 122–127.

⁷Ead. 2008, 135

⁸The mark Ζω is present with different variations in Greece and Asia Minor, especially in late contexts: Deichmann 1976, 217; Paribeni 2004, 696–698. 722, n. 33d; Barsanti 1989, 117 note 77. 165. note 328.

⁹Pensabene 2010, 94.

¹⁰Orlandos 1952, 294–295; Börker 1965, 198 pl. 96.

¹¹Walker 1979, 103–129 in particular 119–120.

¹²Nuzzo in Corcella et al. 2013, 138–140. For the dimensions Id., nota 235.

¹³In later contexts, similar incisions have been linked to artisans' signatures: Barsanti 1989, 117 note 77.

¹⁴The wall belongs to a small church that was built in the late Byzantine era near the northern portico of Hadrian's Library: Dontas 1970, 29–30.

¹⁵ The south-west corner of the internal colonnade, already investigated during the Italian excavations in 1942, has been fully brought to light with recent excavations: Choremi-Spetsieri – Tigginaga 2008, 121–122.

¹⁶ Inglese 2016, 50–51.

¹⁷ On the topic see: Bessac 1996, Russell 2013.

¹⁸ The supply of building material began in the design phase. However, since the project is always in progress and the fact that unforeseen changes may have taken place during the construction, we cannot rule out that some items were ordered during the latter phase. Regarding the design approach in Roman architecture see Wilson Jones 2000.

¹⁹ Tigginaga 2008, 135.

²⁰ Dörpfeld 1885, pl. 1.

²¹ Knithakes – Tigginaga 1981, 4.

²² Choremi-Spetsieri – Tigginaga 2008, 116.

²³ *Ibid.*, nota 17.

²⁴ M 2.85 on the long sides and m 2.88 on the short ones. Dörpfeld 1885, pl. 1.

²⁵ Choremi-Spetsieri – Tigginaga 2008, 117–118.

²⁶ Choremi Spetsieri 1995, 139.

²⁷ Karivieri 1994, 103. Some scholars suggest Hadrian's Library was intact at the time of the Post-Herulian wall construction: Spawforth – Walker 1985, 98 and note 139.

²⁸ Kastriotou 1923, 118–123; Datzule-Stavride 1985, 91–92 pl. 136.

²⁹ Athens, National Archaeological Museum, n. 2006.

³⁰ Karivieri 1994, 104.

³¹ Inglese 2016, 39–41. 48.

³² *Ead.* 138.

³³ The central part of the Hadrian's Library including the area of Eudocia's Basilica was brought to light between 1885–1886 (Koumanoudis 1885, 13–25; *Id.* 1886, 10), 1942–1950 (Travlos 1950, 42–63) and 1970 (Dontas 1970, 28–30).

³⁴ Travlos 1950, 45–49.

Image Credits

Fig. 1: by Monaco et al. 2013, re-elaborated by author. – Fig. 2: Tigginaga 2008, p. 135. – Fig. 3–7: by author. – Fig. 8: photo and drawing by author.

References

Barsanti 1989

C. Barsanti, L'esportazione di marmi dal Proconneso nelle regioni pontiche durante il IV-VI secolo, *RIA* 12, 1989, 91–220.

Bessac 1996

J.-C. Bessac, *La Pierre en Gaule Narbonnaise et les carrières du Bois des Lens (Nîmes): histoire, archéologie, ethnographie, et techniques*, JRA Suppl. XVI (Ann Arbor 1996).

Börker 1965

C. Börker, *Blattkelchkapitelle: Untersuchungen zur kaiserzeitlichen Architekturornamentik in Griechenland* (Berlin 1965).

Corcella et al. 2013

A. Corcella – M. C. Monaco – A. Nuzzo, *Ancora su Pausania I 18,9. La cd. Biblioteca di Adriano ed il Panellenio*, ASAtene 91, 2013, 111–156.

Choremi Spetsieri 1995

A. Choremi Spetsieri, *Library of Hadrian at Athens. Recent Finds*, Ostraka 4, 1995, 137–147.

Choremi-Spetsieri – Tigginaga 2008

A. Χωρέμη-Σπετσιέρη – Ι. Τιγγινάγκα, *Η Βιβλιοθήκη του Αδριανού στην Αθήνα. Τα ανασκαφικά δεδομένα*, in: S. Vlizos (ed.), *Athens during the Roman Period. Recent Discoveries, New Evidence*, Μουσείο Μπενάκη 4, Παράρτημα (Athens 2008) 115–131.

Datzule-Stavride 1985

A. Ντατσούλη-Σταυρίδη, *Ρωμαϊκά πορτραίτα στο Εθνικό αρχαιολογικό μουσείο τής Αθήνα* (Αθήνα 1985).

Deichmann 1976

F. W. Deichmann, *Ravenna. Hauptstadt des spätantiken Abendlandes, Band II, Kommentar 1. Teil* (Wiesbaden 1976).

Dontas 1970

Γ. Δοντάς 1970, *Βιβλιοθήκη Αδριανού*, ADelt 25, 28–30.

Dörpfeld 1885

W. Dörpfeld, *Περὶ τῶν ἐν Ἀμφιαραίῳ οἰκοδομημάτων*, PraktAkAth 1885, 88–93.

Fant 1993a

J. C. Fant, *Ideology, gift and trade: a distribution model for the Roman imperial marble*, in: W. V. Harris (ed.), *The inscribed economy. Production and distribution in the Roman Empire in the light of instrumentum domesticum* (Ann Arbor 1993) 145–170.

Fant 1993b

J. C. Fant, *The Roman imperial marble trade: a distribution model*, in: R. Francovich (ed.), *Archeologia delle attività estrattive e metallurgiche. Atti del V ciclo di lezioni sulla ricerca applicata in archeologia* (Firenze 1993) 71–96.

Inglese 2016

C. Inglese, *I tracciati di cantiere nelle province romane dell'Asia Minore*, in: C. Inglese – A. Pizzo (eds.), *I tracciati di cantiere disegni esecutivi per la trasmissione e diffusione delle conoscenze tecniche* (Roma 2016) 29–54.

Karivieri 1994

A. Karivieri, *The so called Library of Hadrian and the Tetraconch Church in Athens*, in: P. Castrén (ed.), *Post-Herulian Athens. Aspects of life and culture in Athens, AD 267–529* (Helsinki 1994) 89–113.

Kastriotou 1923

Π. Καστριώτου, Ἰουλιανο τον Αποστάτου κεφαλή, *AEphem* 1923, 118–123.

Knithakes – Tigginaga 1981

Ι. Κνιθακης – Ι. Τιγγινάγκα, Βιβλιοθήκη Αδριανού, 36.B'1, 4–5.

Kokkou 1970

Α. Κοκκού, Αδριάνεια έργα εις τας Αθήνας, *ADelt* 25, 1970, 150–173.

Koumanoudis 1885

Σ. Koumanoudis, in *PraktAkAth* 1885, 13–25.

Martin 1965

Ρ. Martin, Manuel d'architecture grecque. I, Matériaux et techniques (Paris 1965).

Orlandos 1952

Α. Κ. Ορλάνδου, Η ξυλόστεγος παλαιοχριστιανική βασιλική της μεσογειακής λεκάνης, (Αθήνα 1952).

Ottati 2018

Α. Ottati, Considerazioni su sigle e tracciati di cantiere nella Biblioteca di Adriano ad Atene, *ASAtene* 96, 2018.

Paribeni 2004

Α. Paribeni, Le sigle dei Marmorari e l'organizzazione del cantiere, in: Α. Guiglia Guidobaldi – C. Barsanti (eds.), *Santa Sofia di Costantinopoli. L'arredo marmoreo della grande chiesa giustiniana* (Città del Vaticano 2004) 651–734.

Pensabene 2010

Ρ. Pensabene, Cave di marmo e pavonazzetto in Frigia. Sulla produzione e sui dati epigrafici, *Marmora* 6, 2010, 71–134.

Russell 2013

Β. Russell, *The economics of the Roman stone trade* (Oxford 2013).

Spawforth – Walker 1985

Α. J. Spawforth – S. Walker, *The World of the Panhellenion*, I, Athens and Eleusis, *JRS* 75, 1985, 78–104.

Tigginaga 2008

Ι. Τιγγινάγκα, Η αφανής αρχιτεκτονική της Βιβλιοθήκης του Αδριανού, in: S. Vlizon (ed.), *Athens during the Roman Period. Recent Discoveries, New Evidence*, Μουσείο Μπενάκη 4, Παράρτημα (Athens 2008) 133–152.

Travlos 1950

Ι. Τραυλός, Άνασκαφαι έν τή Βιβλιοθήκη του ἸΑδριανού, *PraktAkAth* 1950, 42–63.

Vinci 2018

Μ. S. Vinci, Marchi di cava e sigle di costruzione: nota preliminare sul materiale epigrafico proveniente dall'area di Tarraco (Hispania Citerior), *Aquitania* 34, 2018, 141–166.

Van Belle 2014

J.-L. van Belle, *Pour comprendre les signes lapidaires* (Bruxelles 2014).

Walker 1979

Σ. Walker 1979, Corinthian capitals with ringed voids. The work of Athenian craftsmen in the 2nd century AD, *AA* 1979, 103–129.

Wilson Jones 2000

M. Wilson Jones, *Principles of Roman Architecture* (London 2000).