

Notae Lapidinarum: Preliminary Considerations about the Quarry Marks from the Provincial Forum of Tarraco

Vinci, Maria Serena

Source / Izvornik: **ASMOSIA XI, Interdisciplinary Studies on Ancient Stone, Proceedings of the XI International Conference of ASMOSIA, 2018, 699 - 710**

Conference paper / Rad u zborniku

Publication status / Verzija rada: **Published version / Objavljena verzija rada (izdavačev PDF)**

<https://doi.org/10.31534/XI.asmosia.2015/05.10>

Permanent link / Trajna poveznica: <https://urn.nsk.hr/urn:nbn:hr:123:794546>

Rights / Prava: [In copyright](#) / [Zaštićeno autorskim pravom.](#)

Download date / Datum preuzimanja: **2025-02-24**



Repository / Repozitorij:

[FCEAG Repository - Repository of the Faculty of Civil Engineering, Architecture and Geodesy, University of Split](#)



UNIVERSITY OF SPLIT


DIGITALNI AKADEMSKI ARHIVI I REPOZITORIJI



ASMOSIA XI

Interdisciplinary Studies on Ancient Stone

PROCEEDINGS

of the XI ASMOSIA Conference, Split 2015

Edited by Daniela Matetić Poljak and Katja Marasović



Interdisciplinary Studies on Ancient Stone
Proceedings of the XI ASMOSIA Conference (Split 2015)

Publishers:

ARTS ACADEMY IN SPLIT
UNIVERSITY OF SPLIT

and

UNIVERSITY OF SPLIT
FACULTY OF CIVIL ENGINEERING,
ARCHITECTURE AND GEODESY

Technical editor:
Kate Bošković

English language editor:
Graham McMaster

Computer pre-press:
Nikola Križanac

Cover design:
Mladen Čulić

Cover page:

Sigma shaped mensa of pavonazzetto marble from Diocletian's palace in Split

ISBN 978-953-6617-49-4 (Arts Academy in Split)

ISBN 978-953-6116-75-1 (Faculty of Civil Engineering, Architecture and Geodesy)

e-ISBN 978-953-6617-51-7 (Arts Academy in Split)

e-ISBN 978-953-6116-79-9 (Faculty of Civil Engineering, Architecture and Geodesy)

CIP available at the digital catalogue of the University Library in Split, no 170529005

Association for the Study of Marble & Other Stones in Antiquity

ASMOSIA XI

Interdisciplinary Studies of Ancient Stone

Proceedings of the Eleventh International Conference of ASMOSIA,
Split, 18–22 May 2015

Edited by
Daniela Matetić Poljak
Katja Marasović



Split, 2018

Nota bene

All papers are subjected to an international review.

The quality of the images relies on the quality of the originals provided by the authors.

CONTENT

PRESENTATION	15
NECROLOGY: NORMAN HERZ (1923-2013) by Susan Kane	17
1. APPLICATIONS TO SPECIFIC ARCHEOLOGICAL QUESTIONS – USE OF MARBLE	
Hermaphrodites and Sleeping or Reclining Maenads: Production Centres and Quarry Marks <i>Patrizio Pensabene</i>	25
First Remarks about the Pavement of the Newly Discovered Mithraeum of the Colored Marbles at Ostia and New Investigations on Roman and Late Roman White and Colored Marbles from Insula IV, IX <i>Massimiliano David, Stefano Succi and Marcello Turci</i>	33
Alabaster. Quarrying and Trade in the Roman World: Evidence from Pompeii and Herculaneum <i>Simon J. Barker and Simona Perna</i>	45
Recent Work on the Stone at the Villa Arianna and the Villa San Marco (Castellammare di Stabia) and Their Context within the Vesuvian Area <i>Simon J. Barker and J. Clayton Fant</i>	65
Marble Wall Decorations from the Imperial Mausoleum (4 th C.) and the Basilica of San Lorenzo (5 th C.) in Milan: an Update on Colored Marbles in Late Antique Milan <i>Elisabetta Neri, Roberto Bugini and Silvia Gazzoli</i>	79
Sarcophagus Lids Sawn from their Chests <i>Dorothy H. Abramitis and John J. Herrmann</i>	89
The Re-Use of Monolithic Columns in the Invention and Persistence of Roman Architecture <i>Peter D. De Staebler</i>	95
The Trade in Small-Size Statues in the Roman Mediterranean: a Case Study from Alexandria <i>Patrizio Pensabene and Eleonora Gasparini</i>	101
The Marble Dedication of Komon, Son of Asklepiades, from Egypt: Material, Provenance, and Reinforcement of Meaning <i>Patricia A. Butz</i>	109
Multiple Reuse of Imported Marble Pedestals at Caesarea Maritima in Israel <i>Barbara Burrell</i>	117
Iasos and Iasian Marble between the Late Antique and Early Byzantine Eras <i>Diego Peirano</i>	123

Thassos, Known Inscriptions with New Data <i>Tony Kozelj and Manuela Wurch-Kozelj</i>	131
The Value of Marble in Roman <i>Hispalis</i> : Contextual, Typological and Lithological Analysis of an Assemblage of Large Architectural Elements Recovered at N° 17 Goyeneta Street (Seville, Spain) <i>Ruth Taylor, Oliva Rodríguez, Esther Ontiveros, María Luisa Loza, José Beltrán and Araceli Rodríguez</i>	143
<i>Giallo Antico</i> in Context. Distribution, Use and Commercial Actors According to New Stratigraphic Data from the Western Mediterranean (2 nd C. Bc – Late 1 st C. Ad) <i>Stefan Ardeleanu</i>	155
<i>Amethystus</i> : Ancient Properties and Iconographic Selection <i>Luigi Pedroni</i>	167
2. PROVENANCE IDENTIFICATION I: (MARBLE)	
Unraveling the Carrara – Göktepe Entanglement <i>Walter Prochaska, Donato Attanasio and Matthias Bruno</i>	175
The Marble of Roman Imperial Portraits <i>Donato Attanasio, Matthias Bruno, Walter Prochaska and Ali Bahadır Yavuz</i>	185
Tracing Alabaster (Gypsum or Anhydrite) Artwork Using Trace Element Analysis and a Multi-Isotope Approach (Sr, S, O) <i>Lise Leroux, Wolfram Kloppmann, Philippe Bromblet, Catherine Guerrot, Anthony H. Cooper, Pierre-Yves Le Pogam, Dominique Vingtain and Noel Worley</i>	195
Roman Monolithic Fountains and Thasian Marble <i>Annewies van den Hoek, Donato Attanasio and John J. Herrmann</i>	207
Archaeometric Analysis of the Alabaster Thresholds of Villa A, Oplontis (Torre Annunziata, Italy) and New Sr and Pb Isotopic Data for <i>Alabastro Ghiaccione del Circeo</i> <i>Simon J. Barker, Simona Perna, J. Clayton Fant, Lorenzo Lazzarini and Igor M. Villa</i>	215
Roman Villas of Lake Garda and the Occurrence of Coloured Marbles in the Western Part of “Regio X Venetia et Histria” (Northern Italy) <i>Roberto Bugini, Luisa Folli and Elisabetta Roffia</i>	231
Calcitic Marble from Thasos in the North Adriatic Basin: Ravenna, Aquileia, and Milan <i>John J. Herrmann, Robert H. Tykot and Annewies van den Hoek</i>	239
Characterisation of White Marble Objects from the Temple of Apollo and the House of Augustus (Palatine Hill, Rome) <i>Francesca Giustini, Mauro Brilli, Enrico Gallochio and Patrizio Pensabene</i>	247
Study and Archeometric Analysis of the Marble Elements Found in the Roman Theater at Aeclanum (Mirabella Eclano, Avellino - Italy) <i>Antonio Mesisca, Lorenzo Lazzarini, Stefano Cancelliere and Monica Salvadori</i>	255

Two Imperial Monuments in Puteoli: Use of Proconnesian Marble in the Domitianic and Trajanic Periods in Campania <i>Irene Bald Romano, Hans Rupprecht Goette, Donato Attanasio and Walter Prochaska</i>	267
Coloured Marbles in the Neapolitan Pavements (16 th And 17 th Centuries): the Church of <i>Santi Severino e Sossio</i> <i>Roberto Bugini, Luisa Folli and Martino Solito</i>	275
Roman and Early Byzantine Sarcophagi of Calcitic Marble from Thasos in Italy: Ostia and Siracusa <i>Donato Attanasio, John J. Herrmann, Robert H. Tykot and Annewies van den Hoek</i>	281
Revisiting the Origin and Destination of the Late Antique Marzamemi 'Church Wreck' Cargo <i>Justin Leidwanger, Scott H. Pike and Andrew Donnelly</i>	291
The Marbles of the Sculptures of Felix Romuliana in Serbia <i>Walter Prochaska and Maja Živić</i>	301
Calcitic Marble from Thasos and Proconnesos in Nea Anchialos (Thessaly) and Thessaloniki (Macedonia) <i>Vincent Barbin, John J. Herrmann, Aristotle Mentzos and Annewies van den Hoek</i>	311
Architectural Decoration of the Imperial Agora's Porticoes at Iasos <i>Fulvia Bianchi, Donato Attanasio and Walter Prochaska</i>	321
The Winged Victory of Samothrace - New Data on the Different Marbles Used for the Monument from the Sanctuary of the Great Gods <i>Annie Blanc, Philippe Blanc and Ludovic Laugier</i>	331
Polychrome Marbles from the Theatre of the Sanctuary of Apollo Pythios in Gortyna (Crete) <i>Jacopo Bonetto, Nicolò Mareso and Michele Bueno</i>	337
Paul the Silentary, Hagia Sophia, Onyx, Lydia, and Breccia Corallina <i>John J. Herrmann and Annewies van den Hoek</i>	345
Incrustations from Colonia Ulpia Traiana (Near Modern Xanten, Germany) <i>Vilma Ruppinić and Ulrich Schüssler</i>	351
Stone Objects from Vindobona (Austria) – Petrological Characterization and Provenance of Local Stone in a Historico-Economical Setting <i>Andreas Rohatsch, Michaela Kronberger, Sophie Insulander, Martin Mosser and Barbara Hodits</i>	363
Marbles Discovered on the Site of the Forum of Vaison-la-Romaine (Vaucluse, France): Preliminary Results <i>Elsa Roux, Jean-Marc Mignon, Philippe Blanc and Annie Blanc</i>	373
Updated Characterisation of White Saint-Béat Marble. Discrimination Parameters from Classical Marbles <i>Hernando Royo Plumed, Pilar Lapeunte, José Antonio Cuchí, Mauro Brillì and Marie-Claire Savin</i>	379

Grey and Greyish Banded Marbles from the Estremoz Anticline in Lusitania <i>Pilar Lapuente, Trinidad Nogales-Basarrate, Hernando Royo Plumed, Mauro Brilli and Marie-Claire Savin</i>	391
New Data on Spanish Marbles: the Case of <i>Gallaecia</i> (NW Spain) <i>Anna Gutiérrez García-M., Hernando Royo Plumed and Silvia González Soutelo</i>	401
A New Roman Imperial Relief Said to Be from Southern Spain: Problems of Style, Iconography, and Marble Type in Determining Provenance <i>John Pollini, Pilar Lapuente, Trinidad Nogales-Basarrate and Jerry Podany</i>	413
Reuse of the <i>Marmora</i> from the Late Roman Palatial Building at Carranque (Toledo, Spain) in the Visigothic Necropolis <i>Virginia García-Entero, Anna Gutiérrez García-M. and Sergio Vidal Álvarez</i>	427
Imperial Porphyry in Roman Britain <i>David F. Williams</i>	435
Recycling of Marble: Apollonia/Sozousa/Arsuf (Israel) as a Case Study <i>Moshe Fischer, Dimitris Tambakopoulos and Yannis Maniatis</i>	443
Thasian Connections Overseas: Sculpture in the Cyrene Museum (Libya) Made of Dolomitic Marble from Thasos <i>John J. Herrmann and Donato Attanasio</i>	457
Marble on Rome's Southwestern Frontier: Thamugadi and Lambaesis <i>Robert H. Tykot, Ouahiba Bouzidi, John J. Herrmann and Annewies van den Hoek</i>	467
Marble and Sculpture at Lepcis Magna (Tripolitania, Libya): a Preliminary Study Concerning Origin and Workshops <i>Luisa Musso, Laura Buccino, Matthias Bruno, Donato Attanasio and Walter Prochaska</i>	481
The Pentelic Marble in the Carnegie Museum of Art Hall of Sculpture, Pittsburgh, Pennsylvania <i>Albert D. Kollar</i>	491
Analysis of Classical Marble Sculptures in the Michael C. Carlos Museum, Emory University, Atlanta <i>Robert H. Tykot, John J. Herrmann, Renée Stein, Jasper Gaunt, Susan Blevins and Anne R. Skinner</i>	501
3. PROVENANCE IDENTIFICATION II: (OTHER STONES)	
Aphrodisias and the Regional Marble Trade. The <i>Scaenae Frons</i> of the Theatre at Nysa <i>Natalia Toma</i>	513
The Stones of Felix Romuliana (Gamzigrad, Serbia) <i>Bojan Djurić, Divna Jovanović, Stefan Pop Lazić and Walter Prochaska</i>	523
Aspects of Characterisation of Stone Monuments from Southern Pannonia <i>Branka Migotti</i>	537

The Budakalász Travertine Production <i>Bojan Djurić, Sándor Kele and Igor Rižnar</i>	545
Stone Monuments from Carnuntum and Surrounding Areas (Austria) – Petrological Characterization and Quarry Location in a Historical Context <i>Gabrielle Kremer, Isabella Kitz, Beatrix Moshhammer, Maria Heinrich and Erich Draganits</i>	557
Espejón Limestone and Conglomerate (Soria, Spain): Archaeometric Characterization, Quarrying and Use in Roman Times <i>Virginia García-Entero, Anna Gutiérrez García-M, Sergio Vidal Álvarez, María J. Peréx Agorreta and Eva Zarco Martínez</i>	567
The Use of Alcover Stone in Roman Times (<i>Tarraco, Hispania Citerior</i>). Contributions to the <i>Officina Lapidaria Tarraconensis</i> <i>Diana Gorostidi Pi, Jordi López Vilar and Anna Gutiérrez García-M.</i>	577
4. ADVANCES IN PROVENANCE TECHNIQUES, METHODOLOGIES AND DATABASES	
Grainautline – a Supervised Grain Boundary Extraction Tool Supported by Image Processing and Pattern Recognition <i>Kristóf Csorba, Lilla Barancsuk, Balázs Székely and Judit Zöldföldi</i>	587
A Database and GIS Project about Quarrying, Circulation and Use of Stone During the Roman Age in <i>Regio X - Venetia et Histria</i> . The Case Study of the Euganean Trachyte <i>Caterine Previato and Arturo Zara</i>	597
5. QUARRIES AND GEOLOGY	
The Distribution of Troad Granite Columns as Evidence for Reconstructing the Management of Their Production <i>Patrizio Pensabene, Javier Á. Domingo and Isabel Rodà</i>	613
Ancient Quarries and Stonemasonry in Northern Choria Considiana <i>Hale Güney</i>	621
Polychromy in Larisaeon Quarries and its Relation to Architectural Conception <i>Gizem Mater and Ertunç Denктаş</i>	633
Euromos of Caria: the Origin of an Hitherto Unknown Grey Veined Stepped Marble of Roman Antiquity <i>Matthias Bruno, Donato Attanasio, Walter Prochaska and Ali Bahadır Yavuz</i>	639
Unknown Painted Quarry Inscriptions from Bacakale at <i>Docimium</i> (Turkey) <i>Matthias Bruno</i>	651
The Green Schist Marble Stone of Jebel El Hairech (North West of Tunisia): a Multi-Analytical Approach and its Uses in Antiquity <i>Ameur Younès, Mohamed Gaied and Wissem Gallala</i>	659
Building Materials and the Ancient Quarries at <i>Thamugadi</i> (East of Algeria), Case Study: Sandstone and Limestone <i>Younès Rezkallah and Ramdane Marmi</i>	673

The Local Quarries of the Ancient Roman City of <i>Valeria</i> (Cuenca, Spain) <i>Javier Atienza Fuente</i>	683
The Stone and Ancient Quarries of Montjuïc Mountain (Barcelona, Spain) <i>Aureli Álvarez</i>	693
<i>Notae Lapidinarum</i> : Preliminary Considerations about the Quarry Marks from the Provincial Forum of <i>Tarraco</i> <i>Maria Serena Vinci</i>	699
The Different Steps of the Rough-Hewing on a Monumental Sculpture at the Greek Archaic Period: the Unfinished Kouros of Thasos <i>Danièle Braunstein</i>	711
A Review of Copying Techniques in Greco-Roman Sculpture <i>Séverine Moureaud</i>	717
Labour Forces at Imperial Quarries <i>Ben Russell</i>	733
Social Position of Craftsmen inside the Stone and Marble Processing Trades in the Light of Diocletian's Edict on Prices <i>Krešimir Bosnić and Branko Matulić</i>	741
6. STONE PROPERTIES, WEATHERING EFFECTS AND RESTORATION, AS RELATED TO DIAGNOSIS PROBLEMS, MATCHING OF STONE FRAGMENTS AND AUTHENTICITY	
Methods of Consolidation and Protection of Pentelic Marble <i>Maria Apostolopoulou, Elissavet Drakopoulou, Maria Karoglou and Asterios Bakolas</i>	749
7. PIGMENTS AND PAINTINGS ON MARBLE	
Painting and Sculpture Conservation in Two Gallo-Roman Temples in Picardy (France): Champlieu and Pont-Sainte-Maxence <i>Véronique Brunet-Gaston and Christophe Gaston</i>	763
The Use of Colour on Roman Marble Sarcophagi <i>Eliana Siotto</i>	773
New Evidence for Ancient Gilding and Historic Restorations on a Portrait of Antinous in the San Antonio Museum of Art <i>Jessica Powers, Mark Abbe, Michelle Bushey and Scott H. Pike</i>	783
Schists and Pigments from Ancient Swat (Khyber Pukhtunkhwa, Pakistan) <i>Francesco Mariottini, Gianluca Vignaroli, Maurizio Mariottini and Mauro Roma</i>	793
8. SPECIAL THEME SESSION: „THE USE OF MARBLE AND LIMESTONE IN THE ADRIATIC BASIN IN ANTIQUITY”	
Marble Sarcophagi of Roman Dalmatia Material – Provenance – Workmanship <i>Guntram Koch</i>	809

Funerary Monuments and Quarry Management in Middle Dalmatia <i>Nenad Cambi</i>	827
Marble Revetments of Diocletian's Palace <i>Katja Marasović and Vinka Marinković</i>	839
The Use of Limestones as Construction Materials for the Mosaics of Diocletian's Palace <i>Branko Matulić, Domagoj Mudronja and Krešimir Bosnić</i>	855
Restoration of the Peristyle of Diocletian's Palace in Split <i>Goran Nikšić</i>	863
Marble Slabs Used at the Archaeological Site of Sorna near Poreč Istria – Croatia <i>Đeni Gobić-Bravar</i>	871
Ancient Marbles from the Villa in Verige Bay, Brijuni Island, Croatia <i>Mira Pavletić and Đeni Gobić-Bravar</i>	879
Notes on Early Christian Ambos and Altars in the Light of some Fragments from the Islands of Pag and Rab <i>Mirja Jarak</i>	887
The Marbles in the Chapel of the Blessed John of Trogir in the Cathedral of St. Lawrence at Trogir <i>Đeni Gobić-Bravar and Daniela Matetić Poljak</i>	899
The Use of Limestone in the Roman Province of Dalmatia <i>Edisa Lozić and Igor Rižnar</i>	915
The Extraction and Use of Limestone in Istria in Antiquity <i>Klara Buršić-Matijašić and Robert Matijašić</i>	925
Aurisina Limestone in the Roman Age: from Karst Quarries to the Cities of the Adriatic Basin <i>Caterina Previato</i>	933
The Remains of Infrastructural Facilities of the Ancient Quarries on Zadar Islands (Croatia) <i>Mate Parica</i>	941
The Impact of Local Geomorphological and Geological Features of the Area for the Construction of the Burnum Amphitheatre <i>Miroslav Glavičić and Uroš Stepišnik</i>	951
Roman Quarry Klis Kosa near Salona <i>Ivan Alduk</i>	957
Marmore Lavdata Brattia <i>Miona Miliša and Vinka Marinković</i>	963
Quarries of the Lumbarda Archipelago <i>Ivka Lipanović and Vinka Marinković</i>	979

Island of Korčula – Importer and Exporter of Stone in Antiquity <i>Mate Parica and Igor Borzić</i>	985
Faux Marbling Motifs in Early Christian Frescoes in Central and South Dalmatia: Preliminary Report <i>Tonči Borovac, Antonija Gluhan and Nikola Radošević</i>	995
INDEX OF AUTHORS	1009

NOTAE LAPICIDINARUM: PRELIMINARY CONSIDERATIONS ABOUT THE QUARRY MARKS FROM THE PROVINCIAL FORUM OF TARRACO

Maria Serena Vinci

Institut AUSONIUS (UMR 5607), CNRS-Université Bordeaux Montaigne,
Bordeaux, France (serenavnc@gmail.com)

Abstract

The purpose of this study is to present the quarry marks documented in one of the buildings comprising the monumental complex of the Provincial Forum of *Tarraco*.

Understanding the exact meaning of these quarry labels is complicated because of their cryptic linguistic code. This research is a part of a broader project, still in progress, aimed to study the quarry marks, about 70 in total, discovered near El Mèdol quarry, the main extraction site, which supplied stone for the construction of Roman Tarraco (Hispania Citerior). The main aim is to understand their general function in the quarry organization and in the building process. This project has undoubtedly very interesting research perspectives and can throw light on new aspects and data for understanding the organization of a work process that started in the quarry and ended with the production of the monument.

Keywords

quarry marks, Provincial Forum of *Tarraco*, quarry organization

Introduction

The object of this work is to present the quarry marks documented in one of the buildings comprising the monumental complex of the Provincial Forum of *Tarraco*.

It deals mainly with labels consisting of letters or numbers, documented in the area of the so-called Pretorio Tower. This building, which is in the southeast corner of the lower terrace of the Provincial Forum (Fig. 1), is one of the main communication systems between the aforementioned terrace and the circus.

The quarry marks documented in the Provincial Forum up-to-date are nine in total, one of which is difficult to read and interpret due to its poor state of preservation. They are seven alphabetic labels consisting of one, two or three capital letters, one numeric label and one symbol, all of these carved in limestone blocks.

The existence of the majority of these quarry marks was discovered in the 60s, during the archaeological excavation undertaken in the courtyard of the so-called Pretorio Tower (Fig. 2a), directed by A. Balil¹. However, in 1993 X. Dupré and E. Subías² published the alphabetic labels corresponding to the entrance of the so-called *Volta Llarga* (Fig. 2b-c). In neither case were the quarry marks studied in detail, their existence merely being recorded. Finally, the unique label consisting of a symbol is presented in this paper as previously unpublished.

It will be complicated to reach an exact interpretation of the aforementioned labels. However, it will be important to investigate the possible role of these marks for understanding additional aspects of the quarry organization in the construction process of an outstanding monument like the Provincial Forum. Moreover, the question presents wide research perspectives because it is a part of a broader project³, still very much in progress, which is intended to study the quarry marks, about 70 in total, discovered near the main extraction site, El Mèdol quarry, which supplied building stone for the construction of Roman Tarraco.

This project has undoubtedly very interesting research perspectives and can throw light on new aspects and data for understanding the organization of the work process.

1 BALIL 1969.

2 DUPRÉ, SUBÍAS 1993, 603-609.

3 This research is part of the postdoctoral project “The economy of construction processes from the quarry to the monument. Skilled specialists and construction technology in the Provincia Hispania Citerior (1st cent. BC/1st cent. AD)” supported by IdEx Bordeaux-International Postdoctoral Program. The study is also included in the project “*Officinae Lapidariae Tarraconenses. Canteras, talleres y producciones artísticas en piedra de la Provincia Tarraconensis*” (I+D HAR2015-65319-P; principal investigator Prof. D. Gorostidi), supported by the Spanish Ministry of *Economía y Competitividad*.

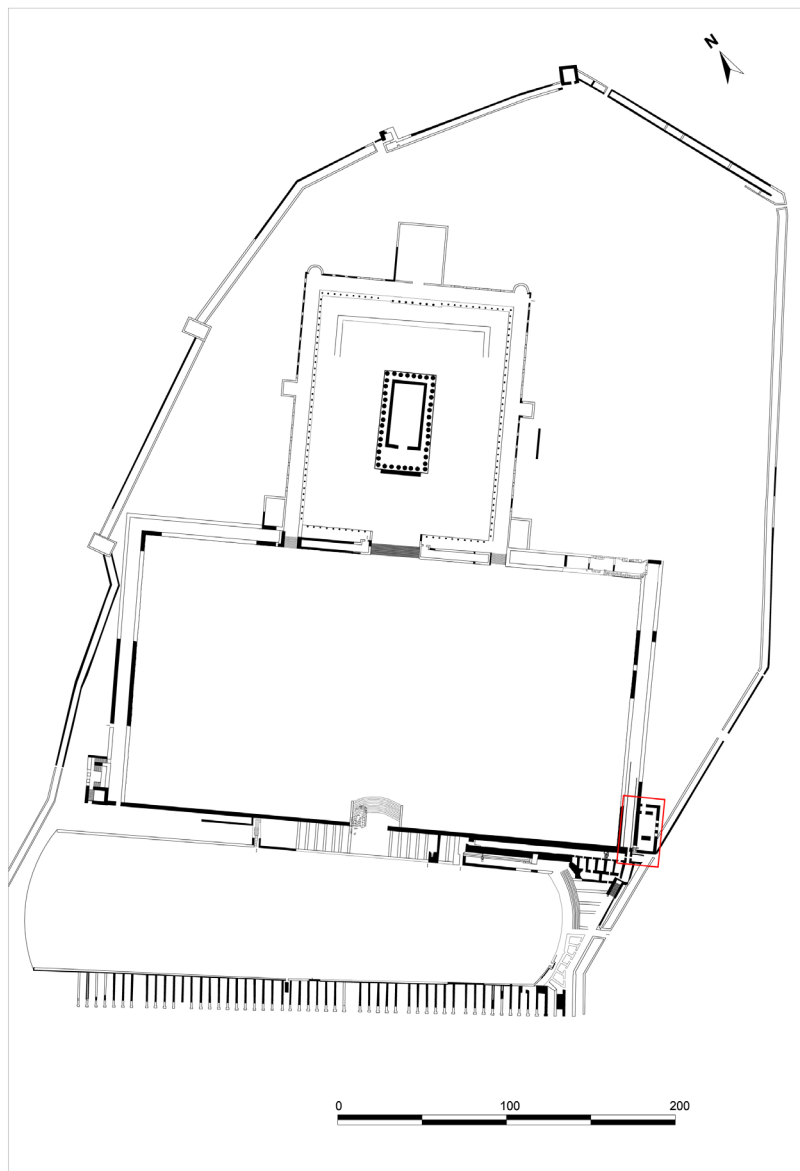


Fig. 1.
Planimetry of the Provincial Forum of
Tarraco with the indication of the area of the
so-called Pretorio Tower (photo: M. S. Vinci)

From the quarry to the monument: the construction of the Provincial Forum of *Tarraco*

It is well-known that, in the imperial age, the city of *Tarraco* was involved in intensive building activity, when the realisation of the Provincial Forum modified the urbanistic and architectural overview of the city of the *Hispania Citerior*⁴ Province. The three enormous spaces

4 The urban and monumental development of the colony starts in Late Republican age and has its fundamental phase in the Augustan age: transformation of the ancient Republican forum (RUIZ DE ARBULO 1990), construction of the theatre (MAR *et al.* 2012, 286-322 with previous bibliography), reorganization of the road network and infrastructures (GURT, RODÀ 2005). This process culminated in the Flavian age with the finalization of the building of the Provincial Forum.

of which the monument consists (the Worship Area or upper terrace, the Representation Square or lower terrace and the Circus), which represent an explicit and incisive instrument for the celebration of the imperial cult, impose a huge economic and constructive effort on the colony, one that certainly was protracted for a long period of time. The exact chronology of the different construction phases of the monument is still the object of scientific debate. However, macro-phases, from the Julio-Claudian period to the Vespasian age, can be identified⁵.

5 It has been possible to underline a clear change of intended use of *Tarraco's* hill a first temenos to which ceramic fragments of Neronian age are associated (SÁNCHEZ REAL 1969, 281), the abandonment of the *figlina* instead of which the Circus was built (LÓPEZ, PIÑOL 2008), the sector of the so-called *Volta Llarga*, where several modifications, due to

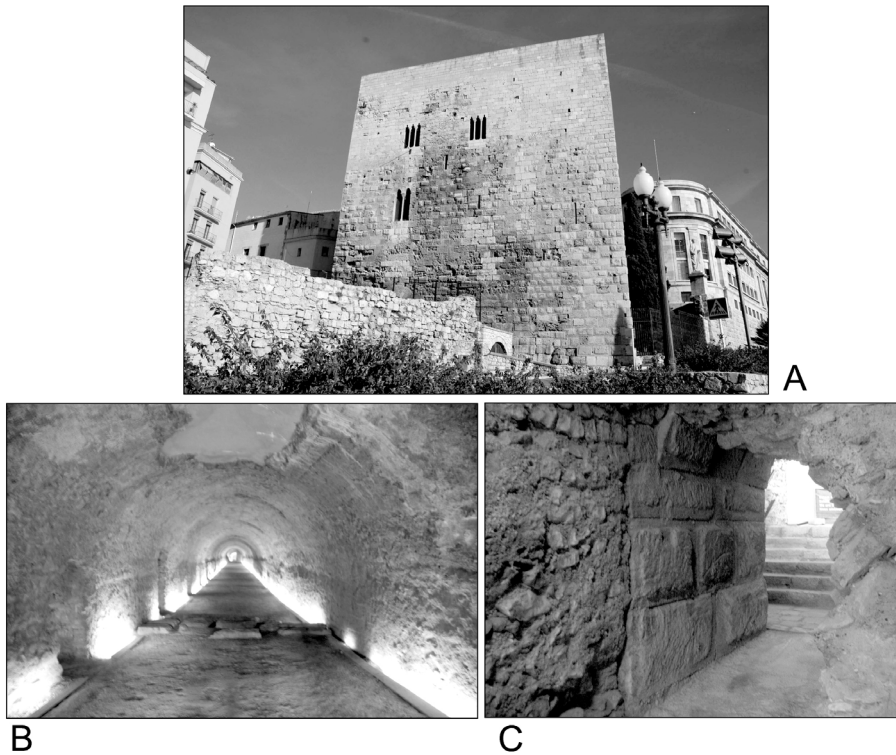


Fig. 2.

A. An overview of the Pretorio Tower;
 B. The main barrel-vaulted room of the Volta Llarga sector;
 C. Detail of the entrance of the Volta Llarga where are located two quarry marks (photos: M. S. Vinci)

The topography of *Tarraco's* hill and the urban structures already in existence⁶ were shaped for the construction of the Provincial Forum, strongly influencing the organization of the building site. In the imperial complex, the use of the stone, associated with the construction technique of *opus quadratum*, defined the creation of solid

and imposing architecture. However, it was connected to complex processes of elaboration, transport and placement of the materials and it needed a constant intervention of skilled manpower and a huge constructive effort⁷.

The two terraces, the Worship Area and the Representation Square, are almost completely built in *opus quadratum*. They are monumental areas where the craftsmanship is well shown, not only in stone working but also in skilful use of these materials for complex structures.

Proximity of the building site to the stone resources⁸ is, obviously, the main reason for their exploitation, due to an easier and faster connection with the main road network and sea transport⁹. The local limestone, the so-called *El Mèdol* Stone, is in fact widely used as

the communication system between the lower terrace and the circus, are visible (VINCI *et al.* 2014). In fact, the constructive evolution of the Provincial Forum is a complex question. Nevertheless, the identification of three macro-phases is unmistakable. Tacitus (TAC., An., I, 78.), at least in its most common interpretation (for a recent and interesting new interpretation see CASTILLO RAMÍREZ 2015, 176-180.), mentions that, in A.D. 15, an embassy of Spaniards received permission from Tiberius to construct a temple to Augustus at the colony of *Tarraco*. The realisation of the temple, represented on coins of Tiberian age and the presence of which would be also confirmed by the materials of the architectural decoration, with the Julio-Claudian style of execution discovered in the upper terrace, represents clear evidence of the renewal of the *Tarraco's* hill in this period. A construction project that acquired definitive monumentalisation in the Flavian age (testified by the epigraphic data, ALFÖLDY 1973).

6 Above all the Via Augusta and the Late Republican city walls.

7 The walls and the foundations of the upper and lower terrace are built mainly in the *opus quadratum* technique. In the foundations, where the structures are particularly stressed, the blocks are often associated to the *opus caementicium* technique.

8 Beyond the main quarry, which is *El Mèdol* quarry, other extraction sites of *El Mèdol* stone have been exploited for constructing specific buildings. The *Torre dels Escipions*, for example, is located nearby the *Punta de la Creueta* quarry, which suggests that this material was used for the construction of the funerary monument (GUTIÉRREZ 2009, 166-169).

9 GUTIÉRREZ *et al.* 2015, 785-787.

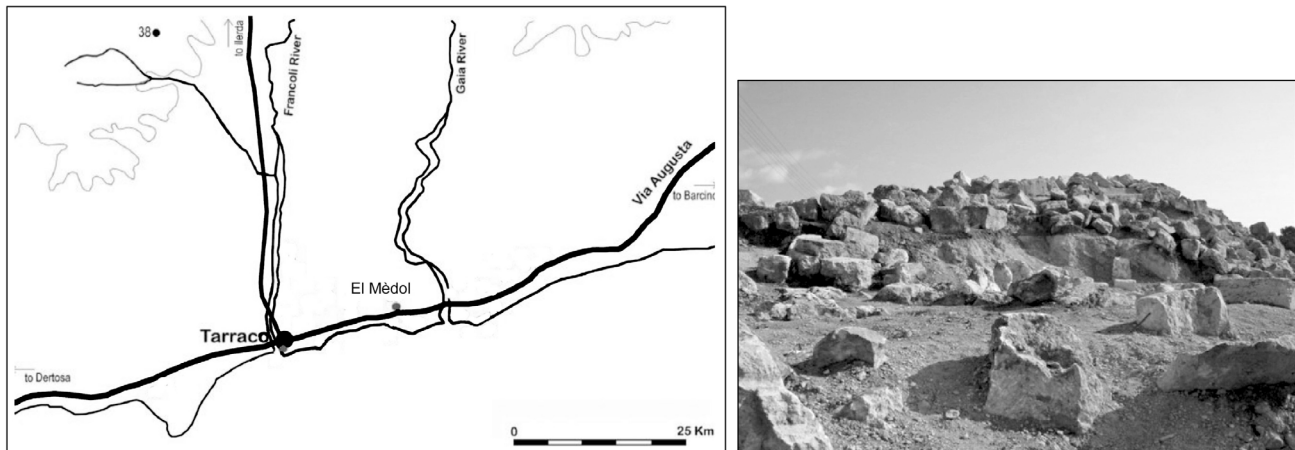


Fig. 3. El Mèdol quarry and the view of a part of the artificial hill (GUTIÉRREZ 2009, 155)

construction material. It is a Miocene bioclastic limestone¹⁰, the use of which is broadly documented in the public architecture of the city and its surrounding. *El Mèdol* quarry is located 7 km northeast from Tarragona, making this area the extraction site that could best satisfy the stone demands of the city. In fact, the quarry was already exploited by the colony in the Late Republican age, to supply materials for the construction of the city walls.

The studies realised until now have identified at least five different extraction sectors¹¹, beyond an area, near the quarry, where abandoned blocks in different working phases have been discovered¹² (Fig. 3). The site consisted of a 10 m high artificial hill made up of abandoned ashlar of various sizes, stone chips or debris and soil¹³. The unique archaeological excavation undertaken in this area, because of the construction of a new road¹⁴, did not clarify completely the chronology and phases of

the deposit. However, different levels of continued activity have been documented, as well as some stratigraphic evidence, a coin of Tiberian age and some fragments of African *terra sigillata*¹⁵. Many of the ashlar that composed the deposit were quite irregular or broken and the tool marks on their surfaces were mostly the same grooves visible at the quarry fronts. Involved here is probably a workshop area to which the blocks were brought from the extraction sector to give them an initial shaping or hewing. Moreover, on some of these blocks, at least 70 quarry marks and inscriptions have been documented, the majority being carved and about 15 red painted or written in charcoal. The study of these labels is the object of a project that is still a work in progress and that will contribute to throw light on the organization of the main quarry of the city of *Tarraco* and on the different skilled specialists employed probably for the construction of an outstanding monument, that is the Provincial Forum.

The quarry marks from the Provincial Forum of *Tarraco*

It has been highlighted previously that all quarry marks documented in the Provincial Forum of *Tarraco*, are located in the southeast area of the Representation Square. In particular, two of these labels are located in the sector of the so-called *Volta Llarga*¹⁶ (Fig. 2b-c). This sector consists in different vaulted spaces, of which the principal is a long barrel-vaulted room, placed against the retaining wall of the lower terrace. It deals with an area with a complex architectural stratigraphy because of several changes of the building project, due to the construction of the Pretorio Tower. The two aforementioned quarry marks, have been documented next to the main

10 It shows a high shell component and has a golden yellow colour (GUTIÉRREZ 2009, 149).

11 The last extraction sector was discovered after a violent fire that, in 2010, broke out at an area of *El Mèdol* that was covered by very dense vegetation. This event allowed on the conduct of an archaeological intervention in 2013 (GUTIÉRREZ *et al.* 2015, 779-789).

12 The area is located outside the quarrying area, between the N-340 road and the AP-7 road.

13 GUTIÉRREZ 2009, 155. The configuration of this hill it is not completely the original one as some of the ashlar and other remains were moved from their initial location due to the construction of modern important roads (Ap 7 motorway and N-340 road). On this occasion, between 2008 and 2009, an archaeological excavation was undertaken.

14 See above, footnote 11.

15 ROIG *et al.* 2011, 403.

16 VINCI *et al.* 2014.

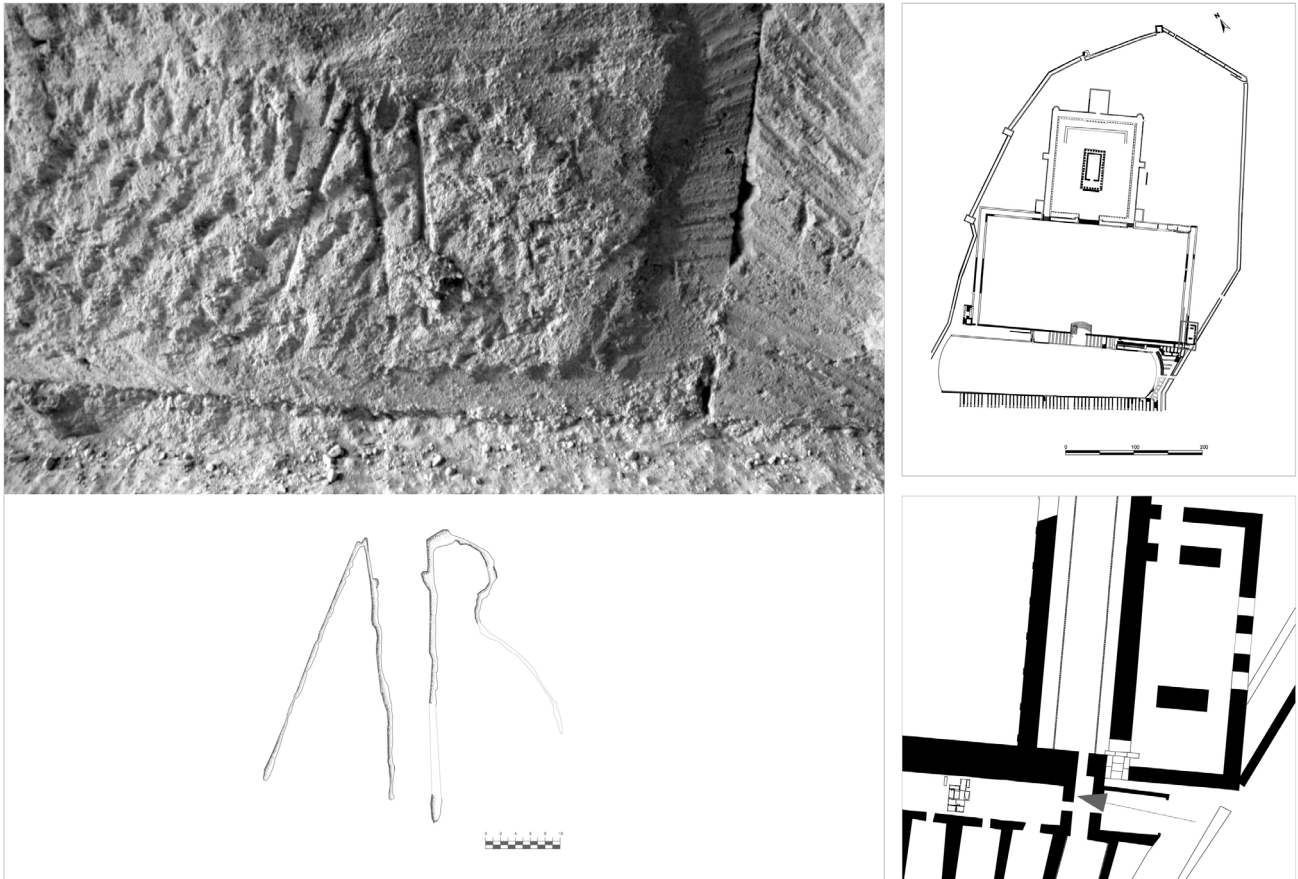


Fig. 4. Volta Llarga. Quarry mark (photo and drawing: M. S. Vinci)

entrance of the *Volta Larga*. One of these was published as a numeral¹⁷, but here it is proposed there should be a different reading. It consists of the two Latin capital letters AR (Fig. 4), of which the A is lacking of the horizontal stroke and the R has the diagonal stroke, curved instead of straight. The other mark was published as TR, but I propose a possible integration for its reading as TR↓ (Fig. 5), where the use of the symbol ↓, which would represent the numeral 50, is used until the Augustan-Tiberian age instead of the traditional writing¹⁸. In both cases the letters are carved with point tool, a thin line, an execution with simplified characters (in the TR↓ label the R is inscribed with straight stroke, even the loop, all perpendicular between each other) and not detailed (in the AR label the R presents an open loop).

The only mark that represents a symbol, a sort of trident (Fig. 6), has been documented on a block included in the foundation of the wall that defines the internal perimeter of the lower terrace. The same mark is widely

known also in other contexts and in different ages¹⁹. According to F. Pesando²⁰, this symbol, also discovered in Pompei, would be the reproduction of a very widespread tool, in the *opus quadratum* building technique, to move and lift blocks, the *holivela*. The representation of the instruments used by the workforce in the building site would be documented also by other symbols. These are, for example, the quarry mark consisting of symmetrical double triangles, which are interpreted as a *bipennis*²¹, or the mark consisting of an H, closed above and below by two horizontal lines, which would refer to the *serrae*, or finally the

17 The quarry mark was previously read as the upside-down number IV (DUPRÉ, SUBÍAS 1993, 605).

18 See GORDON 1957, 181; PARIBENI, SEGENTI 2003, 77.

19 Between other examples it is mentioned the luxury *domus* of the north coast at Leptis Magna (TOMASELLO, DE SIMONE 2005, 338-341); the Claudio Marcelo temple C at Cordoba (GUTIÉRREZ DE ZA 2004, 249-270).

20 PESANDO 2010, 71. The quarry mark has been documented on different blocks of the city walls, specifically in the sector located on the north side of the *insula* VI, 2.

21 LUGLI 1957, 203, fig. 24; LAZZARINI 1973, 19. The symbol of the *bipennis* is largely documented also on Tarraco's city walls (TOUS 1983).



Fig. 5. Volta Llarga. Quarry mark (photo and drawing: M. S. Vinci)

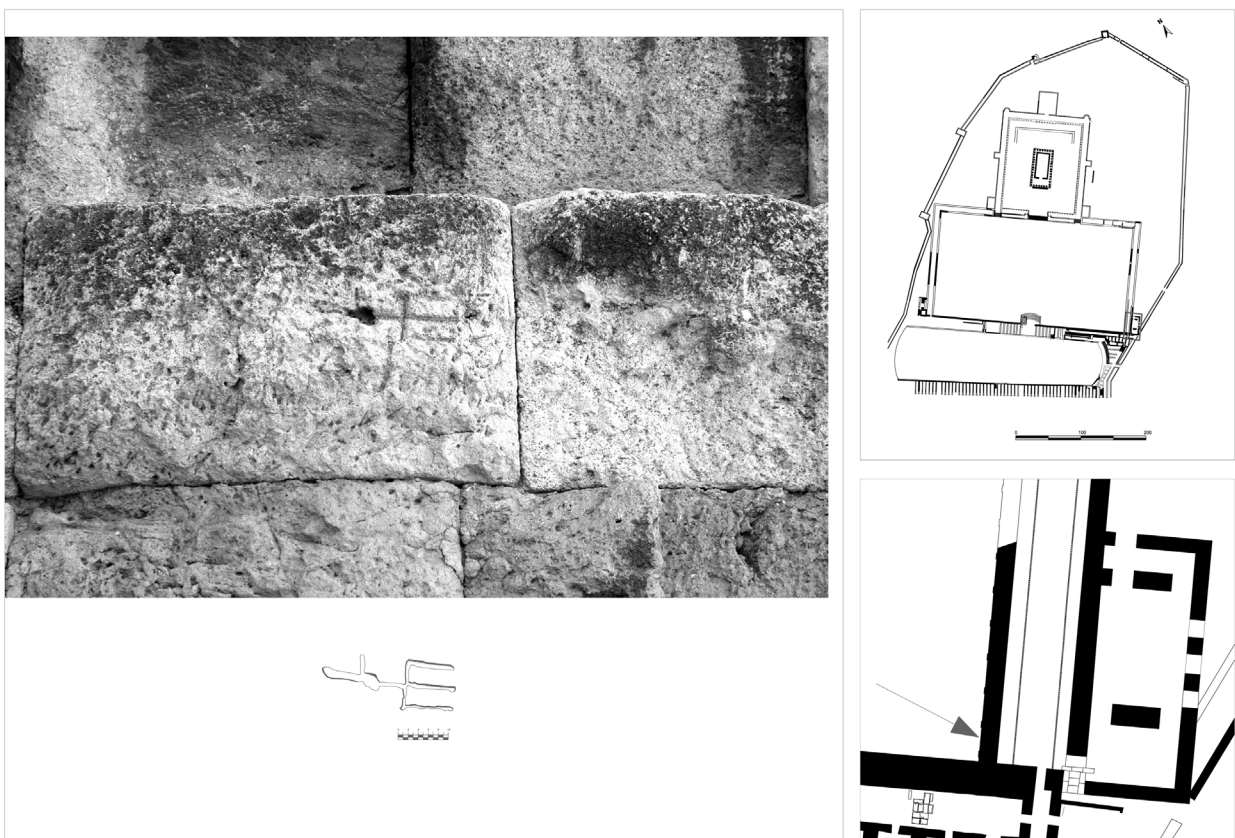


Fig. 6. Pretorio Tower. Quarry mark (photo and drawing: M. S. Vinci)

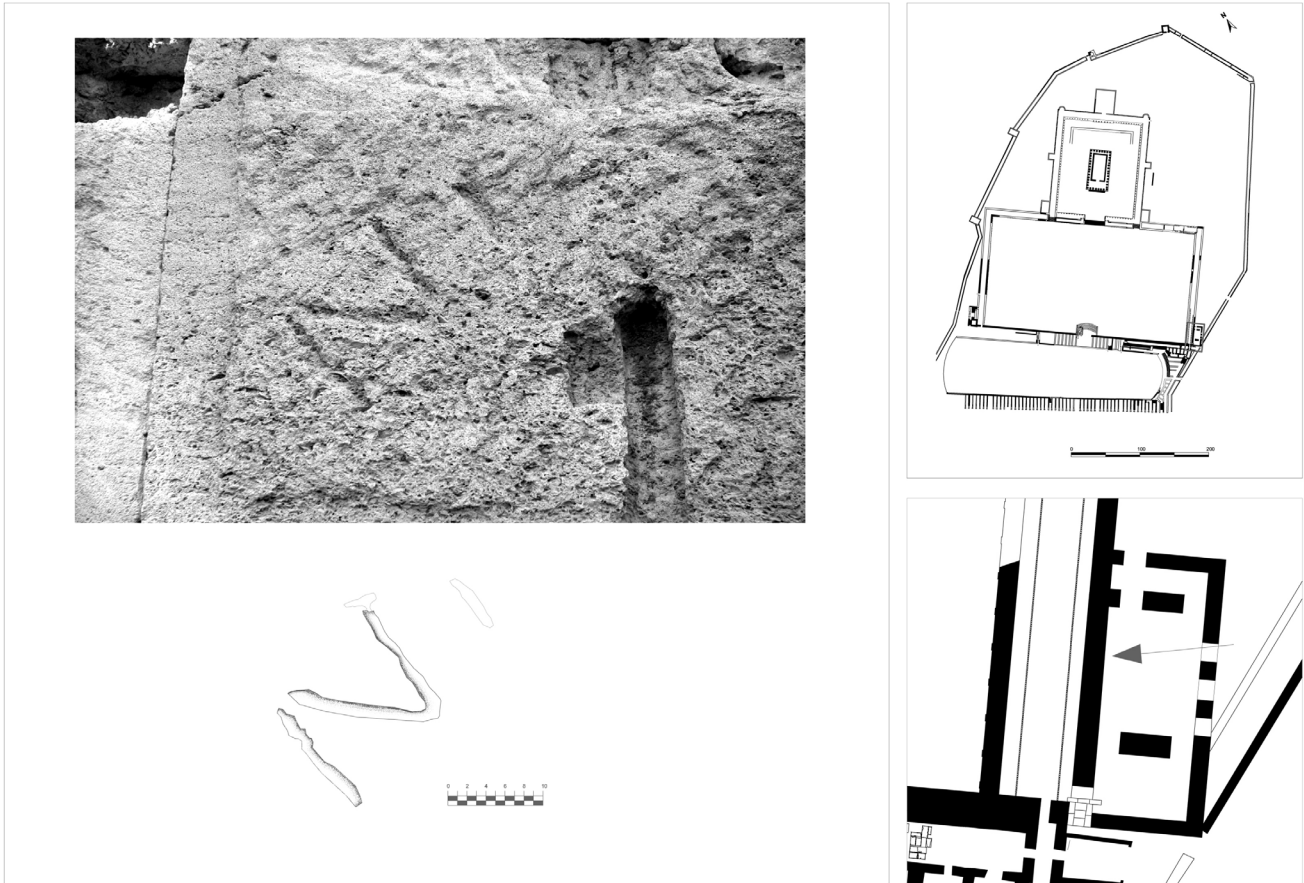


Fig. 7. Courtyard of the Pretorio Tower. Quarry mark (photo and drawing: M. S. Vinci)

T which would represent the pick²². All these examples have been documented in very different chronological and territorial contexts. This data suggests that, beyond the exact interpretation and decoding of the symbols, it had to deal with codes, of which the message and meaning were quite clear and easy to understand for the workforce that had solide knowledge of all stages of the working processes.

All other labels, which are presented in this paper, are documented in the courtyard of the Pretorio Tower. There are one inscribed numeral (IV, Fig. 7) and three marks consisting of one (M, Fig. 8-9), two (VR, Fig.10) or three (TIR, Fig. 11) letters carved using the point and an execution more detailed. Quarry marks with numerals are very widespread, often preceded by the letter N, which probably refers to a commission number, or by letters B or L that identify the *bracchium* (to describe the quarry sector) and the *locus* (a subdivision of *bracchium*) in the quarry²³. For this group of quarry marks too an exact interpretation is difficult to reach. However, it

is very important to highlight that some of these labels have also been documented in the deposit of abandoned ashlar near the *El Mèdol* quarry: these are the inscribed letter M and the mark TIR²⁴. Regarding the label VR, the same letters have been found carved on two blocks in the quarry, but changed in RV. Other ordinal numbers also have been documented in the quarry (always numbers between III and VII).

Notae lapidinarum and quarry organization: preliminary considerations

The use and interpretation of the quarry marks in the ancient world is a very interesting and, at the same time, a complex question. Moreover, the bibliography in existence is still not exhaustive about it, above all related to the documentation that comes from the construction stone quarries.

It has been previously highlighted that the interpretation of the quarry marks located in the Provincial Forum

22 PESANDO 2010, 71. This label is documented also on the city walls of *Tarraco*.

23 PENSABENE 2013, 203.

24 In the Pretorio Tower the mark M is documented on two blocks, whereas TIR is certainly presented once, but probably also on another block on which the label is badly preserved and difficult to read.

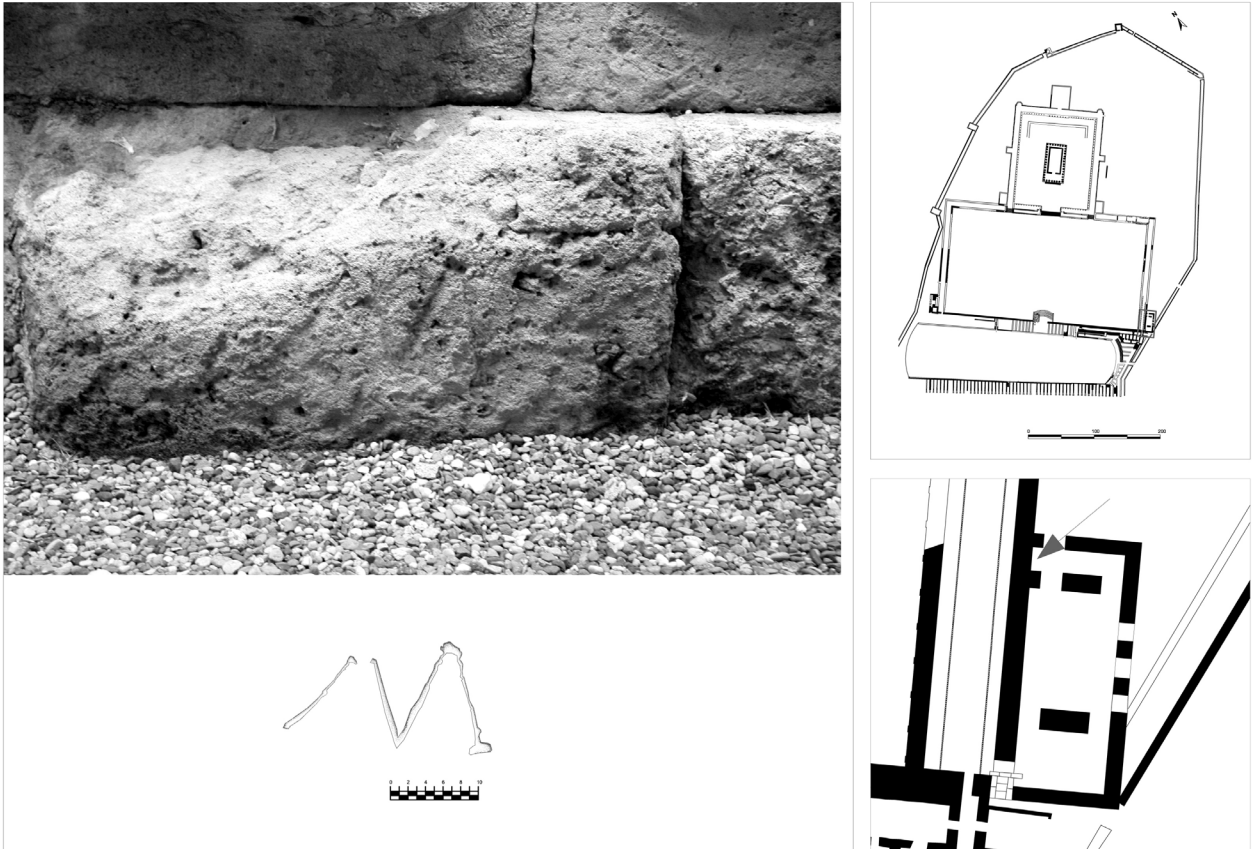


Fig. 8. Courtyard of the Pretorio Tower. Quarry mark (photo and drawing: M. S. Vinci)

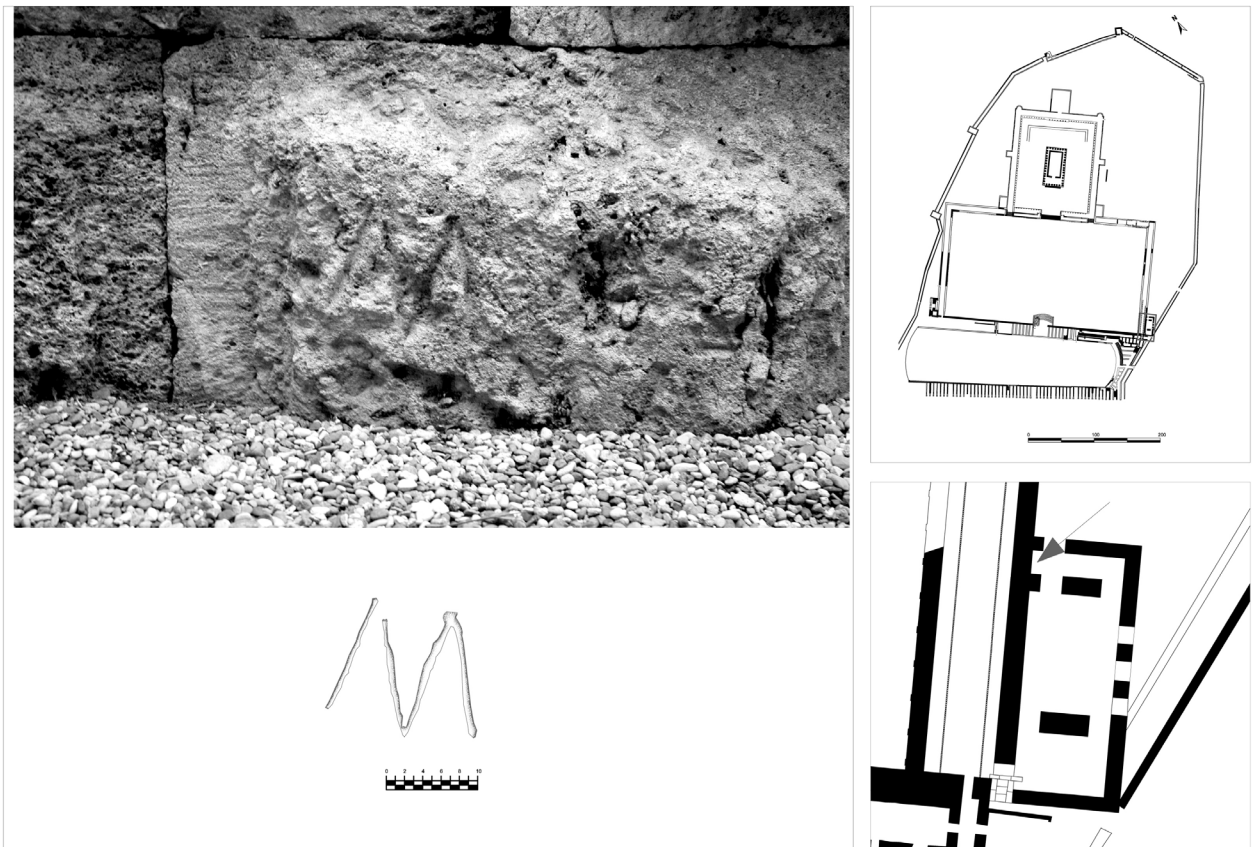


Fig. 9. Courtyard of the Pretorio Tower. Quarry mark (photo and drawing: M. S. Vinci)

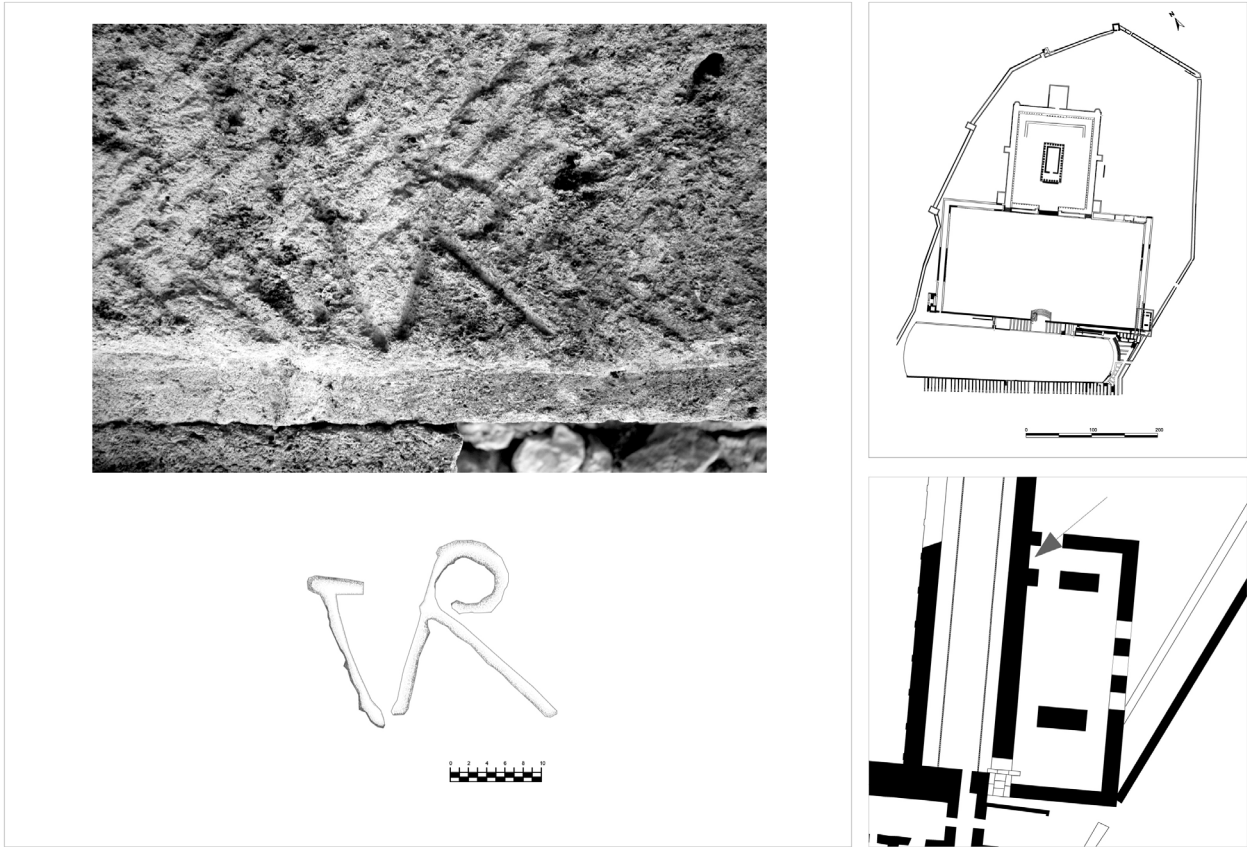


Fig. 10. Courtyard of the Pretorio Tower. Quarry mark (photo and drawing: M. S. Vinci)

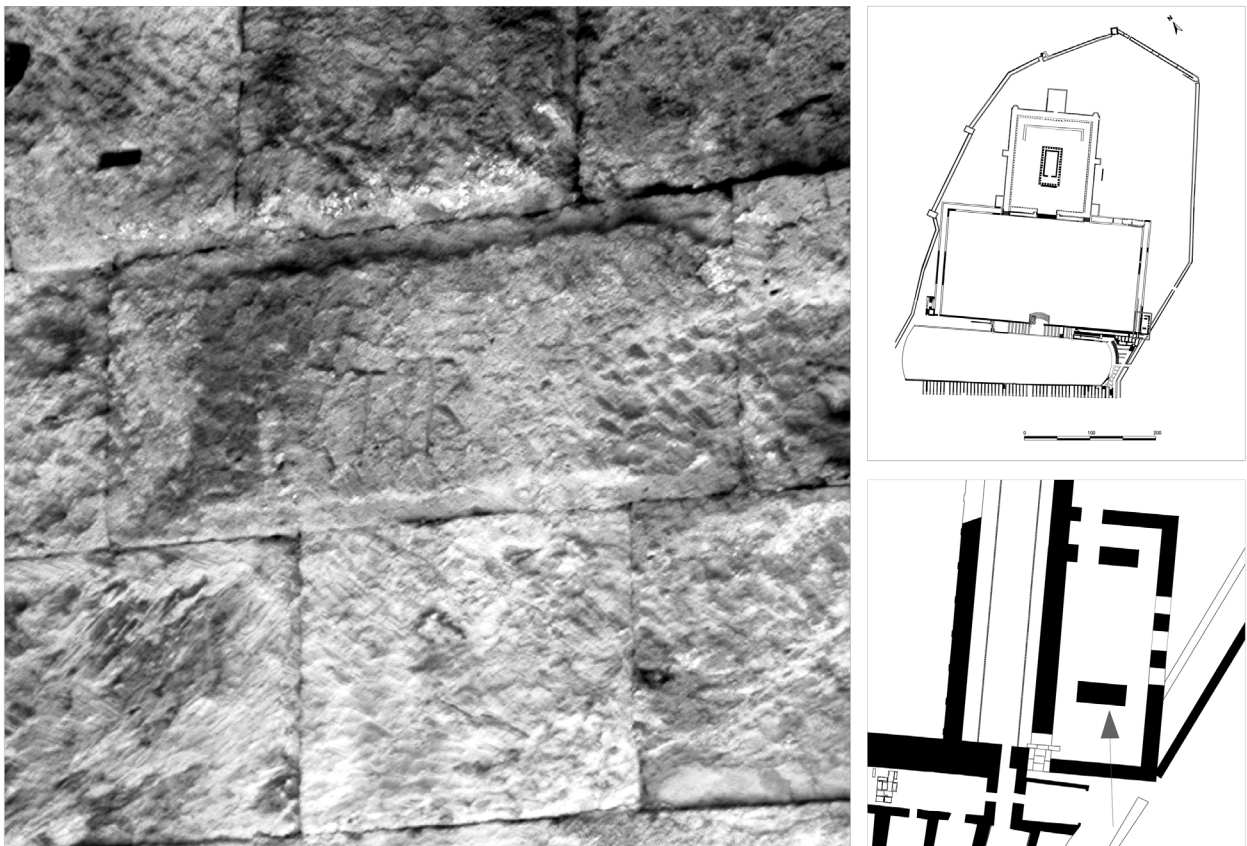


Fig. 11. Courtyard of the Pretorio Tower. Quarry mark (photo and drawing: M. S. Vinci)

is quite difficult due to the presence of cryptic elements that were part of a linguistic code, immediate and easy to understand by the manpower employed in the quarry²⁵. However, the main aim of this study is going beyond the exact interpretation of the labels and trying to understand their general function in the quarry organization and in the building process.

It is well known that the use and presence of quarry marks in the ancient world are documented not only in construction stone quarries, but also, and above all in marble quarries and on marble artefacts. The complex activities of exploitation, management of stocks sites, the marble trade and distribution, imply an accurate organization, a control and accounting system of this valuable material, which came from Italy as well as from the rest of the Roman Provinces²⁶. Worthy of note are the studies carried out by Professor Fant²⁷ who identified and separated the existence of two different groups of quarry marks: marks for the administrative staff who worked outside the quarry, so in stock and distribution sites, ports of departure or arrival of the materials; marks for the administrative staff who worked inside the quarry, which are often cryptic and difficult to interpret because they consist of a few letters.

Based on this information, different elements allow us to hypothesise that quarry marks from the Provincial Forum were useful to the internal management and organization of the quarry: the material in question, that is a limestone, the area of diffusion of which was local and which was used mainly as building material, as well as the few letters of which the labels consist. It is known that a different kind of information on quarry labels could appear, such as letters to abbreviate the name of some members of the staff, like the responsible for the *caesura*, the *procurator*, the contractor or numbers linked to the accounting policy of the amount of quarried products and delivered stones²⁸.

The use of quarry marks in the public architecture of *Tarraco* has been already documented for the construction of the Late Republican city walls²⁹. However, the typological difference of this notation system

did not allow it to be used as a valid parallel for this study. On the contrary, even if there is not all that much archaeological evidence, it is possible to relate the quarry marks from the Provincial Forum with those that come from the *El Mèdol* quarry. In fact, the same inscribed letters found at both sites, the same limestone material, the size of the blocks and the logic, suggest that the notation system is part of the same construction process. Obviously, it is not certain that the deposits date completely from the Roman times, but the presence of Roman quarry marks and a few items of stratigraphic evidence, like a coin from Tiberian age, strongly support an ancient dating for at least some of the blocks. Moreover, even if the quarry exploitation starts in the Late Republican age and slows down during the III century A.D., the quarry's busiest period is the imperial age, which matches the building of the Provincial Forum and so entailed the need to organise the quarry with a more complex system with which to guarantee a stricter control and an easier management³⁰. Based on a first survey, it seems that the abandoned ashlar from the deposit located in the south-east area, with respect to the exploitation fronts of the quarry, were left there due to natural faults or fractures. This would allow us to affirm that the notation system was carved before the shaping and hewing phase of the blocks, so it could be linked with the accounting policy of the extracted material by the different *officinae* who worked in more extraction fronts.

Another question is the documentation of all quarry marks from the Provincial Forum, in a specific area, the Pretorio Tower. It must be certainly taken into consideration that this is one of the best-preserved sectors of the monumental complex, a circumstance that could have determined the conservation of the carved

25 Cryptic elements useful for the development of the work activities are often documented in ancient world. It is the same process that is documented on marble artefacts on which are often visible carving lines that refer to the project and the development of the stoneworking (OTTATI, VINCI 2016, 151-172; VINCI, OTTATI).

26 PENSABENE 2013, 198.

27 FANT 1993a, 145-170; FANT 1993b, 71-96.

28 PENSABENE 2013, 203.

29 TOUS 1983; BALIL 1983, 231-236.

30 The amount of the recorded blocks near to *El Mèdol* quarry is around 6,000. According to an estimate by R. MAR and P. PENSABENE (2008, 526-527), the total amount of the local stone required for the construction of the upper terrace is 7,128.4 m³. Considering that the two authors define an amount of 0.37m³ of stone for each block, it is possible to calculate that around 19,264 blocks were used for building the Worship area (temple, Flavian portico and Worship Hall). As a speculative consideration, it could be hypothesised that the same amount of blocks could have been used for the construction of the Representation Square and the Circus. Considering the total amount of blocks for the three spaces of the monument and the deposit of abandoned ashlar, one could establish a ratio of 1:10 between them. This means that, if the majority of the blocks of the deposit dated from the Roman times, it would consist of the faulty stone production and the rejected material extracted for the building of the Provincial Forum of *Tarraco*.

blocks. However, in this case, the conservation of the quarry marks could be due also to the location of these in foundational levels. The exceptions are the two labels from the *Volta Llarga* sector, but, also in this case, it deals with *substructiones*, so an area out of the main itineraries allowed to the public.

These observations and the conclusions of this work still in progress have very interesting perspectives of study and will undoubtedly throw light on the quarry organization and work of the skilled specialists for building an outstanding monument.

Finally, the study of the relation between quarry marks from the Provincial Forum and *El Mèdol* quarry will certainly allow estimations to be made of the amount of the material used for the construction of the monument, as well as about its different building phases.

BIBLIOGRAPHY

- ANGELI BERTINELLI M.G., DONATI A. (eds.): “Usi e abusi epigrafici” Atti del colloquio internazionale di epigrafia latina (Genova 2001), *Serta antiqua et mediaevalia VI*, Roma, 65-79.
- BALIL A. 1969: Excavaciones en la “Torre de Pilatos” (Tarragona), Campaña de excavaciones de 1962, Madrid.
- BALIL A. 1983: “Segni di scalpellino sulle mura romane di Tarragona”, *Epigraphica XLV*, 231-236.
- CASTILLO RAMÍREZ 2015: “Tácito y el templo de Tarraco: nueva propuesta de interpretación”, in LÓPEZ J. (ed.): *Tarraco Biennial. Actes del 2on Congrès Internacional d’Arqueologia i món antic. August i les províncies occidentals, 2000 aniversari de la mort d’August* (Tarragona, 26-29 de Novembre 2014), Tarragona, 171-180.
- DUPRÉ X., SUBÍAS E. 1993: “Els precedents de l’anomenat Pretori de Tarragona”, in PADRÓ J., PREVOSTI M., ROCA M., SANMARTÍ J. (eds.): *Estudis Universitaris Catalans. Homenatge a Miquel Taradell*, vol. XXIX, Barcelona, 603-609.
- FANT J.C. 1993a: “Ideology, gift and trade: a distribution model for the Roman imperial marbles”, in HARRIS W.V. (ed.): *The inscribed economy. Production and distribution in the Roman Empire in the light of *instrumentum domesticum**, Ann Arbor, 145-170.
- FANT J.C. 1993b: “The Roman imperial marble trade: a distribution model”, in FRANCOVICH R. (ed.): *Archeologia delle attività estrattive e metallurgiche. Atti del V ciclo di lezioni sulla ricerca applicata in archeologia* (Certosa di Pontignano, Siena-Campiglia Marittima, Livorno, 9-21 settembre 1991), Firenze, 71-96.
- GURT J. M., RODÀ I. 2005: “El pont del Diable. El monumento romano dentro de la política territorial augustea”, *Archivo Español de Arqueología* 78, 147-165.
- GUTIÉRREZ DEZA I. 2004: “Marcas de cantera romanas en Córdoba”, *Anales de Arqueología Cordobesa* 15, 249-270.
- GUTIÉRREZ GARCÍA A. 2009: *Roman Quarries in the Northeast of Hispania* (modern Catalonia), Institut Català d’Arqueologia Clàssica, Tarragona.
- GUTIÉRREZ GARCÍA A., HUELIN S., LÓPEZ J., RODÀ I. 2015: “Can a fire broaden our understanding of a Roman quarry? The case of El Mèdol (Tarragona, Spain)”, in *ASMOSIA X*, 779-789.
- GORDON J. A. 1957: *Contributions to Paleography of Latin Inscriptions*, Berkley.
- LAZZARINI M. L. 1973: “Marche di cava delle mura ser-viane”, in: *Roma medio-repubblicana*.

- LÓPEZ J., PIÑOL L. 2008: Tarracotes arquitectòniques romanes. Les troballes de la Plaça de la Font (Tarragona), Tarragona.
- LUGLI G. 1957: La tecnica edilizia romana, Roma.
- MAR R., PENSABENE P. 2008: "Finanziamento dell'edilizia pubblica e calcolo dei costi dei materiali lapidei: il caso del foro superiore di *Tarraco*", in: CAMPOREALE S., DESSALES H., PIZZO A. (eds.): *Arqueología de la construcción I. Los procesos constructivos en el mundo romano: Italia y las provincias orientales*, *Anejos de Archivo Español de Arqueología* 50, Merida, 509-537.
- MAR R., RUIZ DE ARBULO J., VIVÓ D., BELTRÁN J. A. 2012: *Tarraco*. Arquitectura y urbanismo de una capital provincial romana, vol. I, Tarragona.
- OTTATI A., VINCI M. S. 2016: "Alcune considerazioni su una produzione di mortai a Tarragona in epoca romana imperiale", *Zephyrus* 78 luglio-dicembre, 151-172.
- PARIBENI E., SEGENNI S. 2003: "Iscrizioni su manufatti semilavorati delle cave lunensi", in: ANGELI BERTELLI M. G., DONATI A. (eds.): *Serta antiqua et medievalia*, vol. VI, Usi e abusi epigrafici. Atti del colloquio internazionale di epigrafia latina (Genova 2001), Roma, 65-79.
- PENSABENE P. 2013: *I marmi nella Roma antica*, Roma.
- PESANDO F. 2010: "*Quadratariorum notae Pompeianae*: sigle di cantiere e marchi di cava nelle *domus vesuviane*", *Vesuviana* 2, 47-75.
- ROIG J. F., SIRISI M., SOLÀ E., TRENOR J. 2011: "El dipòsit de carreus del Mèdol (Tarragona). Resultats preliminars", *Tribuna d'Arqueologia* 2009-2010, 383-405.
- RUIZ DE ARBULO J. 1990: "El foro de Tàrraco", *Cypsela* 8, 119-138.
- SÁNCHEZ REAL 1969: *Exploración arqueológica en el jardín del aCatedral de Tarragona*, *Madrider Mitteilungen* 10, 276-301.
- TOMASELLO F., DE SIMONE L. 2005: "Marchi di cava punici e la tradizione edilizia locale L P Q I Leptis Magna: documenti per una storia dell'edilizia", in SPANÒ GIAMMELLARO A. (ed.): *Atti del V congresso Internazionale di studi fenici e punici* (Masaala-Palermo, 2-8 ottobre 2000), Palermo, 325-342.
- TOUS J. 1983: "Los signos de cantería en las murallas de Tarragona", in: *Actes du Colloque International de Glytographie* (Saragossa), 392-405.
- VINCI M. S., MACIAS J. M., PUCHE J. M., SOLÀ MORALES P., TOLDRÀ J. M. 2014: "El subsuelo de la Torre del Pretorio: substructiones de tradición helenística bajo la sede del Concilium Provinciae Hispaniae Citerioris (Tarraco)", *Arqueología de la Arquitectura* 11, arqarqt.revistas.csic.es.
- VINCI M. S., OTTATI A. [in press]: "Dal progetto alla realizzazione: alcune osservazioni sui tracciati di posizionamento e di lavorazione dall'area del Foro Provinciale di *Tarraco*", in: *Thiasos Monografie X*, 261-277.