The Value of Marble in Roman Hispalis: Contextual, Typological and Lithological Analysis of an Assemblage of Large Architectural Elements Recovered at Nº 17 Goyeneta Street (Seville, Spain)

Taylor, Ruth; Rodríguez, Oliva; Ontiveros, Esther; Loza, María Luisa; Beltrán, José; Rodríguez, Araceli

Source / Izvornik: **ASMOSIA XI, Interdisciplinary Studies on Ancient Stone, Proceedings of the XI International Conference of ASMOSIA, 2018, 143 - 153**

Conference paper / Rad u zborniku

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

https://doi.org/10.31534/XI.asmosia.2015/01.13

Permanent link / Trajna poveznica: https://urn.nsk.hr/urn:nbn:hr:123:952071

Rights / Prava: In copyright / Zaštićeno autorskim pravom.

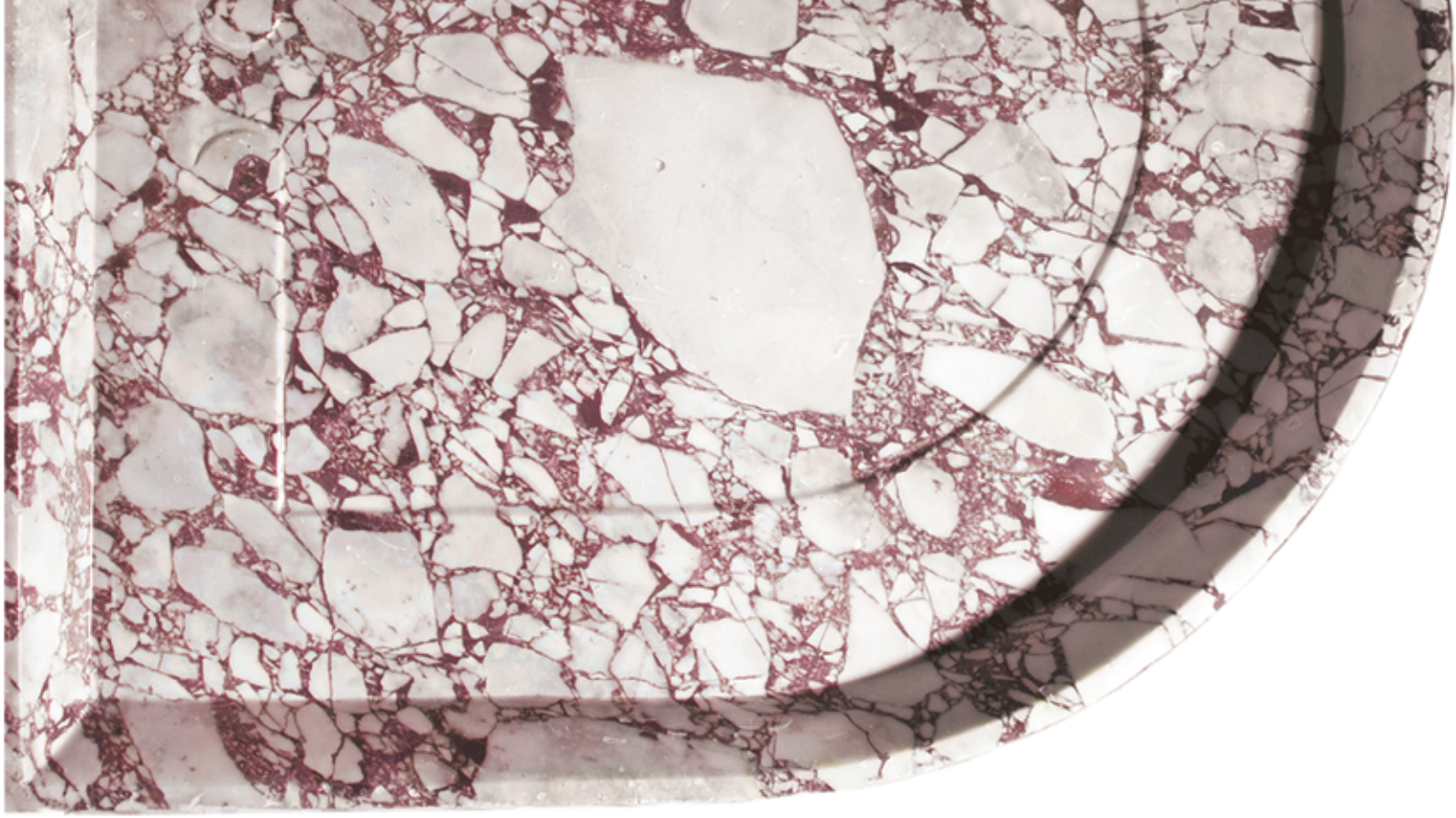
Download date / Datum preuzimanja: **2024-03-28**

Repository / Repozitorij:

FCEAG Repository - Repository of the Faculty of Civil Engineering, Architecture and Geodesy, University of Split

UNIVERSITY OF SPLIT

dabar
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

ARTS ACADEMY IN SPLIT

UNIVERSITY OF SPLIT,
FACULTY OF CIVIL ENGINEERING,
ARCHITECTURE AND GEODESY

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
Patrizio Pensabene 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
Massimiliano David, Stefano Succi and Marcello Turci 33

Alabaster. Quarrying and Trade in the Roman World:
Evidence from Pompeii and Herculaneum
Simon J. Barker and Simona Perna 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
Simon J. Barker and J. Clayton Fant 65

Marble Wall Decorations from the Imperial Mausoleum (4th C.) and the Basilica
of San Lorenzo (5th C.) in Milan: an Update on Colored Marbles in Late Antique Milan
Elisabetta Neri, Roberto Bugini and Silvia Gazzoli 79

Sarcophagus Lids Sawn from their Chests
Dorothy H. Abramitis and John J. Herrmann 89

The Re-Use of Monolithic Columns in the Invention
and Persistence of Roman Architecture
Peter D. De Staebler 95

The Trade in Small-Size Statues in the Roman Mediterranean:
a Case Study from Alexandria
Patrizio Pensabene and Eleonora Gasparini 101

The Marble Dedication of Komon, Son of Asklepiades, from Egypt:
Material, Provenance, and Reinforcement of Meaning
Patricia A. Butz 109

Multiple Reuse of Imported Marble Pedestals at Caesarea Maritima in Israel
Barbara Burrell 117

Iasos and Iasian Marble between the Late Antique and Early Byzantine Eras
Diego Peirano 123

Thassos, Known Inscriptions with New Data
Tony Kozelj and Manuela Wurch-Kozelj 131

The Value of Marble in Roman *Hispalis*: Contextual, Typological and Lithological Analysis of an Assemblage of Large Architectural Elements Recovered at Nº 17 Goyeneta Street (Seville, Spain)
Ruth Taylor, Oliva Rodríguez, Esther Ontiveros, María Luisa Loza, José Beltrán and Araceli Rodríguez 143

Giallo Antico in Context. Distribution, Use and Commercial Actors According to New Stratigraphic Data from the Western Mediterranean (2nd C. Bc – Late 1st C. Ad)
Stefan Ardeleanu 155

Amethystus: Ancient Properties and Iconographic Selection
Luigi Pedroni 167

2. PROVENANCE IDENTIFICATION I: (MARBLE)

Unraveling the Carrara – Göktepe Entanglement
Walter Prochaska, Donato Attanasio and Matthias Bruno 175

The Marble of Roman Imperial Portraits
Donato Attanasio, Matthias Bruno, Walter Prochaska and Ali Bahadir Yavuz 185

Tracing Alabaster (Gypsum or Anhydrite) Artwork Using Trace Element Analysis and a Multi-Isotope Approach (Sr, S, O)
Lise Leroux, Wolfram Kloppmann, Philippe Bromblet, Catherine Guerrot, Anthony H. Cooper, Pierre-Yves Le Pogam, Dominique Vingtain and Noel Worley 195

Roman Monolithic Fountains and Thasian Marble
Annewies van den Hoek, Donato Attanasio and John J. Herrmann 207

Archaeometric Analysis of the Alabaster Thresholds of Villa A, Oplontis (Torre Annunziata, Italy) and New Sr and Pb Isotopic Data for *Alabastro Ghiaccione del Circeo*
Simon J. Barker, Simona Perna, J. Clayton Fant, Lorenzo Lazzarini and Igor M. Villa 215

Roman Villas of Lake Garda and the Occurrence of Coloured Marbles in the Western Part of "Regio X Venetia et Histria" (Northern Italy)
Roberto Bugini, Luisa Folli and Elisabetta Roffia 231

Calcitic Marble from Thasos in the North Adriatic Basin: Ravenna, Aquileia, and Milan
John J. Herrmann, Robert H. Tykot and Annewies van den Hoek 239

Characterisation of White Marble Objects from the Temple of Apollo and the House of Augustus (Palatine Hill, Rome)
Francesca Giustini, Mauro Brilli, Enrico Gallocchio and Patrizio Pensabene 247

Study and Archeometric Analysis of the Marble Elements Found in the Roman Theater at Aeclanum (Mirabella Eclano, Avellino - Italy)
Antonio Mesisca, Lorenzo Lazzarini, Stefano Cancelliere and Monica Salvadori 255

Two Imperial Monuments in Puteoli:
Use of Proconnesian Marble in the Domitianic and Trajanic Periods in Campania
Irene Bald Romano, Hans Rupprecht Goette, Donato Attanasio and Walter Prochaska 267

Coloured Marbles in the Neapolitan Pavements (16th And 17th Centuries):
the Church of *Santi Severino e Sossio*
Roberto Bugini, Luisa Folli and Martino Solito 275

Roman and Early Byzantine Sarcophagi of Calcitic Marble from Thasos in Italy:
Ostia and Siracusa
Donato Attanasio, John J. Herrmann, Robert H. Tykot and Annewies van den Hoek 281

Revisiting the Origin and Destination of the Late Antique Marzamemi
'Church Wreck' Cargo
Justin Leidwanger, Scott H. Pike and Andrew Donnelly 291

The Marbles of the Sculptures of Felix Romuliana in Serbia
Walter Prochaska and Maja Živić 301

Calcitic Marble from Thasos and Proconnesos in Nea Anchialos (Thessaly)
and Thessaloniki (Macedonia)
Vincent Barbin, John J. Herrmann, Aristotle Mentzos and Annewies van den Hoek 311

Architectural Decoration of the Imperial Agora's Porticoes at Iasos
Fulvia Bianchi, Donato Attanasio and Walter Prochaska 321

The Winged Victory of Samothrace - New Data on the Different Marbles
Used for the Monument from the Sanctuary of the Great Gods
Annie Blanc, Philippe Blanc and Ludovic Laugier 331

Polychrome Marbles from the Theatre of the Sanctuary of Apollo Pythios
in Gortyna (Crete)
Jacopo Bonetto, Nicolò Mareso and Michele Bueno 337

Paul the Silentiary, Hagia Sophia, Onyx, Lydia, and Breccia Corallina
John J. Herrmann and Annewies van den Hoek 345

Incrustations from Colonia Ulpia Traiana (Near Modern Xanten, Germany)
Vilma Ruppienė and Ulrich Schüssler 351

Stone Objects from Vindobona (Austria) – Petrological Characterization
and Provenance of Local Stone in a Historico-Economical Setting
Andreas Rohatsch, Michaela Kronberger, Sophie Insulander,
Martin Mosser and Barbara Hodits 363

Marbles Discovered on the Site of the Forum of Vaison-la-Romaine (Vaucluse, France):
Preliminary Results
Elsa Roux, Jean-Marc Mignon, Philippe Blanc and Annie Blanc 373

Updated Characterisation of White Saint-Béat Marble. Discrimination Parameters
from Classical Marbles
Hernando Royo Plumed, Pilar Lapeunte, José Antonio Cuchí,
Mauro Brilli and Marie-Claire Savin 379

Grey and Greyish Banded Marbles from the Estremoz Anticline in Lusitania
Pilar Lapuente, Trinidad Nogales-Basarrate, Hernando Royo Plumed, Mauro Brilli and Marie-Claire Savin 391

New Data on Spanish Marbles: the Case of *Gallaecia* (NW Spain)
Anna Gutiérrez Garcia-M., Hernando Royo Plumed and Silvia González Soutelo 401

A New Roman Imperial Relief Said to Be from Southern Spain: Problems of Style, Iconography, and Marble Type in Determining Provenance
John Pollini, Pilar Lapuente, Trinidad Nogales-Basarrate and Jerry Podany 413

Reuse of the *Marmora* from the Late Roman Palatial Building at Carranque (Toledo, Spain) in the Visigothic Necropolis
Virginia García-Entero, Anna Gutiérrez Garcia-M. and Sergio Vidal Álvarez 427

Imperial Porphyry in Roman Britain
David F. Williams 435

Recycling of Marble: Apollonia/Sozousa/Arsuf (Israel) as a Case Study
Moshe Fischer, Dimitris Tambakopoulos and Yannis Maniatis 443

Thasian Connections Overseas: Sculpture in the Cyrene Museum (Libya) Made of Dolomitic Marble from Thasos
John J. Herrmann and Donato Attanasio 457

Marble on Rome's Southwestern Frontier: Thamugadi and Lambaesis
Robert H. Tykot, Ouahiba Bouzidi, John J. Herrmann and Annewies van den Hoek 467

Marble and Sculpture at Lepcis Magna (Tripolitania, Libya): a Preliminary Study Concerning Origin and Workshops
Luisa Musso, Laura Buccino, Matthias Bruno, Donato Attanasio and Walter Prochaska 481

The Pentelic Marble in the Carnegie Museum of Art Hall of Sculpture, Pittsburgh, Pennsylvania
Albert D. Kollar 491

Analysis of Classical Marble Sculptures in the Michael C. Carlos Museum, Emory University, Atlanta
Robert H. Tykot, John J. Herrmann, Renée Stein, Jasper Gaunt, Susan Blevins and Anne R. Skinner 501

3. PROVENANCE IDENTIFICATION II: (OTHER STONES)

Aphrodisias and the Regional Marble Trade. The *Scaenae Frons* of the Theatre at Nysa
Natalia Toma 513

The Stones of Felix Romuliana (Gamzigrad, Serbia)
Bojan Djurić, Divna Jovanović, Stefan Pop Lazić and Walter Prochaska 523

Aspects of Characterisation of Stone Monuments from Southern Pannonia
Branka Migotti 537

The Budakalász Travertine Production
Bojan Djurić, Sándor Kele and Igor Rižnar 545

Stone Monuments from Carnuntum and Surrounding Areas (Austria) – Petrological Characterization and Quarry Location in a Historical Context
Gabrielle Kremer, Isabella Kitz, Beatrix Moshammer, Maria Heinrich and Erich Draganits 557

Espejón Limestone and Conglomerate (Soria, Spain): Archaeometric Characterization, Quarrying and Use in Roman Times
Virginia García-Entero, Anna Gutiérrez Garcia-M, Sergio Vidal Álvarez, María J. Peréx Agorreta and Eva Zarco Martínez 567

The Use of Alcover Stone in Roman Times (*Tarraco, Hispania Citeri*or). Contributions to the *Officina Lapidaria Tarraconensis*
Diana Gorostidi Pi, Jordi López Vilar and Anna Gutiérrez Garcia-M. 577

4. ADVANCES IN PROVENANCE TECHNIQUES, METHODOLOGIES AND DATABASES

Grainautline – a Supervised Grain Boundary Extraction Tool Supported by Image Processing and Pattern Recognition
Kristóf Csorba, Lilla Barancsuk, Balázs Székely and Judit Zöldföldi 587

A Database and GIS Project about Quarrying, Circulation and Use of Stone During the Roman Age in *Regio X - Venetia et Histria*. The Case Study of the Euganean Trachyte
Caterine Previato and Arturo Zara 597

5. QUARRIES AND GEOLOGY

The Distribution of Troad Granite Columns as Evidence for Reconstructing the Management of Their Production
Patrizio Pensabene, Javier Á. Domingo and Isabel Rodà 613

Ancient Quarries and Stonemasonry in Northern Choria Considiana
Hale Güney 621

Polychromy in Larisaean Quarries and its Relation to Architectural Conception
Gizem Mater and Ertunç Denktaş 633

Euromos of Caria: the Origin of an Hitherto Unknown Grey Veined Stepped Marble of Roman Antiquity
Matthias Bruno, Donato Attanasio, Walter Prochaska and Ali Bahadir Yavuz 639

Unknown Painted Quarry Inscriptions from Bacakale at *Docimium* (Turkey)
Matthias Bruno 651

The Green Schist Marble Stone of Jebel El Hairech (North West of Tunisia): a Multi-Analytical Approach and its Uses in Antiquity
Ameur Younès, Mohamed Gaied and Wissem Gallala 659

Building Materials and the Ancient Quarries at *Thamugadi* (East of Algeria), Case Study: Sandstone and Limestone
Younès Rezkallah and Ramdane Marmi 673

The Local Quarries of the Ancient Roman City of *Valeria* (Cuenca, Spain)
Javier Atienza Fuente 683

The Stone and Ancient Quarries of Montjuïc Mountain (Barcelona, Spain)
Aureli Álvarez 693

Notae Lapicidinarum: Preliminary Considerations about the Quarry Marks from the Provincial Forum of *Tarraco*
Maria Serena Vinci 699

The Different Steps of the Rough-Hewing on a Monumental Sculpture at the Greek Archaic Period: the Unfinished Kouros of Thasos
Danièle Braunstein 711

A Review of Copying Techniques in Greco-Roman Sculpture
Séverine Moureaud 717

Labour Forces at Imperial Quarries
Ben Russell 733

Social Position of Craftsmen inside the Stone and Marble Processing Trades in the Light of Diocletian's Edict on Prices
Krešimir Bosnić and Branko Matulić 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
Maria Apostolopoulou, Elissavet Drakopoulou, Maria Karoglou and Asterios Bakolas 749

7. PIGMENTS AND PAINTINGS ON MARBLE

Painting and Sculpture Conservation in Two Gallo-Roman Temples in Picardy (France): Champlieu and Pont-Sainte-Maxence
Véronique Brunet-Gaston and Christophe Gaston 763

The Use of Colour on Roman Marble Sarcophagi
Eliana Siotto 773

New Evidence for Ancient Gilding and Historic Restorations on a Portrait of Antinous in the San Antonio Museum of Art
Jessica Powers, Mark Abbe, Michelle Bushey and Scott H. Pike 783

Schists and Pigments from Ancient Swat (Khyber Pukhtunkhwa, Pakistan)
Francesco Mariottini, Gianluca Vignaroli, Maurizio Mariottini and Mauro Roma 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
Guntram Koch 809

Funerary Monuments and Quarry Management in Middle Dalmatia
Nenad Cambi 827

Marble Revetments of Diocletian's Palace
Katja Marasović and Vinka Marinković 839

The Use of Limestones as Construction Materials for the Mosaics of Diocletian's Palace
Branko Matulić, Domagoj Mudronja and Krešimir Bosnić 855

Restoration of the Peristyle of Diocletian's Palace in Split
Goran Nikšić 863

Marble Slabs Used at the Archaeological Site of Sorna near Poreč Istria – Croatia
Đeni Gobić-Bravar 871

Ancient Marbles from the Villa in Verige Bay, Brijuni Island, Croatia
Mira Pavletić and Đeni Gobić-Bravar 879

Notes on Early Christian Ambos and Altars in the Light of some Fragments
from the Islands of Pag and Rab
Mirja Jarak 887

The Marbles in the Chapel of the Blessed John of Trogir
in the Cathedral of St. Lawrence at Trogir
Đeni Gobić-Bravar and Daniela Matetić Poljak 899

The Use of Limestone in the Roman Province of Dalmatia
Edisa Lozić and Igor Rižnar 915

The Extraction and Use of Limestone in Istria in Antiquity
Klara Buršić-Matijašić and Robert Matijašić 925

Aurisina Limestone in the Roman Age:
from Karst Quarries to the Cities of the Adriatic Basin
Caterina Previato 933

The Remains of Infrastructural Facilities
of the Ancient Quarries on Zadar Islands (Croatia)
Mate Parica 941

The Impact of Local Geomorphological and Geological Features
of the Area for the Construction of the Burnum Amphitheatre
Miroslav Glavičić and Uroš Stepišnik 951

Roman Quarry Klis Kosa near Salona
Ivan Alduk 957

Marmore Lavdata Brattia
Miona Miliša and Vinka Marinković 963

Quarries of the Lumbarda Archipelago
Ivka Lipanović and Vinka Marinković 979

Island of Korčula – Importer and Exporter of Stone in Antiquity
Mate Parica and Igor Borzić 985

Faux Marbling Motifs in Early Christian Frescoes
in Central and South Dalmatia: Preliminary Report
Tonči Borovac, Antonija Gluhan and Nikola Radošević 995

INDEX OF AUTHORS 1009

DOI: https://doi.org/10.31534/XI.asmosia.2015/01.13

THE VALUE OF MARBLE IN ROMAN *HISPALIS*: CONTEXTUAL, TYPOLOGICAL AND LITHOLOGICAL ANALYSIS OF AN ASSEMBLAGE OF LARGE ARCHITECTURAL ELEMENTS RECOVERED AT Nº 17 GOYENETA STREET (SEVILLE, SPAIN)

Ruth Taylor[1], Oliva Rodríguez[1,*], Esther Ontiveros[2], María Luisa Loza[2], José Beltrán[1,] and Araceli Rodríguez[3]**
[1] Universidad de Sevilla, Seville, Spain (ruth.taylor@hotmail.com; orodriguez@us.es; jbeltran@us.es)
[2] Instituto Andaluz del Patrimonio Histórico, Junta de Andalucía, Seville, Spain (esther.ontiveros@juntadeandalucia.es; marial.loza@gmail.com)
[3] Arqueología & Gestión, S.L., Seville, Spain (araceli_azogue@hotmail.com)

[*] PI of *La construcción en el Valle del Guadalquivir en época romana. Tradición e innovación en las soluciones arquitectónicas y los procesos tecnológicos, económicos y productivos* (HAR2015-64392-C4-4-P)

[**] PI of *Proyecto Marmora. Innovaciones en el estudio arqueológico y arqueométrico del uso de los marmora en la Baetica: Arquitectura, Escultura, Epigrafía* (HAR2013-42078-P)

Abstract

The archaeological excavations carried out at nº 17 Goyeneta Street (Seville, Spain) have provided new insights into the urban layout of Roman *Hispalis* and into the existence of a monumental complex in the northern sector of the city during the 2nd to 4th centuries AD. The contextual and typological study of the assemblage of large architectural elements enables a reconstruction of the building to which they belonged, while the lithological study provides important information on the materials employed in its construction. The visual and petrographic analysis of 13 elements, representative of the typological and lithological diversity of the assemblage, has enabled the identification of 10 different ornamental stones from 7 regional, super-regional and foreign quarry districts. The evidence of the use of these materials together in a large public building in the 2nd century AD constitutes a significant contribution to the understanding of the value of marble in the ancient city.

Keywords
Roman *Hispalis*, monumental building, marble identification

Introduction

Despite the large number of preventive archaeological excavations carried out in recent decades in the historical city centre of Seville (Andalusia, Spain), knowledge of Roman *Hispalis* remains very incomplete. Few excavations have successfully reached and documented Roman levels and have generally encountered poorly preserved remains beneath a sequence of intermittent alluvial episodes and intense occupation. General functional areas have, however, been defined (Fig. 1; BELTRÁN, RODRÍGUEZ 2014, pl. III) and recent studies have stressed the great influence of the palaeomorphology of the ancient *Baetis* – the Guadalquivir River – and of the *Lacus Ligustinus* – the gulf that existed in Antiquity between the Atlantic coastal cities of *Onoba* and *Gadir* – in the life and development of the Roman city (BORJA 2014). The historical reconstruction of Roman *Hispalis* must therefore take into consideration the existence of a thriving fluvial and maritime port (ORDÓÑEZ, GONZÁLEZ 2011).

Evidence of the monumental areas of the heart of the Roman city is scarce and generally constituted by *disiecta membra* (for example the remains of Calle Mármoles, MÁRQUEZ 2003; with a review of the recent proposals in GARCÍA VARGAS 2014: 194-195), often integrated in later buildings and uninformative about their original contexts. The assemblage of large architectural elements. recently documented *in situ* during preventive excavations at nº 17 Goyeneta Street, in Seville's historical city centre, is, therefore, quite unique.

The find spot is located within the Northern *intramuros* sector of the Roman city. The structural remains belong to a partially preserved building which, on the basis of its layout and dimensions and the nature of the architectural elements, can best be described as part of a monumental building or complex. Given the scarcity of this type of archaeological find, the structures and

assemblage of architectural elements under study here are particularly relevant for the reconstruction of the spatial and functional organisation of Roman *Hispalis* and provide a rare insight into one of the monumental areas of the city (Fig. 1).

The archaeological excavation of nº 17 Goyeneta Street was not without difficulties due to the complexity of the stratigraphic sequence and the practical complications caused by the high water table. A sequence of intense occupation and use of the area was established, spanning from Roman times to the present day. Table 1 presents an overview of the main characteristics of the phases documented from the late 1st to the 5th century AD.

The earliest documented Roman phase is dated in the late 1st century AD. However, the date and possible function of the structures belonging to this phase are imprecise due to the damage caused by later constructive phases. At an unknown date in the 2nd century AD, a large building was constructed. Two parallel walls, 1.20 m thick, are documented at a distance of approximately 15

Phase	Archaeological description – interpretation
Late 1st century AD	Earliest evidence of occupation of the area Structures of imprecise function
2nd century	Construction of a large building Interpreted as part of a monumental complex
3rd–4th century	Continuance of the building-complex into the 4th century Reuse of some large architectural elements
5th century	Abandonment of the building Shift in the usage of the area

Table 1. Synthesis of the Roman phases documented during the preventive archaeological excavation of nº 17 Goyeneta Street

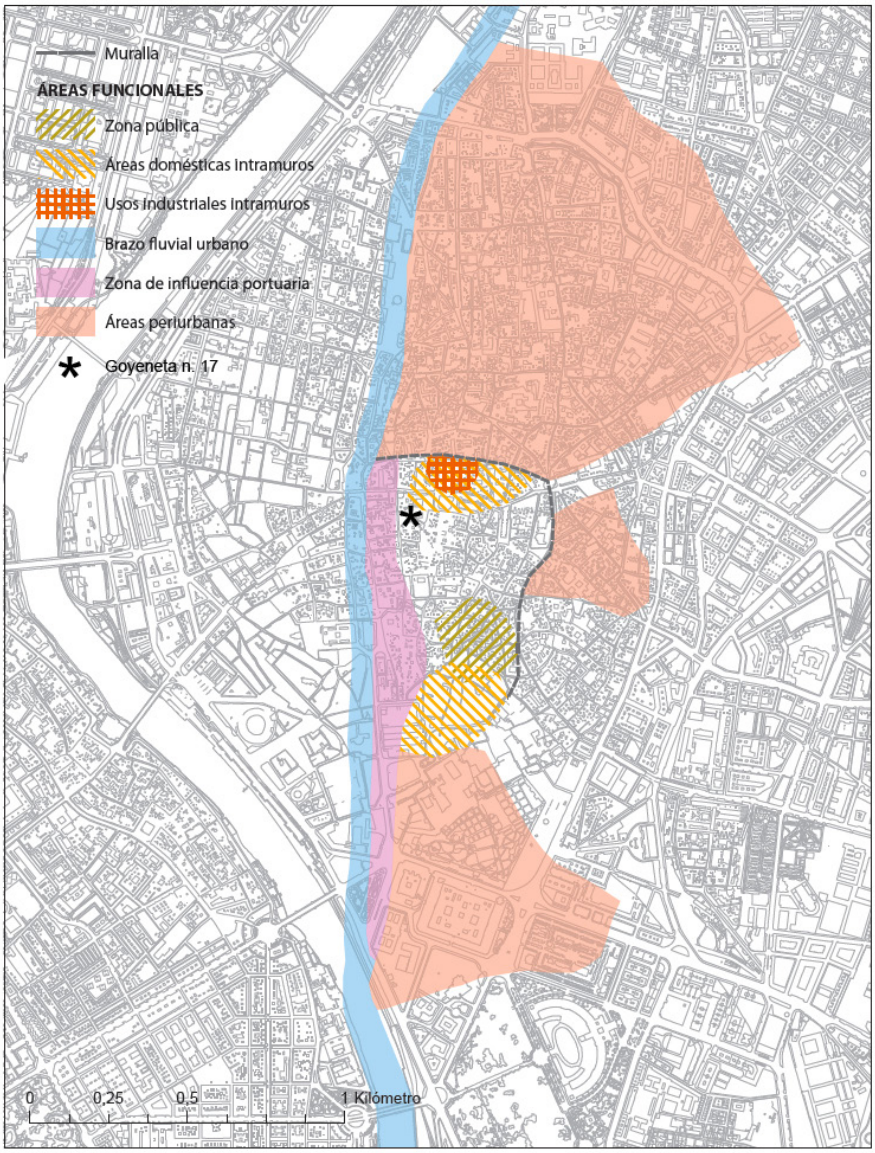


Fig. 1. Map of the functional areas identified in Roman *Hispalis* and the location of nº 17 Goyeneta Street (Seville, Spain)

m. These constitute the outer walls of the building which were lined by a colonnade creating a porch 3 m wide [with white marble pilaster bases, white and pink-white column bases, and column shafts in different coloured stones] opening onto an open air patio [paved with greenish grey and multicolour limestone flagstones] (Figs. 2 and 3).

The continuance of this building, at least structurally if not also functionally, into the 4th century is evidenced by a number of elements documented *in situ*, in positions considered to be consistent with their original function and first use. This is the case of the pilaster bases (327 and 328) preserved in wall 239, a column base (384), a fallen column (383) and the paved stone floor 323. Other elements were found in contexts of reuse yet still within the chronological scope of the building (2nd–4th centuries) and often with physical signs of having been modified and/or downsized in order to be used for new purposes. The abandonment of the building and the shift in the usage of the area in the 5th century AD are consistent with the changes in the patterns of occupation of other urban spaces documented within Roman *Hispalis*. At present, the best documented areas of the Roman city are La Encarnación (AMORES *et al.* 2009; GONZÁLEZ ACUÑA 2011; GARCÍA VARGAS 2014) and Patio de Banderas (TABALES 2015), which may serve as future points of comparative reference, beyond the scope of this paper, for both the functional characterization of the archaeological finds under study here and for the patterns observed in the use of marbles and other decorative stones in different spatial, social and chronological contexts of Roman *Hispalis*.

Materials and methods

A total of 13 architectural elements made out of different varieties of true marble and other coloured stones (*marmora*) were selected for study (Table 2). This selection aimed to be representative of both the typological and the lithological diversity of the overall

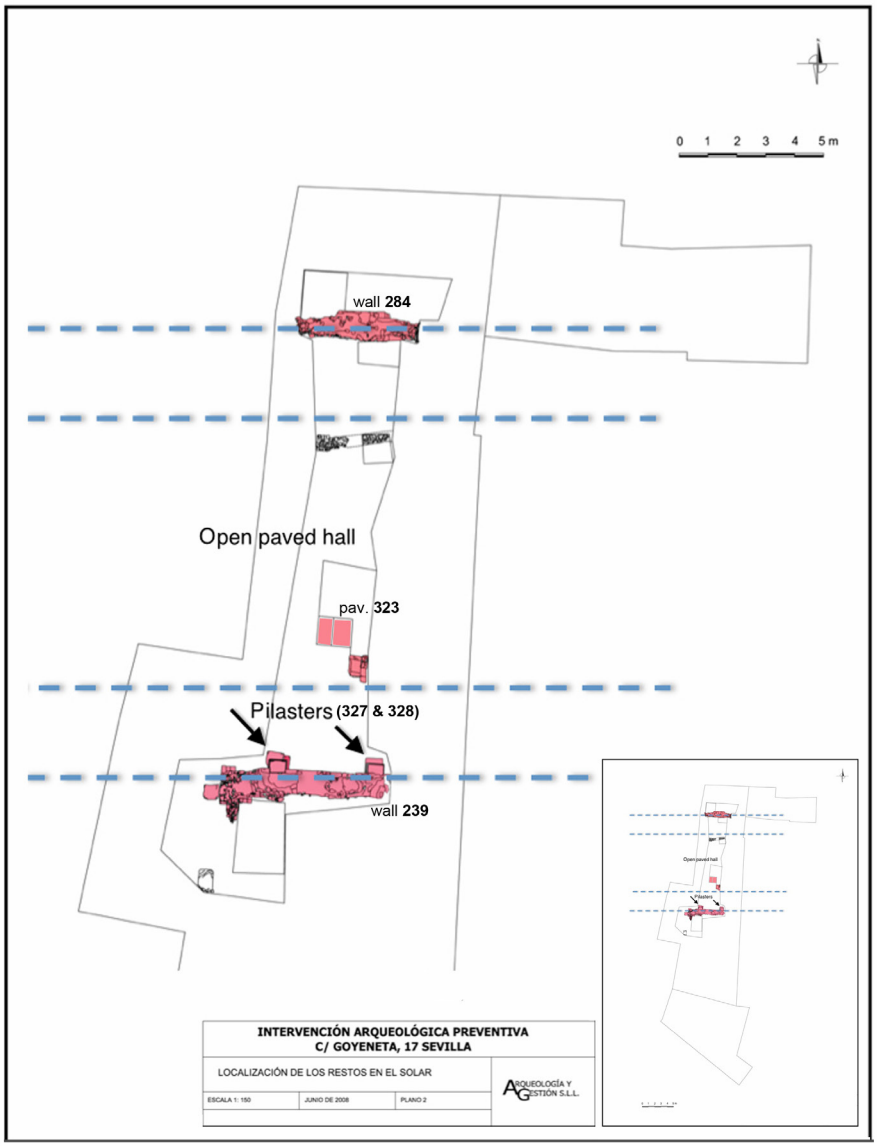


Fig. 2. General plan of the structures belonging to the second phase of the site (2nd century AD) and possible reconstruction of the main walls of the building

Fig. 3.
Detail of the pilasters of the porch documented *in situ* during the excavations

assemblage of large architectural elements recovered during the excavations of the structures best described as part of a monumental building or complex. The pilaster bases 327 and 328, mentioned above, could not be sampled due to their consolidation and sealed packaging in polyurethane, along with the brick wall 239, in view of a rehabilitation project that never took place (Fig. 3). Column 383, also mentioned above, was visually identified as the same material as column 398 (sample G-10) and therefore was not selected for analysis.

Each element was first inventoried and cross-referenced with the information provided by the excavation log (identification, location, spatial and stratigraphic relationships). Each element was then fully described following the standard nomenclature for Roman architectural elements, and measured. Typologically, the architectural elements selected for this study correspond to 4 smooth column shafts with simple imo- and sumoscapo mouldings; 3 attic column bases; 3 pilaster bases with mouldings; and 3 paving slabs.

The detailed macroscopic description of the materials under study is complemented, at this stage of our work, by the petrographic analysis of each lithotype. One to three samples were taken from each element depending of the degree of homogeneity of their material. Thin sections were prepared following the standard procedures for geological materials. Petrographic analysis was carried out using a Leica DMLP polarising optical microscope, with a Leica DFC 280 digital camera, at the Andalusian Institute for Historical Heritage (IAPH).

Both the macroscopic and the petrographic characterisations of the materials under study enabled their comparison with the reference collection of decorative stone materials of the Southwest of the Iberian Peninsula created and expanded during the research projects *Marmora de la Hispania meridional* (HAR2009-11438) (2010-2012) and *Proyecto Marmora* (HAR2013-42078-P) (2014-2016), financed by the competitive research programs of the Spanish government (BELTRÁN *et al.* 2011). Additional literature data was consulted for other geographical regions and for the main Mediterranean white and coloured marble varieties (ANTONELLI, LAZZARINI 2015; GORGONI *et al.* 2002; LAPUENTE *et al.* 2014). The visual and petrographic examination and classification of the materials enabled the identification of 10 lithotypes (Table 3). The coloured *marmora* identified at nº 17 Goyeneta Street are illustrated in Figure 4.

Discussion

Based on the visual and petrographic characteristics of the 10 lithotypes documented in the assemblage of large architectural elements recovered from nº 17 Goyeneta Street, Seville, Spain, and their comparison with the type-materials of known source areas, we have been able to assign a probable provenance to most of the materials present. The identification of well documented marbles (for instance, *Luni*) and other ornamental stones on which we have worked extensively (Almadén de la Plata), as well as visually very characteristic regional materials (the colourful 'Peñaflor' and Sintra limestones) was possible without any great difficulties. The determination of the precise geographical areas of origin of other types may, on the other hand, require further fieldwork and comparative analyses of both regional and Mediterranean reference samples.

Sample (*)	Inventory ID	Basic typological description	Dimensions (cm) in brackets incomplete
G-01	347.1	Plain column shaft	Ø 59-61, length (253)
G-02	348.1	Plain column shaft	Ø 57, length 124
G-04	283.4	Pilaster base	24,5 x 70 x 77
G-06	248.1	Pilaster base	25,5 x 78 x 82
G-07	Floor 323	Paving slab	-
G-08	282.86	Plain column shaft	Ø 50, length (43)
G-09	303.9	Pilaster base	10 x (36,5) x 97
G-10	398.1	Plain column shaft	Ø 42-48, length (222)
G-11	-	Attic column base	Ø 62, plinth 72, height 24
G-13	Floor 323	Paving slab	30 x 81 x 148
G-14	Floor 323	Paving slab	20 x 85 x 130
G-15	-	Attic column base	Ø 69, plinth 80, height 38
G-16	-	Attic column base	Ø 62, plinth 68, height 25,5
(*) Samples G-03, G-05 and G-12 of the correlative series of samples are not included in this study.			

Table 2. Sample list

Marbles	
01. Fine grained white marble	Pilaster bases G-04 and G-06
02. White marble with red hairline veins	Pilaster base G-09
03. Pinkish white marble	Attic column bases G-15 and G-16
04. White and grey veined marble	Column shaft G-08
05. Grey marble	Attic column base G-11
Marmora (Fig. 4)	
06. Multicolour compact microcrystalline limestone	Paving slab G-13
07. Greenish-grey foliated microcrystalline limestone	Paving slabs G-07 and G-14
08. White (clasts) and red (matrix) limestone breccia	Column shaft G-02
09. Fossiliferous crystalline limestone	Column shaft G-10
10. Compact banded crystalline travertine	Column shaft G-01

Table 3. Lithological classification of the materials under study

Lithotype	Provenance
01. Fine grained white marble	Carrara - Luni, Italy
02. White marble with red hairline veins	Almadén de la Plata, Seville province, Spain
03. Pinkish white marble	Almadén de la Plata, Seville province, Spain
04. White and grey veined marble	Almadén de la Plata, Seville province, Spain
05. Grey marble	Almadén de la Plata, Seville province, Spain
06. Multicolour compact microcrystalline limestone	'Peñaflor stone', Seville province, Spain
07. Greenish-grey foliated microcrystalline limestone	'Tarifa stone', Cadiz province, Spain
08. White (clasts) and red (matrix) limestone breccia	Antequera, Malaga province, Spain
09. Fossiliferous crystalline limestone	Sintra, Lisbon region, Portugal
10. Compact banded crystalline travertine	Aïn Tekbalet, Tlemcen province, Algeria

Table 4. Provenance determinations

The provenance determinations of the 10 lithotypes are summarised in Table 4. The lithological and the typological information provided by the archaeological elements under study are presented together in order to highlight the different uses of the different materials within the architectural program. The historical and archaeological implications of the provenance identifications established in this study in the context of Roman *Hispalis* are noted in the conclusions.

01. Fine grained white marble

Marble from Carrara, Italy, was imported from Luni to the Iberian Peninsula from Augustan times onwards (GUTIÉRREZ, RODÀ 2012) and used in a wide range of architectural and epigraphic elements, especially in public contexts. It is widely documented in the cities of the Guadalquivir Valley, for instance at *Italica* (RODRÍGUEZ 2008) and *Astigi* (ORDOÑEZ *et al.* 2015).

Two pilaster bases, samples G-04 and G-06, are identified as white Carrara marble. The two elements share similar dimensions: 24,5 x 70 x 77 cm (G-04) and 25.5 x 78 x 82 cm (G-06). The same material was also identified visually in a pair of twin pilaster bases (inventory ID 327 and 328, with the same dimensions 63 x 57 x 37 cm) discovered in their original position against the brick wall 329 (Fig. 3). Unfortunately, it was not possible to sample these elements, due to their casing in polyurethane. Three identical calcarenite base blocks (inventory ID 336, 341 and 342) for a further three pilasters were documented during the excavation, devoid of their marble elements. Assuming that their pilasters were made of the same marble, an interesting hypothesis emerges regarding the important role of Carrara marble in the architectural program of the porch.

We may note that a fine grained white marble, similar to that of Carrara, was exploited in Antiquity in the Estremoz Anticline, in the Portuguese region of Alentejo (LAPUENTE 1999). A recent overview of the available archaeometric identifications of Portuguese marbles in Baetica (TAYLOR *et al.* 2016) has shown that marbles from Lusitania are in fact quite scarce in Roman *Hispalis*, especially in architectural programs created by matching elements in white marble. Therefore, both the analytical and the archaeological information available for the elements included in this study support their provenance from the Carrara quarries.

02. White marble with red hairline veins

White marble with red hairline veins is one of the most typical varieties of the Almadén de la Plata quarries, located approx. 70 km to the North of Seville. It is identified in sample G-09, a moulded base with a *cyma recta* between two flat fillets. Incomplete, the dimensions of this element are 10 x (36.5) x 97 cm.

03. Pinkish white marble

Another characteristic variety of marble from the quarries of Almadén de la Plata is pinkish white, generally heterogeneous in colour and texture. Recent literature has stressed the existence of some degree of overlap between the physical characteristics of this type and those of visually similar marbles from the Estremoz Anticline

(see, for instance, LAPUENTE *et al.* 2014). In recent years, we have worked extensively on the marbles of the Metamorphic Band of Aracena (BELTRÁN *et al.* 2015) and the Estremoz Anticline, and the quarries of Almadén de la Plata have been the focus of detailed study, including the archaeological description of the ancient quarry works and the archaeometric analysis of a large number of reference samples (TAYLOR 2015), thus providing a strong base for our identifications. In this case, the chromatic, structural, textural and mineralogical parameters in the hand specimens and thin sections of two samples are consistent with the pinkish white marble from Almadén de la Plata. This material is identified in two attic column bases, G-15 (max. 68 cm) and G-16 (max. 80 cm). We may add that the dimensions of these elements match those of the preforms recently documented at the quarry of Los Covachos.

04. White and grey veined marble

A section of a plain column shaft (G-08) corresponds to an intensely banded white and grey marble from the quarries of Almadén de la Plata, possibly from Loma de los Castillejos (ONTIVEROS *et al.* 2012). The diameter of the column from Goyeneta (Ø 47 cm) matches that of the abandoned columns documented *in situ* at this quarry and in its immediate surrounding area (TAYLOR 2015). The length of the columns identified in the quarry district does not exceed 230 cm, thus providing a probable indication for the missing measurement.

05. Grey marble

G-11, an attic column base (max. 72 cm), has been identified as a homogenous grey marble from Almadén de la Plata. While this chromatic variety may be less appealing than other materials in this assemblage, it is noteworthy that this column base is of similar dimensions as those described above in pinkish white marble from the same quarry district. This observation, along with the evidence already discussed in relation to the abandoned preforms at the ancient quarries, appears to indicate some degree of standardization in the products of the Almadén de la Plata district, regardless of the specific chromatic characteristics of the stones (TAYLOR 2015).

06. Multicolour compact microcrystalline limestone (Fig. 4, 06)

Sample G-13 corresponds to a highly ornamental variety of polychrome compact microcrystalline limestone. This type has been identified previously in a number of contexts of the Lower Guadalquivir Valley, from *Corduba* to *Hispalis* (RODRÍGUEZ 2008: 251-253), and has become known as 'Peñaflor stone' (PENSABENE 2013). The origin of the type-name is the modern town of Peñaflor, close to the Roman town of *Celti* (KEAY *et al.* 2000), where the material appears to have first been identified. In Roman archaeological contexts, this material is commonly, but not solely, identified in paving slabs, some of considerable size, that provide an insight into the characteristics of the extraction and distribution of this material. The location of the quarries remains unknown and is the aim of ongoing fieldwork.

07. Greenish-grey foliated microcrystalline limestone (Fig. 4, 07)

A second type of microcrystalline limestone (G-07 & G-14) was used in the stone pavement, alongside the polychrome variety described above. This material displays a homogenous greenish-grey colour and a characteristic foliated structure. It is crossed by occasional straight veins filled with pinkish white calcite. These characteristics match those of the material known regionally as 'Tarifa stone', from the southern tip of the province of Cadiz.

08. White (clasts) and red (matrix) limestone breccia (Fig. 4, 08)

This breccia of white clasts and red matrix is visually very similar to the classical type known as *breccia corallina*, habitually associated with the Bilecik region of Turkey. However, the petrographic characteristics of sample G-02 appear to be different from those of the reference material described by Lazzarini (2002). Sample G-02 displays angular clasts of primarily oolitic white limestone set in an intense red matrix. The clasts are very variable in size (some larger than 20 cm). Based on our present knowledge, this material may be correlated to the brecciated levels of oolitic limestone found in the Subbaetic System of the Baetic Cordillera, and may correspond to the material quarried in Antiquity in the area of Antequera (BELTRÁN *et al.* 2012). This lithotype has been identified in the upper section, including the sumoscapo moulding, of a smooth monolithic column shaft (Ø 56 cm). The most noteworthy feature of this shaft is that it has been recut to a length of 124 cm, creating a flat surface with no evidence of sockets for a possible fixture or assembly.

09. Fossiliferous crystalline limestone (Fig. 4, 09)

The material known in the literature as *lumachella carnina*, originally described as an oriental or Turkish variety (GNOLI 1971: 171-183) and more recently ascribed to an indeterminate origin in the Iberian Peninsula (BORGHINI 2004: 240), has become associated with the Portuguese quarries of Sintra, in the Lisbon region (MAÑAS, FUSCO 2008). Sample G-10 and a second non-analysed column shaft (inventory 383) correspond to this type of fossiliferous crystalline limestone. The columns are cut carefully following the preferred orientation of the sedimentary material. The incomplete length of column 398 is 222 cm. The preliminary petrographic observation suggests that the columns from *Hispalis*

are similar although perhaps less crystalline than the known reference types (RODRÍGUEZ *et al.* 2012: 132-134), which may be due to intraquarry variation. However, the columns are visually a complete match to the variety known as *encarnadão chainette* included in the Catalogue of Portuguese Ornamental Stones (online database of the Portuguese Instituto Nacional de Engenharia, Tecnologia e Inovação, http://rop.lneg.pt/rop).

10. Compact banded crystalline travertine (Fig. 4, 10)

Similar materials are described in the literature as 'calcite alabasters' but we have opted for the term compact banded crystalline travertine. The calcite bands in G-01 are approximately parallel or slightly undulated, generally less than 2 cm but up to 7 cm, and in a wide range of colours (white, cream, pink, yellow, orange), often separated by thin chromatically intense bands. The crystalline texture is variable between bands. The stone is overall very compact despite the banding, but displays some continuous dissolution lines (between bands) along which the stone tends to break. Further analysis is required (including geochemical and isotopic analysis), but this material may have been procured in the region of Tlemcen, Algeria, at the quarries of Aïn Tekbalet (HERRMANN *et al.* 2012). It will be of great interest to follow it up in future work on the patterns of distribution and use

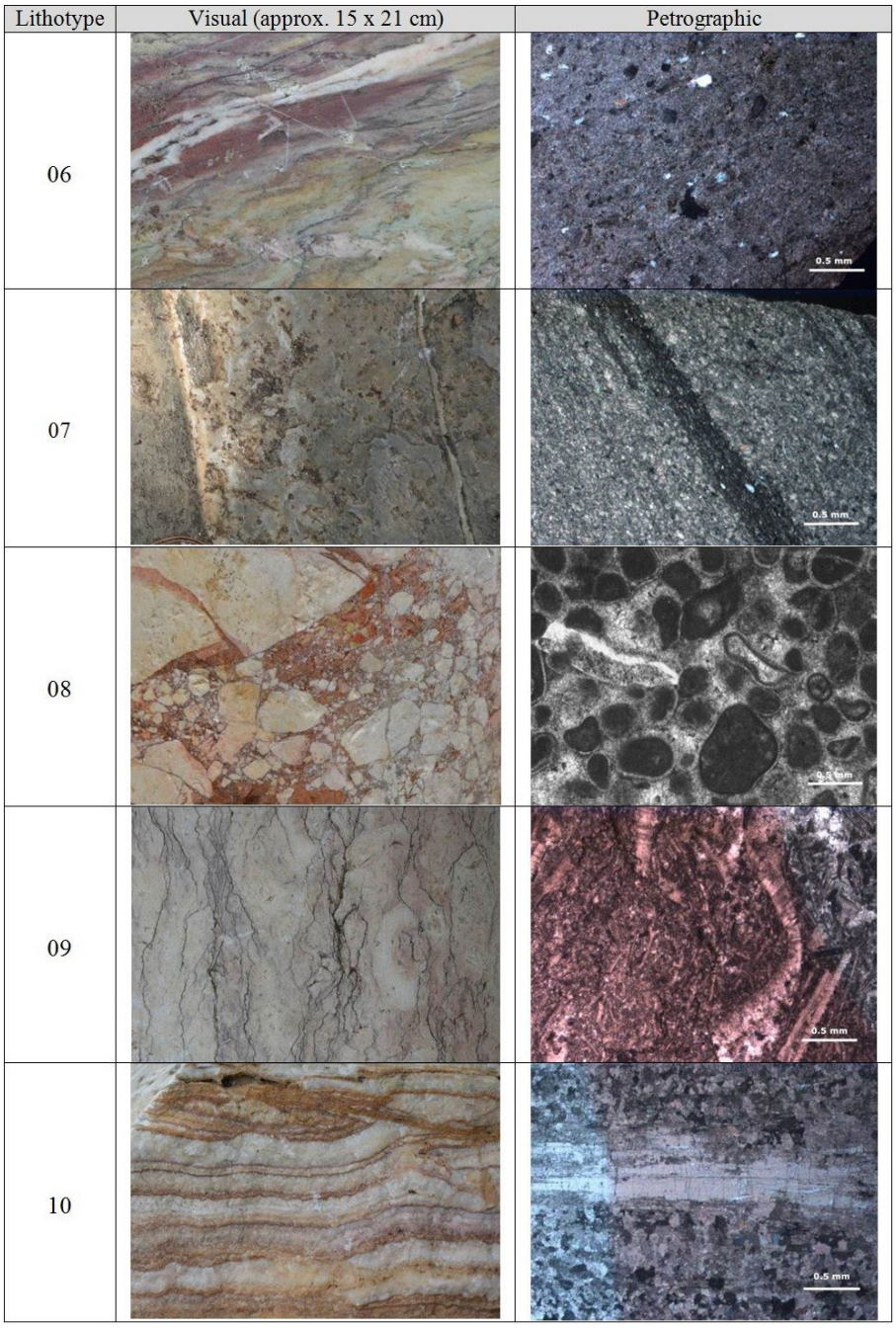
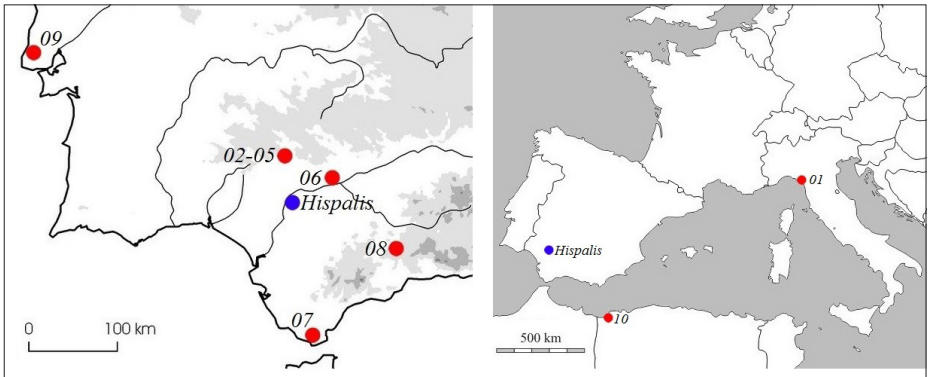


Fig. 4. Visual and petrographic characteristics of the coloured *marmora* documented at nº 17 Goyeneta Street, Seville, Spain



Lithotypes in order of distance from Roman *Hispalis* (approximate shortest route):

02-05	Almadén de la Plata	70 km by land	*09*	Sintra	550 km by sea
06	'Peñaflor stone'	80 km by land or river	*10*	Aïn Tekbalet	650 km by sea
08	Antequera	180 km by land	*01*	*Luni* - Carrara	2.000 km by sea
07	'Tarifa stone'	200 km by land or sea			

Fig. 5.
Distribution map of the lithotypes identified at nº 17 Goyeneta Street (Seville, Spain), in order of distance from Roman *Hispalis*

of this lithotype, as well as on the possible existence of outcrops with similar characteristics in the Baetic Cordillera.

The fragments recovered at nº 17 Goyeneta Street belong to at least two column shafts, judging by the evidence of the imoscapo mouldings. The better preserved shaft displays an incomplete length of 253 cm. Its diameter varies between 62 cm at the imoscapo and 59 cm in the central section of the shaft.

Conclusions

At present, the remains documented at nº 17 Goyeneta Street constitute the most significant assemblage of monumental architectural elements recovered in Roman *Hispalis*. Indeed, the number, the diversity of the lithotypes and, particularly, the monumental dimensions of these elements are not equalled by any of the assemblages documented by any of the preventive archaeological excavations within the historical city centre of Seville, including the nearby 6000 m² site of La Encarnación.

The find spot of this assemblage is located within the Northern sector of the Roman city and indicates the existence of an important monumental complex in this area. The morphology of the building under study - rooms organised around an open central patio monumentalised by large supporting elements – and its location near to the historical margin of the Guadalquivir River, suggests a possible function as part of the infrastructures of the port services and administration. It is interesting to note that many of the structures identified at La Encarnación indicate the existence of a thriving port district in this area of the Roman city in the 2nd century AD (GONZÁLEZ ACUÑA 2011).

The date of the construction of the building and, particularly, its long period of use from the 2nd to the 4th century AD provide two interesting chronological references. The building also underwent remodelling and transformations that affected some of the architectural elements themselves. The sequence documented at nº 17 Goyeneta Street is documented at nearby contexts, including La Encarnación, that reinforce the continuity of the urbanistic development throughout these centuries and the appearance of important changes in the use of this area of the city from the early 5th century onwards (GARCÍA VARGAS 2014). This is the date around which the building under study fell into disuse and may have been partially dismantled, although many of its larger architectural elements were left *in situ*.

The assemblage of large architectural elements analysed in this paper corresponds to 13 individual items belonging to a single building program: 4 smooth column shafts, 3 attic column bases, 3 pilaster bases with mouldings and 3 paving slabs. Within this group we have identified 10 different lithotypes, from 7 different quarry districts, which provided the necessary stones for a monumental and strikingly chromatic architectural program.

Four of these are regional, from within the territory of the Roman province of *Baetica*. Almadén de la Plata is located approximately 55 km from Seville as the crow flies, or 70 km by land. The quarries of 'Peñaflor stone' may be traced to an area at a distance of approximately 65 km as the crow flies, or 80 km by land or river. Antequera, in the hinterland of the present day province of Malaga, is approximately 130 km as the crow flies, 180 km by land or using the *Singilis-Baetis* river system or 370 km by sea from *Malaca*. The distance between Tarifa, on

the southern tip of the Atlantic coastline, near the Strait of Gibraltar, and Roman *Hispalis* is approximately 150 km as the crow flies, and 200 km by land or by sea (Fig. 5).

One of the identified materials can be characterised as superregional, from the quarries of Sintra, located in Roman *Lusitania*, located approximately 350 km as the crow flies, or 550 km by sea, from Seville. The remaining two lithotypes are not from the Iberian Peninsula but from Italy (*Luni*), and most probably Algeria (the banded crystalline travertine from Aïn Tekbalet), and must have arrived at Roman *Hispalis* by sea, either directly from their quarries of origin or redistributed from another centre.

The diversity of lithotypes outlined above indicates the use in Roman *Hispalis* of a wide range of materials from regional, superregional and extra-peninsular quarry areas. The distances from and the means of transportation to *Hispalis* by land, by river and by sea would have been different in each case, as would the characteristics of the systems of exploitation and distribution. However, we may conclude that all of these different materials were present and available in *Hispalis* in the 2nd century AD for the construction of the monumental building identified at nº 17 Goyeneta Street in Seville's historical city centre. The assemblage under study not only provides new data on the monumental areas of the Roman city of Hispalis, located in this case in the Northern intramural sector of the city, but also constitutes an important case study for the reconstruction of the value of regional and imported marbles in the Southwest of Roman Hispania between the 2nd and 4th centuries AD.

REFERENCES

AMORES F., BELTRÁN J., GONZÁLEZ D. 2009: "*Marmora* de *Hispalis*. Estudio de los materiales pétreos recuperados en las excavaciones arqueológicas de La Encarnación (Sevilla)", in T. NOGALES, J. BELTRÁN (eds.): *Marmora Hispana*, L'Erma, Rome, 211-227.

ANTONELLI F., LAZZARINI L. 2015: "An updated petrographic and isotopic reference database for white marbles used in Antiquity", Rendiconti Lincei 26, 399-413.

BELTRÁN J., LOZA L., ONTIVEROS E., PÉREZ J. A., RODRÍGUEZ O., TAYLOR R. 2015: "Marbles of the Aracena Massif (Ossa Morena Zone, Spain): aspects of their exploitation and use in Roman times", in ASMOSIA X, 437-456.

BELTRÁN J., LOZA L., ONTIVEROS E., RODRÍGUEZ O., TAYLOR R. 2011: "La explotación y el empleo de *marmora* en la *Baetica*. Un proyecto de investigación de base arqueométrica", Itálica. Revista de Arqueología Clásica de Andalucía 1, 51-75.

BELTRÁN J., ONTIVEROS E., LOZA L., ROMERO M. 2012: "Roman use, petrography and elemental geochemistry of the Surco Intrabético limestones (western region of Malaga province, Spain)", in ASMOSIA IX, 500-510.

BELTRÁN J., RODRÍGUEZ O. 2014: "*Hispalis* republicana y altoimperial a través de los datos arqueológicos", in J. BELTRÁN, O. RODRÍGUEZ (eds.): Sevilla arqueológica, Universidad de Sevilla, Seville, 140-181.

BORJA F. 2014: "Geoarqueología urbana en Sevilla", in J. BELTRÁN, O. RODRÍGUEZ (eds.): Sevilla arqueológica, Universidad de Sevilla, Seville, 276-303.

GARCÍA VARGAS E. 2014: "La Sevilla tardoantigua", in J. BELTRÁN, O. RODRÍGUEZ (eds.): Sevilla arqueológica, Universidad de Sevilla, Seville, 184-205.

GNOLI R. 1971: Marmora Romana, Edizioni dell' Elefante, Rome.

GONZÁLEZ ACUÑA D. 2011: Forma Urbis Hispalensis. El urbanismo de la ciudad romana de Hispalis a través de los testimonios arqueológicos, Universidad de Sevilla, Seville.

GORGONI C., LAZZARINI L., PALLANTE P., TURI B. 2002: "An updated and detailed mineropetrographic and C-O stable isotopic reference database for the main Mediterranean marbles used in Antiquity", in ASMOSIA V, 115-131.

GUTIÉRREZ A., RODÀ I. 2012: "El mármol de *Luni*-Carrara en la fachada mediterránea de *Hispania*", in S. KEAY (ed.): Rome, Portus and the Mediterranean. British School at Rome, London, 293-312.

HERRMANN J. J., VAN DER HOEK A., TYKOT R. 2012: "Alabastro a pecorella, Aïn Tekbalet and Bou Hanifia, Algeria: a preliminary report", in ASMOSIA IX, 463-470.

KEAY S., CREIGHTON J., REMESAL J. 2000: "Celti (Peñaflor): the archaeology of a Hispano-Roman town in Baetica. Survey and excavations 1987-1992", Oxford: Oxbow Books – University of Southampton.

LAPUENTE P. 1999: "Problemas petrográficos en la identificación de mármoles clásicos: diferenciación de Carrara y Borba", Caesaraugusta 73, 279-288.

LAPUENTE P., NOGALES T., ROYO H., BRILLI M. 2014: "White marble sculpture from the National Museum of Roman Art (Mérida, Spain): sources of local and imported marbles", European Journal of Mineralogy 26, 333-354.

LAZZARINI L. 2002: "The origin and characterization of *breccia nuvolata*, *marmor Sagarium* and *marmor Triponticum*", in ASMOSIA V: 58-67.

MAÑAS I., FUSCO, A. 2008: "Canteras de Lusitania: un análisis arqueológico", in T. NOGALES, J. BELTRÁN (eds.): *Marmora Hispana*, L'Erma, Roma, 419-458.

MÁRQUEZ C. 2003: "Los restos romanos de la calle Mármoles en Sevilla", Romula 2, 127-148.

ONTIVEROS E., BELTRÁN J., TAYLOR R., RODRÍGUEZ O., LÓPEZ P. 2012: "Petrography and elemental geochemistry of the Roman quarries of Los Castillejos and Los Covachos (Almadén de la Plata, Seville, Spain). Outcrops and semielaborated products", in ASMOSIA IX, 407-418.

ORDÓÑEZ S., GONZÁLEZ D. 2011: "*Horrrea* y almacenes en *Hispalis*. Evidencias arqueológicas y evolución de la actividad portuaria", in J. ARCE, B. GOFFAUX (eds.): Horrea d'Hispanie et de la Méditerranée romaine, Casa de Velázquez, Madrid, 159-184.

ORDOÑEZ S., TAYLOR R., RODRÍGUEZ O., GARCÍA-DILS S., BELTRÁN J., SAQUETE J. C. 2015: "A *uotorum nuncupatio* from *Colonia Augusta Firma*. An analytical approach", in ASMOSIA X, 263-268.

PENSABENE P. 2013: I marmi nella Roma antica, Carocci, Rome.

RODRÍGUEZ O. 2008: "Los *marmora* en el programa arquitectónico y decorativo del teatro romano de Itálica: antiguas hipótesis, nuevas propuestas y posibles certezas a la luz de las aportaciones de los análisis de microscopía óptica de polarización", in T. NOGALES, J. BELTRÁN (eds.): *Marmora Hispana*, L'Erma, Rome, 231-259.

RODRÍGUEZ O., MAÑAS I., ONTIVEROS E. 2012: "The *opus sectile* of the curia of Ilipa (Alcalá del Río, Seville). Considerations on the use of stone in public architecture from Roman Baetica", in ASMOSIA IX, 127-135.

TABALES M. A. (dir.). 2015: Excavaciones arqueológicas en el patio de Banderas, Alcázar de Sevilla. Memoria de Investigación 2009-2014, Patronato del Real Alcázar Casa Consistorial de Sevilla, Seville.

TAYLOR R. 2015: Las canteras romanas de mármol de Almadén de la Plata (Sevilla, España): un análisis arqueológico, PhD Thesis, University of Seville.

TAYLOR R., ONTIVEROS E., LOZA M. L., BELTRÁN J. 2017: "*Marmora Lusitana* en la Bética romana", Revista DigitAR 4 (online): 29-39.