

Interdisciplinary Studies on Ancient Stone

Proceedings of the IX ASMOSIA Conference

(Tarragona 2009)

Edited by

Anna Gutiérrez García-M., Pilar Lapuente and Isabel Rodà

Institut Català d'Arqueologia Clàssica

DOCUMENTA 23



Interdisciplinary Studies on Ancient Stone

Proceedings of the IX Association for the Study of Marbles
and Other Stones in Antiquity (ASMOSIA) Conference
(Tarragona 2009)

Edited by

Anna Gutiérrez García-M.
Pilar Lapuente Mercadal
Isabel Rodà de Llanza

D|O|C|U|M|E|N|T|A|23

INSTITUT CATALÀ D'ARQUEOLOGIA CLÀSSICA
Tarragona, 2012

Association for the Study of Marble and Other Stones used in Antiquity. International Symposium (9è : 2009 : Tarragona, Catalunya)

Interdisciplinary studies on ancient stone : proceedings of the IX Association for the Study of Marble and Other Stones in Antiquity (ASMOSIA) Conference (Tarragona 2009). – (Documenta ; 23)

Bibliografia

ISBN 9788493903381

I. Gutiérrez García-Moreno, Anna, ed. II. Lapuente Mercadal, Pilar, ed. III. Rodà, Isabel, 1948- ed. IV. Institut Català d'Arqueologia Clàssica V. Títol VI. Col·lecció: Documenta (Institut Català d'Arqueologia Clàssica) ; 23

1. Escultura en mármol – Roma – Congressos 2. Construcciones de mármol – Roma – Congressos 3. Mármol – Roma – Análisis – Congressos 4. Piedras de construcción – Roma – Análisis – Congressos 5. Pedreras – Roma – Historia – Congressos

904-03(37):552.46(061.3)

Aquesta obra recull les aportacions (comunicacions orals i pòsters) que es van presentar durant el IX Congrés Internacional de l'Association for the Study of Marbles and Other Stones in Antiquity (ASMOSIA), organitzat per l'ICAC en el marc del programa de recerca HAR2008-04600/HIST, amb el suport del programa d'Ajuts ARCS 2008 (referència expedient IR036826) de la Generalitat de Catalunya i del Ministeri de Ciència i Innovació (Accions Complementàries HAR2008-03181-E/HIST), i celebrat a Tarragona entre el 8 i el 13 de juny del 2009.

Aquesta publicació ha estat possible gràcies a l'ajut del programa d'Ajuts ARCS 2008 (referència expedient IR036826) de la Generalitat de Catalunya i del Ministeri de Ciència i Innovació (Accions Complementàries HAR2008-03181-E/HIST), i també als projectes de recerca HAR2008-04600/HIST ("Explotación, uso e intercambio de materias primas inorgánicas entre el norte de Hispania, el sur de la Galia y los puertos de Roma") i HAR2011-25011 ("La explotación y comercio de los recursos naturales en el N. de la Hispania romana: *lapis, metalla, aqua*") del Ministeri de Ciència i Innovació.

Comitè editorial

Juan Manuel Abascal (Universitat d'Alacant), José María Álvarez Martínez (Museo Nacional de Arte Romano, Mérida), Carmen Aranegui (Universitat de València), Achim Arbeiter (Universitat Georg-August de Göttingen, Alemanya), Jean-Charles Balty (Universitat de París-Sorbona [París IV], França), Francesco D'Andria (Universitat del Salento, Itàlia), Pierre Gros (Universitat de Provença, França), Ella Hermon (Université Laval, Quebec, Canadà), Rosa Plana-Mallart (Universitat Paul-Valéry Montpellier 3, França), Lucrezia Ungaro (Sovraintendenza Capitolina, Direzione Musei, Itàlia) i Susan Walker (Ashmolean Museum, Oxford, Regne Unit).

© d'aquesta edició, Institut Català d'Arqueologia Clàssica (ICAC)

Plaça d'en Rovellat, s/n, 43003 Tarragona

Telèfon 977 249 133 – Fax 977 224 401

info@icac.net – www.icac.net

Durant els nou primers mesos de publicació, qualsevol forma de reproducció, distribució, comunicació pública o transformació d'aquesta obra només es pot fer tenint l'autorització dels seus titulars, amb les excepcions previstes per la llei. Adreieu-vos a CEDRO (Centre Espanyol de Drets Reprogràfics, www.cedro.org) si heu de fotocopiar o escanejar fragments d'aquesta obra.

A partir del desè mes de publicació, aquest llibre està disponible en format PDF a la web de l'ICAC i s'autoritzà el públic en general a reproduir, distribuir i comunicar l'obra sempre que se'n reconegui l'autoria i les entitats que la publiquen i no se'n faci un ús comercial, ni lucratiu, ni cap obra derivada.

© d'aquesta edició, les editores; i dels articles, els autors

© de la fotografia de la coberta: ICAC

Primera edició: maig del 2012

Coordinació: Publicacions de l'ICAC

Disseny de la col·lecció: Dièdric

Coberta: Gerard Juan Gili

Fotografia de la coberta: Placa de *broccatello* de la vil·la romana dels Munts, a Altafulla (Tarragona).

Maquetació i impressió: Indústries Gràfiques Gabriel Gibert

Dipòsit Legal: T-336-2012

ISBN: 978-84-939033-8-1

CONTENTS

Presentation	15
In Memoriam Rafael Arana	17
1. APPLICATIONS TO SPECIFIC ARCHAEOLOGICAL QUESTIONS. USE OF MARBLE	
Roman marble salvaging, <i>S. J. Barker</i>	22
Computer technology and three-dimensional models in determining the recutting of Roman portraits: the Getty Augustus, <i>J. Pollini and W. Storage</i>	31
The import and the use of white marble and coloured stone for wall and floor revetment at Sagalassos, <i>M. Corremans, P. Degryse, D. Wielgosz and M. Waelkens</i>	38
Quarry origins, commission, and import of the marble sculptures from the Roman Theater in Philadelphia/Amman, Jordan, <i>E. A. Friedland and R. H. Tykot</i>	52
The “peopled” scroll motif in the Land of Israel in the Roman period: the case of the marble friezes in the Roman theatre at Beth Shean/Sythopolis, <i>A. Ovadiah</i>	61
An introductory study to the ornamental and building stones of the Djemila (Algeria) archaeological site, <i>D. Dessandier, F. Antonelli, L. Lazzarini, M. Varti-Matarangas, L. Leroux, M. Hamiane, C. Riache and C. Khalfallah</i>	68
Unfinished <i>kouros</i> in the Mytilene Archaeological Museum: marble sculpture in Lesbos in the Archaic period, <i>E. Leka</i>	75
Ancient sculptures of imported marble in the central part of Dardania (present day Kosovo), <i>E. Dobruna-Salihu</i>	82
Two incomplete sculptures from Cavae Romanae quarries (Istria, Croatia), <i>K. Džin</i>	89
Late Roman sarcophagi in central Italy made from scavenged blocks, <i>J. J. Herrmann Jr.</i>	93
Archaeometric analyses of white marbles from Hadrian’s Villa (Tivoli, Italy) and the use of Pentelic and Dokymaean marbles in the statuary of the so-called Canopus, <i>P. Pensabene, F. Antonelli, L. Lazzarini and S. Cancelliere</i>	104
Ancient coloured marbles and their surrogates in the Milan cathedral (late 16 th century), <i>R. Bugini and L. Folli</i>	109
The <i>marmora</i> from the Forum of Ruscino (Château-Roussillon, France), <i>P. Pensabene, I. Rébé and I. Rodà</i>	113
The stones of Ammaia (Portugal): use and provenance, <i>D. Taelman, F. Vermeulen, M. De Dapper and P. De Paepe</i>	117
The <i>opus sectile</i> of the <i>curia</i> of Ilipa (Alcalá del Río, Seville). Considerations on the use of stone in public architecture from Roman Baetica, <i>O. Rodríguez, I. Mañas and E. Ontiveros</i>	127
Suitability criteria for the selection of marble to be used for restoration: application to the Alhambra Palace (Granada, Spain), <i>A. Miras, M. A. Vázquez, E. Galán, C. Apostolaki and T. Marcopoulos</i>	136
Almándoz marble from Navarra in the Arcaya Roman <i>thermae</i> in Álava (Northern Spain), <i>L. M. Martínez-Torres, L. Eguiluz, M. Loza Uriarte and J. Niso</i>	142
Espejón <i>marmor</i> and its use in Roman Hispania, <i>M. Salán</i>	146
Use of <i>marmora</i> in the ornamental program of Las Pizarras Roman site (ancient Cauca, Segovia, Spain), <i>C. Pérez, O. Reyes, I. Rodà, A. Álvarez, A. Gutiérrez García-M., A. Domènec and H. Royo</i>	151
Funding of public buildings and calculation of the costs of the stone materials. The case of the Forum of Segobriga (Cuenca, Spain). <i>P. Pensabene, R. Mar and R. Cebrián</i>	161
The marble repertoire of the Roman villa of Cornelius (Valencia, Spain), <i>R. Albiach, E. García-Prósper and A. Gallego</i>	176

Petrographic study of the tumular cist with carved steles of Reguers de Seró (Artesa de Segre, Lleida, Catalonia), <i>M. Garcia-Valles, M. Aulinás, J. B. López Melción and A. Moya</i>	183
The imported <i>marmora</i> from the Jaume I School: an assemblage from the Provincial Forum of Tarraco, <i>R. Arola, J. Á. Domingo and N. Gasull</i>	190
The <i>marmora</i> used in the imperial cult area of Tarraco (Hispania Citerior), <i>A. Àlvarez, J. M. Macias, A. Muñoz, À. Pitarch, I. Teixell and J. J. Menchon</i>	196
<i>Marmora</i> at the Tarraco of the Antonines: the assemblage of Sant Pau and Santa Tecla Hospital (Tarragona, Spain), <i>A. Gutiérrez García-M. and J. López Vilar</i>	204
Columns and <i>rotae</i> in Tarraco made with granite from the Troad, <i>I. Rodà, P. Pensabene and J. Á. Domingo</i>	210
2. PROVENANCES AND IDENTIFICATION I. MARBLES	
Tracing the origin of marbles by inclusion fluid chemistry, <i>W. Prochaska and D. Attanasio</i>	230
Determining white marble provenance of Greek and Roman sculpture in the Museum of Art and Archaeology, University of Missouri, <i>B. Kidd, D. Attanasio and R. H. Tykot</i>	238
On the Ephesian origin of greco scritto marble, <i>D. Attanasio, A. B. Yavuz, M. Bruno, J. J. Herrmann Jr., R. H. Tykot and A. van den Hoek</i>	245
A new source of bigio antico marble: the ancient quarries of Iznik (Turkey), <i>A. B. Yavuz, M. Bruno and D. Attanasio</i>	255
The Sanctuary of the Great Gods on Samothrace, Greece: an extended marble provenance study, <i>Y. Maniatis, D. Tambakopoulos, E. Dotsika, B. D. Wescoat and D. Matsas</i>	263
Provenance investigation of two marble artefacts from ancient Stymphalos, Greece, <i>Y. Maniatis, D. Tambakopoulos and M. Sturgeon</i>	279
The search for the Prehistoric marble sources in the Cyclades, <i>D. Tambakopoulos and Y. Maniatis</i>	287
Characterization and distribution of marble from Cap de Garde and Mt. Filfila, Algeria, <i>J. J. Herrmann Jr., D. Attanasio, R. H. Tykot and A. van den Hoek</i>	300
Provenance investigation of marble sculptures from Butrint, Albania, <i>V. Gaggadis-Robin, I. Pojani, K. Polikreti and Y. Maniatis</i>	310
Provenance study of Czech marbles based on a comparison of mineralogical-petrographic, cathodoluminescence, plus C and O isotopic characteristics, <i>A. Šťastná, R. Přikryl and A. Černíková</i>	322
Rome: white marbles in the Fora of Caesar, Augustus, and Trajan, <i>D. Attanasio, M. Brilli, M. Bruno, L. Ungaro and M. Vitti</i>	331
Three fragments of a Marsyas sarcophagus: multimethod marble analyses, <i>E. Van Keuren, D. Attanasio, J. J. Herrmann Jr., S. Hipol, J. Cox, L. P. Gromet and D. Abramitis</i>	344
Investigations on the white marbles of architectural elements in Salento (Southern Italy), <i>L. Del Pietro</i>	355
White sculptural materials from Villa Adriana: study of provenance, <i>P. Lapuente, P. León, T. Nogales, H. Royo, M. Preite-Martínez and Ph. Blanc</i>	364
Black sculptural materials from Villa Adriana: study of provenance, <i>P. Lapuente, T. Nogales, P. León, H. Royo and M. Preite-Martínez</i>	376
The importation of white marble into Paestum during the Republic and at the beginning of the Empire, <i>M. Cipriani, L. Lazzarini and S. Cancelliere</i>	384
The white marble quarries of Campiglia Marittima (Livorno, Italy) and the provenance of marble artefacts from Populonia, <i>F. Cavari, F. Droghini, M. Giamello, L. Lazzarini and C. Mascione</i>	390
White marbles provenance study of Caesar's head and other major sculptures found in the Rhône River at Arles (France), <i>Ph. Blanc, Ph. Bromblet and L. Leroux</i>	401

Petrography and elemental geochemistry of the Roman quarries of Los Castillejos and Los Covachos (Almadén de la Plata, Seville, Spain). Outcrops and semi-elaborated products, <i>E. Ontiveros, J. Beltrán, R. Taylor, O. Rodriguez and P. López Aldana</i>	407
Study of provenance of the Roman sarcophagus known today as the tomb of King Ramiro II of Aragon, <i>P. Lapuente, J. A. Cuchí, H. Royo, M. Preite-Martínez, Ph. Blanc and C. Garcés</i>	419
Provenance of some ancient marbles from El Pla de Ses Figueres (Cabrera, Balearic Islands, Spain), <i>A. Àlvarez, I. Rodà, M. Riera Rullan, A. Gutiérrez García-M., A. Domènec and H. Royo</i>	426
3. PROVENANCES AND IDENTIFICATION II. OTHER STONES	
Archaeometric characterisation of one Tunisian and two Italian calcareous alabasters used in antiquity, <i>L. Lazzarini, D. Visonà, M. Giamello and I. Villa</i>	436
A first study of some lumachelle (fossiliferous stones) used in Roman antiquity, <i>L. Lazzarini and M. Mariottini</i>	445
Stone blocks used for the building of the Thysdrus and Thapsus amphitheatres in Tunisia, <i>A. Younes, M. E. Gaied and W. Gallala</i>	452
Alabastro a pecorella, Aïn Tekbalet, and Bou Hanifia, Algeria: a preliminary report, <i>J. J. Herrmann Jr., A. van den Hoek and R. H. Tykot</i>	463
Sirmium's main limestone quarry at Dardagani (Bosnia and Herzegovina), <i>B. Djurić, A. Maver, I. Rižnar, D. Jovanović and J. Davidović</i>	471
Miocene limestone as dressed stone for Carnuntum Roman town and surrounding settlements in Upper Pannonia (Austria, Slovakia, Hungary), <i>D. Pivko</i>	480
Ancient uses of the Roman breccia (brèche des Romains) in Gaul, <i>A. Blanc and Ph. Blanc</i>	487
Notes on local stone use in Colonia Patricia Corduba (Córdoba, Spain), <i>M. I. Gutiérrez Deza</i>	493
Roman use, petrography and elemental geochemistry of the Surco Intrabético limestones (western region of Málaga province, Spain), <i>J. Beltrán, E. Ontiveros Ortega, M. L. Loza Azuaga and M. Romero</i>	500
Local stone used on the Roman bridge of Martorell (Barcelona, Spain), <i>A. Àlvarez and À. Pitarch</i>	511
Petrographic characterisation of an <i>opus sectile</i> found in the Roman town of Pollentia (Alcudia, Majorca, Spain), <i>M. E. Chávez, C. Mas, M. Orfila, A. Àlvarez, I. Rodà, A. Gutiérrez García-M., A. Domènec and M. À. Cau</i>	518
4. TRANSPORT AND TRADE OF STONE	
Contracts and costs for shipping marble in the Roman Empire, <i>J. C. Fant</i>	528
Shipwrecks and stone cargoes: some observations, <i>B. Russell</i>	533
The Temple of Apollo at Claros and the Kizilburun shipwreck: preliminary analysis of isotopic data, <i>W. Aylward, D. Carlson, D. Laroche, J. C. Moretti and S. Pike</i>	540
Marble trade in Moesia Inferior. The case of Tomis and Odessos. Its origin and its characteristics, <i>N. Toma</i>	549
5. QUARRIES	
Unknown ancient marble quarries of Western Asia Minor, <i>M. Bruno, H. Elçi, A. B. Yavuz and D. Attanasio</i>	562
Ancient marble and alabaster quarries near Hierapolis in Phrygia (Turkey): new data from archaeological surveys, <i>G. Scardozzi</i>	573
The marble quarries of the metropolis of Ephesus and some examples of the use for marbles in Ephesian architecture and sculpturing, <i>W. Prochaska and S. M. Grillo</i>	584
The ancient quarry at Pagani-Alyfanta, Lesbos, Greece, <i>G. A. Zachos and E. Leka</i>	592

Cipollino marble quarries south of Karystos at Aghii (Euboea, Greece), <i>M. Bruno and M. Vitti</i>	604
New work on quarrying in the territory of Eretria, Euboea, <i>B. Russell and S. Fachard</i>	612
Grey limestone quarries of Byllis (Albania), <i>T. Kozelj and M. Wurch-Kozelj</i>	619
The ancient quarries in Croatia. The technology of extracting stone, <i>M. Buzov</i>	628
Ancient quarries on the Eastern Adriatic Coast with specific reference to the island of Brač (Croatia), <i>I. Donelli, M. Matijaca and I. Paduan</i>	636
The Cavae Romanae quarry. Properties and use of the stone for the amphitheatre in Pula (Croatia), <i>V. Girardi Jurkić</i>	640
The quarries of Almadén de la Plata (Seville, Spain): new data from the recent archaeological interventions, <i>O. Rodríguez, J. Beltán, P. López Aldana, E. Ontiveros and R. Taylor</i>	645
The Roman quarries of the town and territory of Los Bañales (Uncastillo, Zaragoza, Spain), <i>A. Gutiérrez García-M, H. Royo and J. Andreu</i>	651
Quarrying, use and scope of Cabezo Gordo and Rambla de Trujillo marbles (Murcia, Spain) in the Roman era, <i>R. Arana †, J. A. Antolinos, J. M. Noguera, B. Soler and S. Arana</i>	657
Roman quarries in the northeast of Hispania (modern Catalonia, Spain), <i>A. Gutiérrez García-M.</i>	665
The Roman quarry at Montjuïc (Barcelona, Spain), <i>C. Miró and E. Revilla</i>	680
The Roman Republican and medieval quarry of Sant Miquel d'Olèrdola (Olèrdola, Barcelona), <i>N. Molist and P. Otiña</i>	688
Stone quarrying on the final stretch of the Ebro (Spain), <i>M. Genera and A. Álvarez</i>	696
6. QUARRYING TECHNIQUES, ORGANIZATION AND STONE MANUFACTURING	
Quarry blocks in <i>marmor Iassense</i> from the Balik Pazari at Iasos (Turkey), <i>M. Bruno</i>	706
Use of a saw in Roman and proto-Byzantine period on the island of Thassos, <i>T. Kozelj and M. Wurch-Kozelj</i>	715
Stone-cutting workshops at the Getic capital Helis (NE Bulgaria) – tools and techniques, <i>T. Stoyanov and D. Stoyanova</i>	723
The quarries at Luni in the 1 st century AD: final considerations on some aspects of production, diffusion and costs, <i>P. Pensabene</i>	731
The red travertine of Mula (Murcia, Spain): management and administration of quarries in the Roman period, <i>B. Soler, J. M. Noguera, R. Arana † and J. A. Antolinos</i>	744
7. PIGMENTS AND PAINTINGS ON MARBLE	
The role of the stone in the polychrome treatment of Hellenistic sculptures, <i>C. Blume</i>	754
A Hellenistic greek marble statue with ancient polychromy reported to be from Knidos, <i>M. B. Abbe, G. E. Borromeo and S. Pike</i>	763
8. SYMBOLISM OF STONES. LOCAL AND IMPORTED MATERIALS	
The use and symbolism of Pentelic marble in Domitianic Rome, <i>I. B. Romano, S. Pike and E. Gazda</i>	772
Phrygian for Phrygians: semiotics of “exotic” local marble, <i>B. Burrell</i>	780
The colours of death. Roman cinerary urns in coloured stone, <i>S. Perna</i>	787

MARMORA AT THE TARRACO OF THE ANTONINES: THE ASSEMBLAGE OF SANT PAU AND SANTA TECLA HOSPITAL (TARRAGONA, SPAIN)¹

A. Gutiérrez García-M. and J. López Vilar

Abstract

This paper presents an assemblage of *marmora* found during the archaeological excavation undertaken in 1992, a small part of the site where the Hospital of Sant Pau and Santa Tecla stands today, at Rambla Vella of Tarragona (Spain). Most of them are coloured *marmora* from a wide range of quarries: not only local (Santa Tecla stone, Alcover stone) and regional (broccatello) but also imported, such as giallo antico, pavonazzetto, africano, portasanta, porfido rosso, serpentino, breccia di Settebasi. Even though some fine-grained, white marble fragments were also found, they are not being discussed here. Despite the small number of fragments recovered, this set is highly interesting as they were found in a clear, well-dated stratigraphical context: a soil from 125-150 AD that filled up some sort of building from Augustan times. The location of the site, on the limits of the upper part of the town, which was devoted to public areas (mainly related to the imperial worship, the provincial government and public), and the lower part of Tarraco, where the other activities (residential, colonial govern, etc) took place, is also significant. Therefore, both its location and its date are significant, as during this period the upper part of Roman Tarraco underwent major urban modifications which gave it the magnificence worthy of the capital of the largest province of the western part of Roman Empire.

Keywords

Coloured *marmora*, local stone, column reuse, stratigraphic context, Tarraco, Flavian times.

Brief background: *marmora* finds from ancient Tarraco

The discovery of imported ancient marbles at the archaeological excavations of Tarragona is common. This is not surprising given the importance of the town in Roman times as capital of the provincia Tarraconensis as well as its excellent location in terms of maritime communications, which made Tarraco the arrival point of many goods, both from the eastern and western Mediterranean² (Fig. 1).

The exploitation in Roman times of a local golden-yellow to pinkish limestone called ‘Santa Tecla Stone’ that, thanks to its decorative properties can be included among the *marmora*, is well known³. However, imported marbles were also employed at Tarraco. Among them, the white marble of Luni-Carrara hold a preeminent place as it was the main material used to embellish the upper part of the ancient town as it was largely employed at the *forum provincialis* and the imperial worship area⁴. Nevertheless, other *marmora* have been also found as being part of the ornamental programme of the town but on a smaller ratio. Indeed, both other white marbles and some of the most prized ornamental stones of the entire Mediterranean basin, have been identified. Among them, four types stand out since they have been identified all the archaeological excavations with *marmora* fragments: cipollino or *marmor Caristium*, africano or *marmor lucilleum*, pavonazzetto or *marmor Docimium*, and giallo antico or *marmor Numidicum*⁵.

However, most of the marbles fragments found at Tarraco appeared out of context, pulled off the monu-

1. This work has been undertaken within the framework of the “Explotación, uso e intercambio de materias primas inorgánicas entre el norte de Hispania y el sur de la Galia y los puertos de Roma” (code HAR2008-04600/HIST) and “La explotación y comercio de los recursos naturales en el norte de la Hispania romana: lapis, metallum, aqua” (code HAR2011-25011) research projects, funded by Secretaría de Estado de Investigación (Dirección General de Investigación y Gestión del Plan Nacional de I+D+I) of the Ministerio de Ciencia e Innovación of the Spanish Government as well as the project “Territori, ciutat i port: El comerç entre Roma i Hispània septentrional a partir de les àmfores i els marbres” (code 2010 PBR 0020), funded by the Agència de Gestió d'Àjuts Universitaris i de Recerca (AGAUR) of the Generalitat de Catalunya.

2. For a global vision of Roman Tarraco see Alföldy 1978 and Aquilué *et al.* 1991; all the archaeological excavations undertaken during the recent decades at Tarragona have been compiled and published as the number 5 volume of the *Documenta* Series of the ICAC (Macias *et al.* 2007).

3. The exploitation, use and chronology of extraction and employment of this limestone has been object of a thorough study, presented during the IX ASMOSIA Conference, held in Tarragona in June 2009, and included on the exhibition *Marbles and Stones from Spain* organized in occasion of this same Conference (Àlvarez *et al.* 2009a, 2009b); its existence and use, however, was already known thanks to being mentioned in several previous works (see Gutiérrez García-M. 2009, 208).

4. During the second half of the 1st century AD, the upper town of Tarraco was reorganized in three terraces; the upper one was destined to the imperial cult with the erection of a temple surrounded by a portico while the middle one hosted the forum of the province and associated buildings and the lower one was the Circus. The several finds on marble show that the first two terraces were largely decorated with ornamental elements elaborated on marble from Luni (Pensabene 1993; Mar 1993; Pensabene and Mar, 2004; Macias *et al.* 2007, 776-778; Pensabene 2004, 436; Àlvarez *et al.* in press).

5. It is worth noting that the last three of these *marmora* were largely used in the architectural programmes related to the imperial figure in the time of Augustus (and that the quarries that supplied all of them, as well as the white marble of Luni, were of imperial property since very early (Pensabene 2002, 46; Rodà 2004, 405).

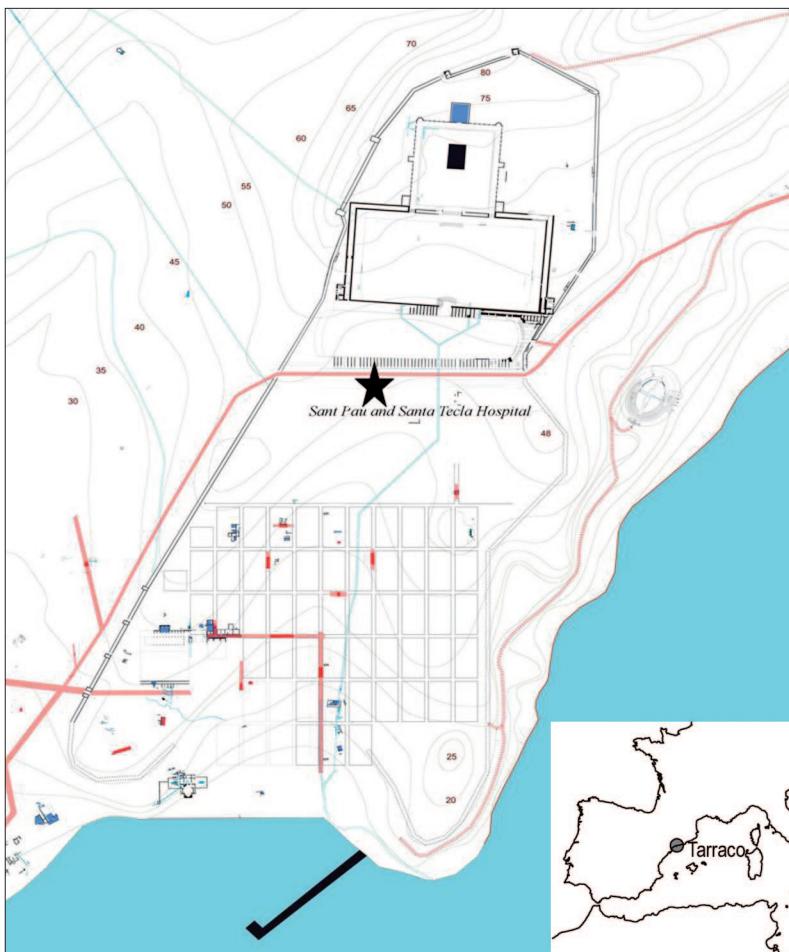


FIG. 1. Location of Sant Pau and Santa Tecla Hospital archaeological site (star).

ments that they decorated and in secondary use, either within waste contexts, reused as building material or re-elaborated in later periods⁶. Hence the importance of an assemblage of marbles, even of small quantity, when it comes from a clear, well-dated stratigraphical position, either when it is found still decorating the original monument and/or when it comes from the contexts of a possible workshop.

The assemblage from Sant Pau and Santa Tecla Hospital

In fact, the case of the marble assemblage from Sant Pau and Santa Tecla Hospital is quite uncommon on the framework of the archaeological excavations undertaken in Tarragona. This assemblage was uncovered in 1992, during the rescue excavation of a small part of the lot where the Hospital of Sant Pau i Santa Tecla stands today, at Rambla Vella of Tarragona, at the south limit of the lower terrace of the upper part of Tarraco (Fig. 1)⁷.

Only part of the site consisting of about 50 m² was object of archaeological works due to the fact that the rest of it had been lowered previously without archaeological control; as a result, the existing Roman remains were destroyed.

Nevertheless, the results of this small dig were rather interesting. It revealed the remains of a wall and a pavement of beaten soil dating from Augustus' times; they probably belonged to a building of domestic purposes, which was demolished during the second quarter of the 2nd century AD after which a big cistern paved with *opus signinum* was build. A small but remarkable set of marble fragments was found among the soil that filled in the structure of Augustan times. The date of this context is precise enough: it ranges among 125-150 AD, and in this lies an important part of the interest of the assemblage.

A total of number of 46 marbles fragments was uncovered at Sant Pau and Santa Tecla Hospital site (Table 1). As already stated, even though this set is quite restricted in size when compared with other marble assemblages

6. See the identification of marbles by A. Àlvarez of the pieces of *marmora* and other stones found at a 5th century waste pit excavated by the TED'A (Àlvarez 1989) as well as the latest finds, also from late Roman contexts, which are presented at this same volume (Àlvarez *et al.*; Arola *et al.*).

7. The excavation was first presented at the XIV International Conference of Classical Archaeology held in Tarragona in the following year (Foguet and López 1994) and has been also included at the *Planimetria Arqueològica de Tarraco* (Macias *et al.* 2007, 88-90, fitxa 264).

Num.	Stratigraphic context nº	Marble type	Type of object / thickness
1	216	Giallo antico	veneer (15 mm)
2	212	Giallo antico	moulding
3	112	Giallo antico	fragment
4	112	Giallo antico	veneer (17,5 mm)
5	112	Portasanta	veneer (11,5 mm)
6	215	Portasanta	veneer (17 mm)
7	112	Pavonazzetto	veneer (8 mm)
8	216	Pavonazzetto brecciatto	veneer (10 mm)
9	112	Santa Tecla stone	veneer (26,5 mm)
10	112	Santa Tecla stone	veneer (24,5)
11	112	Santa Tecla stone	veneer (23,5 mm) // burnt
12	216	Santa Tecla stone	veneer (22 mm)
13	112	Santa Tecla stone	veneer (9,5 mm)
14	112	Santa Tecla stone	veneer (indet.)
15	112	Santa Tecla stone	veneer (indet.)
16	112	Alcover stone	veneer (12 mm)
17	112	Broccatello	veneer (9,5 mm)
18	112	Rosso antico	veneer (16 mm)
19	112	Breccia di Settebasi	veneer (6 mm)
20	112	Africano	veneer (13 mm)
21	112	Greco scritto	veneer (11 mm)
22	216	Fine-grained, white marble (Carrara?)	veneer (12 mm)
23	112	Fine-grained, white marble (Carrara?)	fragment
24	112	Fine-grained, white marble (Carrara?)	fragment
25	112	Fine-grained, white marble (Carrara?)	veneer ?
26	112	Fine-grained, white marble (Carrara?)	fragment
27	112	Fine-grained, white marble (Carrara?)	fragment
28	112	Fine-grained, white marble (Carrara?)	fragment
29	112	Fine-grained, white marble (Carrara?)	fragment
30	112	Cipollino?	veneer (23 mm)
31	112	Pavonazzetto	fluted column fragm. (edge:16 mm)
32	112	Fine-grained, white marble (Carrara?)	veneer (31 mm)
33	116	Fine-grained, white marble (Carrara?)	fragment
34	112	Fine-grained, white marble (Carrara?)	fragment
35	112	Fine-grained, white marble (Carrara?)	fragment
36	112	Fine-grained, white marble (Carrara?)	veneer (19 mm)
37	112	Fine-grained, white marble (Carrara?)	veneer (21 mm)
38	112	Indeterminate	veneer (32,5 mm)
39	112	Portasanta	fluted column fragm. (edge: 17 mm)
40	112	Giallo antico	fluted column fragm. (edge: 18 mm)
41	112	Giallo antico	fluted column fragm. ?
42	112	Pavonazzetto	veneer (5 mm)
43	112	Pavonazzetto	veneer (18 mm)
44	112	Pavonazzetto	veneer (18 mm)
45	112	Porfido rosso	veneer (8 mm)
46	112	Porfido verde di Grecia	veneer (8 mm)

TABLE I. Table showing the entire assemblage of *marmora* found at Sant Pau and Santa Tecla Hospital archaeological site.

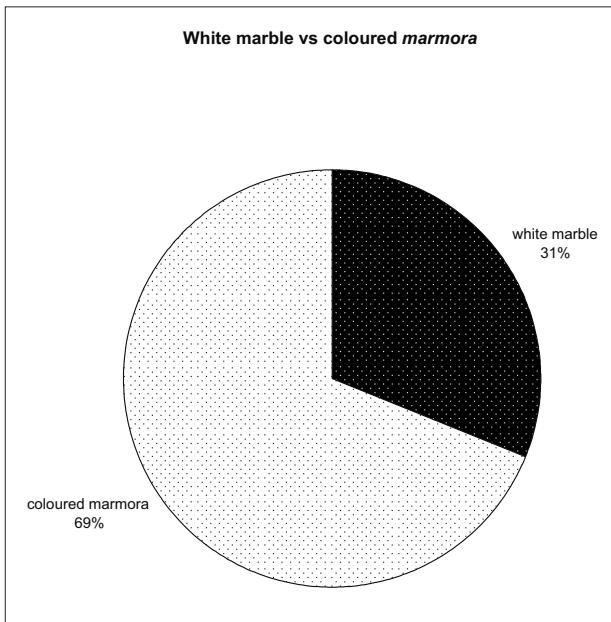


FIG. 2. Pie chart showing the ratio of white marbles versus coloured *marmora* found at Sant Pau and Santa Tecla Hospital archaeological site.

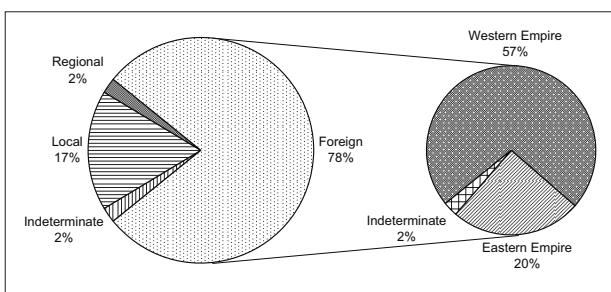


FIG. 3. Pie chart showing the ratio of imported, regional and local marbles found at Sant Pau and Santa Tecla Hospital archaeological site.

from other excavations nearby (i.e. at the Part Alta of Tarragona)⁸, its significance is nevertheless high.

First of all, it is entirely composed by stones intended for ornamental purposes and it includes both white marbles and coloured *marmora* (Fig. 2). Also, despite the restricted number of fragments, it is representative of a wide range of ornamental stones used in ancient times. Thus, the only type of white marble found at Sant Pau

and Santa Tecla Hospital is most likely the almost omnipresent at Tarraco white marble from Luni-Carrara⁹; yet the variety of coloured *marmora* is significant.

On the other hand, it is worth noting that not only *marmora* from all the Mediterranean basin but also from local and regional provenance have been identified as part of this set (Fig. 3). Indeed, the count indicates a significant presence of local marble in Santa Tecla, from the local quarries opened at the area of La Budallera, only a few kilometers north from the town of Tarraco¹⁰. Yet there is also one example of another local stone, Alcover stone, which, even though it cannot be counted among the *marmora*, it has been identified in other sites of around Tarraco as being used for ornamental purposes¹¹.

Broccatello, or Jaspi de la Cinta, from the quarries near Dertosa (modern Tortosa, about 80 kilometers south from Tarragona), is also represented at this assemblage with only one fragment. Although this stone cannot be considered of foreign provenance due to the proximity of its point of extraction to the point of use, i.e. Tarraco, broccatello was used undoubtedly as ornamental stone as it was used not only in Hispania but also in other places of the western and central empire next to the most highly prized *marmora*¹².

Nevertheless, the overwhelming majority of the fragments belong to imported marbles. Among them, the (probable) white marble from Luni-Carrara stands out as the most numerous. Second in number are giallo antico (*marmor Numidicum*) and pavonazzetto (*marmor Docinium*), from the African and oriental territories of the Roman Empire, respectively. The other marbles from the farthest side of the Mediterranean basin that were documented at Sant Pau and Santa Tecla Hospital are three fragments of portasanta (*marmor Chium*), one single fragment of several other *marmora*, i.e. africano (*marmor lucilleum*), breccia di Settebasi, rosso antico, porfido verde (*lapis Lacedemonius*), and porfido rosso (or *lapis Porphirites*) (Table 1).

Besides its provenance, some other considerations can be made on these marbles. They all are small fragments, mostly from thin veneers of below 2 cm of thickness but a few of them are 2,3 to 3,2 cm thick. Nevertheless, some of them are tiny parts of fluted column shafts (Fig. 4). Their characteristics indicate that in the vicinity of the site could an *officina marmoraria* might have existed. Indeed, the small size of the fragments recovered showed

8. See footnote 6.

9. All them are fine-grained marble and very alike; despite they have not been object of analysis yet, the overwhelming use of Luni-Carrara marble at the upper part of ancient Tarraco strongly points at this provenance for our fragments.

10. For an account of the quarries where Santa Tecla stone was exploited see Àlvarez *et al.* 2009a, 40-52 and Gutiérrez García-M. 2009, 208-222.

11. Alcover stone has been mostly identified as epigraphic medium in plaques and other flat-plaques purposes such as pavement slabs or tombstones due to its strong bedding, it has been also found employed as wall veneers at the 'lower' baths of the Roman villa of Els Munts (Altafulla) and at the Roman villa of La Llosa (Cambrils), at the *territorium* of Tarraco (Gutiérrez García-M. 2009, 224-225). Despite this stone lacks a colourful pattern as it is of light brown colour, once polished shows an homogeneity and fine finish that supports the assumption that in some cases it was used as ornamental stone, even of moderate richness if compared with other materials.

12. Broccatello is one of the best-known *marmora* from Spain as it has been object of attention of several scholars and researchers (Àlvarez 1985, Àlvarez *et al.* 2009b, 74-79; in press; Falcone and Lazzarini 1998; Mayer and Rodà 1999); for an updated compendium of the places where broccatello has been identified and its use, see Gutiérrez García-M. 2009, 234-237.



FIG. 4. Three fragments of fluted column shafts found during the excavations of the site. Foto: J. López Vilar.

that they are the residual parts of cutting larger pieces, i.e. cutting waste.

Conclusions

As already mentioned, despite the restricted number of fragments of recovered at Sant Pau and Santa Tecla Hospital site, the variety of *marmora* is significant. This is especially true in the case of the coloured *marmora*; indeed, when compared with other marble assemblages from the upper area of Tarraco¹³, the range of *marmora* represented at our assemblage compares favourably with

the other assemblages, which are, in contrast, considerably larger in number of fragments. Focusing on the proportions of marble types of our assemblage, it is also worth noting that the proportions of each marble type within the assemblage match with what has been observed overall for the use of ornamental marbles at Tarraco. Thus, it reflects the significantly higher presence of white marble (probably) from Luni-Carrara in comparison with the rest of the set. The next most represented marbles are two of those also recorded as largely employed not only at other contexts of Tarraco, pavonazzetto and giallo antico; africano, which together with the previous ones and cipollino forms the group of *marmor* mostly employed in decorative programmes related to the imperial power in Augustan times, was also found but with only one single fragment.

Next to the imported marbles, regional and local stones should be not forgotten. As for most of the imported *marmora*, only one piece of broccatello has been recovered. Santa Tecla stone is more common, as it is usual in the context of Tarraco since it is the decorative stone par excellence of the town. Nevertheless, the absence of Ilisós, a Jurassic stone with relative ornamental qualities that crops out at the same spots where Santa Tecla appears¹⁴, is quite noteworthy, especially if we take into account that another local stone with relative ornamental qualities but from further away, Alcover stone, was found at the site.

On the other hand, these fluted column fragments implies the presence at Tarraco of this type of columns made of pavonazzetto, portasanta and giallo antico maybe erected at some point of the upper part of the town, where the representation and worship areas were. How-



FIG. 5. Fragment of veneer in pavonazzetto with evidence of its cut by using a coping saw. Foto: J. López Vilar.

13. See above, footnote 6.

14. An account of the macroscopic, microscopic, exploitation use and chronology of this stone is included at the monograph on Santa Tecla stone (Álvarez *et al.* 2009a, 16, 30, 37-52, 66-71, 95-96).

ever, the fact that fragments of fluted columns as well as relatively thin plaques, some of which still keep the lower break that indicates it was produced with a coping saw, in those same marbles indicate that these columns were actually cut down in plaques (Fig. 5). Thus, at this point or at least nearby, there was a workshop whose activity was to put in new uses abandoned or unused materials.

Therefore, this assemblage not only confirms the presence of such valued materials, some of them in form of large columns, in the second quarter of the 2nd century AD at the capital town of the *Hispania Tarragonensis* but also points to the existence of possible workshop in a quite central location of the town.

Therefore, we believe that this new assemblage makes a small but significant contribution to the understanding not only of the monumental area of the upper Tarraco but also of the management and reuse of these materials once in the provincial capital.

References

- ALFÖLDY, G. 1978: "Tarraco", *Realencyclopädie der Clas- sischen Altertumswissenschaft Suppl. XV*, 570-644 = *Tarraco, Forum, Temes d'història i d'arqueologia tar- ragonines*, 8, Tarragona 1991.
- ÀLVAREZ, A. 1985: "Descripción petrológica del broccatello o jaspi de la Cinta de Tortosa", in: *XVII Congreso Nacional de Arqueología (Logroño 1983)*, Universidad de Zaragoza, Zaragoza, 719.
- ÀLVAREZ, A.; GARCÍA-ENTERO, V.; GUTIÉRREZ GARCIA-M., A.; RODÀ, I. 2009a: *El marmor de Tarraco. Explotació, utilització i comercialització de la pedra de Santa Tecla en època romana / Tarraco Marmor. The Quarrying, Use and Trade of Santa Tecla Stone in Roman Times*, Hic et Nunc 6, Institut Català d'Arqueologia Clàssica (ICAC), Tarragona.
- ÀLVAREZ, A.; DOMÈNECH, A.; LAPUENTE, P.; PITARCH, À.; ROYO, H. 2009b: *Marbles and Stones of Hispania. Exhibition Catalogue*, Institut Català d'Arqueologia Clàssica, Tarragona.
- ÀLVAREZ, A.; MACIAS, J.M.; MENCHON, J.J.; MUÑOZ, A.; PITARCH, A.; TEIXELL, I. 2012 a: "The marmorata used in the imperial cult area of Tarraco (Hispania Citerior)", in this volume.
- ÀLVAREZ, A.; GUTIÉRREZ GARCIA-M.; A, RODÀ, I. 2010: "Las rocas ornamentales en las provincias del imperio: el caso del broccatello y la piedra de Santa Tecla", in: CAMPOREALE, S., PIZZO, A., DESSALES, E. (eds.) *Arqueología de la construcción II. Los procesos construc- tivos en el mundo romano: Italia y las provincias ori- entales*, Anejos de Archivo Español de Arqueología LVII, Madrid-Mérida, 539-554.
- AQUILUÉ, X.; DUPRÉ, X.; MASSÓ, J; RUIZ DE ARBULO, J. 1991: *Tarraco, guia arqueológica*, Ed. El Mèdol, Tarragona.
- AROLA, R.; DOMINGO, J.A.; GASULL, N. 2012: "The marbles of Jaume I school: a group coming from the provincial forum of Tarraco", in this volume.
- FALCONE, R.; LAZZARINI, L. 1998: "Note storico-scientifiche sull'broccatello di Spagna", in: PENSABENE, P., *Marmi antichi II. Problemi d'impiego, di restaure e d'identificazione*, Studi Miscellanei, 31, L'Erma di Bretschneider, Roma, 87-97.
- FOGUET, G.; LÓPEZ, J. 1994: "Alguns aspectes de l'urbanisme romà de Tàrraco: delimitació d'espais monumentals i residencials a la llum de les darreres excavacions", in: *XIV Congrés Internacional d'Arqueologia Clàssica* (Tarragona, 1993). Actes, vol. II, Tarragona, 162.
- GUTIÉRREZ GARCIA-M.; A. 2009: *Roman Quarries in the Northeast of Hispania (modern Catalonia)*, Documenta 10, Institut Català d'Arqueologia Clàssica, Tarragona.
- MACIAS, J.M.; FIZ, I.; PIÑOL, Ll.; MIRÓ, M. T.; GUITART, J. (dir.) 2007a: *Planimetria arqueològica de Tàrraco*, Documenta 5, Institut Català d'Arqueologia Clàssica, Tarragona.
- MACIAS, J.M.; MENCHON, J.J.; MUÑOZ, A.; TEIXELL, I. 2007b: "Excavaciones en la catedral de Tarragona y su entorno: avances y retrocesos en la investigación sobre el Culto Imperial", in: NOGALES, T.; GONZÁLEZ, J. (eds.), *Culto Imperial: política y poder*, Hispania Antigua, Serie Arqueológica 1, L'Erma di Bretschneider, Roma, 765-787.
- MAR, R. 1993: "El recinto de culto imperial de Tarraco y la arquitectura flavia", in: MAR, R. (ed.) *Els monu- ments provincials de Tàrraco. Noves aportacions al seu coneixement*, Documents d'Arqueologia Clàssica 1, Universitat Rovira i Virgili, Tarragona, 107-156.
- MAYER, M.; RODÀ, I. 1985: "Consideraciones sobre el conjunto epigráfico de Dertosa", in: *XVII Congreso Nacional de Arqueología (Logroño, 1983)*, Universidad de Zaragoza, Zaragoza, 701-737.
- PENSABENE, P. 1993: "La decorazione architettonica dei monumenti provinciali di Tarraco", in: MAR, R. (ed.) *Els monuments provincials de Tàrraco. Noves aportacions al seu coneixement*, Documents d'Arqueologia Clàssica 1, Universitat Rovira i Virgili, Tarragona, 33-105.
- PENSABENE, P. 2004: "La diffusione del marmo lunense nelle provincie occidentali", in RAMALLO, S. (ed.) *La decoración arquitectónica en las ciudades romanas de occidente. Actas del Congreso Internacional (Cartagena, 8-10 octubre 2003)*, Universidad de Murcia, Murcia, 421-443.
- PENSABENE, P.; MAR, R. 2004: "Dos frisos marmóreos en la acrópolis de Tarraco, el Templo de Augusto y el complejo provincial de culto imperial", in: RUIZ DE ARBULO, J. (ed.) *Simulacra Romae. Roma y las capi- tales provinciales del Occidente Europeo. Estudios Ar- queológicos*, Consorcio Urbium Hispaniae Romanae, Tarragona, 73-86.
- RODÀ, I. 2004: "El mármol como soporte privilegiado en los programas ornamentales de época imperial", in: RAMALLO, S. (ed.) *La decoración arquitectónica en las ciudades romanas de Occidente. Actas del Congreso Internaciona (Cartagena, 8-10 octubre 2003)*, Universidad de Murcia, Murcia, 405-420.

Studies on Ancient Sto of the IX ASMOSIA Conference

Generalitat de Catalunya
Departament d'Economia
i Coneixement

URV UNIVERSITAT
ROVIRA I VIRGILI



Amb el suport de

UAB
Universitat Autònoma
de Barcelona



Agència
de Gestió d'Ajuts
Universitaris
i de Recerca

ISBN: 978-84-939033-8-1



9 788493 903381