Interdisciplinary Studies on Ancient Stone
Proceedings of the XI ASMOSIA Conference (Split 2015)
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.
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 Gallochio 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 Cancelleri 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 Anniewies 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 Anniewies 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 Anniewies 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 Cuchi, 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
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Budakalász Travertine Production</td>
<td>545</td>
</tr>
<tr>
<td>Bojan Djurić, Sándor Kele and Igor Rižnar</td>
<td></td>
</tr>
<tr>
<td>Stone Monuments from Carnuntum and Surrounding Areas (Austria) –</td>
<td>557</td>
</tr>
<tr>
<td>Petrological Characterization and Quarry Location in a Historical Context</td>
<td></td>
</tr>
<tr>
<td>Gabrielle Kremer, Isabella Kitz, Beatriz Moshammer, Maria Heinrich and Erich Draganits</td>
<td></td>
</tr>
<tr>
<td>Espejón Limestone and Conglomerate (Soria, Spain):</td>
<td>567</td>
</tr>
<tr>
<td>Archaeometric Characterization, Quarrying and Use in Roman Times</td>
<td></td>
</tr>
<tr>
<td>Virginia García-Entero, Anna Gutiérrez García-M, Sergio Vidal Álvarez, Maria J. Peréz Agorreta and Eva Zarco Martínez</td>
<td></td>
</tr>
<tr>
<td>The Use of Alcover Stone in Roman Times (Tarraco, Hispania Citerior), Contributions to the Officina Lapidaria Tarracensis</td>
<td>577</td>
</tr>
<tr>
<td>Diana Gorostidi Pi, Jordi López Vilar and Anna Gutiérrez García-M.</td>
<td></td>
</tr>
<tr>
<td>4. ADVANCES IN PROVENANCE TECHNIQUES, METHODOLOGIES AND DATABASES</td>
<td></td>
</tr>
<tr>
<td>Grainautline – a Supervised Grain Boundary Extraction Tool</td>
<td>587</td>
</tr>
<tr>
<td>Supported by Image Processing and Pattern Recognition</td>
<td></td>
</tr>
<tr>
<td>Kristóf Csorba, Lilla Barancsuk, Balázs Székely and Judit Zöldföldi</td>
<td></td>
</tr>
<tr>
<td>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</td>
<td>597</td>
</tr>
<tr>
<td>Caterine Previato and Arturo Zara</td>
<td></td>
</tr>
<tr>
<td>5. QUARRIES AND GEOLOGY</td>
<td></td>
</tr>
<tr>
<td>The Distribution of Troad Granite Columns as Evidence for Reconstructing the Management of Their Production</td>
<td>613</td>
</tr>
<tr>
<td>Patrizio Pensabene, Javier Á. Domingo and Isabel Rodà</td>
<td></td>
</tr>
<tr>
<td>Ancient Quarries and Stonemasonry in Northern Choria Considiana</td>
<td>621</td>
</tr>
<tr>
<td>Hale Güney</td>
<td></td>
</tr>
<tr>
<td>Polychromy in Larisaean Quarries and its Relation to Architectural Conception</td>
<td>633</td>
</tr>
<tr>
<td>Gizem Mater and Ertuńç Denkaň</td>
<td></td>
</tr>
<tr>
<td>Euromos of Caria: the Origin of an Hitherto Unknown Grey Veined Stepped Marble of Roman Antiquity</td>
<td>639</td>
</tr>
<tr>
<td>Matthias Bruno, Donato Attanasio, Walter Prochaska and Ali Bahadir Yavuz</td>
<td></td>
</tr>
<tr>
<td>Unknown Painted Quarry Inscriptions from Bacakale at Docimium (Turkey)</td>
<td>651</td>
</tr>
<tr>
<td>Matthias Bruno</td>
<td></td>
</tr>
<tr>
<td>The Green Schist Marble Stone of Jebel El Hairech (North West of Tunisia): a Multi-Analytical Approach and its Uses in Antiquity</td>
<td>659</td>
</tr>
<tr>
<td>Ameur Younès, Mohamed Gaied and Wissem Gallala</td>
<td></td>
</tr>
<tr>
<td>Building Materials and the Ancient Quarries at Thamugadi (East of Algeria), Case Study: Sandstone and Limestone</td>
<td>673</td>
</tr>
<tr>
<td>Younès Rezkallah and Ramdane Marmi</td>
<td></td>
</tr>
</tbody>
</table>
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
Deni Gobić-Bravar ......................................................................................................... 871

Ancient Marbles from the Villa in Verige Bay, Brijuni Island, Croatia
Mira Pavletić and Deni 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
Deni 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 Boržić ................................................................. 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
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 Neri1,3, Roberto Bugini2 and Silvia Gazzoli3

1 Université Paris-Sorbonne, Paris, France/Università Cattolica del Sacro Cuore, Milan, Italy (Elisabetta.neri@unicatt.it)
2 CNR-ICVBC, Ist. Conservazione Beni Culturali, Milan, Italy (bugini@icvbc.cnr.it)
3 Università Cattolica del Sacro Cuore, Milan, Italy (silviag.gazzoli@gmail.com)

Abstract

The unpublished remains of marble crustae from late Antique Milan are here presented. They covered the walls of two buildings of imperial commission in Milan: the Imperial Mausoleum and the Basilica of San Lorenzo (4th–5th C. AD). The comparison between the two buildings allows the formulation of hypotheses on the supply, reuse and use of this type of decoration for two buildings that were designed less than one century apart, but in two definitely different political contexts.

Keywords

Opus sectile, Late Antique, colored marbles, Milan, wall decoration

1. The Imperial mausoleum

Context

The Imperial Mausoleum, located in the southwestern suburb of Milan, was demolished in the 16th c. to build the present-day church of San Vittore al Corpo. A small portion of the mausoleum was excavated by Mario Mirabella Roberti in 1972–73. The building was located in one of the first necropoleis to be Christianized (since the first half of the 4th c.). It had an octagonal plan, alternating circular and rectangular niches, and its elevation probably included upper galleries, as suggested by comparing it with an anonymous depiction (at the Staatsgalerie in Stuttgart) and with the later example of Sant’Aquilino. It was erected in the mid-4th c., according to a recent thermoluminescence analysis of the foundation’s bricks1. Of its rich decoration, only the imprint of the floor opus sectile remains on site, with black and white alternating triangles and hexagons, a common pattern in 4th c. Northern Italy.

Short before the demolition of the mausoleum, Jacopo Filippo Besta (15th c.) described its architecture, organized on two floors, with corridors and an upper deambulatory, as “as round above as it is below”, adding that it was “all finished with mosaic”. Bonaventura Castiglioni (+1553) describes the ancient appearance of the building, focusing his attention on the parietal sectilia: “some works in the finest marbles of different colours, tessellated, that is like mosaics; stone slabs sawn with various friezes, composed with vases, flowers and animals, which have now disappeared, the walls whitewashed and the magnificent works withdrawn”2. The

References

1 SANNAZARO 2015; LUSUARDI SIENA, NERI 2013.
2 NERI, LUSUARDI SIENA, GREPPI 2015.
3 SANNAZARO 2015.
4 Bonaventura Castiglione, cod Ambr. N. 153, f. 30v.: ‘in costeto tempio vi erano anche alcuni lavori di marmi finissimi di diversi colori tassillati, ossia alla mosaica, tavole di pietra segate con frisi vari, componuti di vasi...”
Thomarmor numid
lapis lacedaemonius
– mentioned as the most expensive in the
Palombino limestone; moreover, precious lithotypes
marble, with the exception of “nero delle Prealpi” and
decoration was lacunary – were integrated by painting.

The preserved crustae represent less than 1% of
the surface that was probably decorated in the excavated
portion of the mausoleum. When the building was demol-
ished, the decoration had already been largely removed;
some fragments of medieval and late medieval frescoes,
also found in the layers of collapse, testify that some por-
tions of the wall – most likely where the early Christian
decoration was lacunary – were integrated by painting.

The crustae are predominantly made of imported
marble, with the exception of “nero delle Prealpi” and
Palombino limestone; moreover, precious lithotypes
– mentioned as the most expensive in the
Edictum de pretiis – predominate: Imperial porphyry (Egypt), Spartan basalt or “green porphyry” (lapis lacedaemonius,
Greece), “Pavazzetto” or Phrygian marble (Turkey),
giallo antico or Numidian marble (marmor numidicum, Tunisia), Egyptian alabaster marble, and fine-
grained white marbles. These are associated with “rosso
antico” or Tainaron marble (marmor taenarium, Greece),
“fior di pesco” (marmor chalcidicum, Greece), “cipollino”
from Euboea (marmor carystium, Greece) and “africano”
(marmor luculleum, Turkey). They are found in the
following percentages:

Imperial porphyry 9.2%, green porphyry 7.9%, pavazzetto
5.3%, giallo antico 8.1%, alabaster 0.3%, fine-grained white marbles 7.2%, rosso antico 2/6%, Eretria red 7.4%,
fior di pesco 6.3%, cipollino 10.1%, africano 5.8%, Nero
delle Prealpi 7.4%, Palombino 22.2%.

The most frequent patterns that can be identi-
ified are simple rectilinear bands and border listels, kyma
moulds with an oblique side, together with several lis-
tels with semicircular sections and flat slabs, mainly in
pavoazzetto and africano marble. Geometrical elements
are next in terms of abundance: lozenges, triangles and
rectangles, which could have formed a decorative band
similar to that observed in the panels with rotae in the apse
of San Vitale in Ravenna. Elements of an architectural
partition were also identified: a fragment of a fluted lesena,
two spirals from a 30-cm wide ionic capital, four egg and
dart mouldings from an ionic kyma with the correspond-
ing linings, and some arrow-shaped elements (Fig. 1a).

Other elements form a well-known pattern with
four petals inscribed in a circle: two variants are attested,
one with palombino petals on a red porphyry background
and a specular one with red porphyry petals on a white
background (Fig. 1b). The decoration is enriched by other
floral patterns, conveying the idea of nature’s vitality: acan-
thus gyral in fine-grain marble, with incised leaf veins; a
four-petal flower, possibly surrounded by a gyral, as ob-
served in the domus outside Porta Marina at Ostia; and
the domus on the Esquiline Hill in Rome, it could be
interpreted as a fish (Fig. 1d).

Animals were most likely depicted in the branch-
es, but only a protome with carved features and rubrica-
tion traces remains; based on comparison with similar crustae from the Euphrasian Basilica in Poreč and from
the domus on the Esquiline Hill in Rome, it could be
interpreted as a fish (Fig. 1d).

Therefore, beyond the usual geometrical reperto-
ire common to other Milanese sites, vegetal and floral

5 On the value of the different lithotypes based on the
Edictum, see Marmi antichi 1989 and I marmi colorati
della Roma imperiale 2006. For specific considerations
on the prices see GNOLI 1988.

6 The quantitative data are furnished in weight of mate-
rial. The percentages are similar to these of number of

7 GUIDOBALDI 2000, 251–262 and references.
8 TERRY 1986, 147–164.
9 FOGAGNOLO 2011, 455–466.
10 Crustae from wall decorations have been identified in
buildings with Imperial patronage (Herculean baths,
Imperial palace, basilica of San Lorenzo) and in the
churches founded by Ambrose. No systematic and
comprehensive study of these materials has been car-
ried out, which would allow their chronology to be clar-
ified. The only context studied in detail is the baptistery
of San Giovanni alle Fonti, dated to the 5th–6th c. phase;
only there some figurative and geometric sectilia have
been recognized (such as four-petal flowers, or patterns
of alternated triangles and lozenges) similar to those
suggested from the loose elements from the Mausoleum
(LUSUARDI SIENA, SACCHI 2004).
Fig. 1. Imperial Mausoleum (Milan Italy), crustae: a. architectonical elements, b. vegetal elements, c. geometrical compositions, (photo: E. Neri)
motifs – more complex to execute – give the wall decoration a peculiar animation.

From a technical standpoint, the crustae have two flat sides, one of which is smooth (more rarely two for the reused pieces). The side in contact with the mortar is sometimes not smoothed, but rather displays the marks of wire-sawing, i.e. slightly oblique and curved parallel grooves.

The thickness is rather regular within a given set of crustae. The cases of reuse or reworking are extremely sparse, as is the case for the site of Porta Marina at Ostia, but not for the urban domus on the Pincian and Esquiline hills as well as the so-called domus “above the Seven Halls”\(^1\). The borders are carefully cut, edged and hewn with a “martellina”, except the curved listels that are neatly smoothed. All pieces except those in Nero delle Prealpi or Palombino are polished. A fragment of an alabaster slab is still clamped to its original cocciopesto mortar by an L-shaped bronzed clamp.

The decoration was integrated by small, thin glass elements coloured in purple, yellow and blue.

The scarcity of reused elements, the prevalence of precious imported marbles, the diversified repertoire of motifs and the integration of glass indicate exceptional standards for the workshop and the artisans, as well as for the financial and supply capacity of the customer. This observation is not surprising given the context of Imperial patronage; furthermore, it suggests that the decoration be dated to the time of the building’s conception or shortly afterwards.

The repertoire is similar to what the artisans used when working for the potentiros who financed not only the domus at Porta Marina, an inevitable reference thanks to its state of conservation, but also the urban domus “above the seven halls”, in the Cadorna barracks on the Esquiline Hill and on the Pincian Hill, where the same workers as at Porta Marina are supposed. The traces of similar decoration in Milan could be a confirmation that the models and the artisans from Rome circulated outside the city, as supposed already for the Spanish villae of Gabia la Grande, Elche and Antequera\(^2\), which are chronologically near the construction of the Imperial mausoleum.

\(^{11}\) For Porta Marina at Ostia, see GUIDOBALDI 2000. For the urban domus on the Esquiline and Pincian hills, see respectively FOGAGNOLO 2011 and RONCHETTI 2009, 241–252. For the domus “above the seven halls”, see BIANCHI, BRUNO, DE NUCCIO 2002, 161–168 and 465.


2. San Lorenzo

Context

The church is built immediately outside the Roman gate (Porta Ticinese), on previously unoccupied land, surrounded by canals and near the fluvial harbour, not far from the amphitheatre whose conglomerate blocks (of Ceppo del Brembo stone) were reused for the basilica’s foundations.

The dating, patronage and original function of the church are still debated. However, especially since Laura Fieni’s studies, most scholars agree to date it between the late 4\(^{th}\) and the early 5\(^{th}\) c., based on archaeological and archaeometric elements (dating of pottery from an excavation below the façade and of the amphorae from the dome’s cover; construction technique). Thermoluminescence dating of the bricks and C14 analyses of mortar return an average dating between 390 and 410. The grandeur of the construction, the richness of the decoration and the reuse of material from public buildings tied to the Imperial authority suggest that the customer was the Emperor himself or a member of his family: Theodosius, who died in Milan in 395; Stilicho, the Barbarian general whom he left as a regent; or Galla Placidia, his daughter, as stated by post-9\(^{th}\) c. sources. More recently, patronage by Valentinian III was proposed\(^{13}\).

Written sources repeatedly highlight the presence of magnificent marble covering. Bishop Veranus of Cavaillon (+589), who was in Milan on St. Lawrence’s day on his way back from Rome and had already visited Ravenna, thought that San Lorenzo was the most beautiful church in Italy (domus mirificam). The Versus de Mediolano civitate (8\(^{th}\) c.) takes the church as an example of the splendour of the city, with its interior (alma intus) shining with a variety of marbles and a gold cover. Later sources insist on the presence of porphyry and gold, two materials linked with the Imperial functions of the church. According to the 9\(^{th}\).-c. bishop Benzo of Alba, “there is no more beautiful church in Italy” than San Lorenzo, “all in porphyry and gold” (Ad Heinricum imperatorem libri VII, MGH, In usum scholarum, LXV, SS, XI). The three chapels of Sant’Aquilino, Sant’Ippolito and San Sisto also had a decoration similar to that of the central part of the church.

For Sant’Aquilino in particular, the only chapel with surviving decoration, Galvano Flamma (Chronica extravagans and Chronica maior, 14\(^{th}\) c.) recalls the ornaments in porphyry and other precious marbles. Carlo Torre (Il ritratto di Milano, 1674) records the presence of round slabs of precious marble between the arches.

\(^{13}\) NERI, LUSUARDI SIENA, GREPPI 2015b.
Non-stratigraphic excavations and restorations, carried out in 1913 and 1937, revealed numerous fragments of the marble wall decoration, but only now are they studied systematically. Due to the excavation procedures, these fragments do not have a context, other than a generic attribution to the central part (tetraconch) of the church or to Sant’Aquilino.

E.N.

Marble decoration in Sant’Aquilino

A wide range of decoration types has been found for Sant’Aquilino. The octagon was probably decorated with an architectural partition: the remains consist of two fragments of wide slabs, similar to those found in the villa of Toscolano Maderno and in the apse of San Vitale, as well as bases (3 fragments) and shafts (6 fragments) of fluted leonesae in cipollino marble, topped with reused 2nd c. capitals in fine-grained white and rubricated marble (Fig. 2). The leonesae have two types of fluting, suggesting that they were used in different locations or in a corner (Fig. 3). Curved listels framing large circular slabs demonstrate the presence of rotae (Fig. 4).

On top of geometrical patterns – a trace of which remains imprinted in the original mortar, still preserved in the chapel – carved or bas-relief slabs in cipollino from Eubea, displaying friezes with gyralis, vases, and naturalistic figures (birds, fish, etc.), enriched the decoration (Fig. 5). Some carved fragments with branches stemming from a cantharos, as well as fragments from a slab showing gyralis from a chalice, rendered in bas-relief with a raw background (Fig. 6 and 7), deserve a specific mention.

E.N.

Marble decoration from the tetraconch of the church

The remains of the decoration of the central part of the basilica are more fragmentary but more abundant (1450 crustae). There is little information available on the context where the fragments were found: Calderini, Chierici and Cecchelli report piles of stone elements of various types, mixed with demolition materials, as generically found in the main hall of the church.

A large variety of marble is attested: both local materials (Majolica limestone and Nero delle Prealpi) and imported stones are represented. White “marbles” are predominant, accounting for 49% of the fragments; among these, medium-grained marble is prevalent, followed by coarse-grained and fine grained marble,

14 LUSUARDI SIENA 1990.
15 SACCHI 2015.
16 These remains are currently on exhibit in Sant’Aquilino.
17 All the materials are now in the upper gallery of the church. For the followed methods see ANGELELLI, GUIDOBALDI 2002, 155–163, with some modifications proposed in FURLAN, MADRIGALI 2009, 817–851.
18 CALDERINI, CHIERICI, CECCHELLI 1951, 88.
MARBLE WALL DECORATIONS FROM THE IMPERIAL MAUSOLEUM (4th C.) AND THE BASILICA OF SAN LORENZO (5th C.) IN MILAN...

Fig. 3. Basilica of San Lorenzo (Milan, Italy), chapel of Sant’Aquilino, inlaid marble: elements of pilaster (drawing: R. Rachini)

Fig. 4. Basilica of San Lorenzo (Milan, Italy), chapel of Sant’Aquilino, inlaid marble: elements of rotae (drawing: R. Rachini)

Fig. 5. Basilica of San Lorenzo (Milan, Italy), chapel of Sant’Aquilino, inlaid marble with bird (drawing: R. Rachini)
Proconnesian marble, Thassos marble, Majolica limestone, Musso marble, Botticino stone and very thin-grained marbles. A large variety of coloured marbles has been observed, representing 41% of the observed fragments. The most frequently attested is “pavoazzetto”, followed by Giallo antico; less frequent lithotypes include Cipollino, Rosso Antico, Breccia Corallina, Africano, Fior di Pesco, Portasanta, Bianco and Nero Antico, Rosso Ammonitico, Griego Arabescato and Greco Scritto. The limited presence of porphyry is remarkable: Imperial porphyry is represented by one small fragment, whose shape suggests it belonged to a curved element of a frame, and green porphyry is also observed in only one fragment. Black limestone from the Lombard Alpine foothills (Nero delle Prealpi, most likely from the “Calcari di Perledo e Varenna” Triassic formation) represent 10% of the fragments.

In terms of shapes, a reduced number of squares and hexagons is observed (respectively 4 and 9 samples), with varying thickness and sizes. This is in contrast with a large number of triangles, made of white and coloured marbles and black limestone, which could have formed linear bands as suggested by the presence of isosceles triangles. Listels of white and coloured marble are also abundant, hinting at the presence of square or rectangular bands and borders. In terms of filling, large slabs of cipollino and black limestone are found, as well as the only fragment of green porphyry. Lozenges are also observed, especially in white and coloured marble, with some samples in Nero delle Prealpi; they were most likely used in bands.

Curved elements made of Numidian marble have been identified; they are very thin (ca. 0.8 cm) and cut with a saw on both faces. However, no other reference in the studied materials allows the reconstruction of a hypothetical pattern for this decoration. Another typical element is a triangle with two curved sides: together with other pieces with complex outline it suggests the presence of figurative elements (Fig. 8).

The crustae from this site have different characteristics. More than half of the fragments have both faces smoothed; the most notable exceptions are almost all the Nero delle Prealpi and Majolica fragments, as well as most of the Giallo antico fragments. In particular, black limestone fragments always have a coarse face and a smooth one, although the latter has a grey patina that sometimes hides the manufacturing features. Majolica and Giallo antico fragments show clear traces of chiselling, i.e. large conchoidal chipping, suggesting that the chisel was used perpendicularly or at a 75-degree angle.

In this context, it was not possible to identify the provenance of the elements from the same motif; however, it can be assumed that the materials belonged to different parts of the decoration and have been collected in one point after an accidental event. Some of the element display marks of fire, suggesting that the slabs were found with the remains of the early medieval destruction of the building, and had already been selected in ancient times.

S.G.

19 GUIDOBALDI 2009, fig. 14 c; BUGINI, FOLLI 2008, fig. 5.5.
20 GUIDOBALDI 2009, tav IV.F.
21 Fields in Cipollino have been also observed in San Giovanni alle Fonti (LUSUARDI SIENA, SACCHI 2004, 87).
22 ROCKWELL 1989.
3. Comparison

The comparison between the two sites shows that a figurative decoration, with small elements to render the details of floral, vegetal and animal motifs, was in place at the Imperial mausoleum. This explains the wide use of palombino, absent from San Lorenzo and from all other Milanese sites with marble decoration. The first parallel in Northern Italy comes from the recent study of the crustae from the villa in Toscolano Maderno\(^\text{23}\). Moreover, some lithotypes in the Mausoleum are not attested in San Lorenzo, e.g. “African” marble and Egyptian alabaster. The use of Imperial porphyry and green porphyry are more significant in the Mausoleum, although a selection of the marbles in ancient times has to be accounted for; the use of local marbles (Nero delle Prealpi and Botticino stone) is limited here, but widely documented in San Lorenzo.

The decoration in San Lorenzo and Sant’Aquilino primarily consists of geometrical motifs and architectural partitions. These partitions and the carved slabs are mostly made with Cipollino, newly graving re-used ancient slabs or reusing 2\(^\text{nd}\) c. architectonical elements.

Though the reuse of older marble slabs is frequent, the technical know-how required to smooth, cut and polish the crustae does not change.

The mid-4\(^\text{th}\)c. phase of the Imperial mausoleum includes an unusual type of figurative decoration, generally associated in literature with craftsmen from Rome\(^\text{24}\). The supply of (mostly new) coloured marble confirms the high-level patronage and its financial capacity at a time when the Imperial court resided in Milan. The 5\(^\text{th}\)c. works in San Lorenzo, as shown for the construction materials as well\(^\text{25}\), mostly reuse coloured marble slabs or architectural elements from other buildings, working them with the same techniques but using a larger proportion of locally sourced materials.

E.N.–R.B.

---

23 SACCHI 2015.
24 NERI et al. 2015a.
25 FIENI 2014.
REFERENCES


FOGAGNOLI S. 2011: "Nuove acquisizioni di opus sectile parietale e pavimentale dagli scavi della caserma ‘R. Cadorna’ all’Esquilino", in AISCOM XVI, 455–466.


ROCKWELL P. 1989: Lavorare la pietra: manuale per l’archeologo, lo storico d’arte e il restauratore (Beni culturali 7), Roma


SACCHI F. 2015: "La decorazione marmorea e gli arredi lapidei", in I. ROFFIA (ed.): La villa romana dei Nonii – Arri a Toscolano Maderno, Milano, 236–247.
