

Architectural Decoration of the Imperial Agora's Porticoes at Iasos

Bianchi, Fulvia; Attanasio, Donato; Prochaska, Walter

Source / Izvornik: **ASMOSIA XI, Interdisciplinary Studies on Ancient Stone, Proceedings of the XI International Conference of ASMOSIA, 2018, 321 - 330**

Conference paper / Rad u zborniku

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

<https://doi.org/10.31534/XI.asmosia.2015/02.16>

Permanent link / Trajna poveznica: <https://um.nsk.hr/um:nbn:hr:123:387476>

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

Download date / Datum preuzimanja: **2025-04-01**



Repository / Repozitorij:

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



ASMOSIA XI

Interdisciplinary Studies on Ancient Stone

PROCEEDINGS

of the XI ASMOSIA Conference, Split 2015

Edited by Daniela Matetić Poljak and Katja Marasović



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

Publishers:

ARTS ACADEMY IN SPLIT
UNIVERSITY OF SPLIT

and

UNIVERSITY OF SPLIT
FACULTY OF CIVIL ENGINEERING,
ARCHITECTURE AND GEODESY

Technical editor:
Kate Bošković

English language editor:
Graham McMaster

Computer pre-press:
Nikola Križanac

Cover design:
Mladen Čulić

Cover page:

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

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

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

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

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

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

Association for the Study of Marble & Other Stones in Antiquity

ASMOSIA XI

Interdisciplinary Studies of Ancient Stone

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

Edited by
Daniela Matetić Poljak
Katja Marasović



Split, 2018

Nota bene

All papers are subjected to an international review.

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

CONTENT

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

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

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

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

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

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

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

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

ARCHITECTURAL DECORATION OF THE IMPERIAL AGORA'S PORTICOES AT IASOS

Fulvia Bianchi¹, Donato Attanasio² and Walter Prochaska³

¹ Via Monte Pertica 21, Rome, Italy (fulviabianchi@yahoo.it)

² Istituto di Struttura della Materia, Consiglio Nazionale delle Ricerche (ISM-CNR), Rome, Italy (donato.attanasio@ism.cnr.it)

³ Department of Applied Geological Science and Geophysics, University of Leoben, Leoben, Austria (walter.prochaska@unileoben.ac.at)

Abstract

The present study deals with the decoration patterns, the craftsmen and the different marbles used in the porticoes of the Agora of Iasos. The recent discovery of a large white marble quarry district at Milas and a gray banded one at Euromos has suggested that previous hypotheses on the origin of marbles used in the Iasos Agora must be verified. For this purpose, several architectural elements in white and grey veined marbles were sampled and submitted to archaeometrical analyses (EPR, trace analysis and carbon and oxygen isotopes) in order to define exactly their provenance. These analytical results exclude the use of Aphrodisias and Stratonikeia marbles and confirm that of other local and extra-regional white marbles from Milas, Euromos and Proconnesos. This new evidence allowed the reconsideration of the origin of the decorative patterns and of the craftsmen working at Iasos during the mid imperial period.

Keywords

Iasos' agora, architectural decoration, craftsmen, archaeometric identification

Introduction

Iasos, a city on a rocky peninsula on the Gulf of Mandalya in Caria, underwent an intense building activity during the first centuries of imperial age. A new district was planned on the southern slopes of the hill and a new aqueduct was built while some of the public Hellenistic monuments were embellished, like the stage fronts of the theater and of the Bouleuterion, or completely reconstructed, like the porticoes of the central agora. In particular the reconstruction is perfectly dated between 136 and 138 AD by the inscription written on the architrave.¹



Fig. 1. Iasos (Turkey), general view of the Agora from the North-East corner

Up to now only the porticoes of the agora (Fig. 1) and the Bouleuterion were studied, by Elisabetta Pagello² and Roberto Parapetti³ in the 1980s but they dealt only with the general architecture of both monuments without considering their decorative aspects, ornamental patterns and the provenance of the craftsmen. The marble provenance of the agora's porticoes was generally assumed to be from Aphrodisias, Stratonikeia and Milas.⁴ The exact identification of the origin of the marbles used in these porticoes is a relevant question because it concerns Aphrodisias marble, the use of which is generally connected to specific craftsmen and decorative patterns from the Carian city. Normally the use of this marble is connected to specific craftsmen related to the Carian marble of the city of Aphrodisias and so the hypothetical presence of this marble opens raises questions. But until now this specific problem has never been discussed, so that the

1 PUGLIESE CARRATELLI 1987, 151-154; TROTTA 2008.

2 PAGELLO 1987, 137-150.

3 PARAPETTI 1987, 105-136.

4 PAGELLO 1987, 140-141.

cultural provenance of the craftsmen who worked at Iasos is still an open question.⁵ Macroscopically it could be noticed that for the entablatures, the column capitals and bases of the porticoes of the agora a white coarse grained marble was used, while for the column shafts, as well as the pedestals of the central row of the southern side, a coarse gray veined stepped marble was employed. For this reason, 14 elements of the South and East porticoes of the agora were sampled in order to determine on an analytical basis the marble provenance, which would be useful to define, together with stylistic evidence, the cultural background of the craftsmen involved.

Marble quarries, decorative tradition and craftsmen: state of research

It is well known that in the 2nd century specialized workshops in Asia Minor created a well-defined architectural and decorative language. This was characterized by the use of particular ornamental motifs, such as pointed acanthus leaves, anthemion with palmettes decorating the sima of the cornices, and the modeling of the profile of the trabeation. All these elements became expressions of the so called Asiatic style that was rapidly disseminated not only in Asia Minor but also in other eastern and western Roman provinces by itinerant craftsmen.⁶ They were linked to cities and/or quarries such as Aphrodisias, Ephesus, Pergamon, famous for their “architectural decorative schools”,⁷ or directly to quarries, such as that of Proconnesos island. In particular the Marmara district had a chief role in the diffusion of the Asiatic style thanks to the export of completely and semi-finished elements and the related activity of their itinerant stonemasons.⁸

Although Iasos is located in Caria, a marble rich region, being on the coastline, with one harbor or more probably two, it could have been easily supplied with extra-regional marbles too. Therefore to ascertain the presence of itinerant Asiatic craftsmen it is necessary to analyze not only the ornamental motifs but also to determine the provenance of the marbles used to embellish and renew the monumental aspect of the cities in Asia Minor, in this case of Iasos, considering the close link between some white marbles and their quarries, stonemasons and patrons. The use of different marbles helps us fully to understand the building processes, restorations or reconstructions of monuments, casting light also on several economic, politic and social historical aspects.

White marble quarries of Caria

The closest quarry to Iasos is that of Euromos, where from the mid-imperial age a coarse gray veined stepped marble was extracted on the top of the hill near the ancient temple of Zeus.⁹ Also not far from Iasos are the quarries of Milas located on the slopes of Sodra Dağ north of the ancient city, where this white coarse grained marble was widely used from late classical times.¹⁰ More than 30 km inland is the large quarry district of Stratonikeia, producing a white medium coarse-grained marble, which was used for the buildings of the Hellenistic and Roman monuments of this ancient city. The extent of the quarry testifies the widespread local use.¹¹ On the southern shores of Bafa Lake, the ancient Gulf of Latmicus, are the quarries of Miletos and Heracleia on Latmos producing both a medium grained, lightly grey marble used, as it is well known, since the mid-6th century B.C. in the nearby Heracleia and for the temple of Apollo at Didyma.¹² But the most important and famous quarry district is that of the so-called city quarries of Aphrodisias located only two kilometers north of the city and producing a coarse grained white grey marble employed

5 On the “quarry of city” ATTANASIO 2003, 162-165; ATTANASIO, BRILLI, OGLE 2006, 162-169; MONNA, PENSABENE 1977, 89-101; PONTI 1996; ROCKWELL 1996. The question about craftsmen involves both sculptural and architectural production: about “itinerant sculptors” FLORIANI SQUARCIAPINO 1940, 80-96; FLORIANI SQUARCIAPINO 1974, 167-170; LANDWEHR, ATTANASIO, BRUNO 2012-2013; on Aphrodisian School of decoration HEILMEYER 1970, 97-101; PENSABENE 2011, 52-54.

6 PENSABENE 2002a, 54; VANDEPUT 1997, 129-147, 155-158; WARD-PERKINS 1992, 85-105.

7 HEILMEYER 1970, 93-101; PENSABENE 2011; about the use of the word “school of sculpture” and its definition see BEJOR 2011.

8 ASGARI 1988; ASGARI 1990; ASGARI 1992; on the question in general PENSABENE 2002a, 50-64; PENSABENE 2002b, 203-205; WARD-PERKINS 1992.

9 PESCHLOW, BINDOKAT 1981, 211; GERMAN 1981, 226; BRUNO *et al.* in the same proceedings; BRUNO, BIANCHI 2015, 77-78.

10 Few information about MONNA, PENSABENE 1977, 117-119. Present quarry information, sampling and analytical data are based on a survey carried out by Attanasio, Bruno, Prochaska, and Yavuz in 2012 and in press.

11 BRUNO *et al.* 2009.

12 MONNA, PENSABENE 1977, 123-124; PESCHLOW BINDOKAT 1981; about analytic data on Miletos and Eracleia marble quarries see GERMAN 1981; ATTANASIO, BRILLI, OGLE 2006, 190-197.



Fig. 2. Iasos (Turkey), Agora, eastern portico, column shafts (from left to right nos. 1, 3, 2)



Fig. 3. Iasos (Turkey), Agora, eastern portico, frieze no. 5



Fig. 4. Iasos (Turkey), Agora, eastern portico, frieze no. 6



Fig. 5. Iasos (Turkey), Agora, northern portico, cornice no. 13

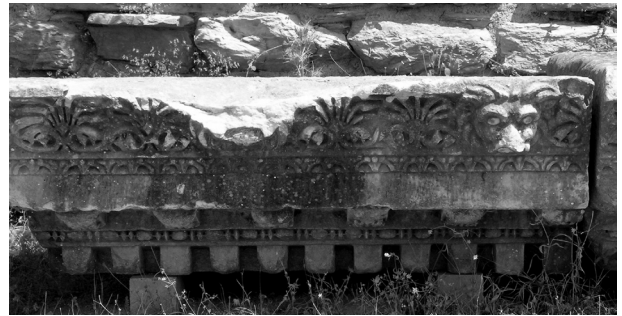


Fig. 6. Iasos (Turkey), Agora, northern portico, cornice no. 14

for sculptural and architectural productions¹³. The importance of these quarries is linked not only to one of the most relevant sculptural schools of imperial times but also to a specific architectural decorative tradition transmitted and disseminated by specialized craftsmen.¹⁴

Analyses and provenance

Table 1 lists the fourteen architectural marbles that were sampled and tested at Iasos including 3 column shafts (Fig. 2), 4 friezes (Figs. 3-4), 2 cornices (Figs. 5-6) and 1 Corinthian capital (Fig. 7) from the eastern portico, 3 pedestals (Fig. 8) and 1 floor slab from the southern double

13 For the city and the sculptural and architectural decorative schools connected with the quarries, see note 5; for the other districts LONG, STEARNS 2009; BRUNO *et al.* 2009.

14 Related to Aphrodisias are the quarries of Göktepe, recently discovered 40 kilometers south-west of the city. They produce very fine grained black, which is the most important source of the so called *nero antico*, and white honey colored and translucent marbles, as well as a bichrome variety, which was used by Aphrodisias sculptors to produce statues of high quality from the end of the 1st century B.C. with an increasing production from the Hadrianic age until late antiquity. ATTANASIO *et al.* 2008; ATTANASIO, BRUNO, YAVUZ 2009; LANDWEHR, ATTANASIO, BRUNO 2012-2013.



Fig. 7. Iasos (Turkey), Agora, eastern portico, Corinthian capital no. 8



Fig. 8. Iasos (Turkey), Agora, southern portico, pedestal no. 11

No.	Location	Description	MGS mm	$\delta^{18}\text{O}$ ‰	$\delta^{13}\text{C}$ ‰	EPR Intensity %	EPR Linewidth %	Provenance	Relative Probability %	Absolute Probability %
1	East portico	Column shaft, stepped	1.75	-6.40	1.36	181.3	55.2	Euromos	98	84
2		Column shaft, stepped	1.1	-7.37	2.06	212.1	63.2	Euromos	93	63
3		Column shaft brecciated	0.7	-4.79	4.20	115.2	56.7	Unknown (Ephesos 1 ?)		
4		Frieze, white	0.7	-3.74	1.09	35.5	54.7	Milas	66	71
5		Frieze, white	0.6	-4.31	1.88	15.3	42.6	Milas	97	61
6		Frieze, white	0.4	-2.60	2.83	30.5	54.9	Milas	94	23
7		Frieze, white	0.8	-3.91	1.63	33.6	44.3	Milas	90	97
8		Capital, white	0.65	-4.16	1.70	12.0	50.9	Milas	88	71
9	South portico	Pedestal, stepped	0.9	-7.75	1.28	97.0	58.2	Euromos	92	68
10		Pedestal, stepped	0.7	-8.53	2.17	72.4	60.5	Euromos	61	12
11		Pedestal stepped	0.9	-7.49	1.52	131.8	56.6	Euromos	85	80
12		Floor slab, white	1	-1.33	1.61	4.6	52.7	Proconnesos	44	32
13	North portico	Cornice, white	md coarse	0.07	3.35	4.1	42.7	Proconnesos	58	12
14	portico	Cornice, white	md coarse	-1.98	3.14	18.3	43.6	Proconnesos	45	40

Table 1. Analytical and provenance data for 14 architectural marbles sampled at Iasos. Isotopes and EPR parameters are given ‰ o % with respect to the Pee Dee Belemnite and Dolomite N368 BCS standards, respectively. Statistical probabilities are defined in ATTANASIO, BRILLI, OGLE 2006

No.	Site, samples	MGS	$\delta^{18}\text{O}$ ‰	$\delta^{13}\text{C}$ ‰	EPR Intensity %	EPR Linewidth %
1	Euromos, 56	1.27	-6.25	1.73	118.9	55.6
2	Afyon, 65	0.86	-4.32	1.82	246.2	54.0
3	Altıntaş, 48	0.67	-5.38	2.27	158.3	57.7
4	Proconneso 1, 380	1.72	-2.08	2.65	6.0	57.8
5	Milas, 40	0.88	-3.49	1.97	45.5	48.7
6	Mileto, 56	1.49	-2.56	2.05	17.7	53.2
7	Efeso 1, 88	1.74	-4.42	3.81	60.0	56.4
8	Efeso 2, 38	1.71	-3.14	0.35	41.8	45.5
9	Herakleia, 51	1.61	-2.59	1.74	22.6	53.2

Table 2. Mean variable values for nine Asiatic fine - and medium-grained marbles considered to be possible sources for the Iasos samples and included into the database. Units are as in Table 1

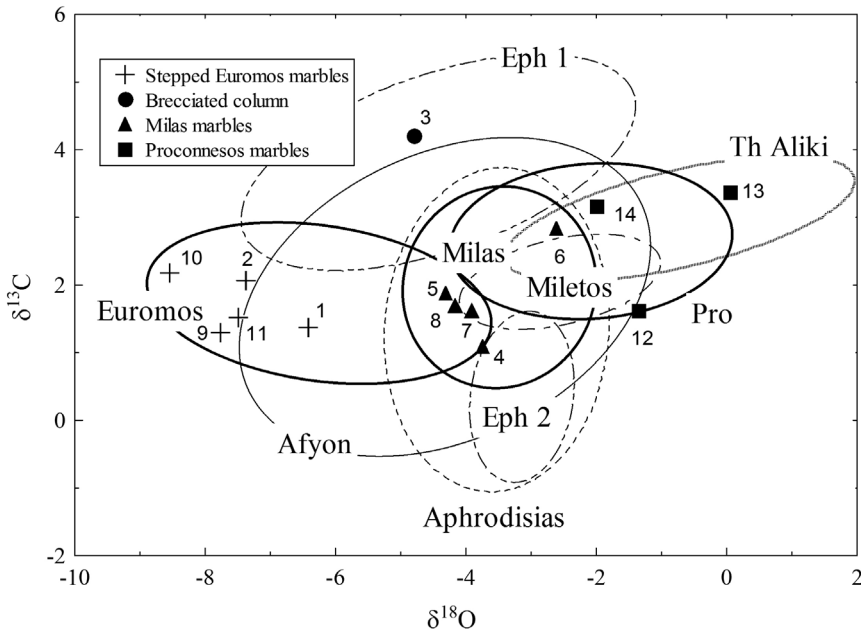


Fig. 9. Isotopic diagram of the 14 architectural marbles tested at Iasos



Fig. 10. Iasos (Turkey), Agora, eastern portico, Corinthian capital in white marble placed on the column shaft no. 2



Fig. 11. Iasos (Turkey), Agora, eastern portico, Corinthian capital in white marble placed on the column shaft no.1

portico¹⁵. The provenance was obtained following a well established procedure that uses statistical data analysis of isotopic, EPR and grain size measurements to obtain the most probable quarry of provenance among a set of sources deemed to be viable on the basis of archaeological considerations and analytical properties.¹⁶ The same procedure was adopted also for stepped marbles originating from Euromos despite the fact that this variety can be easily and unmistakably identified by eye and has no

15 The two cornices are placed in the northern portico.

16 ATTANASIO, BRILLI, OGLE 2006.

likely alternatives among known ancient marble sources.¹⁷ The database selection used for this work is shown in Table 2 where the main properties of single quarry sites are summarized using mean variable values. Results of the statistical analysis of provenance are listed in Table 1 using the probability parameters defined elsewhere¹⁶ and are illustrated by the isotopic graph of Figure 9. With few exceptions all assignments and in particular the Milas quarry provenance of the friezes with people scrolls (nos. 4-7) and the Corinthian capital no. 8 appear to be clear

17 For the Euromos quarries, BRUNO *et al.* in this volume.



Fig. 12. Iasos (Turkey), Agora, northern portico, Corinthian capital in white marble placed on the column shaft at the North-East corner



Fig. 13. Iasos (Turkey), Agora, northern portico, architrave in white marble



Fig. 14. Iasos (Turkey), Agora, eastern portico, architrave with inscription in white marble

and unquestionable. The same is true for the Euromos provenance of all stepped marbles (nos. 9-11). The marble of column no. 3 is characteristically brecciated and was assumed at first to be a variety of Euromos marble. But this is not the case. However, as shown clearly by the analyses, the exact provenance of this stone could not be determined, despite the fact that the data are compatible with a possible Ephesos 1 origin. The isotopic values and the weak EPR intensity of the floor slab confirm the macroscopic identification as Proconnesian marble. Proconnesian provenance is also suggested for the two cornices nos. 13 and 14, though these artifacts exhibit some atypical parameter values that make their provenance less obvious.

Architectural decorative patterns and craftsmen of the porticoes of Agora

We will proceed now to an analysis of the ornamental features of the architectural elements relevant to the agora of Iasos in order to define the ornamental patterns and the origin of the craftsmen. This analysis concerns the items of the northern and eastern porticoes, which are well preserved¹⁸.

The Corinthian capitals (Figs. 10-11) are generally characterized by slender and fan-shaped acanthus leaves, deeply drilled middle lobes of the leaflets, mid ribs of leaves flanked by deep drilled veins; the mid-ribs of the leaves of the upper row can go as far as the base of the *kalathos* or stop at the upper lobes of the middle leaflets of the lower row of acanthus leaves. The leaflets are separated by oblique almond-shaped eyelets, sometimes characterized by a straight long side and lower edges. Geometrical figures are created on the surface of the *kalathos* by touching pointed lobes of the lower adjacent leaflets. The caules are generally a simple triangular projection, the bracts are composed of two leaves separated by triangular eyelets, the lower one of which has a rather narrow and elongated shape. The drooping top leaves of the bracts touch the acanthus leaf placed above the overhanging top leaflet of the acanthus leaves of the upper row. Volutes and helices have a narrow and slightly concave ribbon, and the abacus is well shaped. The fluted-and-acanthus capitals (Fig. 12) pertinent to the inner colonnade of the northern portico have two rows of acanthus leaves wrapping the lower half of the *kalathos*, while the upper one is covered by flutes.

18 A few new architectural fragmented elements were discovered in the excavations made by the Italian archaeological mission directed by M. Spanu in 2012 and 2013, BERTI 2015; ROMAGNOLI 2012; SPANU 2012, 446-447; SPANU 2013, 2-3; SPANU 2014, 575-578.



Fig. 15. Iasos (Turkey), Agora, eastern portico, frieze with peopled scrolls in white marble



Fig. 16. Iasos (Turkey), Agora, northern portico, cornice in white marble. The anthemion is decorated with a Silenus head

The acanthus leaves are typologically identical to those of the Corinthian capitals; the flutes have a well shaped semi-circular upper edge.

The acanthus leaf of these two types of capital is comparable with that of the Corinthian and fluted-and-acanthus capitals of the temple of Zeus at Euromos¹⁹ and of the City Gate of Mylasa both of the Hadrianic period²⁰. The capitals of the temple of Hadrian at Ephesus²¹ of the late Trajanic period show the basic pattern of this type of acanthus leaf, a pattern testified to also by the contemporary capitals of the portico of Labraunda²² and by those of the second floor of the Agora Gate of Miletos of Hadrianic age, where probably Ephesian craftsmen also worked²³.

19 PÜLZ 1989, 452-453, tab. 44, 1, 3-4.

20 VANDEPUT 1997, tab. 98, 1.

21 VANDEPUT 1997, 138, tabs. 87, 1.

22 VANDEPUT 1997, 136, tab. 94, 3.

23 STROCKA 1981, 31; KÖSTER 2004, 128-129, tabs. 89, 2; 132.

The architraves of the northern (Fig. 13) and eastern (Fig. 14) porticoes have canonical top moldings (anthemion, egg-and-dart, bead-and-reel) and are divided in three bands separated from each other by a “rope” and a bead-and-reel. The ionic kyma has eggs that are large and pointed, with frames by sloping edges, separated by darts. The bead-and-reel is composed of disc-shaped reels and globular beads or by oval beads and rhomboidal reels, the “rope motif” by oblique segments distinguished by a soft vein. The anthemion of the architraves of the northern portico is composed of palmettes of varied shapes, alternately open and closed with a U-shaped linking scroll, while that of the eastern portico shows palmettes alternately opened and closed, placed side by side and linked by additional eyelets. Quite uniform is the carving of the moldings with the exception of the anthemion: those of the architraves of the northern portico are characterized by a more or less soft or hard carving but generally the workmanship is of high quality;²⁴ the anthemion of the architraves of the eastern portico seems more flat and cut out on the background surface by drill work. The Ephesian Temple of Hadrian²⁵, the Celsus Library and the Temple of Zeus at Euromos give the patterns for these moldings even if the Ionic kyma with enlarged frames is still limitedly used.²⁶

The convex frieze of the northern portico, crowned by an Ionic kyma is smooth, unlike that of the eastern portico, which is overrun by acanthuspopulated scrolls (Fig. 3-4) in high relief. The pattern is formed by series of pairs of stems completely covered by leaves, rising by a populated acanthus bush. By the main stems, moving with sinuous movement on the convex surface of the frieze, the secondary stems detach, rolling up and ending in flowers or animals. The series of scrolls are linked (Fig. 15) by standing figures holding them in their hands. Shoots fill the empty surface between the scrolls so that the background is almost totally obliterated. Generally there are signs of drill work on the surface of the vegetal elements, small holes or deep veins being left, creating a well defined patterns of light and shade: in some cases the elements lose so much of their natural vitality that the final result is not

24 Only one item is completely different in carving by the other ones so that could be pertinent to a later restoring.

25 STROCKA 1981, 26; KÖSTER 2004, tab. 115.

26 This type of kyma will be more typical of the Hadrianic period, as items of the Temple of Zeus at Kyzicos and the Temple of Serapis at Ephesus testify, BARATTOLO 1995, 86, tab. 31, 1-2; STROCKA 1988, 303-305, tab. 47. The rope motif distinguishes the second fascia by the last one in the architrave of the trabeation of the second storey of Celsus Library; this motif is more used in the II century, KÖSTER 2004, 161, 164.

very plastic or dynamic, but in others, the figures and the acanthus leaves are soft and well modeled. The patterns of these friezes are those of the Celsus library (113-117 AD) and the Temple of Hadrian on Curetes Street (117-118 AD), which have been updated: the scrolls, covering the largest part of the available surface, reflect the further decorative development of the Hadrianic period²⁷.

The cornices of the the northern portico have a cyma decorated by an anthemion composed of upright and pendent palmettes adorned in an acanthus-like-way too, with alternating lion and Silenus heads (Fig. 16). The corona below has concave flutes, the ceiling is supported by consoles with underlying acanthus leaves while the coffers are surrounded by an Ionic cyma and filled by flowers. The leaf-and-dart below crowns the dentils used as bed-molding. All the decorative elements are generally very well worked and in some cases characterized by a powerful undercut which makes them almost completely free of the background surface. The cornices (Figs. 5-6) of the eastern portico are different only in the type of anthemion decorating the cyma, separated by the smooth corona by the leaf-and-dart, while above the dentils is a bead-and-reel. The anthemion is composed of upright palmettes alternately open and closed of varied shapes linked by only one or two joined S-shaped horizontal tendrils ending with two small leaves, without melting into the lower side leaves of the palmettes. The vegetal decoration of the cyma and of the other parts of the cornice is generally flat, undercut much more deeply by the drill, the result being a hard and cold carving.

The cornices of the two porticoes generally reflect the Ephesian decorative architectural tradition of the late Trajan period: the flutes ornamenting the corona, the shape of the dentils, square or more rectangular, the leaf-and-dart with the midriff not yet divided into three parts and the cut top of the stirrup frame, the acanthus leaves of the consoles and the ionic cyma of the coffers are characteristic of the decoration of the Celsus Library and of the temple of Hadrian.²⁸In particular the leaf-and-dart crowning the dentils or the corona is used in the cornice of the trabeation of the first and second storey of the Agora Gate at Miletos²⁹ and in the Ephesian monuments mentioned above. To these can be added

the cornices of the Nymphaion F3 of Perge of the Hadrianic period where bead-and-reel over the dentils is also used³⁰. Despite the Ephesian basic patterns not that the type of anthemion as the carving quality of the cornices of North portico could indicate a gap of the construction of the porticos. In fact the anthemion is quite comparable with that of the cornices of Vedius gymnasium at Ephesus dated to the middle of the 2nd century³¹.

The analysis allows us to highlight first and foremost the spread of Ephesian models in Iasos and in its nearby towns: the capitals of the temple of Hadrian at Ephesus are the patterns of those of the temple of Zeus at Euromos and of the City Gate of Mylasa, both of the Hadrianic period; some aspects of the decoration of the Agora at Miletos reflects the same Ephesian ornamental tradition. This last one is well testified to also by the architectural decoration - capitals and entablature - of the porticoes of Iasos Agora. This tradition is transmitted not only by regional craftsmen, who had just worked in the cities of Euromos, Mylasa and Miletos but also directly by Ephesian masters. The carving quality of some friezes and of the cornices of the north portico of the agora suggests, in fact, the working of extra-regional-craftsmen.

Conclusions

The archaeometric analyses of the sampled elements allow us to exclude the use of marble of Aphrodisias and to establish that of local origin from the Euromos and Milas quarries as well as that of Proconnessos. The analyses of the decoration have shown the use of Ephesian patterns at Iasos as well as in nearby towns, the work of regional and extra-regional craftsmen, in particular of Ephesian origin, and a gap in the construction of the porticoes of Iasos Agora. In fact, the two sampled cornices in Proconnessian marble of the eastern portico show a carving quality and an anthemion type different from those on the northern portico, and they are comparable with the cornices of the Vedius Gymnasium at Ephesus, dated around the mid-2nd century. One of the two inscriptions of the architraves of the eastern portico, pertaining to the North-East side of the trabeation, is dated to 136 A.D.; the other is dated to 138 A.D. and was visible in the central part of the colonnade. The first inscription recalls that Dionysios, son of Theophilos, paid for and provided the architectural elements of the portico, the stylobate, column bases and shafts and the relief decorative elements; the second inscription, pertinent to the central part of the colonnade, commemorates the Ierocles donation in order to complete the building of the Eastern portico. The earthquake of 139

27 STROCKA 1978, 896-899, tab. 286, 11-12; VANDEPUT 1997, 155; 156; tabs. 85, 2; 86, 2.

28 In particular for the use of flutes decorating the corona and the anthemion of the cyma see the decoration of the cyma and of the cavetto under the corona of the cornice of the lower storey of the Celsus Library, STROCKA 1978, 895, tab. 282, 3, and the cornice of the trabeation of the Hadrian Temple, KÖSTER 2004, t. 115.

29 KÖSTER 2004, 127-128, tab. 83, 2; 130-131, tab. 97, 1.

30 VANDEPUT 1997, tabs. 106, 2 and 107, 2.

31 VANDEPUT 1997, tab. 88, 1.

A.D. forced its construction to be completed rapidly, and the elements of the trabeation are undecorated in the southern end of the colonnade. To this last building phase belong the two sampled cornices in Proconnesian marble decorated in different ways.

The preliminary study of architectural decoration of some elements of the trabeation of the northern and eastern porticoes of the agora has shown the link with the Ephesian patterns disseminated by itinerant craftsmen in the Carian region in the Hadrianic period. The architectural decoration of the porticoes of the agora at Iasos is another expression of this cultural environment. Decorative and carving types reflect not only the different quality levels of the craftsmen, both regional and extra-regional, who worked all together in the Iasos agora, producing its architectural ornament, but also the building history of the porticoes. In fact, the agora of Iasos, thanks to the inscriptions of the eastern portico is a fixed point of the knowledge of architectural decoration of the Hadrianic period in Asia Minor and of the diffusion of Ephesian patterns in the Carian region.

BIBLIOGRAPHY

- ASGARI N. 1988: "The stages of workmanship of the Corinthian capital in Proconnesus and its export form", in *ASMOSIA I*, 115-125.
- ASGARI N. 1990: "Objects de marbre finis, semi-finis etinachevés du Proconnèse", in M. WAELEKENS *et al.* (eds.): *Pierre éternelle du Nil au Rhin. Carrières et fabrication*, 106-126.
- ASGARI N. 1992: "Observation on two types of quarry items from Proconnesus", in *ASMOSIA II*, 247-252.
- ATTANASIO D. 2003: *Ancient white marble: analysis and identification by paramagnetic resonance spectroscopy*, Rome.
- ATTANASIO D., BRILLI M., OGLE N. 2006: *The isotopic signature of classical marbles*, Rome.
- ATTANASIO D., BRUNO M., YAVUZ A. B., ELÇI E. 2008: "Aphrodisias and the Newly Discovered Quarries at Göktepe", in: R. R. R. SMITH, J. L. LENAGHAN (eds.): *Roman Portraits from Aphrodisias. Exhibition Catalogue*, Istanbul, 217-227.
- ATTANASIO D., BRUNO M., YAVUZ A. B. 2009: "Quarries in the Region of Aphrodisias: the Black and White Marbles of Göktepe (Muğla, Turkey)", *JRA* 22, 312-348.
- BARATTOLO A. 1995: "The Temple of Hadrian-Zeus at Cyzicus. A new Proposed Reconstruction for a Fresh Architectonic and Ideological Interpretation", *IstMitt* 45, 57-108.
- BERTI F. 2015: "La *stoà* occidentale dell'agorà di Iasos in età romana", *Studi classici e orientali*, 61, 2, 5-22.
- BEJOR G. 2011: "Produzioni e scuole: uno sguardo alla questione", in F. D'ANDRIA, I. ROMEO (eds.): *Roman Sculpture in Asia Minor*, 32-36.
- BRUNO M., ELÇI H., YAVUZ A. B., ATTANASIO D. 2009: "Unknown Marble Quarries of Western Asia Minor", in *ASMOSIA IX*, 562-572.
- BRUNO M., BIANCHI F. 2015: *Marmi di Leptis Magna*, Roma.
- FLORIANI SQUARCIAPINO M. 1940: *La Scuola di Afrodisia*, Roma.
- FLORIANI SQUARCIAPINO M. 1974: *Sculture del Foro Severiano di Leptis Magna*, Roma.
- GERMAN K. 1981: "Lagerstätteneigenschaften und herkunftstypische Merkmalsmuster von Marmoren am Südwestrand des Menderes-Massivs (Südwestanatolien)", in *PESCHLOW-BINDOKAT* 1981, 214-235.
- HEILMEYER W. D. 1970: *Korintische Normalkapitelle. Studien zur Geschichte der römischen Architekturdekoration*, Heidelberg.
- KÖSTER R. 2004: *Die Bauornamentik von Milet, Teil 1, Die Bauornamentik der frühen und mittleren Kaiserzeit*, Berlin – New York.

- LANDWEHR C., ATTANASIO D., BRUNO M. 2012-2013: "The sculptural marbles of Caesarea Mauretaniae (Cherchel, Algeria)", *JdI* 127-128, 227-260.
- MONNA D., PENSABENE P. 1977: *Marmi dell'Asia Minore*, Roma.
- PAGELLO E. 1987: "Il foro romano imperiale. Considerazioni preliminari", in *Studi su Iasos di Caria. Venticinque anni di scavi della Missione archeologica italiana*, Roma, 137-150.
- PARAPETTI R. 1987: "Il bouleuterion. Aspetti architettonici e decorativi", in *Studi su Iasos di Caria, Venticinque anni di scavi della Missione archeologica italiana*, Roma, 105-136.
- PENSABENE P. 2002a: "Il fenomeno del marmo nel mondo romano", in M. DE NUCCIO, L. UNGARO (eds.): *I marmi colorati della Roma imperiale*, Venezia, 3-67.
- PENSABENE P. 2002b: "Le principali cave di marmo bianco", in M. DE NUCCIO, L. UNGARO (eds.): *I marmi colorati della Roma imperiale*, Venezia, 203-265.
- PENSABENE P. 2011: "Su alcuni aspetti produttivi delle "scuole" di scultura di Docimio, Afrodizia e Nicomedia", in F. D'ANDRIA, I. ROMEO (eds): *Roman Sculpture in Asia Minor*, 37-61.
- PESCHLOW-BINDOKAT A. 1981: *Die Steinbrüche von Milet und Herakleia am Latmos*, *JdI* 96, 158-235.
- PONTI G. 1996: "Ancient quarrying at Aphrodisias in the light of geological configuration", *Aphrodisias Papers* 3, 105-110.
- PUGLIESE CARRATELLI G. 1987: "Le due dediche della stoà orientale", *Studi su Iasos di Caria, Venticinque anni di scavi della Missione archeologica italiana*, Roma, 151-154.
- PÜLZ S. 1989: "Zum Zeus tempel von Euromos", *IstMitt* 39, 451-453.
- ROMAGNOLI G. 2012: "Scavi nella *stoà* settentrionale dell'agorà di Iasos. Campagna 2011", *Bollettino dell'Associazione Iasos di Caria* 18, 10-14.
- SPANU M. 2012: "Iasos 2011", *Kazı Sonuçları Toplantısı*, 34, 2, 445-454.
- SPANU M. 2013: "La campagna 2012 a Iasos", *Bollettino dell'Associazione Iasos di Caria* 19, 2-6.
- SPANU M. 2014: "The 2012 and 2013 excavation and research campaigns at Iasos", *Kazı Sonuçları Toplantısı* 36, 3, 575-596.
- STROCKA V. M. 1978: "Zur Datierung der Celsusbibliothek", in E. AKURGAL (eds): *The Proceedings of the Xth International Congress of Classical Archaeology*, Ankara-Izmir 23-30/IX/1973, 2, Ankara, 893-900.
- STROCKA V. M. 1981: *Das Markttor von Milet*, Berlin.
- STROCKA V. M. 1988: "Wechselwirkungen der stadtrömischen und kleinasiatischen Architektur unter Trajan und Hadrian", *IstMitt* 38, 291-307.
- TROTTA F. 2008: "A proposito delle due dediche della stoà orientale", in *Iasos in età romana. Miscellanea storico-archeologica*, Ferrara, 7-15.
- VANDEPUT L. 1997: *The Architectural Decoration in Roman Asian Minor. Sagalassos: a Case Study*, Katholieke Universiteit Leuven.
- WARD PERKINS J. B. 1992, "Nicomedia and the Marble Trade", in H. DODGE, B. WARD PERKINS (eds): *Marble in Antiquity*, London, 61-105.