Revisiting the Origin and Destination of the Late Antique Marzamemi 'Church Wreck' Cargo

Leidwanger, Justin; Pike, Scott H.; Donnelly, Andrew

Source / Izvornik: **ASMOSIA XI, Interdisciplinary Studies on Ancient Stone, Proceedings of the XI International Conference of ASMOSIA, 2018, 291 - 299**

Conference paper / Rad u zborniku

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

https://doi.org/10.31534/XI.asmosia.2015/02.13

Permanent link / Trajna poveznica: https://urn.nsk.hr/urn:nbn:hr:123:915819

Rights / Prava: In copyright / Zaštićeno autorskim pravom.

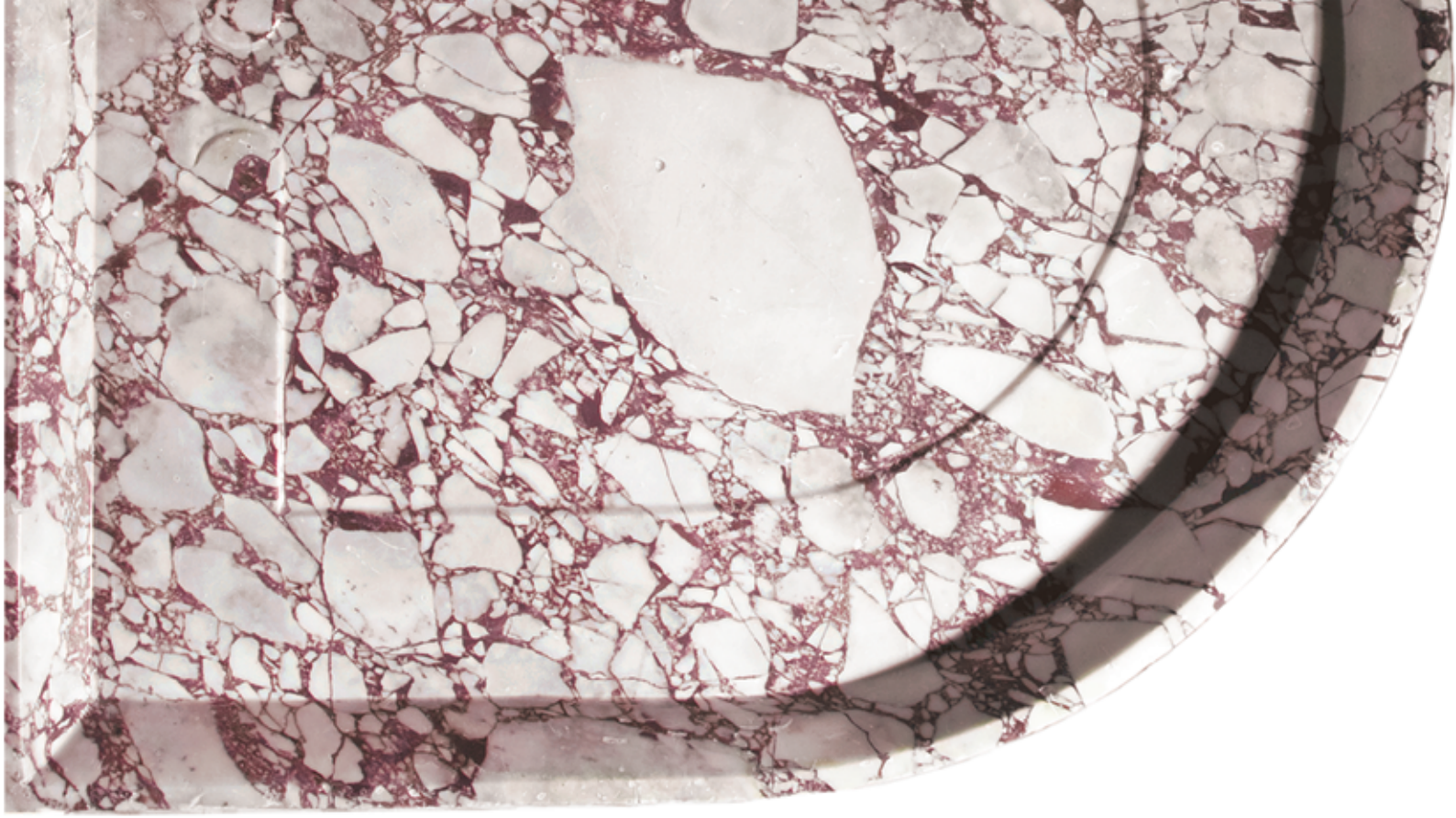
Download date / Datum preuzimanja: **2025-03-22**

Repository / Repozitorij:

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

UNIVERSITY OF SPLIT

dabar
DIGITALNI AKADEMSKI ARHIVI I REPOZITORIJI



ASMOSIA XI

Interdisciplinary Studies on Ancient Stone

PROCEEDINGS

of the XI ASMOSIA Conference, Split 2015

Edited by Daniela Matetić Poljak and Katja Marasović

ARTS ACADEMY IN SPLIT

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

Interdisciplinary Studies on Ancient Stone

Proceedings of the XI ASMOSIA Conference (Split 2015)

Publishers:

ARTS ACADEMY IN SPLIT
UNIVERSITY OF SPLIT

and

UNIVERSITY OF SPLIT
FACULTY OF CIVIL ENGINEERING,
ARCHITECTURE AND GEODESY

Technical editor:
Kate Bošković

English language editor:
Graham McMaster

Computer pre-press:
Nikola Križanac

Cover design:
Mladen Čulić

Cover page:
Sigma shaped *mensa* of *pavonazzetto* marble from Diocletian's palace in Split

ISBN 978-953-6617-49-4 (Arts Academy in Split)
ISBN 978-953-6116-75-1 (Faculty of Civil Engineering, Architecture and Geodesy)

e-ISBN 978-953-6617-51-7 (Arts Academy in Split)
e-ISBN 978-953-6116-79-9 (Faculty of Civil Engineering, Architecture and Geodesy)

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

Association for the Study of Marble & Other Stones in Antiquity

ASMOSIA XI

Interdisciplinary Studies of Ancient Stone

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

Edited by
Daniela Matetić Poljak
Katja Marasović

Split, 2018

Nota bene
All papers are subjected to an international review.
The quality of the images relies on the quality of the originals provided by the authors.

CONTENT

PRESENTATION 15

NECROLOGY: NORMAN HERZ (1923-2013) ***by Susan Kane*** 17

1. APPLICATIONS TO SPECIFIC ARCHEOLOGICAL QUESTIONS – USE OF MARBLE

Hermaphrodites and Sleeping or Reclining Maenads:
Production Centres and Quarry Marks
Patrizio Pensabene 25

First Remarks about the Pavement of the Newly Discovered Mithraeum
of the Colored Marbles at Ostia and New Investigations on
Roman and Late Roman White and Colored Marbles from Insula IV, IX
Massimiliano David, Stefano Succi and Marcello Turci 33

Alabaster. Quarrying and Trade in the Roman World:
Evidence from Pompeii and Herculaneum
Simon J. Barker and Simona Perna 45

Recent Work on the Stone at the Villa Arianna and the Villa San Marco
(Castellammare di Stabia) and Their Context within the Vesuvian Area
Simon J. Barker and J. Clayton Fant 65

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

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

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

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

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

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

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

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

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

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

Amethystus: Ancient Properties and Iconographic Selection
Luigi Pedroni 167

2. PROVENANCE IDENTIFICATION I: (MARBLE)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Imperial Porphyry in Roman Britain
David F. Williams 435

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

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

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

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

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

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

3. PROVENANCE IDENTIFICATION II: (OTHER STONES)

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

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

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

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

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

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

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

4. ADVANCES IN PROVENANCE TECHNIQUES, METHODOLOGIES AND DATABASES

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

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

5. QUARRIES AND GEOLOGY

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

Ancient Quarries and Stonemasonry in Northern Choria Considiana
Hale Güney 621

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

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

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

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

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

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

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

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

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

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

Labour Forces at Imperial Quarries
Ben Russell 733

Social Position of Craftsmen inside the Stone and Marble Processing Trades in the Light of Diocletian's Edict on Prices
Krešimir Bosnić and Branko Matulić 741

6. STONE PROPERTIES, WEATHERING EFFECTS AND RESTORATION, AS RELATED TO DIAGNOSIS PROBLEMS, MATCHING OF STONE FRAGMENTS AND AUTHENTICITY

Methods of Consolidation and Protection of Pentelic Marble
Maria Apostolopoulou, Elissavet Drakopoulou, Maria Karoglou and Asterios Bakolas 749

7. PIGMENTS AND PAINTINGS ON MARBLE

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

The Use of Colour on Roman Marble Sarcophagi
Eliana Siotto 773

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

Schists and Pigments from Ancient Swat (Khyber Pukhtunkhwa, Pakistan)
Francesco Mariottini, Gianluca Vignaroli, Maurizio Mariottini and Mauro Roma 793

8. SPECIAL THEME SESSION: „THE USE OF MARBLE AND LIMESTONE IN THE ADRIATIC BASIN IN ANTIQUITY"

Marble Sarcophagi of Roman Dalmatia Material – Provenance – Workmanship
Guntram Koch 809

Funerary Monuments and Quarry Management in Middle Dalmatia
Nenad Cambi 827

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

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

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

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

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

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

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

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

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

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

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

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

Roman Quarry Klis Kosa near Salona
Ivan Alduk 957

Marmore Lavdata Brattia
Miona Miliša and Vinka Marinković 963

Quarries of the Lumbarda Archipelago
Ivka Lipanović and Vinka Marinković 979

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

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

INDEX OF AUTHORS 1009

DOI: https://doi.org/10.31534/XI.asmosia.2015/02.13

REVISITING THE ORIGIN AND DESTINATION OF THE LATE ANTIQUE MARZAMEMI 'CHURCH WRECK' CARGO

Justin Leidwanger[1], Scott H. Pike[2] and Andrew Donnelly[3]
[1] Department of Classics, Stanford University, Stanford, California, United States (jleidwa@stanford.edu)
[2] Deptartment of Environmental and Earth Sciences, Willamette University, Salem, Oregon, United States (spike@willamette.edu)
[3] Department of Classical Studies, Loyola University Chicago, Chicago, Illinois, United States (adonnel@luc.edu)

Abstract

Initially explored by Gerhard Kapitän in the 1960s, the famous 6th c. AD 'church wreck' at Marzamemi (Sicily) — with its cargo of prefabricated religious architectural elements — holds a special place in discussions of the ancient stone transport and late antique exchange. Renewed investigations aim to shed light on the broader socioeconomic and historical circumstances surrounding the shipment, including patterns of maritime connectivity between the divergent east and west and the possible roles of imperial agency and local patronage in ambitious architectural programs. Critical to these questions are the origin and destination of the cargo. Stable isotope analysis offers a window into the geographic range of resources available for this architectural program and, by extension, possible clues to the organization of materials, labor, and sponsorship. Analysis of the historical and architectural context allows evaluation of plausible destinations. This study opens new possibilities for interpreting the social and political world of 6th century exchange and a re-evaluation of the multifaceted relationship between Justinian and the recently acquired imperial lands.

Keywords
shipwreck, late antiquity, stone trade

Renewed investigations of the Marzamemi 'Church Wreck'

The discovery, by fishermen in the late 1950s, of a highly unusual site in the shallow waters off southeast Sicily at Marzamemi garnered considerable attention from both the scholarly community and the public (Fig. 1). Scattered across the seabed, obscured by marine growth and shifting sands, lay a mix of architectural elements, some with obvious Christian iconography. Pioneering underwater archaeologist Gerhard Kapitän undertook investigations of the site intermittently over the next decade, when it became popularly known as the 'church wreck' (KAPITÄN 1961; 1969; 1980). A half century after these important efforts, renewed fieldwork at this site began in 2013 under the leadership of Stanford University and the Soprintendenza del Mare as part of the broad Marzamemi Maritime Heritage Project. The lack of comprehensive study of the site, including non-cargo finds, raises issues for the contextualization of the important architectural shipment. The current project thus aims to understand the shipwreck's broader socioeconomic world, and in particular the mechanisms behind this assemblage.

The site presents a dispersed field of artifacts strewn across an uneven and dynamic seabed of reef, rock, and sand extending more than 65 m by at least 30 m (Fig. 2). The stone architectural elements that mark the site rest primarily within and around several sandy depressions at about 7 m deep. Over three campaigns between 2013 and 2015, the team mapped the surface remains and excavated several areas totaling 144 m^2 in and around the promising sandy patch near the center of the site (Fig. 3). A variety of major architectural elements and many fragments of panels have been raised for additional study, together with numerous pieces of ceramics, stone, concretions, and other small finds. The documentation and interpretation of the wreck site and assemblage are complicated by two critical factors. First, illicit removal over the intervening decades since the site's discovery and initial exploration is well attested, and at times artifacts have been raised primarily to ensure their preservation in this accessible area. Second, considerable post-depositional disturbance is evident in the juxtaposition of cultural material with rock and fallen reef. With the materials raised in the 1960s currently residing in Siracusa and the more recently excavated finds in the newly restored historic Palmento di Rudinì that now serves as the project's local base of operations and conservation lab, the entire assemblage has not yet been studied as a whole nor have the earlier finds yet been subjected to renewed study. As is typical for any excavation in progress, the observations offered here should thus be treated as preliminary (LEIDWANGER, BRUNO 2014; LEIDWANGER, TUSA 2015; 2016).

Fig. 1.
Central and eastern Mediterranean region with Marzamemi and other major locations noted in the text (map: J. Leidwanger)

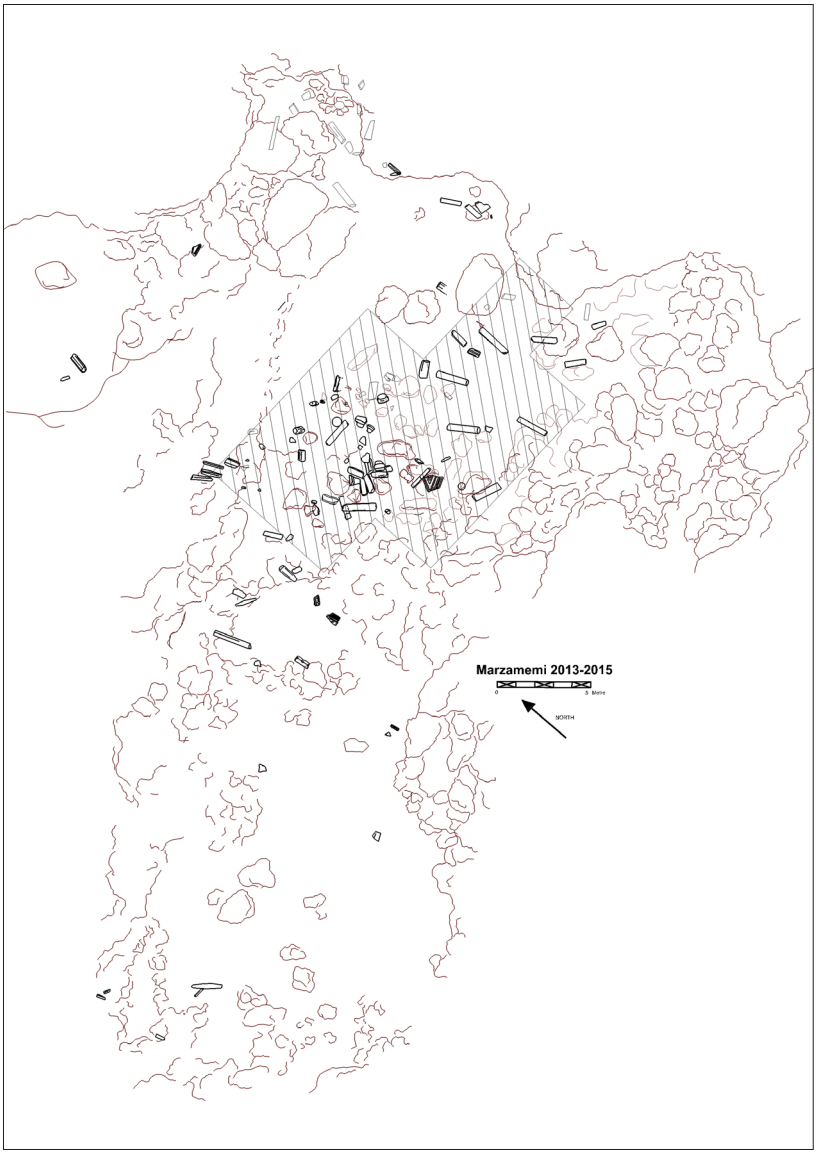


Fig. 2.
Plan of the Marzamemi shipwreck site with shaded area showing the main focus of the 2013-2015 excavation seasons (plan: S. Matthews)

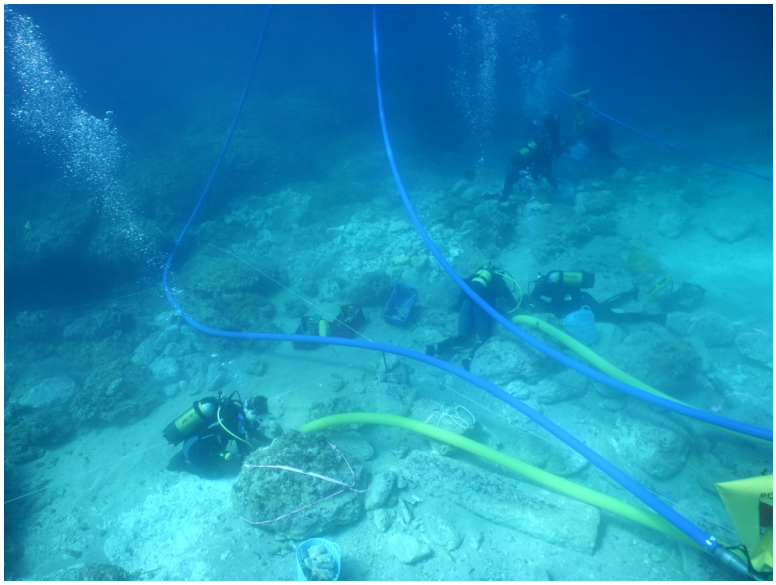


Fig. 3.
View of the main excavation area during fieldwork in 2015 (photo: L. McPhie)

Fig. 4.
Depot area with recently excavated columns and capitals waiting to be raised in 2015 (photo: L. McPhie)

Fig. 5.
Preparing to recover a newly discovered fragment of the ambo in 2015 (photo: J. Leidwanger)

Fig. 6. Panel fragment from the shipwreck cargo. This find was discovered in fall 2014, at some distance from the site, from which it had been removed illicitly (photo: A. Oron)

Critical to this interpretive goal of understanding the context of this unusual shipwreck is identification of the cargo's extent, origin, and (where possible) the most likely destination. The majority of the assemblage consists of interior decorative elements belonging to elite 6th century architecture, particularly religious architecture in the case of panels bearing prominent Christian iconography. To judge from the elements studied by Kapitän and those remaining on the seabed, the shipment reflects the purposeful collection of specific decorative elements intended for maximum visual enhancement — and perhaps symbolic value — of architecture that would otherwise have been constructed largely of local stone. While a series of monolithic columns, bases and capitals comprise the bulk of this group (Fig. 4), the most famous pieces are certainly the decorative panels belonging to an ambo and chancel screen (Figs. 5 and 6). As was noted early by Kapitän, these pieces bear the distinctive style and iconography that can be linked to the 6th century, notably the era of the early Byzantine emperor Justinian. The structural architectural elements are easily identified as such even in their sometimes corroded state on the seabed, but their numbers and relationships are by no means as clear. Kapitän suggested a set of 28 matching columns, bases and capitals, yet the confirmation or rejection of this intriguing hypothesis depends on a careful study of the whole of the assemblage and its context. For the time being, these numbers must be considered estimates based on surface counts and limited intrusive investigation. The columns are largely fragmentary, making it difficult to judge the overall quantity; at the same time, many more fragments of columns and other elements have been brought to light through recent fieldwork, raising the possibility that the relative numbers of individual elements may vary. The materials also hint at different stages of production and different overall dimensions. Such uneven numbers and potentially also the greater diversity merit continued study — on the seabed, through compositional analysis and digital modeling — before any firm conclusions might be drawn.

Among the non-architectural finds are a variety of ceramics that likewise hint at a diverse and potentially important assemblage. Kapitän's investigations clearly brought to light some important evidence for these wares, but without full publication we are left with just a few glimpses of the finer pieces — including an African Red Slip plate with iconography of Christ or a praying figure (KAPITÄN 1969, 125) — or those with a particularly interesting story and contemporary comparanda, such as the so-called 'wine thief' (for decanting wine from a larger vessel into a smaller one), water jar, and globular transport amphoras evidently quite like those found on board the famous 7th c. Yassıada vessel also under excavation (in Turkey) in the early 1960s (KAPITÄN 1969, 133; *cf.* Bass 1982). Recent excavations have shed new light on this ceramic assemblage. Alongside the Late Roman 2 (LR2) globular transport amphoras of probable Aegean origin are fragments of Late Roman 1 (LR1) jars of likely Cilician origin, as well as probable Late Roman 4 (LR4) jars from the southern Levant. These finds remain modest in number even with a recently discovered stone mortar and fragments of both cooking pots and common wares, yet they offer a critical new window into the socioeconomic context in which cargos like the "church wreck" architecture were circulating.

The present contribution aims to take a closer look at two fundamental questions surrounding this important assemblage: the origin of the stone architectural materials and their possible destinations. Beyond the broad caveat mentioned above regarding any excavation in progress, two critical points must be emphasized. First, the geological origin of the stone is not tantamount to the geographical origin of the vessel or voyage. Identifying where these materials were quarried can offer indirect evidence for maritime connections, but exploring the mechanisms at work in such a shipment requires balancing these against the wider archaeological assemblage. Second, the destination is one of the most

Sample	$\delta^{13}C$‰	$\delta^{18}O$‰	MGS (mm)	Color	Possible Attribution
WU14-040	2.8	-3.0	1.0	white/gray	Marmara
WU14-041	2.8	-1.0	unavailable	dark gray /green	LMarmara, Paros-Chorodaki, or calcitic Thasian
WU14-042	3.0	-1.7	0.8	white	Marmara or Paros Chorodaki
WU14-044	3.4	-2.1	1.5	white	Marmara or Paros Chorodaki
WU14-046	2.9	-3.6	1.6	white	Marmara or Afyon
WU14-047	2.8	-0.1	fine grain	dark gray /green	Marmara or Chorodaki
WU14-048	2.8	-3.1	1.0	white	Marmara
WU14-050	0.7	-2.2	0.8	white/gray	Paros Chorodaki or a Turkish Anatolian marble

Fig. 7. Marzamemi shipwreck stable isotope ratios of carbon and oxygen, maximum grain size, color and possible source quarry attribution. Stable isotope ratios are reported relative to the PDB international standard and grain size is measured in mm (table: S. Pike)

eagerly sought questions in any shipwreck investigation, but it is also generally one of the most difficult. Plausible possibilities can be raised based on comparanda at sites of consumption (in this case buildings that were actually built), but these are probabilities at best. Even the location of the shipwreck itself may not yield helpful evidence for the destination, since vessels need not have traveled the most direct route, and were often engaged in multiple stops prior to their final port. With these caveats in mind, some observations may be offered.

Investigating the origin of the cargo: physiochemical snalysis of the stone

At the time of original excavation, Kapitän enlisted the help of J. B. Ward-Perkins, who offered an initial identification of their source region based largely on macroscopic observations (KAPITÄN 1980, 72, 78 and 99). Although Ward-Perkins had an outstanding connoisseur's eye for marble identification and indeed helped to lay the foundations for the study of the ancient marble trade, the current questions necessarily move beyond subjective macroscopic interpretations of marble sources by using scientific methods developed well after the 1960s. Chief among these is the carbon and oxygen stable isotope analysis championed by Norman Herz in the 1980s (HERZ 1987). Since then, other researchers have expanded the database to include additional quarries and higher resolutions within quarries (e.g. GORGONI, LAZZARINI, PALLANTE 2002; PIKE 2009; ATTANASIO, BRILLI, OGLE 2006). Macroscopic textural data coupled with the stable isotope ratios of carbon and oxygen have provided high-confidence quarry attributions for many samples. Additionally, MANDI *et al.* (1991) and ATTANASIO, BRILLI, OGLE (2006) have demonstrated that electron paramagnetic data can further discriminate between marble types with overlapping stable isotope regions. The current study of the Marzamemi materials reflects a preliminary examination using stable isotope analysis to suggest the most likely origin of certain components within the ship's stone architectural cargo.

Samples were collected opportunistically from small chips weathered by the elements and gathered from the excavation units. It is unknown from which architectural forms each sample derives although an attempt was made to sample across the full range of stone types. Macroscopically, there are two varieties of marbles present in the collection. The first are white, light gray to beige-white marbles with fine to medium grained textures. The second are gray-green to green banded marbles, also with fine to medium grained textures. Furthermore, all the samples were collected from near the edge of the marble block and most show compact weathering rinds up to a couple millimeters thick or holes left by boring organisms.

Ideally, a multi-method approach would be used to assess the source for these marbles. However, this preliminary report only presents the results of macroscopic observations coupled with stable isotope data for carbon and oxygen. Small aliquots collected by drill of the freshest marble available were analyzed by continuous flow mass spectroscopy at the Stable Isotope Laboratory, Department of Geology, University of Alabama using the protocols established by SPÖTL, VENNEMANN (2003) and DEBAJYOTI, SKRZYPEK (2007). The isotope values of $^{13}C/^{12}C$ and $^{18}O/^{16}O$ are reported as per mil (‰) relative to the international PDB standard for carbon and oxygen isotopic ratios.

The table here (Fig. 7) lists the data including maximum grain size and potential sources, while the scatterplot diagram (Fig. 8) shows the distribution of these data in stable isotope space. The light marble and dark marble data are superimposed upon the graphical representation of GORGONI *et al.* (2002) of the carbon

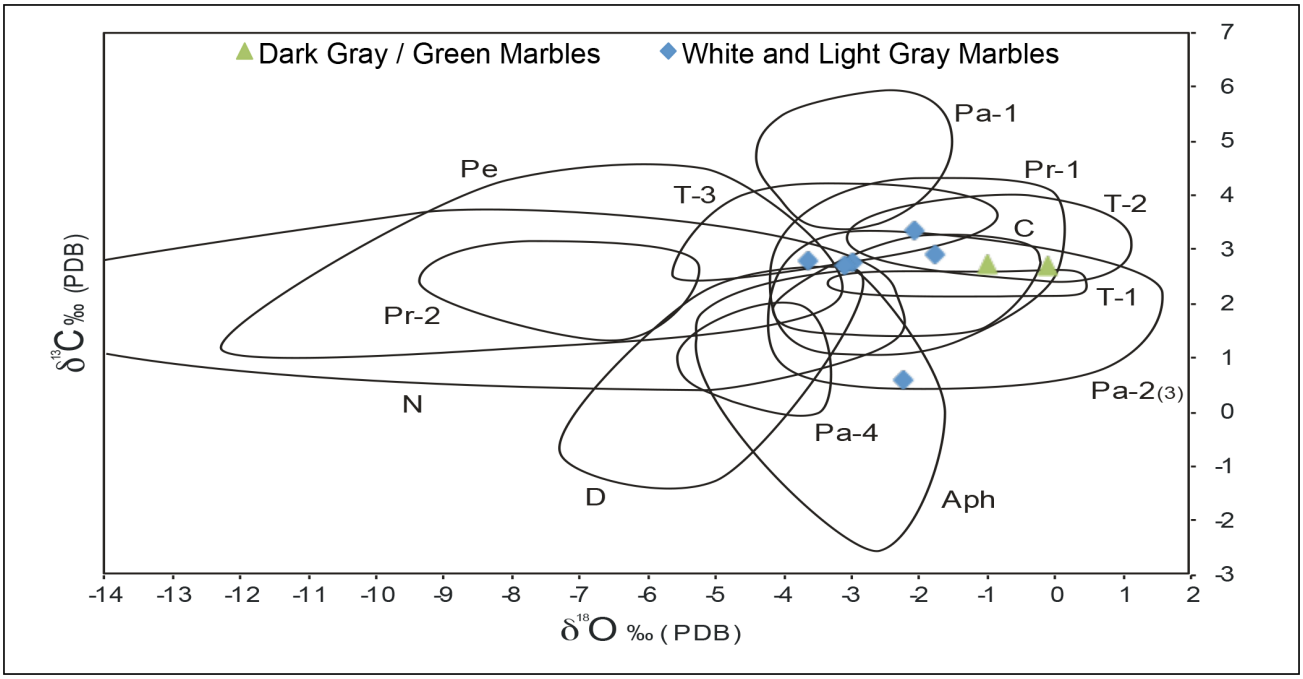


Fig. 8. Scatter-plot diagram in d13C(PDB) vs d18O(PDB) space of the Marzamemi shipwreck samples plotted against the white marble stable isotope database as published by GORGONI, LAZZARINI, PALLANTE (2002). As a group, the white and light gray marbles are likely of eastern Mediterranean origin, most likely Proconessus, although other quarries in modern Turkey and perhaps Thasos cannot be ruled out for certain samples. The two dark gray/green samples may derive from Thasos, Procennesus, or even Paros. However, when coupled with archaeological comparanda of early Christian decorative elements, the colored fragments most likely are Thessalian verde antico (diagram: S. Pike)

and oxygen stable isotope database. Note that during the stable isotope lab runs, samples WU14-045 and WU14-049 had a very low beam size, likely due to their poor preservation. Although the lab is reanalyzing these two samples, the data could not yet be included in this report.

Coupled with the macroscopic textural data it appears that these marbles are likely of eastern Mediterranean origin, most likely Proconessus although other quarries in modern Turkey and perhaps Thasos cannot be ruled out for certain samples. From an archaeological point of view, Proconnesus certainly makes good sense for the light-colored stone, and is consonant with what is known about the large scale of operation during the 6th century, particularly for capitals, bases and columns (ASGARI 1995). The possibility that some might have originated on Thasos is intriguing and merits further attention. The green stones present another challenge of interpretation, with several sources available at the time. Yet in light of the current understanding of the production of church furniture during the 6th century, Thessalian 'verde antico' seems the most likely candidate if the samples derived from fragments of the ambo (MELFOS 2008).

With these preliminary thoughts in mind regarding a most likely origin for the major cargo in the northern Aegean and Sea of Marmara, some possibilities can be raised for the potential destinations that could reasonably have accommodated such a monumental cargo.

First thoughts on the historical context and final destination

The era of the Marzamemi ship, the reign of Justinian, was marked by grand ambition, including no less than the remaking of the Roman Empire. The vessel and cargo under study reflect two aspects of that ambition: conquest and renewal. The movement of goods and artisans flourished in this newly reconnected Mediterranean. Buildings, often ecclesiastical, fashioned from high-quality stone usually imported from the east, were constructed in cities throughout Justinian's growing empire. This rebuilding came on the heels of several military campaigns. After concluding a peace with the Sassanids in the east in 532, Justinian turned his attention westward. His armies invaded North Africa in 533, Italy in 535, and took the southern coast of the Iberian Peninsula in 552. These conquests would not last: the majority of the Italian peninsula fell to the Lombards just a few years after Justinian's death; Spain was retaken in the early 7th century; and North Africa fell to the emergent caliphate shortly thereafter. Yet it is a mistake to see this short-lived pan-Mediterranean conquest as a failure. While Justinian's new empire did not endure, the connectivity it brought about transformed the visual landscape of several cities in the western Mediterranean. Carrying cargo for a newly-invigorated economy destined for a territory

only recently returned to the Byzantine oikoumene, the 'church wreck' is a tangible reminder of what was accomplished in a relatively brief time.

Much of the following remains speculation at this early stage in fieldwork, yet it is nevertheless worthwhile to evaluate potential destinations for such a cargo, especially as contrasting theories about this facet have circulated since Kapitän's original investigations.

No one, as far as we know, has postulated the Iberian Peninsula as a potential destination for this vessel. This is likely with good reason: out of all of Justinian's conquests, perhaps the least is known about the occupation of Spain, and what building material we have from the Byzantine period has been excavated poorly (KULIKOWSKI 2004). Verde antico is found in Spain at some late Roman sites, including Cordova (GREENHALGH 2012); so too is Proconnesian marble, though more often in the form of sarcophagi, not building material (KULIKOWSKI 2004). Spain cannot be ruled out, but there is little contemporary material to indicate it was the vessel's ultimate destination.

North Africa — either Apollonia or Sabratha — was Kapitän's presumed destination. Both sites had been excavated in part by Ward-Perkins, on whose expertise Kapitän relied, and both are appealing. If the destination was Apollonia, the cargo was most plausibly destined for the Central Church, one of the few late antique structures in the city not made solely from spolia or local stone (WARD-PERKINS, GOODCHILD, HARRISON 2003). The building is a collection of local limestone and some Proconnesian marble columns, bases, capitals, and chancel fittings, though there is not enough of this marble to adorn the entire building. The 'church wreck' thus fits well into this narrative as the second, lost vessel that would have supplied the missing building material for this grand imperial edifice.

Sabratha is an equally appealing destination, as is a city Kapitän did not mention, Carthage. Both experienced extensive rebuilding under Justinian. Perhaps the most famous example in Sabratha is the Basilica of Justinian, a "very noteworthy church" according to Procopius (*Aed.* 6.4.13). Carthage's visual landscape changed drastically following the Byzantine arrival. Justinian rebuilt the circuit wall, enhanced the forum, and erected churches, a monastery, and a public bath (*Aed.* 6.5). Proconnesian marble was used in these and other North African cities reconquered by Justinian, but never in same quantity used elsewhere. One wonders, however, if the African Red Slip plate was intended as a commercial good, in which case North Africa is certainly a less likely destination (LEONE 2013). Certainly North Africa cannot be ruled out. The presence of significant spolia in later buildings, such as the Great Mosque of Kairouan (with Proconnesian marble) indicates that Justinian invested far more material in this area than might currently be realized.

Kapitän was skeptical of Italy as a potential destination due to the "political situation at the time" (KAPITÄN 1969, 133), presumably a reference to the long and destabilizing war Justinian was conducting in the peninsula. This statement assumes that trade, monumental architecture, and warfare cannot exist together, but events in Italy defy that assumption. In a recent paper, Elena Castagnino Berlinghieri and Andrea Paribeni have suggested Syracuse — some 35 km north of Marzamemi on the eastern shore of Sicily — as the intended location. This is compelling primarily because of the location where the vessel sank, but also because Sicily was Justinian's stepping stone into Italy and the most secure of his new Italian holdings. There is nothing in either the city of Syracuse itself or in the textual sources that indicates such a cargo had a home in this city, but the possibility cannot be ruled out.

Another possibility is the Adriatic region, an area well-supplied with Proconnesian marble from the Veneto down to the heel of the boot. At the center, Ravenna had been flourishing as the capital of Italy since the beginning of the 5th century. Even before Justinian's reconquest of Italy brought about greater access to markets, Ravenna was already refashioning itself. By the beginning of the 6th century spolia began to run out, leading to a boom in the local brick-making industry. Churches such as San Vitale, Sant'Apollinare in Classe, and San Michele in Africisco were all constructed of these new flatter, broader bricks. Ravenna was taking on a distinctive look, one that broke from earlier tradition (DELIYANNIS 2010). What was originally an indigenous architectural program was enhanced and became something new with the arrival of Justinian's forces, who brought with them greater access to, among other things, luxury stone. Between 540 and 600, Ravenna and its port of Classe were lavishly provided with Proconnesian marble (HARPER 1997). Ravenna also served as a regional supply depot for this building industry. Ann Terry has argued that the Euphrasian Basilica in Poreč, in modern Croatia, was constructed in large part from Proconnesian decorative materials obtained not directly from Constantinople, but as pairs or other small sets most likely from nearby Ravenna (TERRY 1988). That the cargo may have been intended for further redistribution rather than use in one urban context like Ravenna is plausible, and the capitals do not necessarily resemble those most extensively used in the city.

Proconnesian marble was of great importance to Justinian. He adorned his own capital with it and constructed a palace on the island from which it was quarried. But it was also critical to other areas of his new empire as well, and one of our many goals, as more material emerges from the depths, is to determine how this vessel's cargo helps us understand the short-lived but extremely important economic networks created by Justinian's ambition.

Toward a better understanding of the 'Church Wreck'

In revisiting the two basic questions about the Marzamemi vessel — its origin and possible destination — the present contribution aims to situate this shipwreck within its broader socioeconomic context of late antique connectivity and exchange. While an origin in the northern Aegean or Sea of Marmara seems increasingly likely, distinguishing among the several possible destinations remains a formidable challenge. What is evident from the assemblage, however, is that this cargo, so unusual and wealthy, need not be seen as a special one-off commission, but rather as a shipment tightly embedded in the routine commercial exchange of its period. Much work remains to be done, and it should be stated clearly that no critique raised here regarding earlier interpretations is intended as criticism of the pioneering accomplished by Kapitän in the 1960s; indeed, the present project is very much in his debt for raising some of these critical questions that, a half-century later, have only proven themselves to be more central and timely than ever.

ACKNOWLEDGMENTS

The authors are grateful to Sebastiano Tusa (Soprintendenza del Mare), Matteo Azzaro (El Cachalote Diving Center) and the staff and students of the Marzamemi project for their dedication to the fieldwork and research presented here. Fred Andrus (Department of Geology, University of Alabama) kindly provided invaluable assistance with the stable isotope analysis. The expert audience at the ASMOSIA meeting offered thoughtful comments and raised insightful questions that we have endeavored to address here.

BIBLIOGRAPHY

ASGARI N. 1995: "The Proconnesian Production of Architectural Elements in Late Antiquity, Based on Evidence from the Marble Quarries", in C. MANGO, G. DAGRON (eds.): Constantinople and Its Hinterland: Papers from the Twenty-Seventh Spring Symposium of Byzantine Studies, Oxford, April 1993, Hampshire, 263-288.

ATTANASIO D., BRILLI M., OGLE N. 2006: The Isotopic Signature of Classical Marbles, "L'Erma" di Bretschneider, Rome.

CASTAGNINO BERLINGHIERI E. F., PARIBENI A. 2011: "Byzantine Merchant Ships and Marble Trade", Skyllis 11, 64-75.

DEBAJYOTI P., SKRZYPEK G. 2007: "Assessment of Carbonate-Phosphoric Acid Analytical Technique Performed Using GasBench II in Continuous Flow Isotope Ratio Mass Spectrometry", International Journal of Mass Spectrometry 262, 180–186.

DELIYANNIS D. 2010: Ravenna in Late Antiquity. Cambridge, Cambridge University Press, 2010.

GORGONI C., LAZZARINI L., PALLANTE P. 2002: "New Archaeometric Data on Rosso Antico and Other Red Marbles Used in Antiquity", in ASMOSIA VI, 199-206.

GREENHALGH M. 2012: Constantinople to Córdoba. Dismantling Ancient Architecture in the East, North Africa and Islamic Spain, Boston, Brill, 2012.

HARPER J. G. 1997: "The Provisioning of Marble for the Sixth-Century Churches of Ravenna: A Reconstructive Analysis", in R. L. COLELLA (ed.): Pratum Romanum: Richard Krautheimer zum 100. Geburtstag, Weisbaden, 131-148.

HERZ N. 1987: "Carbon and Oxygen Isotopic Ratios: A Data Base for Classical Greek and Roman Marble", Archaeometry 29, 35-43.

KAPITÄN G. 1961: "Schiffsfrachten antiker Baugesteine und Architekturteile vor den Küsten Ostsiziliens", Klio 39, 276-318.

KAPITÄN G. 1969: "The Church Wreck off Marzamemi", Archaeology 22.2, 122-133.

KAPITÄN G. 1980: "Elementi architettonici per una basilica dal relitto navale del VI secolo di Marzamemi (Siracusa)", Corsi di cultura sull'arte ravennate e bizantina 27, 71–136.

KULIKOWSKI M. 2004: Late Roman Spain and Its Cities. Baltimore, Johns Hopkins University Press.

LEIDWANGER J., BRUNO N. 2014: "Marzamemi II 'Church Wreck' Excavation: 2013 Field Season", Archaeologia Maritima Mediterranea 10, 191-198.

LEIDWANGER J., TUSA S. 2015: "Marzamemi II 'Church Wreck' Excavation: 2014 Field Season", Archaeologia Maritima Mediterranea 12, 103-115.

LEIDWANGER J., TUSA S. 2016: "Marzamemi II 'Church Wreck' Excavation: 2015 Field Season", Archaeologia Maritima Mediterranea 13, 129-143.

LEONE A. 2013: The End of the Pagan City: Religion, Economy, and Urbanism in Late Antique North Africa, Oxford, Oxford University Press.

MANDI V., MANIATIS Y., BASSIAKOS Y., KILIKOGLOU V. 1991: "Provenance Investigation of Marbles with ESR Spectroscopy: Further Developments", in ASMOSIA II, 213-222.

MELFOS V. 2008: "Green Thessalian Stone: The Byzantine Quarries and the Use of a Unique Architectural Material from the Larisa Area, Greece. Petrographic and Geochemical Characterization", Oxford Journal of Archaeology 27.4, 387-405.

PIKE S. 2009: "A Stable Isotope Database for the Ancient White Marble Quarries of Mount Pentelikon, Greece", in ASMOSIA VII, 699-708.

PROCOPIUS: De Aedificiis, edited by H.B. DEWING. Cambridge, Harvard University Press, 1940.

SPÖTL C., VENNEMANN T. W. 2003: "Continuous-Flow Isotope Ratio Mass Spectrometric Analysis of Carbonate Minerals", Rapid Communications in Mass Spectrometry 17, 1004–1006.

TERRY A. 1988: "The Sculpture at the Cathedral of Eufrasius in Poreč", Dumbarton Oaks Papers 42, 13-64.

WARD-PERKINS J. B., GOODCHILD R. G., HARRISON R. M. 2003: Christian Monuments of Cyrenaica, Society for Libyan Studies, London.