

Archaeology and Economy in the Ancient World



53

Single Contributions

Sessions 2–3

Martin Bentz
Michael Heinzelmann (Eds.)

**Proceedings of the
19th International Congress of Classical Archaeology**

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Edited by

Martin Bentz and Michael Heinzelmann

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CONTENTS

Session 2: The impact of natural environmental factors on ancient economy: climate, landscape

Panel 2.8: Environmental Factors on Regional Economies

Michele Matteazzi

...inde navigatur septem maria Altinum usque...

Il paesaggio litorale alto adriatico tra *Atria* e *Altinum* in epoca romana 5

Session 3: Systems of production: land use, industry, technology, artistic production

Panel 3.2: Organization of Space and Work: Potter's Workshops in the Greek World

Giovanna Greco

Cumae: Imports and Productions in the Archaic City 25

Panel 3.3: (Re)Producing Images of the Divine between Late Republican Times and Late Antiquity

Antonino Crisà

Tokens and the Reproduction of Divinities in Hellenistic and Roman Sicily: Some Preliminary Case Studies 47

Kristine Iara

Budget Cuts and Material Expression of Religion 59

Panel 3.8: Women and Men at Work! Entrepreneurs, Ateliers and Craftsmen in the Construction and Destruction of Roman Tombs

Marianna Castiglione

Working in Pompeian Funerary Contexts. Some Notes on Business, Craftsmanship and Customers 67

Myriam Pilutti Namer
The Afterlife of Stones after the Disruption of Roman Tombs in Late Antiquity
and Middle Ages. A Selection of Case Studies from the *regio Venetia et Histria* 71

**Panel 3.10: Contextualizing Craftsmanship in the Ancient World:
an “Economic” Sphere?**

Mario Denti
Introduction 77

Sandra Blakely
Metallurgy between Myth and Production: Cognized and Operational Craft
in the Northeastern Aegean 79

Julien Zurbach
Domestic vs Commercial? Non-elite Craftsmen between Mycenaean
and Archaic Times 89

Despoina Tsiafaki
Crafts and Craftsmanship within the Societies of Northern Greece
in Archaic Times 91

Mario Denti
Craftsmanship and Gentilitial Empowerment in the South Italian Iron Age 103

K. Harrington
Craft and Community: Social and Economic Adaptation
in the Corinthian Potters’ Quarter 105

**Panel 3.11: Salt, Fish Processing and Amphorae Production
Across the Mediterranean in the 1st Millennium BC.
An Overview of the Technological and Economic Interactions**

**Darío Bernal-Casasola – Ricard Marlasca – José Manuel Vargas Girón –
José Alberto Retamosa Gámez**
De las complejas estrategias pesqueras hispanorromanas.
Atunes, boquerones, caballas, jureles y sardinas en El Olivillo de *Gades* 109

Panel 3.13: The Rise of Bling: Charting the Incredible Increase in the Consumption of Decorative Metal Objects in the Roman Empire

Mikhail Treister

The Gold of Phanagoria (Bosporan Kingdom):
A Complex Archaeo-metallurgical Study 129

Josy Luginbühl

Young Ladies with Their Writing Equipment.
Indications of Literacy in Roman Tombs 147

Espen B. Andersson

The Economic Centre of Pompeii Revealed by Roman Cash Keeping 159

Panel 3.16: The Logistics and Socio-Economic Impact of Construction in Late Republican and Imperial Rome

Christopher Courault

Construir una ciudad *ex novo* en *Hispania*. Una actualización cuantitativa sobre el primer urbanismo de *Corduba* (s. II a. C.) 175

J. Á. Domingo – P. Barresi – P. Pensabene – J. R. Domingo

Una propuesta de reconstrucción de los costes de los teatros:
el caso de Leptis Magna 195

Simone Mulattieri

Forme e funzioni degli antichi magazzini romani: dalla costa tirrenica all'entroterra di Roma. Gli esempi di *Portus* e *Lucus Feroniae* 231

Panel 3.20: The Production of Portrait Statuary in Roman Cities. An Economic Factor?

Cruces Blázquez-Cerrato – Santiago Sánchez de la Parra-Pérez

Investments of Hispano-Roman Elites in Metal Statues:
A First Costs Evaluation according to Epigraphy 245

Panagiotis Konstantinidis – Marios Mylonas

Economic and Commercial Aspects of Portrait Statuary from the City of Epidauros and the Sanctuary of Apollo Maleatas and Asklepios (146 BC–3rd century AD) 261

Panel 3.21: Farmhouses in Macedonia from the 4th Century BC until the Roman Era: Rural Landscape and Rural Economy

Katerina Tzanavari

Family-oriented Farms Along via Egnatia. The Case of Ancient Lete 281

Eleni Gerofoka

Analysis of the Agricultural Management of a Hellenistic Pieria Farmhouse Based on Archaeological Evidence and Archaeological Relevance 297

Eleni Klinaki

Currency from Two Farmsteads in the Ancient Leivithra Plains in Southern Pieria 313

Ioanna Vassiliadou

Pierian-Macedonian Pitch. A Brand Name Agricultural Product of Ancient Macedonia 333

Kostas Ketanis

Roman Control and Management of the Rural Economy in Macedonia 347

Angeliki Koukouvou

Villae Rusticae at the Beroia Countryside (Macedonia, Greece) 361

Panel 3.23: Unfinished Details in Ancient Architecture. Consequences of Financial Shortages, Organizational Constraints or Aesthetic Ignorance?

Natalia Toma – Frank Rumscheid

Introduction 383

Matthias Grawehr

Heben, Stemmen, Schauen. Funktionen und Deutungen von Buckelbossen in der antiken Architektur 385

Therese Emanuelsson-Paulson

Polygonal Columns: Unfinished Construction or Inexpensive Fashion? 389

Reinhard Heinz

Das vollendet unvollendete Mausoleum von Belevi 393

Georg A. Plattner Intentionelle Unfertigkeit in der römisch-kaiserzeitlichen Architektur in Ephesos und Kleinasien	397
Fulvia Bianchi – Matthias Bruno Il Complesso Severiano di Leptis Magna: il cantiere e la decorazione architettonica tra finito e non finito	401
Natalia Toma Effizienzstrategien kaiserzeitlicher Marmor-Bauunternehmer. Der Fall des Stadion-Osttors in Milet	405
Ursula Quatember Honoring One's Pledge? Benefactors and Their Building Donations in Roman Asia Minor	409
Panel 3.25: Production of Tiles and Bricks	
Luigi Cicala – Luigi Vecchio The Bricks of Elea-Velia: Archaeology and Epigraphy of Production	415
Heinz Sperling Rekonstruktion von Betriebsmodellen antiker Produktionsanlagen mit Hilfe von Prozessketten-Analysen. Methodik und Anwendung bei der Ziegelherstellung in römischer Zeit	433
Panel 3.26: Serial Production	
Elisabeth Trinkl Serial Production in Classical Greece: Attic Figural Vases	439
Harald Schulze Blei als Material für die Serienproduktion von Votivgaben	451
Dagmara Wielgosz-Rondolino Serial Production or Individual Orders? Palmyrene Sculpture from the 1 st to the 3 rd Century AD	469
Eleonora Cussini Serial Production or Individual Orders? Palmyrene Inscriptions on Artefacts from the 1 st to the 3 rd Centuries AD	473

Panel 3.27: Roman and Late Antique Glass Production

Frank Wiesenberg

New Light on Old Panes – Current Results Obtained
by Experimental Archaeology: Making Roman Window Glass 479

**Miguel Cisneros – Nova Barrero – Pilar Caldera – Alfredo Encuentra –
Esperanza Ortiz – Juan Á. Paz**

Semiprecious Stones and Blue Glass: An Approach to the Imitation Phenomenon
in *Hispania* during the Roman Period 493

Ella Magdalena Hetzel

Craftwork in Roman Cologne – A Microeconomic View on Cluster Structures
Regarding Transformation of New Ideas 507

Panel 3.28: Food Production and Consumption

Stavros Dimakopoulos

Educating Farmers. Economic Strategies in Xenophon's *Oeconomicus*
and Their Applications in the Agricultural Landscape 513

Giulia Falco

Snow and Ice in Antiquity. Supply, Preserving, Trade, Consumption 525

Vedat Keleş – Michael D. Yilmaz

Fishing and the Processing of Seafood in Parion 535

**Stéphane Mauné – Enrique García Vargas – Oriane Bourgeon –
Corinne Dubler – Iván González Tobar – Quentin Desbonnets –
Ophélie Tiago Seoane**

OLEASTRO: Neue Ergebnisse des französisch-spanischen
Forschungsprogramms (2013–2018) 553

**Florian Hermann – João Pedro Bernardes – Felix Teichner –
Ricardo Soares**

Boca do Rio (Algarve, Portugal). A Centre of Export Oriented
'*garum*' Production on the Shore of Roman Lusitania 565

**Nabil Kallala – Joan Sanmartí – Maria Carme Belarte –
Joan Ramon – Bouthéina Maraoui-Telmini – Francisco José Cantero –
Dani López – Marta Portillo – Silvia Valenzuela-Lamas**
L'économie vivrière d'*Althiburos* (au NO de la Tunisie) à l'époque
protohistorique-numide 571

Panel 3.29: Production and Distribution of Roman Pottery

Mongi Nasr
L'atelier de Sidi Aïch (Vicus Gemellae) : productions et commercialisation 581

Sergiu Matveev
Keramische Verbrennungsöfen der römischen Tradition
des III.–IV. Jahrhundert n. Chr. zwischen Prut und Dniester 599

Leah Reynolds
Pottery and Exchange at the Imperial Fringe:
Samian Ware at Rural Settlements in Wales and the Marches 611

PREFACE

On behalf of the 'Associazione Internazionale di Archeologia Classica (AIAC)' the 19th International Congress for Classical Archaeology took place in Cologne and Bonn from 22 to 26 May 2018. It was jointly organized by the two Archaeological Institutes of the Universities of Cologne and Bonn, and the primary theme of the congress was 'Archaeology and Economy in the Ancient World'. In fact, economic aspects permeate all areas of public and private life in ancient societies, whether in urban development, religion, art, housing, or in death.

Research on ancient economy has long played a significant role in ancient history. Increasingly in the last decades, awareness has grown in archaeology that the material culture of ancient societies offers excellent opportunities for studying the structure, performance and dynamics of ancient economic systems and economic processes. Therefore, the main objective of this congress was to understand economy as a central element of classical societies and to analyze its interaction with ecological, political, social, religious, and cultural factors. The theme of the congress was addressed to all disciplines that deal with the Greco-Roman civilization and their neighbouring cultures from the Aegean Bronze Age to the end of Late Antiquity.

The participation of more than 1,200 scholars from more than 40 countries demonstrates the great response to the topic of the congress. Altogether more than 900 papers in 128 panels were presented, as were more than 110 posters.

The publication of the congress takes place in two ways: larger panels are presented as independent volumes (vol. 1–52). All other contributions – papers and posters – are published in four larger joint volumes (vol. 53–56).

We would like to take this opportunity to thank all participants and helpers of the congress who made it such a great success. Its realization would not have been possible without the generous support of many institutions, whom we would like to thank once again: the Universities of Bonn and Cologne, the Archaeological Society of Cologne, the Archaeology Foundation of Cologne, the Gerda Henkel Foundation, the Fritz Thyssen Foundation, the Sal. Oppenheim Foundation, the German Research Foundation (DFG), the German Academic Exchange Service (DAAD), the Romano-Germanic Museum Cologne and the LVR-LandesMuseum Bonn. Finally, our thanks go to all colleagues and panel organizers who were involved in the editing and printing process.

Bonn/Cologne, in August 2019

Martin Bentz & Michael Heinzemann

SESSION 2

**The impact of natural
environmental factors on ancient economy:
climate, landscape**

Environmental Factors on Regional Economies

Panel 2.8

...inde navigatur septem maria Altinum usque...
**Il paesaggio litorale alto adriatico tra *Atria* e *Altinum*
in epoca romana**

Michele Matteazzi

Introduzione

Il litorale alto-adriatico veneto, oggi per la maggior parte occupato dal bacino della laguna di Venezia e dalla parte più settentrionale del delta del fiume Po (fig. 1), era in epoca romana inserito nella *X regio Italiae* e suddiviso tra gli *agri* di tre distinti *municipia* (fig. 2): *Atria* (Adria), centro portuale fondato da genti veneto-etrusche lungo il corso principale del fiume Po e divenuto particolarmente importante in epoca preromana, tanto che alcuni autori classici ritengono abbia dato il nome allo stesso mare Adriatico;

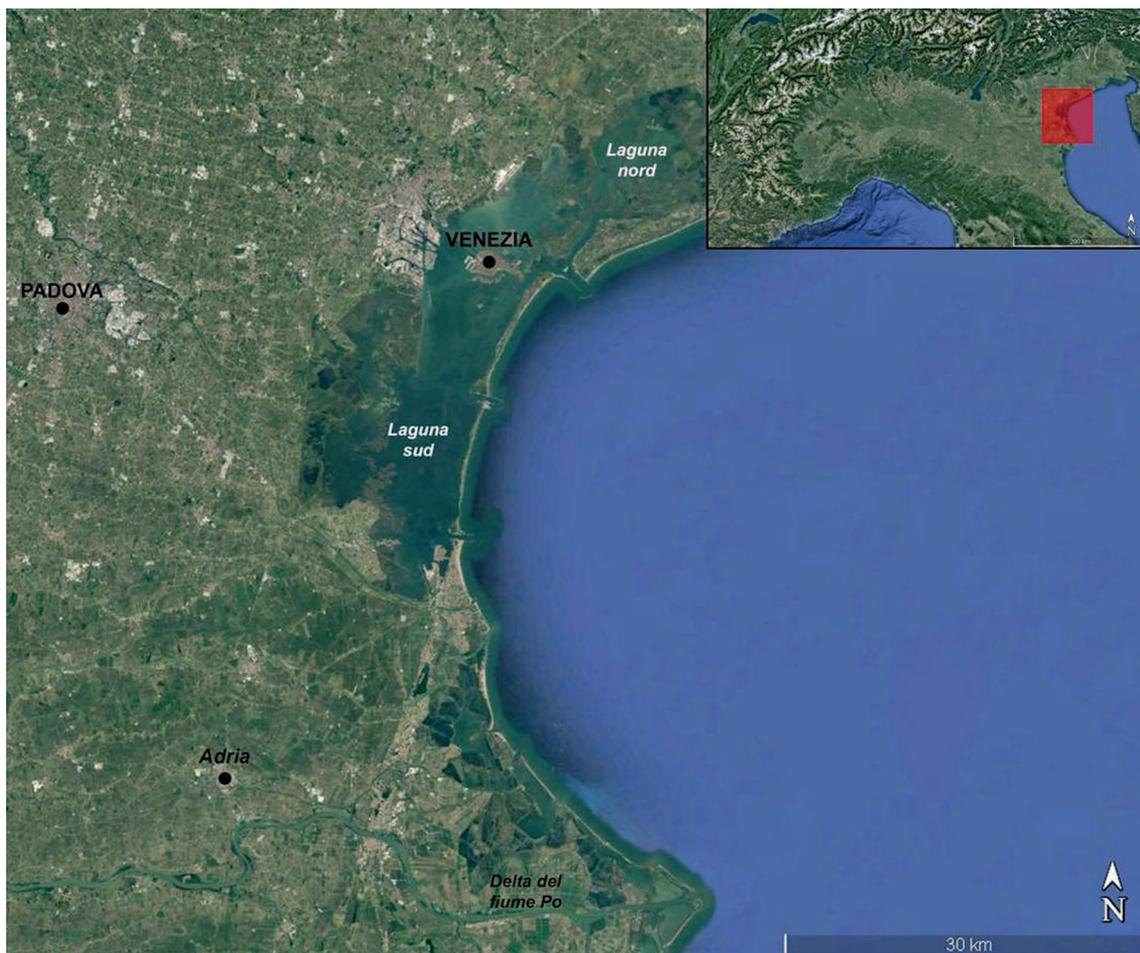


Fig. 1: Localizzazione dell'area di studio.

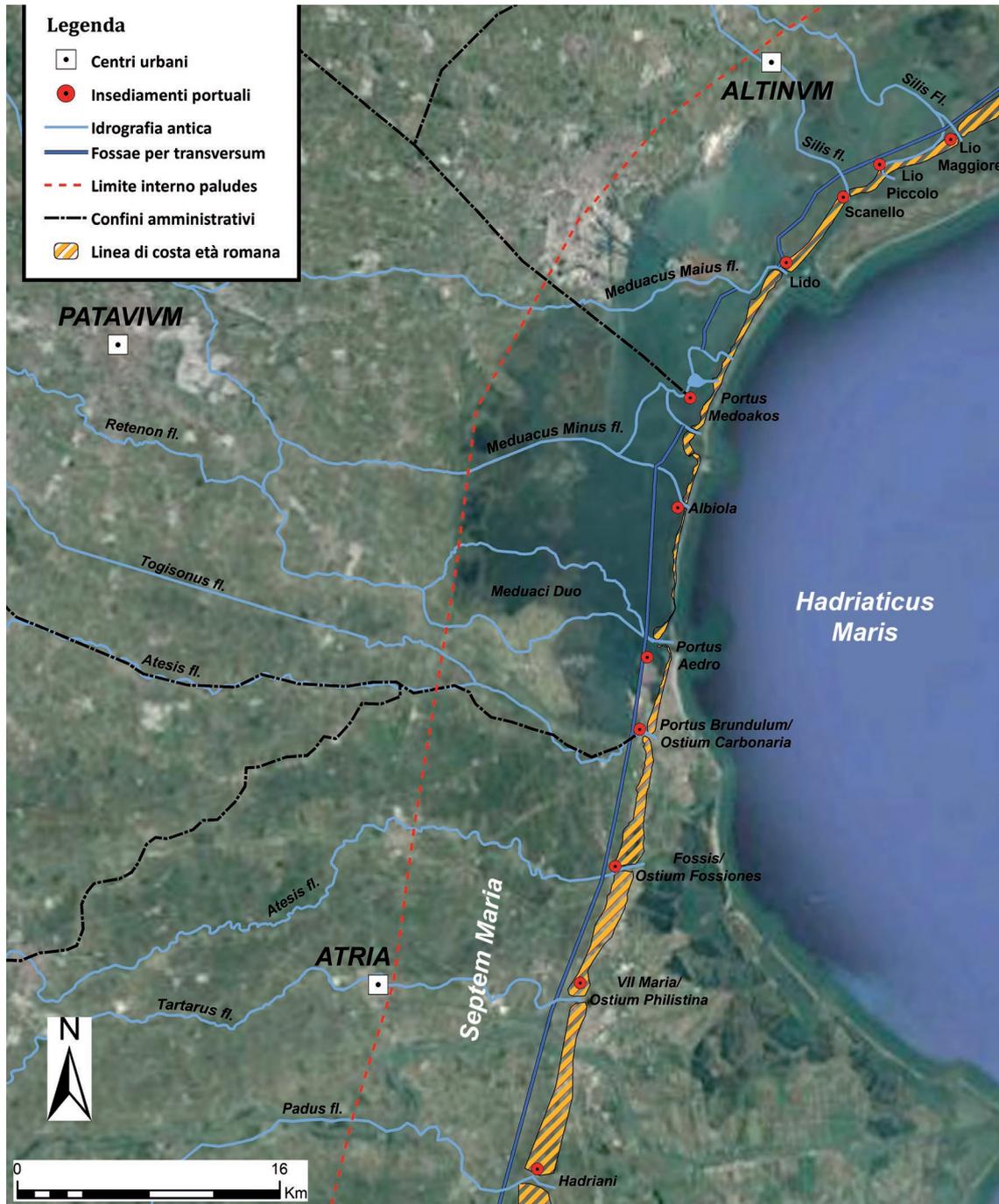


Fig. 2: Il paesaggio litorale tra Atria e Altinum in epoca romana.

Patavium (Padova), il principale centro dei Veneti sin dall'arrivo dei Romani nella *Venetia* tra la fine del III e l'inizio del II secolo a. C.; *Altinum*, porto fondato dai Veneti che, a partire dal I secolo a. C., divenne sempre più importante fino a soppiantare completamente quello di *Atria* nel corso dell'età imperiale.

Se oggi la relazione tra paesaggio e acqua appare molto stretta (per la presenza della laguna e di un complesso sistema fluviale che trova nei fiumi Brenta, Adige e soprattutto Po i suoi agenti principali), sappiamo che questa condizione dovette verificarsi anche in epoca romana, quando le fonti classiche (Strabone e Vitruvio su tutti) ci dicono che l'intera area litorale tra Ravenna e Aquileia formava parte di una vasta area palustre nota come *Gallicae paludes*. Queste *paludes* erano attraversate da numerosi corsi d'acqua che sfociavano nell'Adriatico ed erano soggette al ritmo continuo e alternato delle maree, in un modo tale che veniva a crearsi, secondo le parole di Vitruvio,¹ una *incredibilis salubritas*, in parte ottenuta anche artificialmente grazie all'escavo di canali navigabili che garantivano il ricambio delle maree.

Stando a quanto ci dice lo storico patavino Tito Livio,² di cui possediamo un'interessante descrizione del tratto di costa prossimo a *Patavium*, l'ambiente naturale si definiva allora per la presenza di una serie di *stagna ab tergo inrigua aestibus maritimis* (stagni continuamente rinnovati delle maree) caratterizzati da bassi fondali (*vada*) che separavano la terraferma, per lo più costituita di *agros haud procul campestris* (campi coltivati), e da un *tenue praetentum litus* (una sottile striscia di terra) che formava il litorale vero e proprio. Un paesaggio che, come possiamo facilmente verificare, non doveva mostrarsi molto diverso da quello che possiamo ammirare tutt'oggi approcciandoci alla laguna veneta (fig. 1): un contesto umido formato da pozze d'acqua (*stagna*), barene (*paludes*) e bassi fondali (*vada*) separato dal mare da una piccola striscia di terra (*litus*).

Sappiamo inoltre che in questo tratto di pianura si trovava la parte più settentrionale del grande delta del fiume *Padus* (Po), che a sud raggiungeva Ravenna e, soprattutto, la zona (ad est del centro di *Atria*) dove il fiume stesso sfociava in mare con più diramazioni: una vasta palude d'acqua dolce suggestivamente chiamata *Septem Maria* (fig. 2).³ Qui i fiumi *Tartarus* (Canalbianco), *Athesis* (Adige), *Togisonus* (canale di Bovolenta?) e *Meduacus* (Brenta) scorrevano e mescolavano le proprie acque con quelle del *Padus*; oltre al fiume *Silis* (Sile/Piave), che sfociava in mare in prossimità di *Altinum*.

Accanto ai corsi d'acqua naturali vi erano poi quelle che Plinio il Vecchio⁴ definisce *fossae per transversum*: canali artificiali che, scavati perpendicolarmente alle varie aste fluviali e parallelamente alla costa, formavano parte di una linea di navigazione per acque interne che collegava Ravenna e *Altinum*. L'esistenza di una tale direttrice fluviale è testimoniata da numerose fonti, tra le quali l'*Itinerarium Antonini* che, all'interno dell'itinerario da *Ariminum* ad Aquileia, avverte il viaggiatore che, a partire da Ravenna, *inde navigatur septem maria Altinum usque*.⁵

Contesto geomorfologico

Secondo studi anche piuttosto recenti, in epoca romana una linea di costa più arretrata di quella attuale definiva il settore più settentrionale del nostro territorio, assestandosi lungo la direttrice oggi descritta dai canali di Treporti e San Felice e dalle isole di Lio Piccolo e Lio Maggiore (fig. 2), allora collegate alla terraferma dagli apparati laterali di un antico delta del fiume Piave.⁶ Su questa linea si aprivano almeno quattro bocche di porto (riconoscibili nelle zone di Lido, Treporti/Scanello, Lio Piccolo e Lio Maggiore), che permettevano una diretta comunicazione con il mare; mentre la zona più interna, ora interamente coperta dalle acque salmastre della laguna, era allora caratterizzata da condizioni di emergenza (derivate dall'abbassamento del livello marino che caratterizzò l'inizio dell'età romana) che favorirono, soprattutto tra II e V secolo d.C., un'alta frequentazione umana che comportò la fondazione di nuovi insediamenti e la sistemazione di aree coltivate.⁷

Nella parte centrale, la linea di spiaggia venne invece ad assestarsi, già attorno al I millennio a.C., su una posizione più o meno corrispondente all'attuale, con un fronte costiero unico da Malamocco a Chioggia e proseguito verso sud lungo l'allineamento Brondolo-Sant'Anna-Cavanella d'Adige (fig. 2).⁸ Varchi litoranei dovevano aprirsi: presso la località Terre Perse del Lido; in prossimità dall'attuale bocca di porto di Malamocco, erede del *portus Medoàkos* ricordato da Strabone,⁹ nell'area di Portosecco, il cui toponimo indica l'antica presenza del porto di *Albiola/Pastene*, ricordato dalle fonti a partire dal VI secolo d.C. e scomparso prima del 1213;¹⁰ nei pressi di Chioggia e Brondolo, verosimilmente da riconoscere come le sedi dei porti di *Aedro* e *Brundulum* ricordati da Plinio.¹¹ La presenza, nella zona di Brondolo, di un'antica foce padano-atesina potrebbe inoltre identificarsi con l'*ostium Carbonaria* sempre menzionato da Plinio.¹²

Questa parte del litorale era allora soggetta all'azione morfosedimentaria dei fiumi Brenta e Adige, che gradualmente trasformarono la maggior parte dell'ambiente lagunare che aveva caratterizzato le precedenti età del Bronzo e del Ferro in una vasta area palustre d'acqua dolce definita da torbiere, stagni e canali.¹³

Allo stesso modo, nel settore meridionale, l'azione deposizionale dei fiumi Po, Adige e Tartaro, contribuirono al formarsi di una serie di vaste aree palustri, ovvero i *septem maria* in più occasioni ricordati dalle fonti (fig. 2). Tale nome è ad esempio evocato dal nome dell'insediamento di *VII Maria* riportato nella *Tabula Peutingeriana* (seg. III) e da ubicare non lontano dall'attuale centro di Loreo, in prossimità di un'antica foce del Po verosimilmente identificabile con il pliniano *ostium Philistina quod alii Tartarum vocant*, dove in epoca medievale sorse il *portus Laureti*.¹⁴ Altre bocche di porto dovevano aprirsi a nord, nei pressi di Cavanella d'Adige, dove possiamo localizzare l'*ostium Fossiones* citato da Plinio e corrispondente al sito del medievale porto di *Fosson* e, molto probabilmente, dell'insediamento di *Fossis* della *Tabula*; e a sud, presso la località di San Basilio di Ariano, ovvero nelle vicinanze di quella che forse era la foce primaria del fiume *Padus*, dove è probabile si ubicasse l'*Hadriani* della *Tabula*, verosimilmente un insediamento

portuale il cui nome (possibile corruzione di un originario *portus Hadrianus?*) potrebbe anche suggerire di riconoscere come il principale scalo a mare della città di *Atria*.

Viabilità

Sembra abbastanza logico che, in un tale territorio, le comunicazioni avvenissero principalmente via acqua, sfruttando i vari corsi fluviali e, in particolare, le *fossae per transversum*: questi canali artificiali, che dovevano caratterizzare il paesaggio litorale sin da epoca Greco-Etrusca, a partire dall'età augustea furono organizzate in una sistematica linea di navigazione collegante Ravenna, allora quartier generale della flotta imperiale, con *Altinum*, importante porto e centro commerciale. Probabilmente più tardi, ma sicuramente prima del 301 (quando è ricordata nell'*Edictum pretiis* di Diocleziano), sappiamo che tale rotta venne prolungata fino ad Aquileia.¹⁵

Pare altrettanto sensato pensare che una simile idrovia fosse seguita da un percorso terrestre, che potrebbe essere testimoniato dall'itinerario costiero indicato nella *Tabula Peutingeriana* (segg. III–IV) tra Ravenna ad *Altinum*. Anche se, come evidenzia lo studio archeomorfologico del territorio (fig. 3),¹⁶ quella della *Tabula* sembra in realtà una direttrice piuttosto tarda che viene ad unificare due precedenti tracciati: uno relativo alla *via Popillia*, strada consolare realizzata nel 132 a.C. come diretto collegamento tra *Ariminum* (Rimini) ed Aquileia; e un secondo percorso prettamente paracostiero.

Per quanto riguarda la *via Popillia*, una volta raggiunta Ravenna questa si portava ad *Atria*, continuando poi a nord in direzione di *Altinum* e toccando alcuni degli insediamenti presenti nella *Tabula*: *Evrone* (Codevigo), *Mino Meduaco* (Lova) e *Maior Meduaco* (Gambarare), dove si collegava alla *via Annia* proveniente da *Patavium*. L'evidenza archeologica di un tratto stradale antico al di sotto dell'attuale laguna nord,¹⁷ tuttavia, sembra suggerire la probabile esistenza di un percorso alternativo della strada che, dopo il centro di *Mino Meduaco*, avrebbe raggiunto direttamente *Altinum* passando per l'area dell'altomedievale monastero e porto di S. Ilario (fig. 3), che alcuni indizi suggerirebbero di riconoscere con il sito dell'insediamento di *ad Portum*.¹⁸

Il secondo itinerario correva invece parallelo alla costa, toccando gli insediamenti di *Hadriani* (San Basilio di Ariano), *VII maria* (Fornaci di Loreo) e *Fossis* (Cavanella d'Adige) e proseguendo poi verso nord lungo i cordoni dunosi che definivano la costa antica fino ad *Altinum*, come confermano i ritrovamenti effettuati in differenti zone dell'attuale bacino lagunare:¹⁹ ragionevolmente questa direttrice, permettendo un collegamento diretto tra tutte le principali realtà portuali della costa altoadriatica tra Ravenna e Altino, sembrerebbe potersi riconoscere come il vero e proprio percorso terrestre di appoggio alla direttrice idroviaria padana.

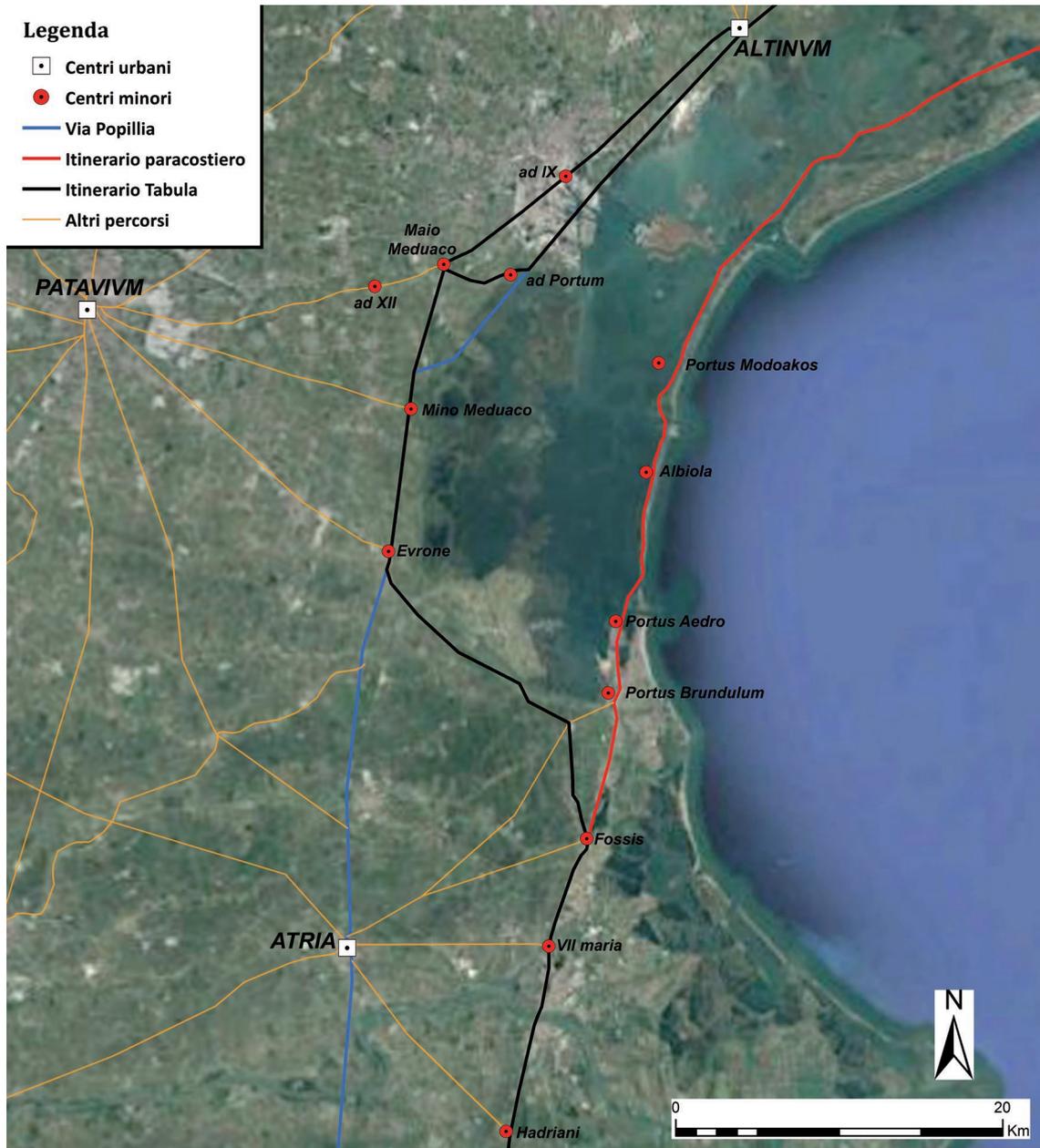


Fig. 3: Viabilità principale in epoca romana.

Contesto insediativo

La presenza romana in questo tratto di litorale sembra svilupparsi senza particolare soluzione di continuità tra la fine del II secolo a. C. e il V secolo d. C. (fig. 4). La maggior parte dei ritrovamenti sembra comunque concentrarsi nella parte più settentrionale, ovvero nella zona gravitante attorno al centro di *Altinum*, in questo confermando il noto passo di Marziale (IV, 25, 1–2) che paragona le ville del litorale altinate a quelle della ben più famosa *Baia*. Al contrario, la presenza insediativa nell'area corrispondente all'attuale bacino meridionale della laguna e, più a sud, nel settore pertinente all'*ager* di *Atria* appare di minore intensità, con più sporadiche attestazioni e maggiormente concentrate in prossimità della costa o nei dintorni del centro urbano di *Atria*. Se non si tratta di una semplice lacuna del dato archeologico, questa discrepanza potrebbe ben spiegarsi con la differente situazione geomorfologica del territorio.

Infatti, il settore settentrionale si definisce in epoca romana per un'importante regressione marina (iniziata tra II e I secolo a. C.) che porta alla cosiddetta «emergenza romana», con un livello delle acque più basso di quello attuale di circa 1,5 m:²⁰ in questo modo si incrementa fortemente l'estensione della terra emersa, favorendone notevolmente l'occupazione e lo sfruttamento da parte dell'uomo. Di contro, nell'area centrale e meridionale la presenza dei fiumi Brenta, Adige e Po e, soprattutto, la loro secolare attività deposizionale, condusse ad una graduale colmatatura della grande laguna protostorica, trasformandola in una palude d'acqua dolce dominata da torbiere e canneti e, dunque, non propriamente ideale per l'impostazione di insediamenti permanenti.

Oltre alla presenza di laboratori artigianali, apprestamenti portuali, *horrea* ed evidenze di attività produttive (come fornaci e saline), due sono le principali tipologie insediative documentate nel territorio. Innanzitutto, complessi abitativi in parte assimilabili alla tipica *villa rustica*, dotati di pavimentazioni a mosaico, decorazioni marmoree, intonaci dipinti e con ricca presenza di ceramica fine attestanti qualità e raffinatezza degli insediamenti; ma da essa anche fortemente differenziandosi per un'evidente proiezione commerciale materializzata in aree di attracco e ricovero per imbarcazioni e una serie di canalizzazioni artificiali che permettevano un diretto collegamento con il sistema idroviario padano. Alcuni dei migliori esempi di questo tipo di insediamenti noti nell'area di studio sono senza dubbio quelli di San Basilio di Ariano e Corte Cavanella di Loreo, non lontano dal moderno centro di Cavanella d'Adige (fig. 5a).²¹

Specialmente nel bacino lagunare settentrionale, sono state poi variamente indagate strutture abitative più piccole (fattorie?), caratterizzate da una pianta rettangolare di circa 100 mq con mura continue su tre lati e una fronte di accesso con quattro pilastri (fig. 5b).

Per entrambe le tipologie, si nota l'impiego di particolari tecniche costruttive (come il massiccio uso di pali in legno nelle fondazioni) e «accorgimenti tecnici» (drenaggi e bonifiche), messi in atto con l'evidente scopo di resistere alle particolari condizioni ambientali di un paesaggio largamente dominato dall'acqua, dove la necessità primaria è

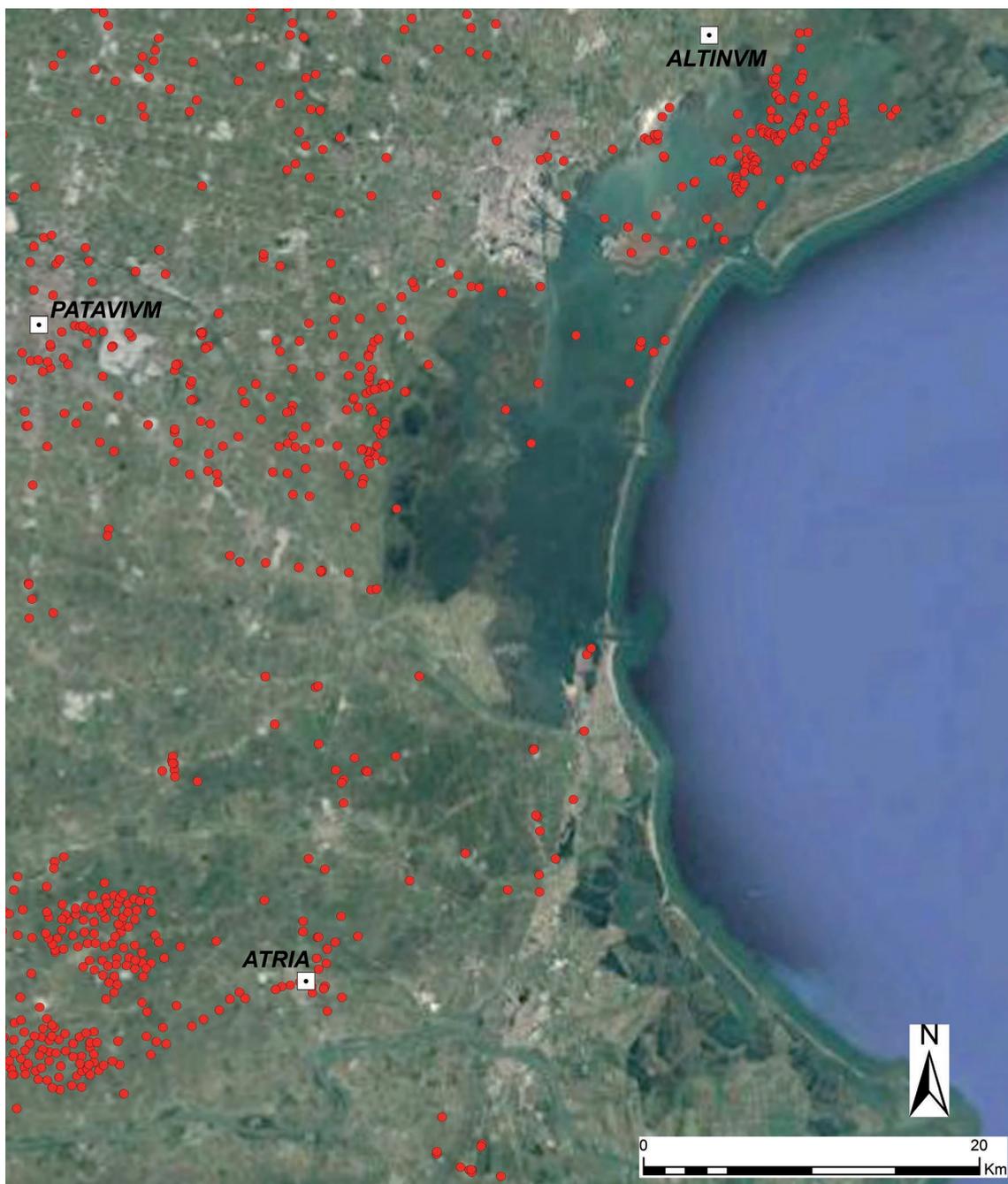


Fig. 4: Carta distributiva dei ritrovamenti archeologici riferibili ad epoca romana (II sec. a. C. – VI sec. d. C.).

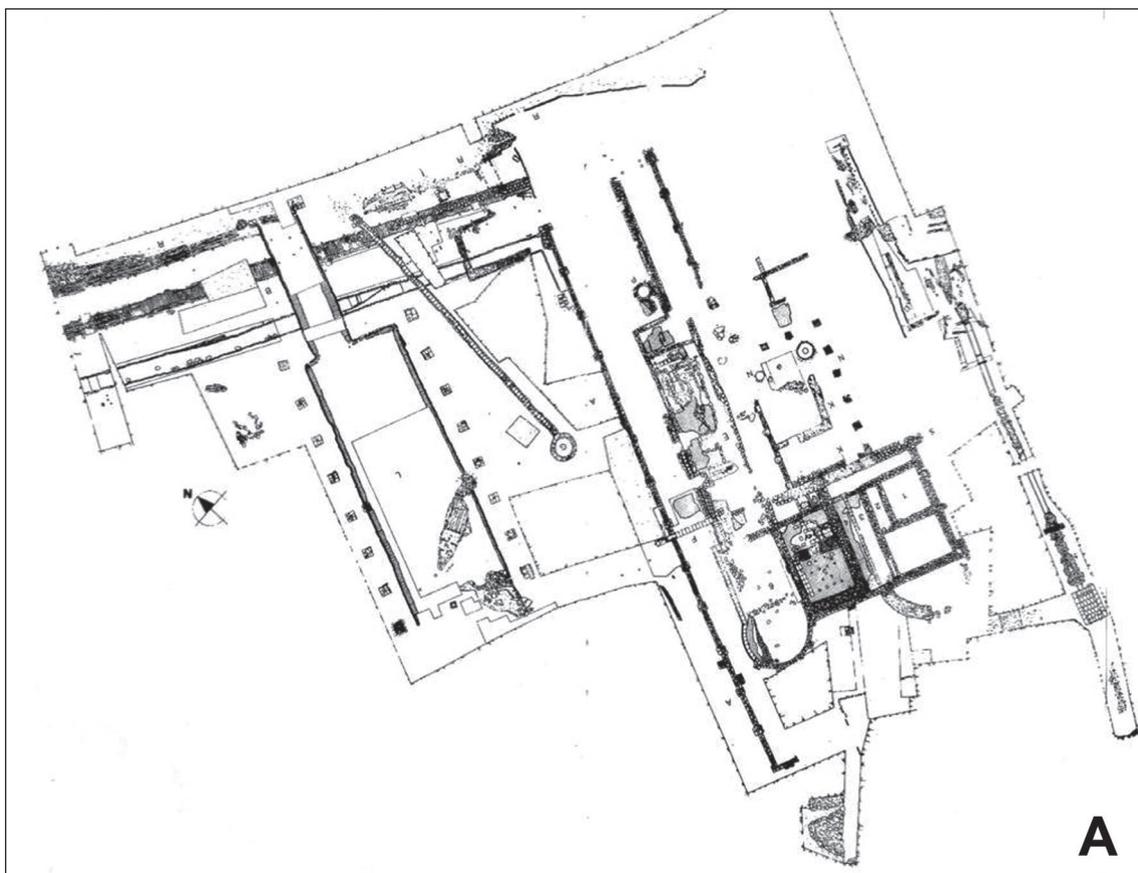


Fig. 5: Tipologie insediative presenti nella piana costiera: a) planimetria della *villa rustica/mansio* di Corte Cavanella; b) pianta e ricostruzione di una delle numerose strutture abitative minori (fattorie?) rinvenute nell'attuale laguna di Venezia.

quella di mantenere il sito il più possibile all'asciutto e al riparo da eventuali alluvioni. Per questo vennero largamente sfruttati a fini insediativi i dossi di origine fluviale e gli antichi cordoni litorali formati da dune di sabbia più alti del piano di campagna circostante, le uniche aree permanentemente emerse e costituite da suoli relativamente solidi.

Uso del territorio

Una considerevole parte dei ritrovamenti databili ad età romana, comunque, è attribuibile a strutture di bonifica e di regimentazione idraulica, per lo più funzionali ad adattare gli spazi naturali disponibili e preservare le aree abitabili dall'erosione dell'acqua. In questo senso, particolari infrastrutture, rinvenute in particolare nel bacino settentrionale della laguna di Venezia, sono i cosiddetti «argini-strada»,²² strutture a sviluppo longitudinale consistenti in una doppia paratia lignea (in genere costituita da una semplice palizzata o da assi di legno giustapposte e fermate da pali) per lo più riempita con semplice terra mista a materiale eterogeneo e, in alcuni casi, con drenaggi di anfore in sottofondazione (fig. 6). Queste strutture, che sembrano aver avuto un uso piuttosto prolungato (con cronologie che spaziano dal I al VI/VII secolo d.C.), servivano molto probabilmente per il transito, ovvero erano strade sopraelevate realizzate per superare superfici sommerse o parzialmente emerse altrimenti difficilmente attraversabili e basifondi non adatti alla navigazione.

È interessante notare che queste strade-argine sembrano seguire, in molti casi, l'orientamento delle centuriazioni di *Altinum*,²³ suggerendo che il territorio oggi sommerso dalla laguna potesse essere oggetto di una qualche forma di divisione agraria. Questa è d'altra parte la sensazione che si ha anche nel settore centrale, dove il percorso di vari canali lagunari e, soprattutto, la principale rete viaria dell'attuale centro di Chioggia si mostrano curiosamente isorientati con la centuriazione meridionale di *Pata-vium*.²⁴ Più difficile è invece dire se questo potesse verificarsi anche nel settore più meridionale, non essendoci al momento alcuna evidenza che la trama della *centuriatio* che definiva l'agro adriate²⁵ potesse estendersi fino alla costa.

Diviso o meno, è comunque abbastanza certo che la primaria vocazione del territorio litorale fosse decisamente di carattere commerciale, come suggerisce l'archeologia, che ben documenta una vasta presenza antropica a supporto di una fitta rete di scambi:²⁶ c'erano aree portuali maggiori lungo la costa, vicino alle principali bocche di porto, e scali minori all'interno con la funzione di servire da punti di appoggio alla navigazione interna e da nodi commerciali in direzione dei principali centri urbani. La presenza di àncore di epoca romana, recuperate in mare in zone circoscritte e antistanti le antiche bocche di porto, spingerebbero d'altra parte ad ipotizzare l'esistenza di stazioni di ancoraggio poste sul lato a mare, dove sarebbe avvenuto un trasferimento delle merci da navi d'altura ad imbarcazioni di più basso tonnellaggio, più adatte alla navigazione attraverso fiumi e canali.²⁷

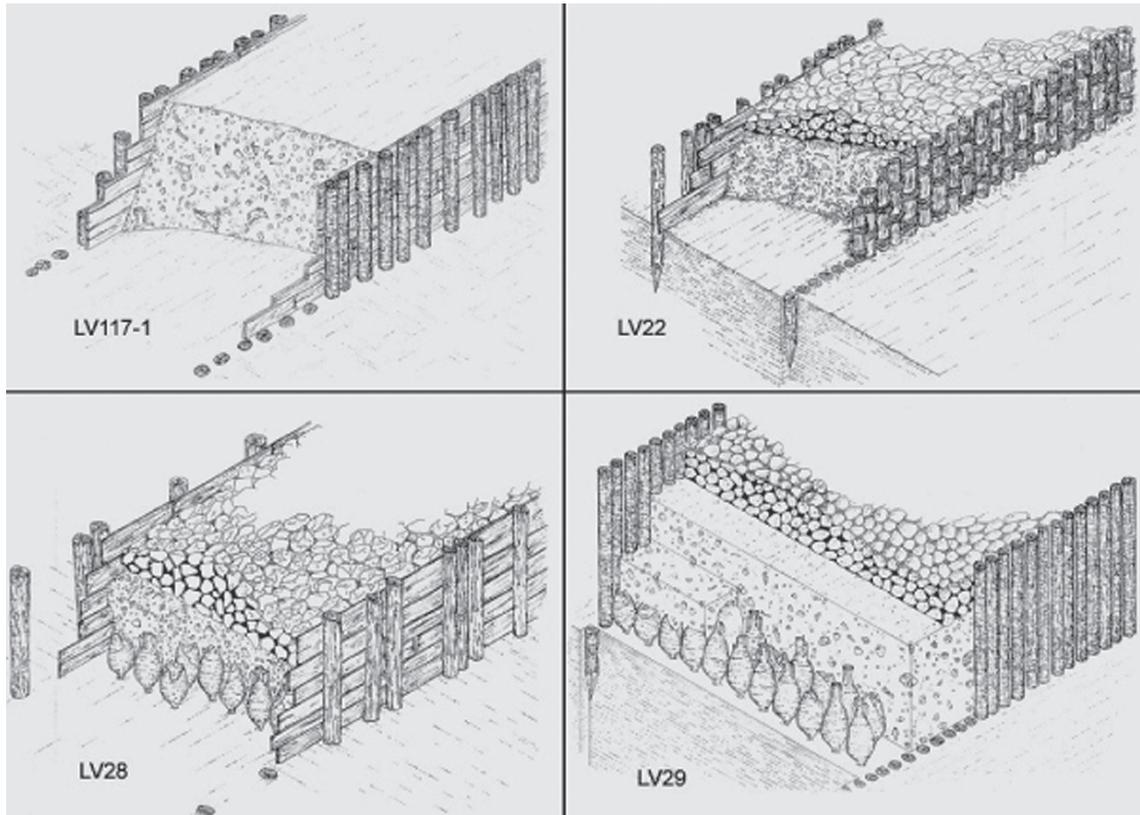


Fig. 6: Differenti tipologie di argini-strada documentati in laguna.

Potremmo allora riconoscere negli scali a mare, come quelli archeologicamente documentati a Scanello e Malamocco (fig. 7),²⁸ punti di raccolta di beni che da qui sarebbero stati immessi in un circuito di distribuzione interna, raggiungendo approdi secondari variamente dislocati all'interno delle *paludes* e, quindi, i principali centri abitati sulla terraferma. Esempi di queste realtà portuali minori possono essere viste negli insediamenti di Sacca Le Case²⁹ e di Lio Piccolo (fig. 8),³⁰ nel settore settentrionale e, probabilmente, nel sito di Corte Cavanella in quello meridionale. Questi stessi insediamenti dovevano comunque fungere anche da luoghi di sosta e punto di riferimento, oltre che per imbarcazioni provenienti dal mare, anche e soprattutto per il traffico all'interno delle paludi, come suggerisce l'evidenza di basamenti di torre a pianta quadrata rinvenute in varie località della laguna nord³¹ e verosimilmente funzionali alla segnalazione dei principali nodi idroviari altrimenti non facilmente riconoscibili in un ambiente palustre caratterizzato da canali, barene e bassifondi.

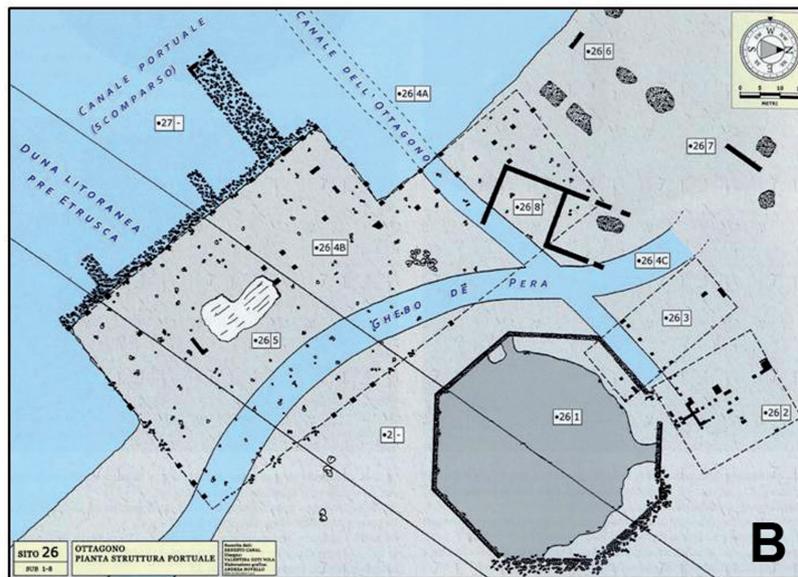
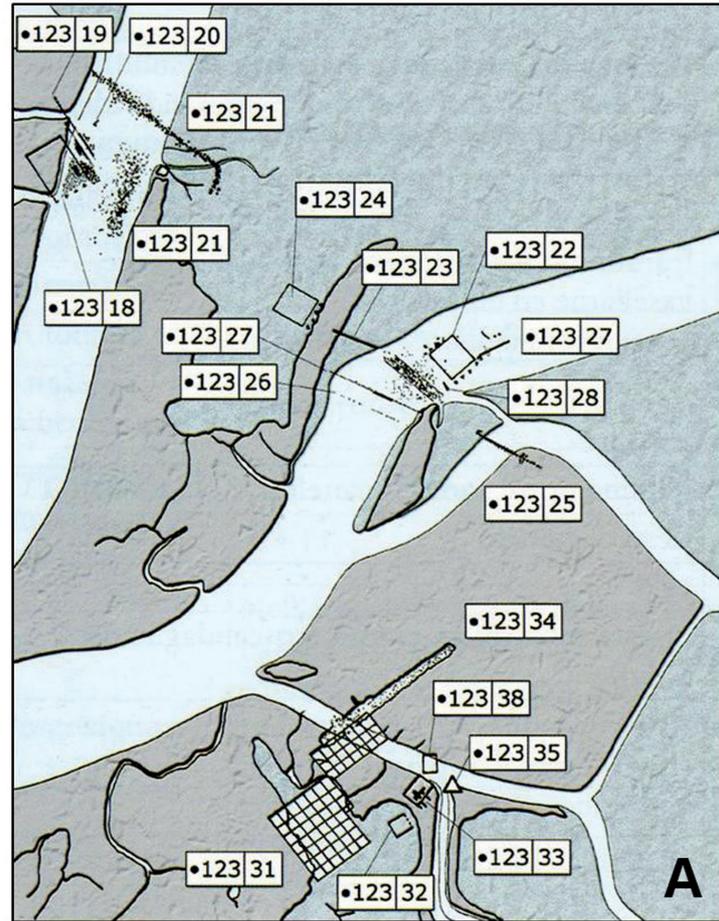


Fig. 7: Esempi di insediamenti portuali maggiori: a) Scanello; b) Malamocco.

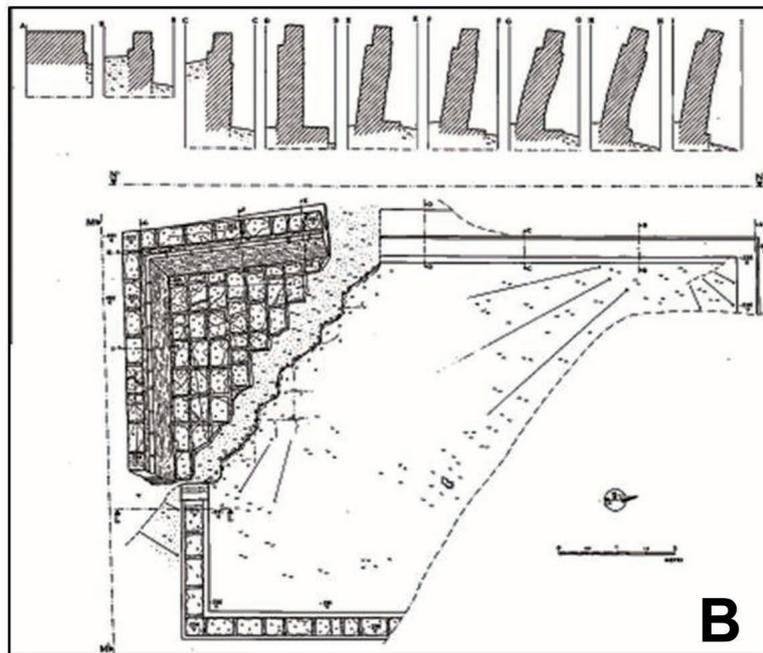
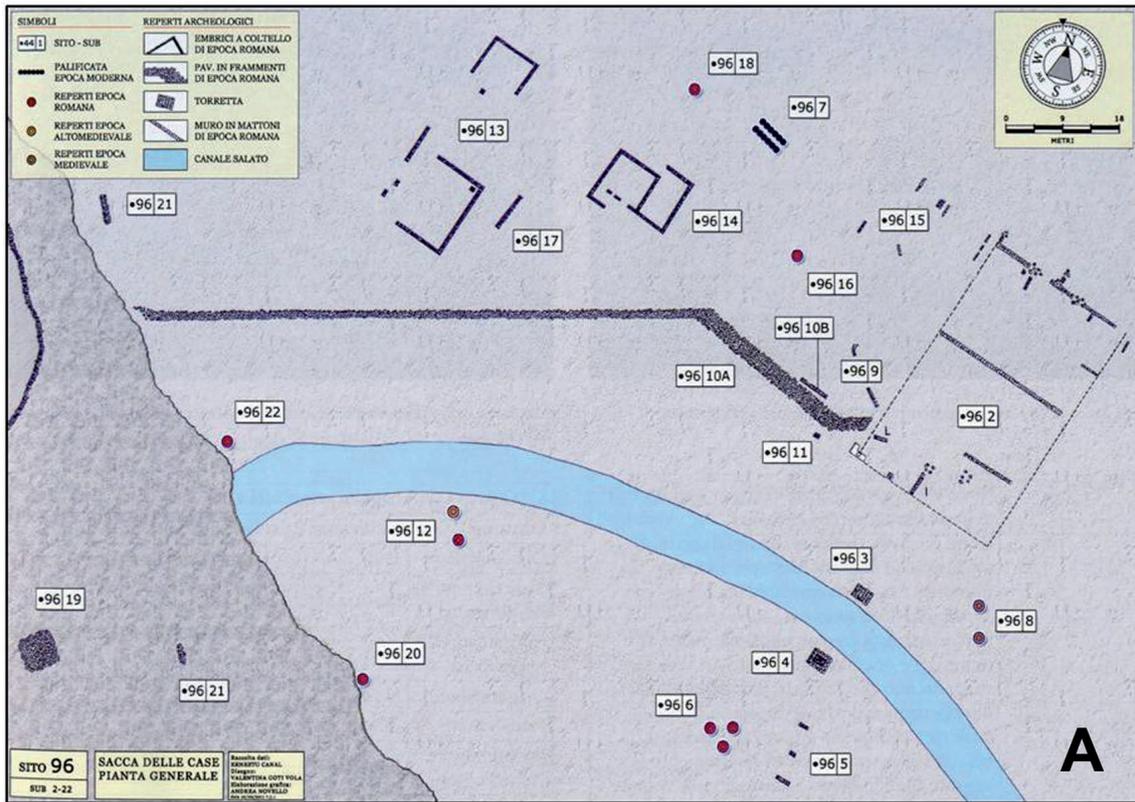


Fig. 8: Esempi di insediamenti portuali minori: a) Sacca Le Case; b) Lio Piccolo.

Considerazioni finali

Il litorale alto adriatico tra *Atria* e *Altinum* era dunque in epoca romana caratterizzato da un'articolata e complessa struttura territoriale e insediativa, funzionale da un lato ad ottimizzare le prerogative marittime della regione e, dall'altro, all'insediamento e allo sfruttamento delle risorse ambientali. In questo senso, l'alta differenza delle evidenze archeologiche tra i vari settori può verosimilmente riconoscersi nel diverso aspetto morfologico della piana litorale: se, infatti, a nord l'alta disponibilità di terra emersa avrebbe favorito e incentivato un'occupazione diffusa, nei settori centrale e meridionale la presenza fluviale di Brenta, Adige e soprattutto Po, interrando gradualmente la più antica laguna, venne a creare un ambiente palustre poco propenso ad ospitare insediamenti stabili, che per questo dovettero prevalentemente collocarsi lungo il margine interno delle *paludes*.

Questo avrebbe d'altro canto favorito anche la messa in atto, da parte dei principali centri urbani di riferimento, di differenti modelli di gestione territoriale. Sembra infatti verosimile pensare che nei settori inseriti all'interno degli agri di *Altinum* e *Atria*, ovvero due centri portuali fortemente legati ad attività di tipo mercantile, fossero interessi economici prevalentemente diretti al commercio ad indirizzare popolamento e sfruttamento delle risorse, tanto marittime quanto palustri. Mentre per l'area di influenza patavina, con un centro di riferimento principalmente proiettato all'interno, sembrerebbe abbastanza logico che la maggior parte degli insediamenti fosse attratto dalla terraferma, lasciando sostanzialmente alla zona litorale una semplice funzione di collegamento con la costa adriatica, dove la presenza di importanti realtà portuali ben si integrava all'interno della rete di comunicazioni tra Ravenna e Aquileia e, soprattutto, delle principali rotte marittime alto-adriatiche.

Note

¹ Vitr. 1, 4, 11.

² Liv. 10, 2.

³ Bosio 1979.

⁴ Plin. nat. 3, 120.

⁵ Itinerarium Antonini 126, 6.

⁶ Bondesan 2004.

⁷ Rosada – Zabeo 2012.

⁸ Primon 2004.

⁹ Strab. 5, 1, 7, 5–8.

¹⁰ Dorigo 1995.

¹¹ Plin. nat. 3, 121.

¹² Matteazzi 2019.

- ¹³ Bondesan et. al. 1995.
¹⁴ Bosio 1979.
¹⁵ Rosada 2003.
¹⁶ Matteazzi 2019.
¹⁷ Canal 2013.
¹⁸ Matteazzi 2019.
¹⁹ Canal 2013.
²⁰ Canal 2013.
²¹ Marchiori 1990.
²² Zabeo 2016.
²³ Canal 2013.
²⁴ Matteazzi 2014.
²⁵ Matteazzi 2017.
²⁶ Canal 2013.
²⁷ Rosada – Zabeo 2012.
²⁸ Canal 2013.
²⁹ Canal 2013.
³⁰ D’Agostino – Medas 2010.
³¹ D’Agostino – Medas 2010.

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SESSION 3

**Systems of production:
land use, industry, technology,
artistic production**

**Organization of Space and Work:
Potter's Workshops in the Greek World**

Panel 3.2

Organized by

Jon Albers

Cumae: Imports and Productions in the Archaic City

Giovanna Greco

The Site

The recent archaeological investigations between Pithekoussai and Cumae allowed us to fix a series of well-established data in the bibliography based on the reading and interpretation of ancient sources. On the island of Ischia, strategically placed along the metal routes, the first Euboean settlement was established during the first half of the 8th century BC. The new colony of Cumae on the mainland that the ancient sources consider the oldest Greek *apoikia* in the west was founded later and with the contribution of other groups of Greeks migrating from the motherland.

The archaeological research on the island, conducted for decades by Giorgio Buchner and David Ridgway with exceptional methodology and attention, has allowed these events to be placed during the first half of the 8th century BC. Instead, we must record, for Cumae, a considerable lack of research; its exploration and the relative scientific debate, especially for the Archaic period, were substantially linked to the works of Emilio Stevens and to the edition of Ettore Gabrici, to the early 19th century. Cumae returned, for a long time, only shreds of documentation, sporadically and inorganically recovered, proof of a reality much more complex. For many centuries, fortuitous recoveries, spooling and stealing marked of research in the most ancient Greek colony of the west. The history of research in Cumae has been already told and is a rather edifying story for Italian archeology; it is only at the beginning of the 20th century that the Italian State finances the first research and excavation works in Cumae; on the Acropolis the Temple of Apollo and that of Jupiter were discovered, but the most evocative and exciting find, which obviously had a great echo, was the c. d. *grotta della Sibilla*, whose discovery seemed to evoke the Virgilian mythology.

In 1927 the Archaeological Park of Cumae will be established and the research, with alternating events, most often solicited by external emergencies, almost exclusively invest the Acropolis; to Amedeo Maiuri we owe the first exploration the flat part at the foot of Mount Cumae, which led, among other things, to the discovery of the Capitulum and the Roman Forum (fig. 1).

But the area of the lower city still remained firmly in the hands of private individuals who continued to cultivate the land and to inhabit a splendid eighteenth-century *masseria*, known as Masseria del Gigante, for the discovery of the colossal torso marble of Jupiter, today at the MANN (Museo Archeologico Nazionale Napoli)

This, in a very short summary, is the history of research in Cumae, which for many years has remained an unknown land, and not only for the scientific community.¹

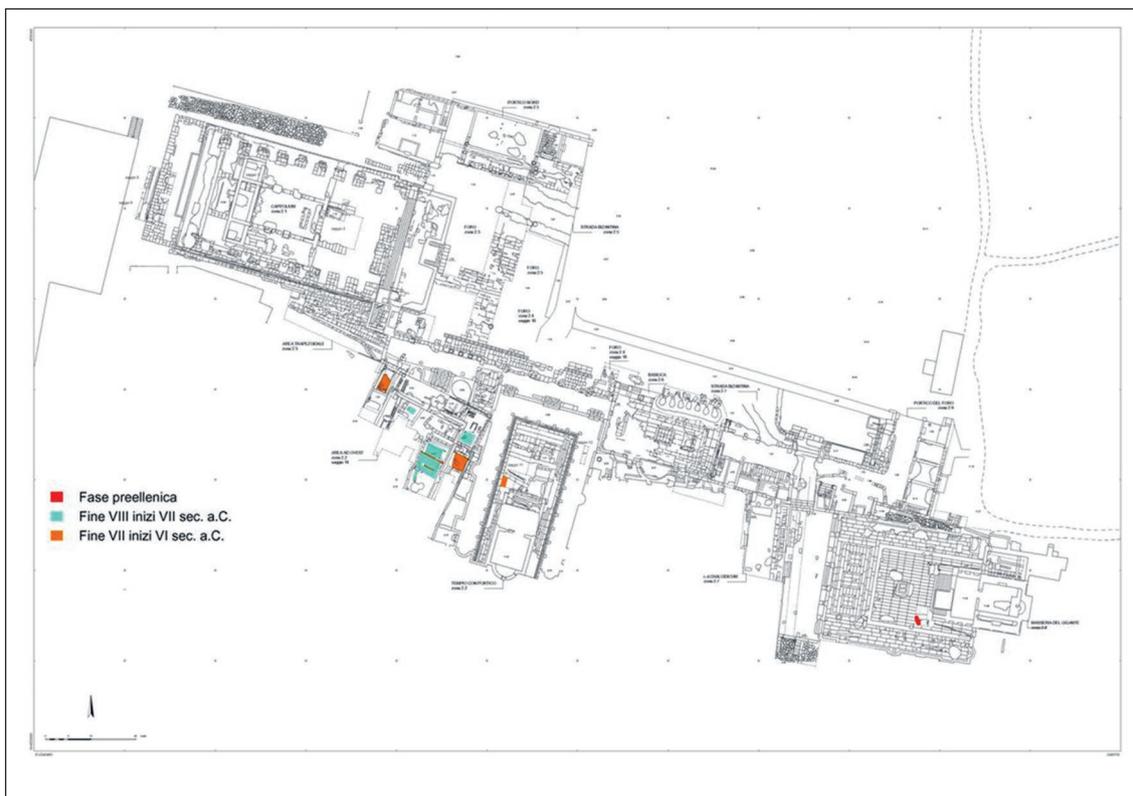


Fig. 1: Cumae. Roman Forum.

New Research (fig. 2)

We had the first systematic program of wide-ranging research only in 1994, funded by the Campania Region with funds from European Union, organized by the Department of Antiquities of Naples. The Kyme project, carried out in three successive steps (1994–1996, 1999–2002, 2004–2006) involved were the main scientific Neapolitan institutions: the University Federico II, the University “L’Orientale” and the Center Jean Bérard.²

The aim was to start a wide exploration of the ancient city to define the urban organization, the port area, the defensive walls, the public monuments, the extension of the urban areas, with the final aim of giving back to the public one of the most fascinating archaeological realities of the ancient world, which became part of the collective imagination of western culture, thanks to the song of Virgil.

Slowly the structural and material reality of Cumae emerges from the shadow of a research that has never really been planned and the shape of the city begins to give back form and structure. From the reconstruction of the geomorphological evolution of the coast and the agricultural landscape to the better knowledge of the pre-Hellenic settlement, there are numerous innovations triggered by the research carried out in the last twenty years.



Fig. 2: Cumae. Roman Forum. Panoramic view.

The new data show how the native settlement was actually much more extensive and articulated than assumed in the literature and occupied, in a scattered form not only the plateau and the slopes of Monte di Cumae but also the flat area facing the coast.

It is only around the middle of the 8th century BC. that on the graves of the indigenous people, covered with lapilli, a sedimentation level is formed, determined both by natural inputs and by land reported to level and plan a different form of occupation of the area that will be used as an indigenous and Hellenic necropolis.³ The consistent presence of pottery of indigenous production, mixed with the first Hellenic ceramics and in stratigraphic relationship with the first housing structures of the Greeks allow to outline for a settlement reality for Cumae parallel to Pithekoussai with, in the early stages of colonization, the formation of a still mixed Greeks – indigenous community, of which we certainly do not know the relations of strength, of alliance, of cohesion (fig. 3).

The excavations in the “lower town” returned a substantial amount of Greek pottery that dated around the middle of the 8th century BC, significantly reducing the chronological hiatus with the settlement on the island. And the most significant evidence is the contextual presence of ceramics produced in local clay in imitation of the imported Euboean or Corinthian ceramics; these materials are the same as those found in Pithecusae. A enduring presence on the coast in the third quarter of the 8th century BC, as



Fig. 3: Cumae. Masseria del Gigante. Graves of the Indigenous people.

evidenced by the many materials found in the whole area of the “lower town”; relations and contacts with the indigenous people who live in the area date back, however, to about half of the century as evidenced by the well-known chevrons cups of Euboean production found in a pre-Hellenic tomb, such as “exotic” and valuable elements of the grave offerings.⁴

But the new discovery of an early Archaic houses of the Greek colony arranged on a fairly extensive area, dates back to the last quarter of the 8th century BC (fig. 4a–c).

The residential area, probably organized by sectors, already delimited and destined to housing buildings since this first moment, lives with different transformations and extensions up to the final decades of the 6th century BC when this settlement is removed to make space for a different organization that will be reserved for monuments with exclusively public and sacred functions (a first phase of public Agora).⁵

New monumental buildings were erected with in the area, which show constructive techniques, orientations and planimetric organization that are completely different from the houses they replaced.

The most recent materials date the start of this urban program in the final decades of the 6th century BC, while the use phase covers the entire 5th century BC. It is a process of political organization that, very probably, started a few years before the appearance on the political scene of the town of the figure of Aristodemus, to which the definition and completion of the urban planning revision of the town, on the other hand well emphasized in the fortification walls, in the construction of two impressive public works, such as the sewage collector and the large moat and, on the Acropolis, in the construction of the monumental Temple of Jupiter. The Greek town between the 6th and 5th century BC seems therefore well organized around a political/cultural center, in monumental forms, in the flat part at the foot of the Acropolis where it defines the space intended, in all likelihood, to the Agora and its sacred and public buildings. The town, protected by a powerful defensive wall, is also equipped with impressive civil works functional to the development and exploitation of living spaces while the necropolis continues its development outside the walls along the plain of Licola and the Acropolis remains destined for sacred functions.⁶

At the end of the 5th century BC (421 BC) the Samnites who had already taken Capua in 423 BC, conquered Cumae and the monumental buildings of the Classical age are destroyed and the decorative materials as well as the votive are discharged and sealed in pits, with proper closing ceremonies that perpetuate them the cultural and votive character. The element that marks a clear *caesura* with the Greek urban planning organization most is the introduction of a new orientation for the buildings, which nevertheless retain the sacred/public character that the area already had in the times of Aristodemus. So the public square (Agora) retains its function but has a different orientation and is bordered by a mighty yellow tuff wall that is the background of a first *portico* that borders, on the long sides, the open public space.⁷

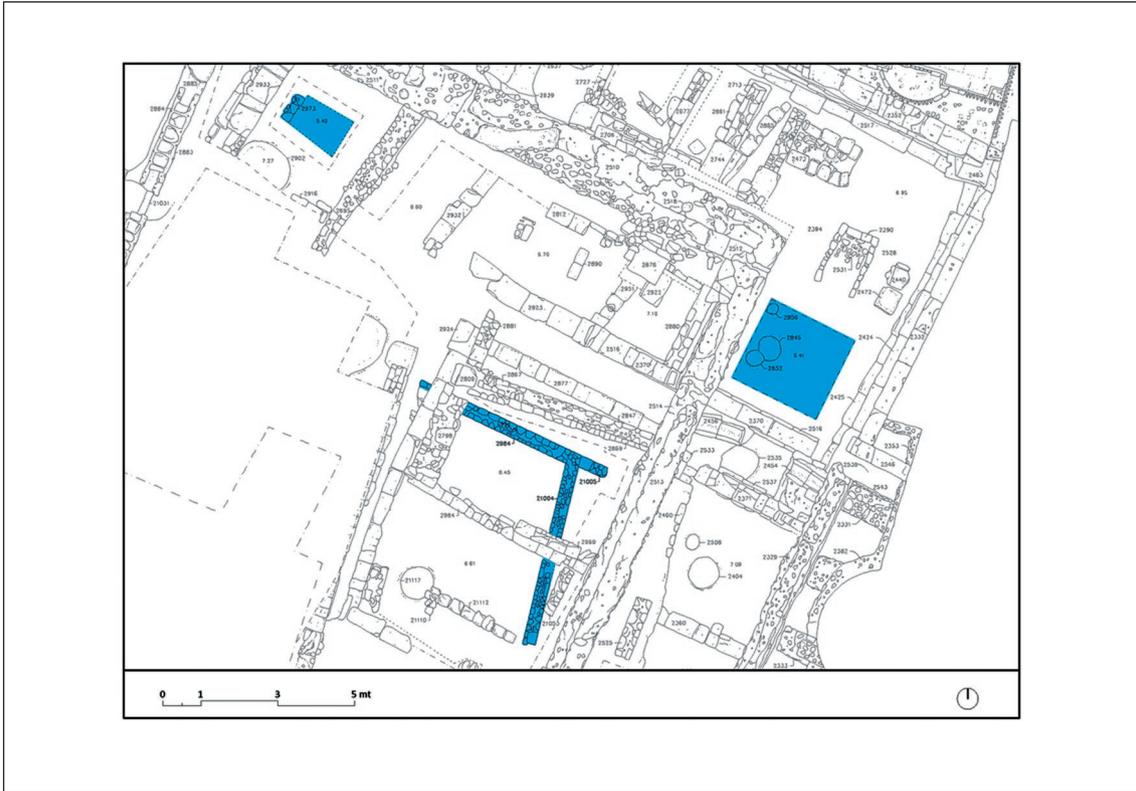




Fig. 4a–c: Archaic houses.

The history of the town changes deeply and it is the moment of the alliance with Rome that will lead to the assumption by the Samnite city of the *civitas sine suffragio* (338 BC).⁸

Imports (8th–7th century BC)

This brief summary of the news resulting from the last season of archaeological research in Cumae is the setting for the issue of pottery classes imports, not only from Greece, alongside a rich and varied local production that starts from the beginning of the settlement⁹.

In Cumae they products from Corinthian, Argive, Ionian, Rhodian-Cretan, Oriental, Attic, Laconic and Phoenician workshops arrive from the first moments of the most ancient phases settlement; the notable presence of Etruscan bucchero, which appears towards the decline of the 7th century BC, is one of the most recent acquisitions of research. The considerable quantity, quality and variety of materials found speak for a flourishing economy, involved in traffic and trade routes that cross the western Mediterranean.

A comparative work between the pottery imported at Pithekoussai and Cumae showed a strict homogeneity between the two centers, thus revealing an identical commercial trend, a clear sign of an identical form of consumption and product choices; and the affinities between the two settlements are also recorded for the presence of other archaic productions such as bucchero and Etruscan-Corinthian pottery, well attested in both sites (fig. 5).¹⁰

The frequency-tables made on the materials imported into the two centers, while providing some taxonomic data, although still very labile, reflect rather clearly a Mediterranean circulation of productions, as shown by the known wrecks in the bibliography (such as that of Giglio) where there are coexistences of products from shops and different areas; however, it is the choices of the products and therefore their consumption and forms of absorption that define the identity and homogeneity between Pithekoussai and Cumae in the Archaic period; at the same time they define well the economic relationships that had to exist among different peoples such as Greeks, Orientals, Cypriots, Phoenicians, Etruscans at an equal level of exchanges and contacts.¹¹

The first attested production is, obviously, the ceramics of Euboic production due to a chronological horizon of the half of the 8th century BC (MG II/TGI) present both on the island and on the mainland, although in different contexts; on the mainland the context is still purely indigenous and it has been well demonstrated, just by the recent revision of pre-Hellenic materials, that the indigenous settlement on the coast was lively and flourishing, in close exchange with both the northern Lazio communities and the Villanovan groups of northern and southern Campania (Pontecagnano and Sala Consilina)

PRODUZIONE	PERIODO									
	775-750	750-725	725-700	700-675	675-650	650-625	625-600	600-575	575-550	
	MG II	TG I	TG II-PCA	MPC	TPC	TR	CA	MC	TC	
	SECOLO									
	VIII sec.			VII sec.				Prima metà VI sec.		
Euboico-cicladica	P									
	C		I							
Corinzia		P								
		C								
Argiva		P								
			C							
Laconica							P			
							C			
Fenicio-cipriota		P								
			C							
Rodia			P							
Rodio-Cretese (KW)			P							
			C							
Orientale		P					P			
			C			C		C		
Chiota										
Ionica (coppe)								C		
								P		
								C		

Fig. 5: Pithekoussai and Cumae: imported pottery.

and with those of Valle del Sarno. The chevron Euboic cups, found on the island, come instead from an already Hellenic context referable to a first generation of the Greek colony. It is only in the last quarter of the 8th century BC, when there relations with the indigenous communities are deeply modified, that the presence of imported pottery, in Cumae, shows a remarkably significant peak of attestations, a clear sign of a not sporadic presence or linked to relations of exchange and contacts, but rather a sign of a better structured settlement. The housing structures highlighted in the flat area at the foot of Monte di Cumae constitute the clearest evidence of a now Hellenic occupation and of a transformation of the use of the space that, from necropolis and indigenous settlement, becomes the seat of a stable Greek settlement that soon, already in the first decades of the seventh century, it will assume urban connotations.¹²

The first imported ceramics offer a very varied and rich panorama: a lekythos of the TG II in a Cumaean grave is an Argive production while a presence of pottery from Phoenician-Cypriot workshops is attested in the Archaic settlement, mainly plates datable between the TGII and the MPC. The large transport containers document the arrival of products from the eastern Mediterranean even more clearly and reflect a circuit of trade and relations that invests almost all the main centers facing the Mediterranean. In Cumae as well as in Pithekoussai, there are amphorae from Chio, SOS Attic amphorae, Corinthian amphorae type A, Phoenician amphorae of TGII, amphorae from Lesbos that well document the influx of products and the trafficking network in which Cumae. It is perfectly included (fig. 6a–b, 7a–b). But it is Corinthian pottery that constitute the most quantitatively significant nucleus of imports; the fossil guide, for these high Archaic levels from the urban area is the Thapsos type cup with or without panel; there are also numerous kotylai, pyxis, lekythoi coming from Corinthian workshops, while the form of the *aryballos* is less widespread, and even less so, that of the *alabastron*, forms, however, better attested in the necropolis.¹³

For the first time, in the houses, the crater-calyx appears. Early a local pottery production of imitation takes place during the first decades of the 7th century BC and replacing, almost entirely, the flow of imports from the Corinthian workshops.

PRODUZIONE	FORMA	CONTESTO	BIBLIOGRAFIA
Euboica	Anfora TG II	Pithecusa, necropoli	Buchner-Ridgway 1993
Corinzia	Anfora grezza TG I-II	Pithecusa, necropoli	Buchner-Ridgway 1993
	Anfora grezza TG II	Pithecusa, necropoli, abitato Monte Vico, Scarico Gosetti	Buchner-Ridgway 1993; Di Sandro 1986
	Anfora Tipo A VII-VI sec.	Pithecusa, necropoli, abitato Monte Vico, Scarico Gosetti, abitato punta Chiarito	Buchner-Ridgway 1993; Di Sandro 1986 Gialanella 1994
Fenicia	Anfora grezza TG I	Pithecusa, necropoli	Buchner-Ridgway 1993
	Anfora grezza TG I-II	Pithecusa, necropoli	Buchner-Ridgway 1993
	Anfora grezza TG II	Pithecusa, necropoli	Buchner-Ridgway 1993
	Anfora a spalla emisferica distinta TG II	Pithecusa, abitato Monte Vico, Scarico Gosetti.	Di Sandro 1986, p. 91.
PRODUZIONE	FORMA	CONTESTO	BIBLIOGRAFIA
Chiota	Anfora protochiota TG II	Pithecusa, necropoli	Buchner-Ridgway 1993
	Anfora chiota C	Pithecusa, necropoli	Buchner-Ridgway 1993
	Anfora chiota Metà VII-inizi VI sec. a.C.	Pithecusa, abitato Monte Vico, Scarico Gosetti.	Di Sandro 1986, p. 58, Tav 11.
	Anfora chiota Inizi-metà VI sec. a.C.	Pithecusa, abitato Monte Vico, Scarico Gosetti	Di Sandro 1986, pp. 54-57, Tav 11.
Greco-orientale	Anfora grezza ad ogiva TG II	Pithecusa, necropoli abitato Monte Vico, Scarico Gosetti	Buchner-Ridgway 1993 Di Sandro 1986, pp. 100-101
	Anfora di Lesbo II quarto del VII sec. a.C.	Pithecusa, abitato Monte Vico, Scarico Gosetti	Di Sandro 1986, pp. 86-87
	Anfora VII sec. a.C.	Pithecusa, abitato Monte Vico, Scarico Gosetti	Ridgway 1984, pp. 102-104, fig. 23
	Anfora VI sec. a.C.	Pithecusa, abitato Monte Vico, Scarico Gosetti	Di Sandro, 1986, pp. 77-81
Attica	Anfora SOS TG II	Pithecusa, necropoli, Pithecula, abitato Monte Vico, Scarico Gosetti	Buchner-Ridgway 1993 Di Sandro 1986

Fig. 6a-b: Cumae. Anforae.

PRODUZIONE	FORMA	CONTESTO	BIBLIOGRAFIA
Corinzia	Anfora tipo A Inizi del VI sec. a.C.	Abitato – Area del Foro Mura arcaiche - terrapieni	<i>Cuma. Le fortificazioni</i>
Fenicia	Anfora grezza TG II	Necropoli	Catalogo Museo Campi Flegrei, p. 198
Chiota	Anfora chiota Fine VII-inizi VI sec. a.C.	Abitato – Area del Foro Mura arcaiche - terrapieni	Tomeo 2008 <i>Cuma. Le fortificazioni</i>
Greco- orientale (generico)	Anfora di Clazomene Seconda metà del VII-VI sec.	Abitato – Area del Foro Mura arcaiche - terrapieni	Tomeo 2008 <i>Cuma. Le fortificazioni</i>
	Anfora di Lesbo VI sec.	Abitato – Area del Foro Mura arcaiche - terrapieni	Tomeo 2008 <i>Cuma. Le fortificazioni</i>
	Anfora VI sec.	Mura arcaiche - terrapieni	<i>Cuma. Le fortificazioni</i>
Nord-Egeo	Anfora VI sec.	Mura arcaiche - terrapieni	<i>Cuma. Le fortificazioni</i>

PRODUZIONE	FORMA	CONTESTO	BIBLIOGRAFIA
Laconica	Anfora Prima metà VI	Mura arcaiche - terrapieni	<i>Cuma. Le fortificazioni</i>
Attica	Anfora SOS TG II	Necropoli Fondo Artico Abitato - Area del Foro Mura arcaiche - terrapieni	Pellegrini 1903, coll. 261-263, fig. LII Tomeo 2008 <i>Cuma. Le fortificazioni</i>
	Anfora à la brosse Primo-secondo quarto del VI sec.	Abitato - Area del Foro Mura arcaiche - terrapieni	Tomeo 2008 <i>Cuma. Le fortificazioni</i>

Fig. 7a–b: Pithekoussai. Anforae.

Local Production of Corinthian Pottery (8th/7th century BC) (fig. 8)

Since the earliest stages of Greek settlement, both on the island and on the coast, the presence of locally produced pottery is remarkable, in the characteristic Phlegrean clay rich in tiny volcanic compounds, which incorporates and reproduces decorative forms and repertoires of the pottery imported from the motherland. The age-old question of the origin of the clay used for this production has not yet been completely clarified and it becomes, very probably, also completely pleonastic to continue to explore the different solutions. Geomorphological, petrographic, chemical and archaeometric studies and research have highlighted the use of a clay with a substantial identity both on the island and on the mainland, labeled under the generic name of 'flegrean clay'; and that there were deposits of clay as well as on the island (as assumed by G. Buchner) also on the mainland, today it is not at all to be excluded; on the other hand, there were ceramic workshops in Cumae since the first moments of the colonial settlement, it is very plausible that an import from the island of both clay and pottery is not very cheap and rather unproductive; the two centers – on the island and on the mainland – are both producers and are perfectly bipolar and mutually independent; that then the formal

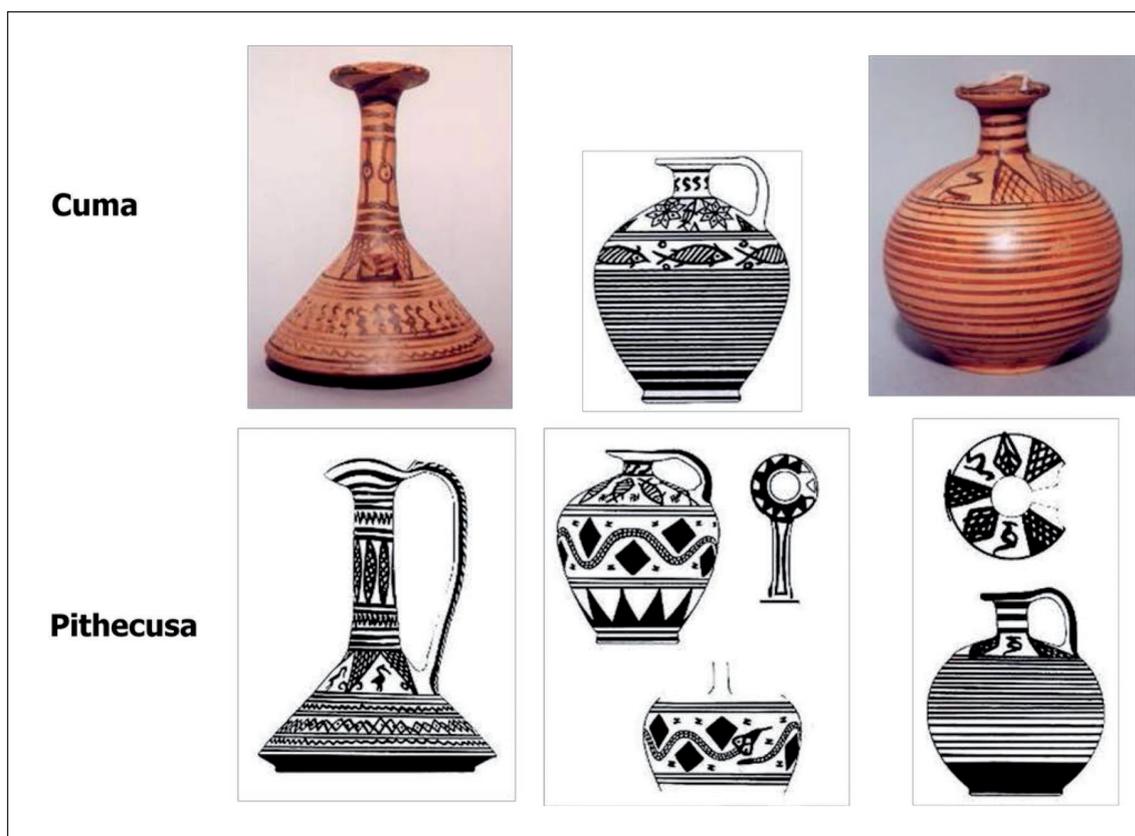


Fig. 8: Cumae. Corinthian pottery: local production.

and decorative repertoire reflect the same trend, the same style and the same figurative language is the result of the common roots and common parameters of reference of the artisans. The essential contribution of the archaeometric analysis has allowed to identify and define the local productions – on the island or on the mainland – which are already developed during the second half of the 8th century BC, acquiring formal and decorative repertoires from imported products but determining choices, selections and methods of production of all their own such as to make this local production perfectly identifiable and distinguishable. The production of imitation Corinthian pottery is of the highest technical and qualitative level, perfectly able to rival the products that continue to flow from the Euboian and Corinthian workshops; the Pithekoussan-Cumaean workshops intensify the production especially in the last quarter of VIII and, during the 7th century BC, local production will almost completely displace the imported one.

The Cumaean fabric of the Corinthian pottery includes a not very varied formal repertoire; the forms are substantially that used for eating and drinking; in the contexts of the urban area the association between skyphos/oinochoe as well as in the necropolis is well attested; the basic set used for the consumption of wine, provides the association of skyphos/oinochoe/kotyle. The skyphoi are produced in two main variants: with an offset lip and a skyphoid cup and with a distinct lip; the decorative repertoire is still geometric and refers to the known repertoire of Corinthian prototypes such as Thapsos skyphoi; the *sigma* decoration in the panels, which diffuses mainly between PCA and MPC, is imitated by the imported ones; a simple decoration with bands on the lip characterizes many samples that have the main motif developed in a panel between the handles. The skyphoi without panel have a decorative repertoire with simple dark bands. Imported model and local production coexist in Cumae in the same contexts of urban area and local production is rather serial, products of a single workshop.

The *kotyle*, an open lipless shape with a deep cup with a continuous profile and two handles under the rim, is attested in local production from the PCA and presents a morphological development that covers a chronological arch from the end of the VIII and up to the middle around the 7th century BC; the decoration, in the area of the handles has very simple motifs: sigma, lozenges, birds, snakes, framed by vertical bands.

The *oinochoe* is the most attested closed form; it almost becomes the guiding fossil of this local production and a sort of ‘motivo firma’ of local workshops. The form is attested both in contexts of necropoleis and urban areas and the first attestations of a local production date back to the middle of 8th century BC Pithekoussai. The decorative repertoire proposes that of the Geometric Corinthian pottery: palmettes, rays, lotus flowers, animals, fish and snakes; the decoration develops on the shoulder while the neck and the body are decorated with Geometric patterns. During the time there is an evolution of the form from low and globular, with short neck, to global with a higher and slender profile, until it becomes almost pear-shaped; this variant will find greater development in the MPC. The local pottery that preserves, overall, the reference models, however, is characterized by a light yellow groove covering the entire surface of the vase and for a

more composite decorative repertoire that draws from different cultural areas. It clearly distinguishes a group of oinochoai known as *Ischia-Cuma-Tarquinia*, characterized by two main decorative motifs, the fish and the snake, drawn from Corinthian repertoire but reinterpreted and moved from their original location on the shoulder of the vase, to the more central to the point of maximum expansion of the body. The production is very homogeneous and is immediately recognizable. In the scientific discussion, the location of the production workshop between the island and the mainland still oscillates; the analysis of material from Cumae, compared with those of the Pithekoussai, allowed us to identify products from an identical workshop and identify some personalities of craftsmen whose products are indifferently present both on the island and on the coast.

The flat-bottomed *lekythos* is a peculiar form of the Corinthian pottery repertoire and becomes very widespread in local production starting from the PCA (last quarter of the 8th century BC); the formal repertoire is very conservative while the decorative one varies between zoomorphic and phytomorphic motifs; the elongated neck always has geometric decoration. Among the forms of the vessels produced by the Pithekousan-Cumaean workshops, stands out the crater, frequent at Pithekoussai while in Cumae it is attested in the urban area in few individuals, among which we highlight the one decorated with an animal theory that makes this exemplar unique in the Phlegrean production of pottery of the PCA.

The recently published study of this production has clearly highlighted the variety of the formal and decorative repertoire that make these products immediately identifiable; it is a production of high quality and craftsmanship and it has been possible to identify the activity of “artisans” specialized in certain figurative motifs. But it is above all the form of *oinochoe* that constitutes the representative form of production and it is no coincidence that, in the screening of the diffusion of these products that reach different locations in the western Mediterranean, the oinochoe/cup pair, the base of the symposium, is the most attested one, as if it were a sort of specialization on the market that seems to require this specific service for the symposium from the Phlegrean workshops of pottery.¹⁴

The products of this workshop – between Cumae and Pithekoussai – circulate between the end of the 8th and 7th centuries BC in the whole Campania plain and they are objects of prestige for the indigenous communities of the hinterland; more sporadically these products arrive in the Vallo di Diano and are attested, not surprisingly, to Zancle, founded, according to sources, from Cumaean pirates or to the Timpone della Motta in Francavilla, in the Sibaritide. To the north, ceramics from the Phlegrean workshops are present in Etruria (in Caere) as in Sulcis or in Carthage or in Andalusia; they are significant traces of the commercial role that first Pithekoussai and then Cumae had in the Mediterranean commercial circuits between the 8th and 7th centuries BC.

Other Local Productions of Pottery

Alongside this production that identifies and defines a very specific Phlegrean territory, there are also other pottery classes that show the shapes and decorative patterns of imported products; next to it is a local production that satisfies the needs of a settlement that has grown and become rich and powerful.

Thus, in the Phlaegrean workshops, a vessel class is produced for eating and drinking with linear decoration; as is the variety of the production of kitchenware and cooking vessel in raw clay; an intense mole production is also that of the large containers (amphorae and pithoi) of the bricks and painted architectural terracottas; it is all a wide range of Pithekoussan – Cumaean productions that goes through, almost without interruption, all the phases of life of Pithekoussai and Cumae. The kilns found in the excavations of Santa Restituta in Ischia document an artisan activity that lasts over time, from the first moments of the arrival of the Greeks on the island to the middle of the 8th century BC and up to the late Hellenistic age. And while the island has returned more material evidence of workshops – if we only take into account the more than 7 kilns of Santa Restituta – Cumae still has not been identified the working district, which even had to be very active. Still during the 3rd century BC, the cumaean workshops are specialized in the production of a particular type of vessel destined to the cooking that will become very famous and refined and it will be Marziale to immortalise the *patella cumana*, one of the first pans to experiment a sort of anti-stick film!

In this scenario, a rather lack of evidence linked specifically to production (scraps of kiln work appear rather late) stands out the discovery, in the levels of use of the Archaic high house, of scraps of the amber working that well document an artisan activity usually considered to be the prerogative of the indigenous world and rather they are documenting both a phase of cohabitation and sharing of spaces and productive activities and a revitalization of a craft with the characteristics of the indigenous world. A large bronze bar, with a trapezoidal shape and weight of 2,580 kg has been recovered in association, together with slag from iron and pebbles for working; they are minor but significant traces of a metallurgical work in Cumae, in the context of a high-Archaic settlement that will be better analyzed and deepened.¹⁵

Archaeometric Analyses

The analysis of the fabrics has been joined in all these years by studying the chronotypological analysis of pottery; at first, we examined and analyzed, for the Archaic production, the class of the fine banded ware and the Ionian cups; for the Classical age the black-glaze ware was examined.¹⁶

The work had three different stage of investigation: a first screening was made with the help of the Munsell tables; the next check was made by the use of a stereo-electron

microscope, according to the protocol developed within the FACEM project (in collaboration with the University of Vienna) and finally a further sampling was submitted to laboratory tests, both chemical-petrographic and mineralogical.

With the FACEM protocol numerous fabrics have been identified, however, referable to two main groups of fabrics: a type of calcareous clay, therefore with a higher percentage of calcite (CaCo) and one of non-calcareous type. Both types have a common origin and are characterized by the presence of volcanic components and therefore a different location of the production center cannot be defined. The distinction of the fabrics, moreover, goes back to the different ways of working the clay and to the addition or lowering of some degreasing agent. The local production is therefore realized through different qualities of fabrics that share similar characteristics that suggest the same raw material coming from the same deposit or from several argilliferous deposits but with the same geological characteristics. The interesting fact is the observation of an almost exclusive use of these fabrics along a chronological period between the seventh and the beginning of the 5th century BC, proof of constant preservation over time of both technological processes and sources of supply.

The results of the analyses allow us to confirm a Cumaean production of the fine-banded ware, starting from the first Archaic productions and up to the Ionic cups of the second half of the 6th century BC. Among the recognized non-local fabrics, a group of Ionic cups with a fabric from the Paestan area stand out, also exported to the south, to Elea, and to the north, to Cumae.

The petrographic, chemical-physical and mineralogical investigations highlighted the mineralogical components of the fabrics, characterized by a substantial uniformity, with inclusions of quartz, white and brown mica and the presence, among other minerals, of traces of pyroxene which clearly define the volcanic nature of the clays used and their relevance to a geographical area corresponding to that of the Phlegrean Fields; some variations are linked to the different production processes that establish the temperatures to be subjected to the ceramic during cooking.

The data that is certainly confirmed is the local production of the different pottery classes; it is a production characterized by a strong conservatism of both the formal and decorative repertoire as well as the processing techniques and the use of raw materials. The question of the location of the clay supply areas still to be identified in the territory of Cumae or more generally in the Phlegrean area remains open. A broader study of a geological nature in the Campi Flegrei area has returned a characterization of the Bay of Naples and a roughly similar composition of the raw materials throughout the coastal area. The absence, at the current state of research, in Cumae, of archaeological evidence of kilns or processing waste and other elements attributable to a productive activity, is, however, a clear limit to the reconstruction of the ways and forms of production Cumaean of pottery.

Notes

- ¹ Greco – Gasparri 2007.
² De Caro 2009, 295–301.
³ Cuma 2009.
⁴ Ridgway 1984, 134.
⁵ Greco 2009, 333–444.
⁶ D’Acunto 2011, 251–261.
⁷ Greco 2011, 35–53.
⁸ Liv. 8, 14, 11; Mele 2014.
⁹ Cuma 2009.
¹⁰ Greco – Tomeo 2012, 511–547.
¹¹ Buchner – Ridgway 1993.
¹² D’Acunto 2011, 251–261.
¹³ Greco et al. 2010, 30–36.
¹⁴ Mermati 2012.
¹⁵ Greco – Gasparri 2009.
¹⁶ Greco et al. 2014, 37–68.

Image Credits

Fig. 1, 2, 4a, 4c, 5, 6ab, 7ab, 8: Department of Humanities, University of Naples Federico II. – Fig. 3: Greco – Gasparri 2009, 14, fig. 2. – Fig. 4b: Greco 2009, 395, fig. 5.

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**(Re)Producing Images of the Divine
between Late Republican Times and Late Antiquity**

Panel 3.3

**Organized by
Marlis Arnhold**

Tokens and the Reproduction of Divinities in Hellenistic and Roman Sicily: Some Preliminary Case Studies

Antonino Crisà

Introduction

A token can be defined as a small object, variously shaped (circle, square, rectangle, etc.), produced and distributed by a private, commercial or state authority, normally used instead of money to exchange objects, obtain specific rights/privileges in certain contexts or communities, or to approve a payment as a receipt. We still use tokens in daily-life. For instance, if we are at the theatre and need to store our coat before a performance starts, an operator gives us a token with a number or code on it. This token has to be returned to the operator to get the coat back. Moreover, tokens are often distributed in hotels to obtain special services or free drinks. A more intangible form of tokens is represented by Bitcoins, which are now used in online transactions as an alternative, virtual currency.¹

Tokens have been produced since protohistoric times, serving as an easy calculation system which preceded alphabetic symbols and numbers. In the Classical world, these artefacts were still produced; tokens in this period were mostly monetiform objects. Called *symbola* in Greek and sometimes *tesserae* by the Romans, they were extremely widespread in the Mediterranean world. Tokens in the Mediterranean were made from a variety of materials (clay, lead, bronze, oricalcum, bone, ivory, etc.). They usually bear iconography, legends or symbols that have significant links to the economic, social, civic and religious aspects of the communities in which the token was produced and circulated. A short (but not exhaustive) outline of this phenomenon can help us to contextualise token production in the broad Mediterranean context.²

Lead and clay tokens were issued in Athens and showed a variety of religious symbols, Greek legends and even the names of commanders. In the Middle East Palmyra is well-known for its production of clay tokens (fig. 1), which carry religious and civic iconographies (divinities, priests, symbols and legends in Palmyrene language); these *tesserae* were used to access local banquets. We also know some small clay discs reproducing Hellenistic coin types were circulating in Syria. Substantial numbers of Roman lead *tesserae* were discovered during works along the banks of the river Tiber in Rome, and during excavations in Ostia. However, many issues concerning this complex phenomenon are still unresolved; much has been neglected by scholars and further investigation is necessary.³

Since 2016 the *Token Communities in the Ancient Mediterranean* project has been running at the University of Warwick a research project funded by the European Research Council (ERC), which will end in 2021. The on-going project aims to understand the role



Fig. 1: A typical banquet *tessera* from Palmyra (Syria).

of tokens in ancient communities in the Mediterranean from the Classical period to the 3rd century AD, focusing on a selection of thematic and geographical case studies.

This paper presents some preliminary results on the *tesserae* found in Sicily and recently ‘re-discovered’ in the island’s museums. Research has been carried out within the *Token Communities* ERC project between 2016 and 2019. In particular, we seek to outline two limited sets of archaeological finds, found in the province of Palermo and Messina. These tokens were produced at *Makella-Marineo* and *Tyndaris-Tindari* (fig. 2).

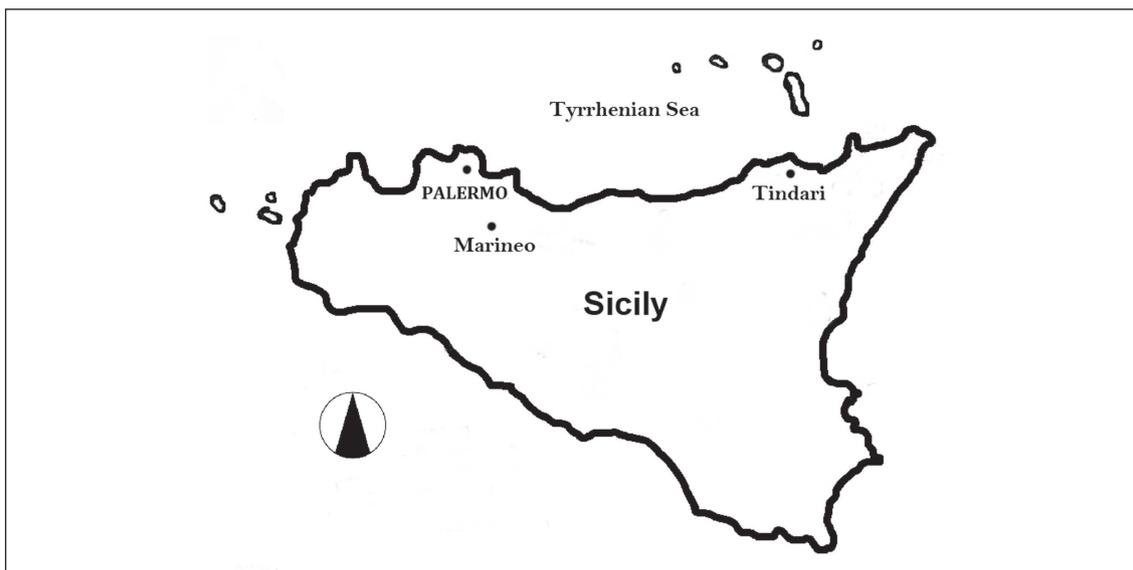


Fig. 2: Map of Sicily, showing the sites of Marineo (Palermo) and Tindari (Messina).

They provide essential data on token production in Sicily, which has never been studied before. Second, as small monetiform objects, they offer information on local religion in the region.⁴

Makella's Tokens: Directly Reproducing Demeter

Marineo (fig. 3), a small town ca. 40 km south-east from Palermo and 14 km east from Santa Cristina Gela, was of interest to antiquarian scholars. For instance, G. Calderone published a substantial monograph on Marineo at the end of nineteenth century, when the archaeological potential of “La Montagnola” was already known. More recently, I. Tamburello performed excavations between the 1960s and the 1970s. On that occasion, the local city council was planning to widen the small cemetery of Marineo close to the archaeological site. F. Spatafora continued investigations in the 1990s. We know that the archaeological structures and houses discovered correspond to the Sicilian settlement of *Makella*, whose name is reported on many tiles found on the site



Fig. 3: View of Marineo.



Fig. 4: Clay token from *Makella*-Marineo (Courtesy of Museo Archeologico “A. Salinas” Palermo, inv. n. 65041).

(ΜΑΚΕΛΛΑ). Historical sources are scarce and only report that *Makella* was conquered by the Romans in 260 B.C. (Pol. 1, 24.3) and revolted against them in 211 B.C. (Liv. 26, 21.14).⁵

Most trenches were opened by Tamburello and Spatafora to partially explore the settlement; they uncovered housing areas, walls and few necropoleis. It is not entirely clear when the early centre of the settlement was founded, but it can be inferred that *Makella* had a vital role in commercial activities in the Eleuterio River valley even before the 7th century BC. As far as we know, the site, which requires more in-depth investigations, had several different phases: a) Archaic and Classical (7th–4th century BC); b) Hellenistic (3rd–1st century BC); c) Medieval (6th–12th century AD). Among the small finds a fairly good number of tokens emerged in the last twentieth-century excavations.⁶

We have currently ‘re-discovered’ 22 unpublished finds from Marineo in two different Sicilian institutions: 17 tokens are preserved at the Palermo Museum and 5 are kept at the Civic Museum of Marineo (the “Museo della Valle dell’Eleuterio”). These *teserae* have moderately standard physical characteristics. They are stamped small discs of purified light orange clay; each disc has fairly regular dimensions (Ø ca. 30 mm).⁷

The reverse is always blank; the obverse shows a recurring iconography, namely a draped female figure standing and holding two torches. It certainly depicts Demeter searching for her daughter Persephone (or Kore), ready to descend into the underworld with her torches; these are one of the most common attributes of the goddess and also appear on Sicilian coins (e.g. the *Menaenum*-Mineo mint) (fig. 5). On the left there is a Greek legend – vertically arranged in two or three lines – which is difficult to read due to its tiny dimensions (ca. 3 mm) and the worn state of most of the tokens. In terms of



Fig. 5: Bronze coin of *Menaeum* showing a veiled head of Demeter and two crossed torches (Roman period).

dating, Marineo's tokens might be considered Hellenistic (4th–3rd century BC?), even if it is hard to determine conclusively a specific date: no specimen can be linked to stratigraphical data relevant to the Hellenistic phases of *Makella*. Of the two tokens with recorded findspots, one was a surface find and the other was found in a medieval layer. However, the Greek legend arranged in a similar manner to Hellenistic coins.⁸

As a goddess of agriculture, Demeter was popular in Sicily, not only in the main centres (e.g. Enna and Selinunte), but also in the inner and less urbanised regions, where grain cultivation and harvesting made her cult and ritual practices widespread. The search of Demeter for her daughter Persephone, who has been kidnapped by Hades and brought in the underworld, echoes the plantation, growth and harvest of cereals. Festivals in honor of Demeter were common in Sicily, Magna Graecia and Greece, and celebrated the goddess through sacrifices and initiation ceremonies, like the *Thesmophoria*, *Katagoge* and *Eleusinian Mysteries*. We also have a significant record of sanctuaries that have preserved votive deposits in Classical and Hellenistic Sicily.⁹

Tyndaris' Token: Reproducing the Dioscuri Indirectly

Tindari (fig. 6) is today a small town on the Tyrrhenian Sea, ca. 60 km from Messina in the municipality of Patti. It was founded in 396 BC by Dionysius I, tyrant of Syracuse, and conquered by the Romans in 254 BC (Diod. 14, 78, 5–6; 23 18, 5). From its beginnings ancient *Tyndaris* had a strong link to the Dioscuri, as the centre's name clearly proves: Tyndareus, mythical king of Sparta, was the father of Castor and stepfather of



Fig. 6: View of Tindari's promontory and the Tyrrhenian Sea.



Fig. 7: Bronze coin of *Tyndaris* showing a veiled head of Demeter and two caps of the Dioscuri with stars (Roman period).



Fig. 8: Clay token from Tindari's necropolis, found in 1896.

Pollux. The city's founders imported the cult of the sacred twins to the new colony, and the veneration of Castor and Pollux continued into the Hellenistic and Roman periods, as coins and mosaics at the *insula* IV quarter vividly demonstrate. In particular *Tyndaris'* coinage shows a substantial record of imagery linked to the Dioscuri (protectors of knights and sailors), who are represented directly as standing warriors or on horseback, or indirectly by symbols, like their caps (fig. 7).¹⁰

Two stylised caps of the Dioscuri also appear on a small clay token recently discovered among the small finds of Tindari's Antiquarium (fig. 8). Originally found in the excavations of the ancient necropolis directed by Antonino Salinas (1841–1914), Director of the Museum of Palermo, the specimen is an *unicum* so far. As with the tokens of Marineo, Tindari's *tessera* is a stamped disc of small purified orange clay (Ø: 34.59 mm; weight: 7.18 g) with a blank reverse. The caps of the two Dioscuri are represented as small ellipses with two crosses or stars above. The stars were symbols of the twins' rebirth.

As already mentioned, Tindari's token was found in late nineteenth-century excavations, when stratigraphical methods were not yet adopted in Sicily. Since we do not

know exactly in which stratum the token was discovered, the lack of such information makes stratigraphical dating method impossible. However, we can use other dating criteria. In particular, a coin issue of *Tyndaris*, dated to the second half of 1st century BC, shows an iconography which is very similar to that on the clay token. This might be used as a cogent dating comparison.¹¹

Conclusion

This paper has presented two sets of archaeological finds, which represent only a limited record of token production in Sicily. This subject is currently under investigation and needs further analysis. Nevertheless, our preliminary data offer much information on the process by which divine imagery was reproduced on a fairly new (and previously neglected) class of archaeological artefacts in Hellenistic and Roman Sicily.

Marineo's tokens provide further evidence on the cult of Demeter in the inner areas of the Palermo province, where Greek and Hellenistic cults found close connections with local (and also indigenous) traditions. All the Demeter tokens have emerged from *Makella*'s archaeological site. The number of tokens discovered so far is remarkable and has to be connected to a well-established diffusion on a local scale, the duration of which we do not know. In terms of production, *tesserae* stamps have not been found. This occurs very rarely: a stamp to produce so-called 'terracotta coins' ('monete di terracotta') has been discovered at Metapontum, but this appears to be an *unicum*. Even if the tokens of *Makella* seem to have a very narrow area of circulation, we cannot exclude the suggestion that further tokens might be found in other neighbouring centres in future excavations.¹²

Demeter also had a dominant role in a variety of ceremonies and religious services, like the Eleusinian Mysteries. It might be argued that the ancient city of *Makella* could be involved in such rites or festivals, in which Demeter was locally venerated and tokens might be used to obtain certain privileges within those events, or perhaps produced as votive objects. Although we do not have any archaeological evidence of a sacred area dedicated to Demeter at *Makella*, the city's inhabitants might have used a suburban sanctuary, the remains of which have not been discovered yet.

Although Tindari's *tessera* is so far unique, it adds further evidence to the cult of the Dioscuri in the city, whose community maintained local traditions. The Dioscuri's veneration was evidently common among sailors, since *Tyndaris* was a small centre on the Tyrrhenian coast and its economy was largely based on maritime activities (i.e. commerce and fishing), as well as on agriculture. Thus, local festivals and ceremonies dedicated to the Dioscuri were presumably common at Tindari and this small clay disc might be used to obtain specific privileges within those events, as occurred for instance in Palmyra with the banquet *tesserae*. As an alternative, the token might be used as an obol of Charon.¹³

Only further investigations in museums and a full analysis and publication of finds may offer a more detailed and thorough outline of this remarkable (and often neglected) class of material, which has significance for archaeology, history, numismatics, religion and local traditions.

Notes

¹ On new tokens and Bitcoins see: Wilding et al. 2017.

² On protohistoric tokens from Middle East see: Schmandt-Besserat 1992.

³ On Roman *tesserae* from the River Tiber see: Rostovtzeff 1903. On clay coin reproductions see: Milne 1939, 93–100. Contributions on Palmyra’s clay tokens are substantial; we only mention: Ingholt et al. 1955; Raja 2015, 165–186. On Athenian tokens see: Kroll 1977, 141–146; Kroll – Mitchel 1980, 86–96; Gkikaki 2019.

⁴ All archaeological materials are under publication by the author, including tokens from Marineo (Palermo) and other sites. He will fully publish more detailed and extensive articles (including relevant find catalogues) soon, assessing a variety of finds from Sicilian museums. For instance, a new article analyses a novel clay token from the archaeological excavations of Tindari’s necropolis (1896): Crisà 2019.

⁵ Calderone 1892, part II, 105–126; Tamburello 1969, 78–82; Tamburello 1970, 31–38; Tamburello 1991, 365–375; Spatafora 1993/1994, 1187–1198; Spatafora 1997, 111–136; Spatafora – De Simone 2007; De Simone 2015, 105–120.

⁶ Tamburello 1988, 23–29; Tamburello 1991, 366–373; Spatafora 1997, 131–136; Spatafora 2000, 895–918.

⁷ As said, a detailed paper and relevant find catalogue is currently under publication by the author. At present, we only have scant references to these tokens: Tamburello 1972, 40; Tamburello 1983, 63; Tamburello 1988, 45; Tamburello 1991, 370; Spatafora 1993/1994, 1195; De Simone 1997, 225–226, 233, nos. V1–V3.

⁸ On *Menaëum*’s coin see: Gabrici 1927, 145, nos. 13–20, pl. 7, n 34; De Simone 1997, 225f.: however, the author had dated these artefacts to 375–50 B.C; Spatafora 1997, 117f.

⁹ Ciaceri 1911, 3–5; Burkert 1985, 160–161; De Angeli 1988, 844–847. 891f.; Graves 1992, 89–92; Hinz 1998; Chirassi Colombo 2008, 25–43; Sfameni Gasparro 2008, 25–40; Zoppi 2015, 25–43.

¹⁰ Burkert 1985, 212f.; Crisà 2008, 235–268; Gulletta 2011, 606–654. On *insula* IV excavations and mosaics see: Bernabò Brea – Cavalier 1965, 205–209; Spigo 2005, 52–54.

¹¹ Calciati 1983: I, 83, n. 26; Crisà 2018, TIND.7.90, 319; TIND.7.91, 323; Crisà 2019.

¹² Mannino 2002, 286f.

¹³ It can be inferred that more tokens might be kept in the storehouses of the local Superintendence of Messina, which we could not investigate due to a lack of permission. Moreover, archaeologists might unearth other similar specimens at Tindari in the future. On the token, used as an obol of Charon, see: Crisà 2019.

Image Credits

Fig. 1: Ingholt et al. 1955, pl. 14, n. 252. – Fig. 2: by the author. – Fig. 3: by the author. – Fig. 4: photo by I. Carollo. – Fig. 5: Classical Numismatic Group, Electronic Auction 130, 4 January 2006, lot n. 163. – Fig. 6: by the author. – Fig. 7: Bertolami Fine Arts – ACR Auctions, E-Auction 49, 12 November 2017, lot n. 338. – Fig. 8: Soprintendenza BB.CC.AA. Messina, with no inv. n.; photo by the author.

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Budget Cuts and Material Expression of Religion

Kristine Iara

This paper derives from my larger research project on Rome's sacral topography in Late Antiquity,¹ a period of profound transformations in political, social, economic and religious terms, affecting both the physical appearance of the city and the civic and religious life of its inhabitants.² In this period, Rome's topography has been affected by three major circumstances or developments: (1) the absence of the emperor,³ (2) Christianization,⁴ and (3) changing economic and social conditions.⁵

The paper sheds light on the interdependence of 'budget cuts' in the funding for Roman religion and its material expression with a focus on the 4th century.⁶ This time span seems particularly appealing for an examination of the reciprocity of economic conditions and the material manifestation of religion, given that the bulk of investment and resources dedicated to the traditional religion lapsed, especially after the emperor's interest turned to the new Christian religion. The paper focuses on three specific questions within the overall of transformations affecting the city of Rome. (1) First, can we detect an impact of decreasing economic resources on activities of religion? If so, is this due to a general decline of available economic resources or rather to the 'budget cuts' that came with the imperial legislation that restricted Roman religion? (2) Second, who were the persons or the groups of persons who had an ongoing interest in investing into religious objects? (3) Third, how did all this affect topography, and to which extent did it become visible?

(1) Can we detect an impact of decreasing economic resources on Roman religion, both material appearances and activities? Three different contexts are considered in the following.

First, temple buildings: The monumental evidence testifies to ongoing funding of religious buildings or other materials as well as religious festivals, on an official level. No new buildings for religious purpose have been erected in this period, but there are several cases of restorations or the rebuilding of temples. Although it *seems* that the evidence for such activities, even more: for such *religiously* motivated activities is numerous, we have to keep in mind that restorations, maintenance, erection and rebuilding of the city's public buildings were among the usual responsibilities of a magistrate within his secular office. Even when contemporaneously the activities within Roman religion were more and more restricted, temples remained public property, and as such, they were protected from structural damage. Thus, maintenance work on the temples of Rome was carried out as much as on any other kind of public building.

Several studies on the amount of non-private construction undertaken in Rome in the 4th century have shown that the evidence regarding works carried out on religious architecture is fully in line with the general picture regarding Rome's urban fabric. In general, we cannot get hold of a direct impact that affected specifically and selectively

the material appearance of Roman religion. In any case, there is an indirect impact, a side-effect of the general developments, by which the city of Rome as a whole was affected and, as a result, religious architecture as part of the public architecture was co-affected: It has been noted in other studies that, especially in the first part of the 4th century, not only the quantity of public investment into construction, but also the quality thereof have decreased. This may be determined jointly by two factors: First, the emperor's interest, beginning with Constantine, turned towards the Christian religion, which soon became the only legitimate form of religion. Second, with the foundation of the new capital Constantinople, the emperor's interest focused on his new city, conceived as a Christian city from the outset. These new enterprises absorbed means and manpower. It was, therefore, rather a question of religious and geographical priorities than of generally decreasing economic resources: the available resources were being diverted into the new capital and to build monuments of the new Christian religion. This resulted in a draining of resources from the city of Rome. The weight of the emperor's attention as a determining factor is all the more significant if taking into consideration the impact of the emperor's favor and his patronage, ever since, on the flourishing or sliding into oblivion of one or another cult, even without Christianity.

It appears, thus, that resources were made available for necessary repairs within Rome, but new construction from official side must have been curtailed in favor of the Christian church and Constantinople. Thus, the city of Rome was affected as a whole, but not selectively and specifically the buildings for Roman religion, because there was no difference between religious architecture of this level and any other kind of public architecture.

The second context to be considered to find an answer to the first question consists of archaeological material from the sanctuary of Magna Mater on the Palatine Hill. This evidence adds further information to the general picture that is provided by large scale architecture. The archaeological material from this site shows congruency with the progressive withdrawal of funding for Roman religion. Roman religion, still receiving official support from Constantine and his immediate Christian successors, was affected especially by the measures issued by Gratian and Theodosius I.⁷ The used space within the sanctuary was more and more downsized and more and more of its structures and rooms fell into decay, reflecting thus a decreasing frequentation for religious purpose. The definite end of its use for religious purpose at the end of the 4th century is contemporaneous with the laws of 391/392.⁸ It seems that the gradual decrease in the use of the facilities of this sanctuary goes hand in hand with the measures that were directed against Roman religion, either by withdrawing official financial support, or by prohibiting religious activities.

The third context to be considered are activities within the *sacra privata*. The evidence from the Mithraic cult⁹ in late antique Rome as well as from Magna Mater's Phrygianum on the Vatican Hill both testify to ongoing religious activities in the 4th century: the last piece of epigraphic evidence from the Phrygianum dates from 390, thus, when all cult

activities within the Roman religion were prohibited. The Mithraic activities continue somewhat further. We may assume that activities and cultic facilities within the *sacra privata*, even though ending with or shortly after the turn of the 4th to the 5th century, did have a longer time of support and continuation than the official cults and the *sacra publica* because they neither required nor depended on public funding. Presumably the slight difference in persistence between the Mithraic and the Metroac cult respectively derives from the different exposure to the public.

(2) Considering the second question regarding the persons or the groups of persons who had an ongoing interest in investing into religious material, we can state that a wide range of different persons had an interest, even the emperor although being Christian. Different forms of investment have been carried out by the emperor, by the senate, the *praefectus urbi* and by 'ordinary Romans' alike. Regarding building activities on an official level, however, we cannot distinct the motivations behind the activities, because we cannot distinct 'public architecture' and 'religious architecture': Given that religious architecture as well as religious statuary were protected by law, the buildings were maintained in their capacity as public architecture, as part of Rome's cityscape, as part of cultural property; the statuary was maintained, at a later point and after some legislation, as objects for the embellishment of the city. From the evidence for activities within the cult of Mithras and Magna Mater, we can get hold of individuals acting privately, on their own expenses, pursuing activities within the *sacra privata*. Most of the persons attested to by the evidence belong to the senatorial aristocracy. However, both the nature and the significance of this evidence are limited in more than one sense: it has been produced by a very small number of the total of Rome's 4th century inhabitants. Therefore, it is not representative neither of the entire populace of Rome in this period nor of the full spectrum of possible production of religious material. It rather represents a small group of very wealthy people¹⁰ producing an elite form of material manifestation of religion. For many reasons we simply can *assume* – but not prove – the ongoing participation of the same social groups of Romans as in previous times, additionally to the evidence produced by the members of the senatorial aristocracy. In sum, we can get hold of people or groups of people involved in both maintaining the physical infrastructure for religious practice and in practicing this religion, on an official or a private level. We cannot get hold of the motivations behind the activities on the one hand, and relative numbers within the whole population on the other.

(3) How did all this affect topography in terms of visibility? We have seen that the temples were maintained, even if the religious activities gradually ceased. This notion is further confirmed by the Regionary Catalogs, in which many of these temples are listed. The Calendar of 354 further lists many of the religious festivals. This means that, at least to this point, the buildings were not (yet) the empty settings for activities that did not take place any more. In sum, the temples, integral part of Rome's architectural

landscape, still determined as much as ever since the visual appearance of the city. They were part of Rome's glorious past and monumental present, thus being an object worth of maintenance of general interest, independently of one's religious affiliations. Even more, they were unchallenged in the monumental center of Rome: the impact of the new Christian religion became monumentally manifest initially not within the city center, but at the outskirts: the huge Constantinian basilicas were erected, beginning with the 4th century, in the *suburbium* beyond the city walls. All in all, it does not seem that there was a direct impact onto the cityscape of Rome as early as in the 4th century.

We can draw at least one final observation even though the evidence is fragmented, scattered and diverged. In this period, there are many developments, determining factors and circumstances, often contradictory and non-linear: the emperor and his direct impact by means of laws and patronage; the same emperor's indirect impact by means of appointments of persons with the 'right' religious affiliation, favors, and patronage; the enormous wealth of the senatorial elite in late antique Rome¹¹, who were willing to spend own means lavishly on games, but not on public buildings and infrastructure¹²; contemporaneously, less public funding for Rome; legislation restricting religious activities on the one hand, protecting the buildings on the other; and many more. It seems that there are no straightforward, clean cut answers to the questions put forward. Rome in the 4th century was a dynamically transforming city, and the transformations took often place in high speed, with mutual influence. It seems that, whereas the course for most developments was set in the 4th century, in some cases even earlier, the tangible and perceivable effects and visible impact onto Rome's topography and urban fabric occurred later, in the 5th and 6th century.

Notes

¹ Post-doctoral research project affiliated at LMU München; funded by a triennial post-doctoral fellowship (2009–2012) of the Deutsches Archäologisches Institut.

² On the immense topic of the transformations of Rome in Late Antiquity: Bauer 1996; Harris 1999; Aurea Roma 2000; Salzman 2002; Meneghini 2003; Bauer 2011; Cameron 2011; Salzman et al. 2015.

³ Mayer 2002; Bauer 2011; Gwynn 2011, 145; Behrwald – Witschel 2012, 17–24; McEvoy – Moser 2017.

⁴ Concisely, with older literature: Praet 1992; Behrwald – Witschel 2012, 18–24.

⁵ Marazzi 2000; Behrwald – Witschel 2012, 13–24.

⁶ 'Roman religion' (instead of 'pagan religion', 'paganism' etc.) will be used throughout in the text as opposed to Christian religion.

⁷ Gwynn 2011, 136. 382: Gratian withdrew the funding for pagan priesthoods, notably the Vestal Virgins (but cf. Lizzi Testa 2007; see also Salzman 2002; Cameron 2011); in 391–392 Theodosius I. passed a series of laws that systematically outlawed pagan cult.

⁸ On the sanctuary on the Palatine Hill most recent Pensabene 2017.

⁹ Mithras in late antique Rome: Bjørnebye 2007 and 2016; Phrygianum and the related evidence: Cameron 2011; Liverani 2008; Pensabene 2008.

¹⁰ Behrwald 2009, 132.

¹¹ Especially Smith 2003, 150.

¹² Behrwald 2009.

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**Women and Men at Work!
Entrepreneurs, Ateliers and Craftsmen
in the Construction and Destruction
of Roman Tombs**

Panel 3.8

Organized by

Marianna Castiglione – Myriam Pilutti Namer

Working in Pompeian Funerary Contexts. Some Notes on Business, Craftsmanship and Customers

Marianna Castiglione

Funerary archaeology is an increasingly discussed topic, generally dealing with the typology of tombs,¹ the inscriptions revealing the social structure of the local communities,² the literary sources on commemoration, and the stratigraphic and anthropological data reconstructing both rituals and societies as a whole.³

Despite this wide interest, scholars generally do not deepen the system linked to the ‘death market’, because of the lack of literary and archaeological documentation. However, the economy relating to tomb ideation, construction and restoration was certainly important in Roman society, involving many activities and people.

Here we propose to investigate this topic in the ancient centre of Pompeii, focusing on the data relating to business, craftsmanship and customers, as revealed by the characteristics of some examples from its large-scale Roman necropolises.⁴ The specificity of this archaeological context and the possibility to compare different kinds of documentation, allow us to infer the information about funerary economy, which is not always easily perceivable.

The same building materials (lava, *cruma*, Nocera grey tuff, Sarno yellow tuff, travertine, bricks and tiles) are used in public and domestic spaces, and this peculiarity shows that funerary commercial networks were limited to an internal or nearby market. Excluding the Garland Tomb (Herculaneum Gate) and a monument along the Stabian way, marble was either a reused material for inscriptions and gravestones, or replaced by some faux-marble revetments (i.e. tomb 19ES, Nocera Gate; monument of *Vestorius Priscus*, Vesuvius Gate – fig. 1 a).

The funerary building techniques are similar to those used in the city: *opus quadratum*, *caementicium*, *mixtum vittatum* and *testaceum*. The core in *opus incertum* was usually covered by big slabs of Nocera tuff or by plaster and stucco revetments, especially from the Augustan period onwards. Tuff slabs and tuff statues show visible signs of working tools: the slabs are ashlar-worked with saw and different chisels, as it is documented in other buildings dating from the 2nd century BCE (fig. 1 b–c).

The inscriptions record few professions, maybe also involved in tomb construction: a carpenter or a stonemason, testified by a *libella* inserted in the front of the enclosure CN (Nocera Gate), a person measuring grounds, remembered in an epitaph with a *groma*, and a freedwoman heading a company specialized in the sale or production of lime – which were activities strictly linked to the building process – mentioned on a marble grave marker, found near the Stabian Gate.⁵

Tombs with two architectural orders and enclosures, with many differences in wall coverings and decorations, are the most popular typologies in Pompeii. There are only



Fig. 1a: Example of faux-marble revetment (Vesuvius Gate Necropolis). b–c: Tuff slab and tuff funerary statue showing signs of tooth chisel (Nocera Gate Necropolis).

two circular tombs and a monumental exedra, which testify to high quality workers and patterns inspired by Rome and the eastern Mediterranean. Besides these foreign influences, the capitals, in particular the Ionic ones, which are very similar also in the urban spaces, reveal a local manufacture done by craftspeople skilled in tuff working.

The tuff funerary statues are examples of a local or a regional production, assuming patterns and workers moving and exchanging ideas as well as artisanal manners. The stucco decoration shows regional transfers, but it also recalls iconographies documented in Rome.⁶

The themes of the tomb paintings (*gorgoneia*, boar hunting, domestic objects, plants, animals, imaginary gardens) were not exclusively created for funerary contexts, with the sole exception of gladiator fights (Herculaneum, Vesuvius, Stabia and Nocera Gates). Thus, we can suppose the existence of local workshops engaging in the decoration of all types of buildings, which probably drew from a repertoire of common elements shared by paintings, stucco and mosaics.⁷

The customers, who were also women, were generally part of the political and economic elite of the city, or they were freedmen: these groups were able to have funerary monuments built for their self-representation or for the entire family.

In conclusion, the visible standardization of materials, workmanship, building techniques and decoration documented in Pompeian necropolises is certainly due to economic necessities more than to contemporary fashions.

Some specific realizations reveal that there were local workers who used local, regional or inter-regional patterns, but there were also local or foreign craftspeople adopting typologies and decorative patterns inspired by Rome, *Magna Graecia* and the eastern Mediterranean. These data suggest some wider economic relationships and emphasize the information obtained from other contexts in Pompeii.

Thus, a specific study on Pompeian tombs, which considers the entire economy of the centre, permits the investigation in depth of the many aspects relating to the business, which grew around the necropolises, and a better understanding of the trade connections of the entire city, in which many craftspeople and ateliers were active and well-known.

Notes

¹ E.g. Valenti 2010.

² E.g. Eck 1998.

³ E.g. Duday – Van Andringa 2017.

⁴ Cf. Campbell 2015.

⁵ Cf. Castiglione 2017.

⁶ Cf. Castiglione 2012.

⁷ Cf. Ghedini – Salvadori 2001; Iorio 2001.

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Fig. 1 a–c: photos by the author. Courtesy of Ministero per i Beni e le Attività Culturali e del Turismo, Soprintendenza Speciale per i beni archeologici di Napoli e Pompei, now Ministero della Cultura, Parco Archeologico di Pompei.

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**The Afterlife of Stones after the Disruption
of Roman Tombs in Late Antiquity and Middle Ages.
A Selection of Case Studies
from the *regio Venetia et Histria***

Myriam Pilutti Namer

The debate concerning the long-term phenomenon of the destruction of monuments in the post-Classical era is generally concerned with theoretical aspects or with specific archaeological evidences involving either classes of artifacts or individual case studies. Among the research studies in the field, funerary monuments could be considered a favoured source.¹

A particularly complex area of research is the one that focuses on ancient Roman archaeological materials that had been reused in the post-Classical era and show clear traces of craftsmen at work.

The aim of my speech consists in investigating three case studies from Venice and its lagoon. Within this peculiar landscape, indeed, many *spolia* are preserved, which are useful to better understand the well-structured organization of the workshops where craftsmen and stonemasons carried out their work. This analysis could help to shed light on the extent to which Venice and the lagoon are connected to the destroyed ancient Roman settlements of the mainland and to the early Medieval urban landscapes that were contemporary to the foundation of the city (i.e. from the 7th century AD).²

Indeed, as is well known, ancient Roman inscriptions in Latin had been reused starting from the 6th century AD; by the 9th century AD, the ancient elements used as building materials employed in the foundations of Saint Mark's bell tower had lost their original meaning.³ In this case, we can reconstruct the ways, in which the original artefacts were readapted and modified for their new usage: apart from the first working required to adapt a segment of the inscription to be used as architectural frame, a second intervention was undertaken to transform the piece into a uniform rectangular slab used to strengthen the foundations of the monument. Two centuries later, in the 11th century, a second case study show us a very different behavior on the part of the craftsmen. In the cathedral of Murano, the funerary monument of the *Acilii* was dismantled and the octagonal pilaster divided in two portions, which still adorn the portal of the basilica of the Saints Maria and Donato.⁴

The third case study consists in the so-called sarcophagus of 'Barbola', which is currently preserved in the chapel of Saint Philomena within the cathedral of Murano.⁵ The front of the sarcophagus, which was probably taken from an ancient Roman settlement of the mainland, had been reused in the church like a floor slab with its reverse side. When the front was discovered it already showed extended reworking dating to the 8th century, including the leveling of the epigraphic mirror to carve a new inscription.⁶ The pavement of the church of Saints Maria and Donato can be dated to the year 1052

thanks to a mosaic inscription. Therefore, it is likely that in Murano as well, craftsmen were engaged both in the 8th century to find, adapt and rework the entire sarcophagus or just the front, and in the 11th to readapt it to its new function as floor slab.⁷

The three cases I have investigated, although they belong to a rather specialist field, have the potential of opening up to a much broader study concerning the social organization of craftsmanship and its features between the 6th and the 11th century. The widespread business of finding ancient materials to be reused in other places has been already studied, i.e., for late antique Ostia by Patrizio Pensabene⁸ and for Veium in the late Middle Ages.⁹ Conversely, as regards *Venetia et Histria*, there are not documented cases, but is perhaps this very lack of information that should be interpreted as meaningful. However, the phenomenon, the modesty of craftsmen and their scarce social relevance, are all factors, which, together with continuous invasions, make the area an immense uninterrupted construction site between the Late Antiquity and the early Middle Ages, with relevant consequences on the urban and agricultural landscape of the ancient *regio*.

The economic value of stones and the prestige of their owners are testified by some – unfortunately few – records;¹⁰ the spoliation of necropolis in this period is something we can take for granted. Further research on this phenomenon would allow us to finally gain better knowledge and understanding of the professionals involved in the flourishing market of the afterlife of stones, which progressively reshaped the urban landscape of a myriad of a myriad of Medieval towns still existing in Europe and around the Mediterranean today.

Notes

¹ Murer 2016; Murer 2019.

² Ammerman 2003; Ammerman – McClennen 2001; Ammerman et al. 2017.

³ Calvelli 2012; Pilutti Namer 2012.

⁴ Calvelli 2005.

⁵ Pilutti Namer 2012; Calvelli 2014.

⁶ Calvelli 2014.

⁷ Pilutti Namer 2012.

⁸ See i.e. Pensabene 2006.

⁹ Pascucci 2009; Fusco et al. 2015.

¹⁰ Pilutti Namer 2012.

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**Contextualizing Craftsmanship
in the Ancient World: an “Economic” Sphere?**

Panel 3.10

Organized by

Mario Denti

Introduction

Mario Denti

New approaches and fresh finds in archaeology and anthropology have gradually mitigating the traditional understanding of craftsmanship in the ancient world as belonging exclusively to the realms of ‘production’ and ‘trade’ – two concepts derived from modern economic thought of economy.

Today, our critical awareness of the irreducible and complex nature of ancient thought and beliefs, paired with in-depth investigations of the historical, political and ideological contexts of artisanal activities, allow us to open new paths for a fuller comprehension of the latter – and of the ritual concerns of the social groups who controlled these activities, which certainly played a role in shaping them.

Within this framework, I would now like to mention some key concepts, around which today’s talks and the following discussion will revolve, concepts that link our different perspectives on distinct periods and regions of the Mediterranean.

- The meaning of the word *economy* in antiquity, and its different forms across space and time;
- The meaning of the word *craftsmanship* in antiquity, and its different forms across space and time;
- The *status* of craftsmen in antiquity, and how it changes across space and time.
- The *status* of the “élite” in antiquity, and how it changes across space and time.
- The *multi-functionality* of the structures we bring to light in our excavations (Alexander Mazarakis Ainian, Alexis Gorgues).

In this perspective, I would like to mention the important work of Aldo Schiavone¹. Here, the author reminds us that the economy as we conceive of it does not exist in ancient literary sources.² Every perception of economy *as a distinct sector of human activities and of social life* is absent: “*economy* of the ancient word is only a modern lexical convention”³.

Rather, an in-depth study of the relationships between craft activities and elite “domestic” contexts in antiquity shows us that technical skills can enhance *status* through control of raw materials and the highly sophisticated know-how required to transform the latter into finished products. Within a non-“economic” perspective (in the modern sense), but a political and cultural perspective, production strategies aim to provide resources for: (1) support of interpersonal relationships; (2) redistribution and intangible compensation (for example, by the creation of *clientelae*); (3) the creation of international relationships; and (4) the construction of cosmological and ritual patterns to consolidate local community identity (Alexis Gorgues, Sandra Blakely).

Within this framework, it is essential to keep in mind ancient notions of gifts as objects that increase their conceptual and ideological value by travelling (Mary Helms): a trajectory that should be understood as internal (inside the community), external

(outside the community), and intra-community (between different communities living together).

In conclusion, approaching artisanal productions in the ancient world requires us to think in terms of interpersonal, gentilital relationships instead of in terms of “market economy”.⁴

Notes

¹ A. Schiavone, *La storia spezzata. Roma antica e Occidente moderno* (Rome 1996).

² Schiavone 1996, 38.

³ Schiavone 1996, 47.

⁴ For a last discussion of this problems, see now M. Denti, *Apprendre à reconnaître les gestes des potiers. Une introduction au colloque*, in: M. Denti – M. Villette (eds.), *Archéologie des espaces artisanaux. Fouiller et comprendre les gestes des potiers. Actes du Colloque International de Rennes (27–28 novembre 2014)* (Montpellier 2019) 11–19.

Metallurgy between Myth and Production: Cognized and Operational Craft in the Northeastern Aegean

Sandra Blakely

What are the heuristic potentials for Rappaport's cognized and operational models when applied to craft at the intersection of cultures – specifically iron metallurgy between Greeks and Thracians on the northeastern Aegean shores? And what are their implications for rethinking the 'economic' aspects of metal production? The southern Thracian shore was exceptionally rich in ores and local skills. Distinctions among local ores demanded different operational approaches to production. Kostoglou has used the material evidence to demonstrate that these operational models also constructed local community identities, among which production remained at the household and workshop level, even through the Roman period. Rappaport's models help us recover some of the complexities in indigenous frameworks for the industry whose cultural function went far beyond production and trade. The Greek economic partners of these Thracians made both cosmological and ritual use of the daimones they constructed as the non-Greek, pre-Greek inventors of metallurgical craft in this region. The integration of these uses into our understanding of the evidence for emic, Thracian uses of metal production as a second level signifier helps move us toward a more complex model of that craft's social function as simultaneously a locus of indigenous identity, and a means of enabling interaction with their non-Thracian economic partners in the region.

An exploration of metallurgy beyond the economic engages naturally with the intersection of economy and religion. Sanctuaries are locations of financial transactions, production, the concentration of imports and competitive display, making them direct analogues for fora as markets and gathering places. An archaeology of sanctuaries foregrounds the question of communication: the messages between men and gods create the stamp of divine authority that renders sanctuaries markets for the information flows that impact negotiation, exchange, and the quest for profit. This focus on communication raises the stakes for a more nuanced attention to the question of how – the different forms of communication, from the verbal to the visual to the material – as well as how well, the question of persuasiveness and legibility. Bernstein's model of restricted and elaborated codes reminds us that the most powerful communications are often precisely those which require the listeners to exercise their knowledge of local cultural traditions in order to understand them.¹ This casts down a powerful warning for us, as investigators etic to our subject cultures, not to appeal to commonsense or intuition, particularly when approaching something as apparently universal as the spectacle of ore transformed into metal. Positioning metallurgy in this conversation offers light on the triangulation of men, gods and metals on the Samothracian *peraiá* of

Aegean Thrace, and offers a new page in the discussion which extends from Eliade to ethnography and materiality.

In the mid-20th century, Mircea Eliade confidently asserted, in accordance with the anthropologies of his day, a universal cognitive response of awe at the spectacle of metallurgy, which transformed raw material – at great risk – into the objects of highest cultural value.² The human category into which this wonderment fell was magic. He built in this on Malinowski's definition of magic as *apotropaia* at the edges of technological competence, and thus the intellectual limitations of the practitioner, however high their practical skills. The model implies homogeneity between meaning and embodied experience, the cognized and the operational, when it comes to the translation of crafting into the ritual sphere. African archaeometallurgical studies, combining excavated materials with ethnographic interviews, offer an opposing model, as they revealed the long history of the simultaneous production of metals and cultural meaning. These demonstrate how the processes of production – the removal of the ore from the bloom, the process of hammering and refining – become metonymous for critical cultural concerns of kingship, ancestors, the landscape and its fertility. Thus the king in his investiture, in the Congo, is 'hammered' like a bloom of ore to separate the dross from the metal. The transformation of the ore into the bloom is metonymic, among the Fipa, for female gestation and fertility.³ Access to the meaning of these metaphors is strictly limited, so that they serve as the boundaries of group membership: there are as many iron metallurgies, and symbolic systems connected to them, as there are cultural groups.

Archaeological theories of materiality recognize these functions of group formation and information flow, but foreground the role of material substances themselves as agents in these processes. They build on Bourdieu's concept of *habitus*, and on Merleau Ponty's phenomenology, which outlined the role of the embodied and the experiential, rather than the merely cognized, human interactions with the world.⁴ Central to these theories has been the proposal that objects are not the passive recipients of human action, but actively shape human society in ways that go beyond ownership or creation, and that extend beyond the formally, critically cognized.⁵ Brought to metallurgy, these foreground how the sequences of production create communities of practice in the workshop, in whose technological choices lurk the world views of their larger ethnic and national groupings. The *chaîne opératoire* signals identity as concretely as the iconography and style of the finished product.⁶ This casts down, on the one hand, the gauntlet to recover those workshop processes in archaeological contexts, and has tended to generate an opposition between social constructionism and semantic approaches. Pfaffenberger notes that "a symbolic anthropology that pays no attention to technological activities is liable to advance interpretations that are gravely erroneous." Symbolism in artifacts arises from the technological activities that generate society, but is not the cause of shared meanings.⁷ Killick has noted that the most committed social constructionists tend to reject any explanations invoking market forces, adaptation,

or the inevitability of progress, in favor of the human factor behind the choices in the workshop, which are shaped (mysteriously) by the objects themselves.⁸ In the competition between those who know how, and those who know that, the former emerge as the most genuine indices of their social world.

These workshop-generated meanings are argued to be relevant across the subject culture, which raises several important problems.⁹ It foregrounds the distance between emic/etic, since investigators, especially in archaeological contexts, are only able to access the processes of production through archaeometry, using microscopic material analyses. And the assertion of legibility within the subject culture raises the question of the permeability between contexts of production and the contexts of use: on what bases can we gauge how the identities that emerge in the workshop function in the public square?

An exploration of that question in these North Aegean contexts will suggest that a bifurcation between the cognized and the operational worlds is less heuristically productive than the model offered by Roy Rappaport. In *Pigs for the Ancestors* (1968) and *Ecology, Meaning and Religion* (1979), Rappaport explored the ecology of the Tsembaga of New Guinea, and proposed a relationship between intellectual and practical spheres which maps onto the fundamental distinction proposed by materiality studies.¹⁰ His, however, hypothesizes a value specific to ritual contexts for the explicitly intellectual lens. Rather than a simple dualism, Rappaport offers a morphology of these two types of knowledge. He proposes five different levels, according to the degree to which a model referred to an instrumental, empirically testable context, or was generalized. The ultimate sacred propositions at the apex of his system were concepts about ancestral spirits. Precisely their distance from operational realities suits them to the cultural work they do, which is to sanctify an entire system of understandings. The unfalsifiable yields the unquestionable, and thus transforms the dubious into the natural.¹¹ His morphology bridges the scientific and the poetic realms, and suggest a cultural effectiveness for models of craft within ritual and mythological realms that is directly proportional to their distance from practical knowledge.

Aegean Thrace, between the Nestos river in the west and the Evros in the east, the Rhodope mountains and the Aegean coast in the south, offers a case study for iron as a signifier that translates into social constructions. From the first Greek arrival in the 8th century BC, the region is characterized by interactions with the non-Greek cultural groups, and the quest for metals: over half of our extant texts that mention Thracians connect them with access to metals.¹² Geomorphological fieldwork has now emphasized the extent to which interactions across ethnic and cultural boundaries, spurred by economic interests in materials as well as transport routes, make Aegean Thrace as much a model of connectivity as the rest of Horden and Purcell's Mediterranean.¹³ This is an intensely rich, multi-period industrial landscape, in which almost all sites have yielded iron remains: the earliest was a 9th century burial near an iron age dolmen in the Rhodope mountains – jewelry, an iron ring and chain and the context make this ev-

idence for the symbolic use of iron in early times. This iron production remained in the hands of Thracians, at the level of household and community-based workshops, rather than Greek colonists or Roman overseers, in contrast to the precious metals in Thasos and Pangaion.

Maria Kostoglou has conducted archaeometric analyses of archaeological iron in the region, the details of which lie far beyond this brief paper. Her results highlight a consistent pattern of diversity at a regional scale, continuity at the local scale, and high levels of competence overall, with the exception of Avdera. Each community maintains its own metallurgical style in choices of ores, fuels, and technologies. Thus at Avdera, only surface carburization or welding of low carbon to high steel is in evidence; Kalyva Kastro yields steeled tools and weapons, but only one smelting technique, iron oxides in bowl furnaces. Messemvria-Zone shows both wrought and cast iron, and all known techniques for steel manufacture used successfully. The ores alone range from titanium rich magnetite sands, oxides, pyrites and manganese to copper rich iron deposits. While these traditions may in part be a response to the demands of different local ores, they also reflect conscious technological choices which articulated and perpetuated local identities. Kostoglou proposes that we should imagine metalworkers mastering their craft in house-based workshops and transferring their empirical knowledge to pupils of the next generation, assuring the continuity of tradition.¹⁴ That knowledge sharing distinguished not Thracian from Greek or Roman, but one Thracian community from another. This can be seen as a strong affirmation, on the one hand, of the capacity for operational knowledge generated in workshops to apply directly to issues that are relevant within the community as a whole.

As for whether these local practices of production, however, translate into publicly legible messages, Kostoglou is cautious at the best, noting that iron technologies manifest social ideology differently than ceramics. Of the objects that were made specifically for display in sanctuaries, and which thus are explicitly meant to function as second level signifiers, she notes the existence of votive iron and steel currency bars, dedicated in the 6th c BC temple of Apollo at Zone. This site also yielded significant amounts overall of votive iron objects, including knives, scissors, weapons, bells, rings. The exceptional elongated iron bar is of the type used as currency in continental Europe, and offers analogies to the use of bars and obeloi as gifts in other sanctuary contexts.¹⁵ The publicly accessible semantic weight of these finds, however, derives entirely from their form and the location, and not from the process of production. The absence of any offering of slag or tools is further indication that the processes of the workshop proper are kept separate from the realm of the gods. The operational meanings, for all their socio-genic force, seem to remain locked into the community of the workshop, not the larger society of which the workshop is a part. This is despite the degree to which the quest for iron played a historical role in their interactions far beyond the workshop.

There is one exception to Kostoglou's hesitation about a more broadly spread social constructionism associated with Thracian iron – iron rings as gifts to the dead, two from

Messembria-Zone, found along with iron strigils, and two from Avdera. These were inclusions in high status burials that suggest that they were objects valued by the elite.¹⁶ The inspiration for possible sacred weight is their analogy to the iron rings associated with Samothrace, objects which exemplify Rappaport's version of the cognized as completely as Kostoglou's workshop signatures exemplify the operational.

Samothrace shares, with its Thracian counterpart, a multi-level investment in successful exchanges between Thracians and Greeks.¹⁷ The Samothracians established their mainland *peraia* shortly after they arrived on the island. Casson deemed them the pioneers of Odryssian trade, and their financial success is indexed by their magnificent city wall.¹⁸ Interactions between Thracians and Samothrace's mainland emporia, including Messembria, were collaborative rather than hostile. Samothrace's Greek settlers had encountered Thracians on the island itself when they arrived. They joined in their celebrations of Bendis on the slopes of Mt. Saos, assimilating her to their own Artemis.¹⁹ The mysteries show considerable energy devoted to enabling the Greek-Thracian interactions that were key to financial success on the mainland. These include the use of the Thracian language in the rites themselves, an abundance of ritual pits, and the invocation of a cave of Hekate. Thracians joined the Greeks in these celebrations: Seuthopolis yielded the earliest inscription attesting the Samothracian rites, and Thracian names, including royalty, appear in the island's initiate lists.²⁰

The iron rings of the cult as known to Lucretius, Pliny, and Isidorus were not merely iron, but magnetic, appropriate for Samothrace's status as one of the inventors of magnetism. Lucretius wrote that a Samothracian ring danced, and iron filings moved, when they were placed in bronze basins and a magnetic stone was applied underneath.²¹ Thirty-two iron rings have now been recovered from the site; twenty-one of these have large flat bezels that show no signs of holding a stone but would very likely bear an image or inscription. All of the rings but two were found in archaeological fill, and so elude dating from any means other than style. The style may reflect a Ptolemaic period; the majority of these came from the West Hill, an area given over to the comforts of the initiates after the completion of their ritual cycle. Here were found a stoa with inscriptions recording initiation, dining rooms, and the bulk of Samothracian coins; it seems that this is where the initiates ate, slept, and perhaps purchased tokens of their initiation, the famous iron rings, to take home with them.

A magnetized ring invites discussion, and the multiple mythic possibilities for these, within the island's tradition, takes us to the top of Rappaport's hierarchy, as far away from the operational realities as possible. If the iconography of a silver ring reflects how these bezels may have been decorated, they may have borne the image of two snakes and two stars, possibly recalled in the two-fold Kourete and the *δίφωες κάβειροι* of Orphic hymn 38.5–8. The importance of these Kabeiroi is confirmed in an epitaph for a Samothracian initiate, found in Kavala, who saw the 'doubly sacred light of Kabiros'.²² Lehmann identified the snakes with Hermes and the stars with the Dioskouroi who were appropriate figures for the rites' promise of maritime aid.²³ And

the Idaian Daktyloi, daimonic inventors of iron on Crete and in Phrygia, magicians and goetes, have multiple points of contact with the rings.²⁴ The fourth-century historian Ephoros credits them with establishing the Samothracian rites, introducing the islanders to incantations, initiations, and mysteries (*BNJ* 70 F 104); they may also echo the Thracian tradition of sacred caves.²⁵ In a tale known to Zenobius and to Sophokles, one such cave was where the Daktyl Kelmis, at the hands of the Great Mother goddess and his brothers Damnameneus (Hammerer) and Akmon (Anvil), was turned into iron. This fate recalled in the phrase ‘kelmis en sidero’ as a proverbial expression for a difficult personality. If a Daktyl is a daimon in the stone, he embodies one of the multiple explanations offered for magnetism. Throughout their ancient attestation, moreover, the ‘finger’ name of the Daktyloi invites endless punning, making them the natural patrons of a token worn on the hand.

The rings also engage, however, with Rappaport’s lowliest form of cognition – the operational and physically experienced. What is relevant in the ritual context is not the manufacture of the rings, or even the process of magnetizing them, but the experience of the wearer as he or she uses the ring as a token of the rites, offering a demonstration of its magnetism as Lucretius described. The phenomenon of magnetism in antiquity was the object of endless debate; its actual mechanism remained unknown, making it a topos for inscrutability.²⁶ This suits these magnetic rings for the aesthetics of secrecy which, as Simmel proposed, relies on the paradox that the sociogenic force of secrecy demands that the secret must not simply be kept, but its possession made known. For me to have a secret has no social force; for me to let it be known that I have it, articulates the social boundary between those who know, and those who do not. This capacity to generate the secrecy on which the rites relied is replayed again at Rappaport’s highest cognitive levels of the mythic and unproveable. The very abundance of possibilities for the divine force in the rings is one of the most effective routes to secrecy – obscuring not through silence, but through the multiplicity of possible answers. The correct pathway through these options, or an understanding of how each of them resonated with a different aspect of the rites, would conceivably form a component of the rituals, for which the rings were a highly condensed, culturally specific sign. Such a sign would be powerful, as Bernstein would note, precisely because of its demand for specialized knowledge.

The Samothracian rings thus demonstrate how Rappaport’s model can bridge the most materially operational and the abstract cognition of a single phenomenon – in this case, metallurgy within a specifically ritual context. Kostoglou’s work on Thracian iron raises another critical point arising from the operational realm of iron metallurgy. In the larger cultural world in which Samothrace was operating, even if the identity of the workshop which produced a particular piece of iron remains unknowable beyond the workshop, the cultural practice of the creation of iron as simultaneously the creation of community was widely known. The knowledge that a given group was the producer yields here to the knowledge of how the practices of production craft identities. This

raises the possibility to see this exceptional use of iron on Samothrace as an additional means through which the cult bridged the Greek-Thracian divide, a crossing fundamental to economic success in the region. The operational knowledge of the crafter was, in the end, itself part of the cognitive categories of the culture who bought, sold, and marveled at his – or her – craft.

Notes

¹ Bernstein 1964.

² Eliade 1962.

³ Blakely 2006, 6.

⁴ Ponty 1945.

⁵ Dobres 2001; Gosden 2005; Joyce – Lopiparo 2005.

⁶ Hegmon 1998; Nanoglou 2009.

⁷ Pfaffenberger 2001, 80.

⁸ Killick 2004.

⁹ Hahn 2011, 5.

¹⁰ Biersack 2006.

¹¹ Wolf 1999; Rappaport 1979, 119–156.

¹² Kostoglou 2008.

¹³ Archibald 2010.

¹⁴ Kostoglou 2010; Kostoglou 2013, 3.

¹⁵ Kostoglou 2008, 43.

¹⁶ Kostoglou 2008, 41 f.

¹⁷ Ilieva 2005; Tiverios 2008; Graham 2002.

¹⁸ Casson 1971, 92 f.

¹⁹ Matsas 2007; Matsas et al. 1993.

²⁰ Cole 1984, 146–148.

²¹ Lucretius DRN 6.1043–1047; Pliny Nat. 32.33; Isidorus *Origines* 19.32.5; *Etymologicum Magnum* s.v. *magnetis*; Zenobius IV.22; Blakely 2012.

²² Karadima and Dimitrova 2003

²³ Lehmann-Hartleben 1940, 355; Lehmann-Hartleben 1939, 138.

²⁴ Blakely 2006: 13–32, 79–98.

²⁵ Ustinova 2002; Ustinova 2009.

²⁶ Blakely 2012.

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Domestic vs Commercial? Non-elite Craftsmen between Mycenaean and Archaic Times

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This paper has two aims: by delineating the different forms of craft specialization in late Bronze age Aegean communities, it should lead to the question of the continuities in that domain into later times; by examining the Homeric and early Archaic data on this topic it should lead to a questioning of the pertinence of the rigid distinction between the demiurgos on one side and the modest craftsmen of Greek city-states on the other side. By doing this, one would like to revise some current assumptions. Not every 'specialization' is linked to the palace in the LBA Aegean, on the contrary. A closer look at the economic condition of craftsmen shows the great variety of the forms of production preexisting to the palace, or existing without it. Notably, specialized communities are clearly attested. The question of the demiurgoi and through it the question of aristocratic control on production does not explain everything in early Iron age and Homeric sources. One should also question the usual distinction between domestic and commercial or prestige production: is there really a sphere of domestic production and consumption completely separated from the rest? We will argue against that point of view.

Crafts and Craftsmanship within the Societies of Northern Greece in Archaic Times

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Abstract

The recent archaeological research in northern Greece, has brought to light significant information regarding the societies living there along with their activities and networking. The material remains, witness of the production and consumption, indicate on the one hand aspects of a local economy interrelated with other (neighboring or not) communities and economies; on the other hand they present their functions and meanings for the people (male and female) who produced, used, and consumed them in various places and times.

Pottery production appears to be among the principal crafts developed throughout the ancient Greek world in order to fulfill a great range of needs (household, daily, private, public, religious, cultural etc.). Their distribution then again reflects trade as well as relations or common behaviors. Furthermore, pots satisfied also the needs of other types of craftsmanship (e.g. smithing) that met an extended development in the region of northern Greece.

Those types of crafts and craftsmanship within this geographical framework during the Archaic times, is the explored topic here. All the above suggest an organization and a system within it they functioned. And this can be traced through their primary, secondary etc. depositional context or find spot.

Introduction

Northern Greece appears to be among the less explored and examined areas regarding ancient Greek world. Opposed to the center and the south, and in particular Athens with Corinth to follow, the region of northern Greece appears as a periphery in the contemporary research. The archaeological work though, that took place during the last decades in collaboration with a general interest in the rest of the Greek world beyond Athens, reveals continuously more information on the area and its inhabitants.¹ Furthermore, the interdisciplinary modern approach and study of the material evidence contributes significantly in a better understanding of the ideological as well as cultural context, in which the unearthed objects belong. Adding to those the historical and/or political conditions of the period, we may result to a configuration of the society that produced and/or consumed them.

Aim of this paper is to explore the existence of social mechanisms and organization within communities in northern Greece during the Archaic period, using material evidence coming from their crafts and craftsmanship as a tool.

Significant role to the economy of the region at Archaic times played the Thermaic Gulf since it functioned as a primary resource in various ways contributing to its existence and to its development.² It was a nutrition source as well as an important mean of transportation and communication. Marine fauna (fish, sea-shells) for example, constituted part of the diet of the inhabitants, as it is indicated by the archaeozoological evidence.³ Moreover, they offer a variety of material for the daily needs of the people there and their craftsmanship.⁴ On the other hand, Thermaic would facilitate the communication with the rest of the world (e.g. southern Greece, Aegean, Black Sea, eastern Greece, Levant etc). It was a well protected space with several safe harbors, such as Mende, Sane, Potidaia, Aineia, Therme and Methone.⁵ Nevertheless, the small picture looking at the big one should not be missed, namely the local needs of transport; to get for example from Pieria (e.g. Methone) to Aineia (they are just across to each other) or to Chalcidice (e.g. Potidaia or Mende). Further, it is known that the Athenians, while departing from Macedonia, get from Pydna to Potidaia⁶; evidence for voyaging and the employment of the local harbors. Those short routes would facilitate local transportation, contacts and transfer of people, goods, ideas and culture.

Those advantages were not missed to the Greeks who, already from the 8th century BC, begun to establish permanent settlements (*apoikiai*) to the Thermaic Gulf; a region inhabited already from the prehistoric times. As for historical times, being of our concern here, it seems that the Thermaic was densely inhabited; suggested also by the ancient authors (Strabo, *Geographika Z'*) who mention that for the foundation of Thessaloniki, Kassander proceeded with the *synoikism* (merging, unification) of 26 small towns (*polismata*) into one new city, namely Thessaloniki. From those 26 settlements, Strabo mentions Apollonia, Chalastra, Gariskos, Therme and Kissos. Taken for granted that all had to be somewhere around Thermaic, it seems that by the late fourth century BC there were more than 26 settlements in the area of Thermaic Gulf. Even though not all known or excavated (or excavated extensively), the up to date material evidence shows that for their Archaic and Classical phases (until the foundation of Thessaloniki) they had a structure and organization as well as rules to function, while they shared some common features and activities. Close similarities occurred for example, between the settlements at Toumba (Thessaloniki) and Karabournaki.⁷

A high level in terms of culture and living standards is observed in the remains (settlements, cemeteries, sanctuaries) of most of those communities, which is reflected also through their craftsmanship and artistic production. Moreover it is known that timber, precious metals and slaves are considered among the primary goods that attracted the Greek interest in northern Greece. Therefore they comprised a heavy core in the economy and thus the life of the region, whereas production and consumption were among the major demands and makings of the societies there. The excavations in the

residential areas of several sites give us a glimpse of the organization and the artisanal character and production along with the trade and the consumption.

Crafts and craftsmanship

One of the primary sites that provide significant information on crafts and craftsmanship in northern Greece is the city of ancient Methone (a colony of Eretria, ca. 733/32 BC).⁸ It is located on the west coast of Pieria, to the north of ancient Pydna (present day Makrygialos). The city flourished due to two main factors. Firstly, it was built close to the ancient north-to-south axis of mainland Greece and had easy access, not only to central and western Macedonia, but also to the Balkan hinterland. Secondly, it had a very safe harbor in the Thermaic Gulf, well protected from the strong winds that often blew there.⁹ The excavation of the “Ypogeio” (basement) for example, has brought to light various classes of artifacts such as metal objects, pottery, glass vases, faience pendants, ivories, bones and deer horns, which could be linked to extensive workshops’ activities, performing already from the establishment of the ‘apoikia’, according to its excavator.¹⁰ Based on the excavation finds, it has been suggested that Methone was an extended artisanal center also in later periods. It covered not only the local needs of the site rather it supplied with its products the communities located inland Macedonia and the Balkans.

The craftsmanship information coming from the excavation at Methone appears to be not only very rich but also interesting and of great importance since it provides evidence for productions that took place in the region and are not always recognizable in other sites. Among these worth of note is the glassmaking that seems to have a long-standing tradition at least in Methone. According to the archaeological remains and the finds from the basement (‘*Ypogeio*’), the acropolis and the agora, the use of glass vessels and jewelry is attested in the settlement as early as the 8th century BC. and lasts until the 4th century BC.¹¹ The excavation of the agora sets light to the crafts and craftsmanship of the town and suggests the production of those glass items as early as the 6th century BC. Of interest are the beads of colorless light blue to light green glass, in the shape of an opium poppy seedpod. At the same area were also unearthed glass rods for the fabrication of the glass objects, as well as discarded beads.

Despite the up to date limited known remains of the actual glass workshops, there is no doubt that the manufacture of glass objects was one of the crafts practiced in the region. Supportive to this assumption is the existence and the exploitation of at least one known source of natron (sodium carbonate) placed at Pikrolimni lake.¹² Known in antiquity as “chalastraion nitron” (Plato, Republic Testimonium 1) with Chalastra a city in Macedonia and a lake where the Chalastraion nitron is formed or dissolved over a period of nine days” (Plato, Republic Testimonium 2), it is obvious that the area had a local source for glassmaking.

Metalwork and smithing appears to be a widespread craft among the area, which was also known for its mineral resources. Remains of installations for metal processing such as bronze or iron have been located in various sites complimenting the information coming from the metal finds everywhere. Tools, weapons and jewelry are among the major categories of objects made by metal. All are extensively found in the excavated sites of the northern Aegean while they seem to follow certain and similar types and patterns that make them recognizable and identifiable with the production of the region.

The craftsmanship of metalwork appears to flourish during the Archaic period. The abundance of bronze and iron objects along with the often repetitive types of jewelry, suggest the function of workshops, even in a large scale in order to cover the needs and the demands of theirs or also other communities. Furthermore, the distribution of the material evidence indicates that those workshops had the capacity of a large scale production, since they had an plus that was exported for demands of communities further north in the Balkans, as it is shown from the findings there.¹³

In the Agora of Methone, spaces (building A room 2, building B room 3) identified as metal workshops (pits with melted bronze, traces of fire, slags, moulds etc.) have been located.¹⁴ The installations were placed within an area with artisanal character proving a social organization and mechanisms that governed the city.

The remains of another metal workshop located in Karabournaki (also a harbor in the area of Thermaic), active at least in the 7th century BC, were unearthed again within the residential area.¹⁵ A few pits and a certain number of slag and clay vessels with metal residue at the bottom, suggest the existence of at least one organized workshop with specialization and technological knowledge. The remains indicate that the workshop produced a variety of objects such as tools for farming and other activities as well as various weapons, knives etc. Furthermore, the moulds found spread in the site is another indication of specialization and they attest the production of various small objects. It appears that iron was the principal metal worked with, with bronze to follow. The workshop(s) would possibly produce the objects required by the inhabitants, the sailors, the merchants or the visitors. Taking the mobility on the site into consideration, due to its role as a commercial center and a harbor, iron smithing must have been in high demand.

Apart, however, from bronze and iron, the metalwork of the region was specialized also in silver- and gold-smithing. A good representative for crafts in the service of the sphere of ritual and communal ideology, are the gold mouthpieces and funerary masks found in 7th and 6th century BC graves at Archontiko, Sindos or Nea Philadelpheia as well as in other cemeteries of the area.¹⁶ They were apparently local productions covering specific needs of those societies with communal cultural background.

The abundance of the mineral resources and the longstanding tradition in metalworking that goes back to the local populations (Thracians et al.) namely before the arrival of the Greek colonists, and it is extended to the entire region west and east of Chalcidice, led to an industry with social aspects. The operation of all different work-

shops demanded not only technological expertise rather more an organization of the production technologies required for their function and maintenance. That involved the negotiation of resources, social relations between miners, charcoal producers, smelters, blacksmiths and other groups of populations (urban or peasants) that were all consumers of the finished products.¹⁷

As regards pottery it is observed an immense diversity aiming to satisfy needs and taste. Local productions and imports are mixed and they result to a great variety in terms of shapes as well as decoration.¹⁸ The long standing tradition in pottery making that goes back into prehistoric times appears to be continued and developed. Hand-made pottery for example, typical for the local populations of the region, continues to be produced down to Classical times. Imitations or influences from the imported ware appear to be a common trait in various groups of clay vessels; witness of the taste as well as the habits of the inhabitants and their social activities (e.g. symposium, communal drinking).

A characteristic example is the shape of krater, the mixing bowl for wine and water that is related to symposium and it is widespread all over northern Greece.¹⁹ Apart from the great numbers of imported items, in particular coming from the Corinthian and Athenian workshops, the preference for such mixing vessels is emphasized from the production of kraters and especially column kraters, in the local workshops dated in the late Archaic period. They clearly copy the shape of the vessels and they added simple decorative motifs – floral or geometric. Painted decoration or black glazed and in grey ware are found as products of the local craftsmanship. At Phari for example, the pottery workshop produced black glazed column kraters, among many other ceramic products.²⁰ Worth of note is that they reproduce the type of the Attic respective kraters. A group of black figure column kraters, often without plates in the handles and of small format has been considered in the past as local production but its exact provenance is at the moment a matter of debate.²¹ The existence of significant numbers of imported and locally made kraters is an indicator that their customers were the inhabitants of all those different settlements who shared similar ideology, had common rituals or practiced the Greek symposium (either bringing it with them from their homes, as *apoikoi*, or adopting it). In any case the local production of kraters suggests that the shape along with its uses such as conspicuous and collective wine consumption was incorporated within the life and culture of the entire region.

Moreover, some of the imported shapes triggered the production of local imitations, a fact that also proves the ability of local craftsmen and perhaps their training in close proximity to immigrant potters that came to work in the area. The amount of local pottery inspired by Attic, Corinthian, eastern Greek or other ware for example, suggests that they were not random formations rather part of an established production. These local vases could have had similar functions as their prototypes, because they have been found in the same contexts, although local products were more frequently encountered in domestic complexes.²²

The manufacture of clay vessels has a longstanding tradition in the region of northern Greece going back to the Neolithic times. The unearthed quantities of local pottery exceed far more those of the imported vases. Through a quick calculation we might say that over than 80% of the findings come from pots made somewhere in the region. It appears that it was a very popular and extended craft widespread in the entire area, with abundant production, consisting that way an important type of occupation, possibly professional, in several instances. Installations and products suggest that it could be not only a part-time occupation but full-time in certain cases. Despite the extensive categories of local ceramics produced in the region during the Archaic period, though, the known installations remains of the pottery workshops distributed in northern Greece are less than a dozen.²³

They are located in different places that geographically include the region extended from Thasos to the east, until the area of Vermion in central Macedonia to the west. Three of them are located in Chalcidice (Torone, Potidaia, Mende), one in Thasos (Phari), two in the Thermaic Gulf (Karabournaki, Methone) and two in Vermion (Kryoneri, Leykopetra). The earliest preserved, located at Torone (Chalcidice), dates into the early Iron Age. Chalcidice is also the place of location for the chronologically latest workshop known so far, that in Mende; its earliest phase dates in the late Archaic period, but it continues in the Classical and Hellenistic times.

The known installations do not seem to have produced all the popular categories of vases that are manufactured in northern Greece.²⁴ There were obviously many more other manufacturing facilities; the large quantities of local pottery unearthed everywhere in the region is supportive of that. The preserved examples show that pottery workshops might exist in many settlements and even more than one in some cases. The products prove a specialization, which would not be unthinkable to be extended to some potters who could be specialized in certain types. An artisanal character could be traced in most of the presented installations.

The up-to-date data make clear that the pottery production in northern Greece during the Archaic period was not only very intensive, but also systematic, organized, and distributed in various sites. The workshops could manufacture a great range of ceramic products and they covered the needs of at least their communities.²⁵

The up to date data (archaeological evidence and literary testimonies) suggest that Archaic times acted as a transitional period that led to the formation of the physiognomy of the region in the Classical world. As for the examined centuries it appears a mixed situation, where Greeks and locals lived and probably worked next to each other or tentatively, together within a system that determined the rules under which their communities functioned.

The unification of Macedonia and the incorporation of most of the rest of the region of northern Greece within the Macedonian kingdom, during the time of Philip II around mid 4th century BC resulted also in a compliance into the system of governance and organization of the Macedonian kingdom, namely the king on the top of the hierarchy

with the *hetairoi* (the local aristocracy) below him being in charge of various issues and sectors. The existing evidence, however, shows that long before the control of the Macedonians and certainly during the Archaic times, northern Greece was occupied by towns well structured, perhaps in an early or proto-urban organization.²⁶

The remains of the residential areas along with the cemeteries²⁷ indicate social hierarchy, even though not very clear to us yet or not known if the entire region followed the same structure or different ones. Crafts and craftsmanship were highly developed all over the region and the material evidence proves or suggests – depending on the case and site – an artisanal character that covered far beyond the household needs. The quantities of local products (e.g. pottery, metalwork) along with their similarities (typological, technological etc) and their distribution show that the local workshops not only covered the demands of their entire community but they exported them in other settlements. The case of the ceramics manufactured by the Phari workshop²⁸ and their dispersion at least to the Thasian Peraia and beyond that, as well as one of the products of the Karabournaki workshop,²⁹ the egg-shell pottery, which was found particularly in the area of the Thermaic Gulf and Chalcidice, consist characteristic examples for an organized regional network that was connected to a well-structured society.

Pottery findings along with other objects, such as jewelry or weapons, may work as indicators of other aspects of a society beyond economy and trade. Obviously, issues of quantity or distribution provide information on commercial routes, exchanges and financial matters, but they tell us other things as well. Production is dependable on consumption that in its turn, it is based on needs, demands, taste, ideology (social, political, funeral etc.) and consequently the cultural physiognomy of the community or the people who use them. This alone presupposes a structure and forms of organization, namely rules, directions and guidelines. Matters such as standardization (in shapes and types) or distribution (of certain categories in specific areas) that describe the majority of the artifacts produced by the crafts and craftsmanship in northern Greece are clear indicators of the existence of some type of hierarchy as well as management.

We refer for example to commercial networks taking place in the northern Aegean already in the 8th century BC, if not earlier, in order to facilitate exchanges in short of longer distances.³⁰ Vital role to their presence played the harbors along with the inland roads (e.g. in Vermion, Leukopetra), which facilitated the transportation of the local products and made them easier accessible. Those utilities take as granted rules and procedures set and coordinated by the town/society/community that controlled them. Thus, since it could not be the entire population or anyone who set, organized and applied these guidelines, it is obvious that there was a system of governance including an elite, even though not yet very clear to us today. Accordingly, crafts and craftsmanship of the region would be parts of this system and reflections of the culture and behaviors of it and its representatives. They belonged to the social mechanisms that formed the exchange and sharing of culture and goods within the contemporary territory of northern Greece as well as with the rest of the Aegean, Black Sea and Mediterranean.

Acknowledgements

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Notes

- ¹ For an overview of the archaeology of the region see Vlachopoulos – Tsiafaki 2017.
- ² Archibald 2013.
- ³ Theodoropoulou 2017.
- ⁴ Veropoulidou et al. 2011, 220.
- ⁵ Soueref 1998, 29.
- ⁶ Soueref 1998, 34.
- ⁷ Manakidou – Tsiafaki 2017; Soueref 2017; Tsiafaki forthcoming.
- ⁸ Besios et al. 2012.
- ⁹ Ignatiadou 2012, 81–88.
- ¹⁰ Besios in Besios et al. 2012.
- ¹¹ Ignatiadou – Athanassiadou 2012, 199–203.
- ¹² Manakidou 2017, 27–29; Dotsika et al. 2011, 1–7.
- ¹³ Misailidou-Despotidou 2008, 60.
- ¹⁴ Besios 2013, 89–92.
- ¹⁵ Tiverios et al. 2007; Tsiafakis 2010, 386; Sanidas et al. 2015; Tsiafaki forthcoming.
- ¹⁶ Vokotopoulou et al. 1985; Chrysostomou – Chrysostomou 2005, 505–516; Misailidou-Despotidou 2008, 43. Kuzman – Ardjanliev 2018, 59–64.
- ¹⁷ Nerantzis 2015, 72.
- ¹⁸ Tiverios 2013, 15–22.
- ¹⁹ Manakidou 2018, 187–202.
- ²⁰ Manakidou forthcoming; Perreault et al. 2012, 132–133 εικ. 4–5.
- ²¹ Tiverios et al. 2012; Manakidou 2018, 187–202.
- ²² Manakidou 2018, 187–202.
- ²³ Adam-Beleni et al. 2013, *passim*.
- ²⁴ Tsiafaki 2019, 99–104.
- ²⁵ Adam-Beleni et al. 2013, *passim*. Tsiafaki 2019, 99–106.
- ²⁶ Evident in most of the sites of the period presented in Vlachopoulos – Tsiafaki 2017.
- ²⁷ For an overview see Vlachopoulos – Tsiafaki 2017, *passim*.
- ²⁸ Perreault et al. 2013, 27–38.

²⁹ Tsiafakis 2010, 385–386; Tsiafaki – Manakidou 2013, 73–88.

³⁰ Cf. Gimatzidis 2017, 279–287.

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Craftsmanship and Gentilital Empowerment in the South Italian Iron Age

Mario Denti

The aim of this contribution is to understand the relationships between the craftsmanship activity and the construction of elite identities and hegemony in a main center of the South Italian Iron Age, Incoronata. Characterized by a mixed situation – potters Enotrians and Greeks were working together during a century, from the end of the VIIIth to the end of the VIIth Century B.C. – this site offers a crucial model for analyzing the mechanisms of a collective sharing of techniques, objects, rituals, imageries, and ideology between a non-Greek community dominating the Ionian coastal belt of Enotria and an Aegean group of people and potters arriving here.

In a pre- (or para-)colonial historical context, the recent archaeological investigation of Rennes University enlighten us on the leading role played by the indigenous community in this process, on the importance of the creation of a common (“middle”) ground for craftsmanship activities and ritual practices, in which the different communities encountered, as well as on the fundamental role of the ideological sphere, as a specific instrument for the social interaction and the construction of gentilital identities: a phenomenon, in which the “economic” sphere (as an autonomous and oriented activity) looks not to be able to be the key of understanding the complexity of local and international relationships of this world.

Craft and Community: Social and Economic Adaptation in the Corinthian Potters' Quarter

K. Harrington

Corinthian fineware was widely exported in the 7th–6th centuries BC, and excavations in the Potters' Quarter of Corinth have produced extensive evidence of production, including misfired pottery, kiln supports, water channels, and workshop buildings. Yet, demand for Corinthian pottery declined over time, and the Quarter underwent a drastic transformation in the mid-5th century BC when the rerouting of the city wall destroyed several buildings. This paper focused on this later period of transformation and, particularly, on a 5th–4th century BC house and workshop, the Terracotta Factory, which produced figurines and miniature vessels long after other production in the Quarter ceased. In the excavations of the Potters' Quarter in 1929–1931, Agnes Newhall Stillwell recovered hundreds of objects from this building, including items related to household daily life (loomweights, cooking pottery, storage vessels, and small personal items) and craft production (molds, tools, workshop debris, and repeated figurine types).

Though terracotta figurines from the Classical period are common at sites across the Greek world, the workshops which produced such objects have rarely been excavated and even more rarely published in detail. The Terracotta Factory is one exception to this trend. This household workshop presents an opportunity to examine not just the processes of production, but also the daily lives and economic choices of the craftspeople who lived and worked in this space. The Terracotta Factory can be understood in the context of other domestic coroplastic workshops from mainland Greece, such as those from Olynthos and Nea Halos. Typically, figurines were formed in the house and fired elsewhere, as seems to have been the case here.

The building provides clear evidence of the ability of a crafting household to respond actively to changing social and economic circumstances. I argue that this workshop survived into the 4th century by intentionally modifying their range of products to meet a local religious market, rather than the long-distance market upon which earlier potters had relied, while still drawing on traditional technical knowledge and established infrastructure. In addition, after the rerouting of the city wall several destroyed buildings became sites of unusual cult activity, in the form of small stelai-shrines installed on top of the abandoned structures. Similar shrines were found at several other ceramic workshops elsewhere in Corinth, as well as in the Terracotta Factory. The residents of the Terracotta Factory thus likely remained part of the larger community of ceramic craftspeople. Participation in the repeated rituals of dedication at stele shrines marked one as a member of the group and reinforced community identity and affiliation, even as members of the community moved elsewhere, due to both the destruction of parts of the Quarter and changes in the demand for Corinthian pottery across the Mediterranean. The neighborhood of the Potters' Quarter was undergoing tremendous social and phys-

ical upheaval and the memory practices associated with the stelai-shrines represented a link to the past, as well as a very tangible link to place for both individual households and the wider community of potters. The Terracotta Factory was part of a community of craftspeople based in both technical knowledge and social practices.

**Salt, Fish Processing and Amphorae Production
Across the Mediterranean in the 1st Millennium BC.
An Overview of the Technological
and Economic Interactions**

Panel 3.11

Organized by

Enrique García-Vargas – Francisco José García Fernandez –

Antonio Sáez Romero

De las complejas estrategias pesqueras hispanorromanas. Atunes, boquerones, caballas, jureles y sardinas en El Olivillo de *Gades*

Darío Bernal-Casasola – Ricard Marlasca – José Manuel Vargas Girón –
José Alberto Retamosa Gámez

Resumen

En las últimas décadas se han propuesto diversos modelos de explotación pesquera en el Mediterráneo Occidental, basados en las evidencias arqueo-ictiológicas documentadas en centros de producción conservera y en mercados y contextos de consumo. Además de una perenne pesca local destinada al autoconsumo, se ha planteado que la pesca industrial del atún y la caballa, activa desde época republicana, fue progresivamente dando paso a capturas de peces de menor tamaño, sobre todo clupeidos y engráulidos, debido al agotamiento o presión de los caladeros a partir del s. III d. C.

Recientes excavaciones arqueológicas en *Gades* (Edificio El Olivillo), acometidas por la Universidad de Cádiz, han documentado un Testaccio haliéutico portuario generado como resultado de descargas de residuos de la actividad pesquero-conservera, en las que abundan los atunes, las sardinas y las caballas entre época augustea y a lo largo del s. I d. C. Ello, unido a otros indicadores en el ámbito del *Fretum Gaditanum*, permite proponer una estrategia de explotación mucho más compleja y variada, atribuyendo a cuestiones metodológicas y en parte fortuitas la ausencia de atunes en la Antigüedad Tardía y la de sardinas a inicios de época imperial. Y poniendo sobre la mesa la necesidad de disponer de una muestra arqueo-zoológica más amplia que la actualmente disponible, aún insuficiente, para poder plantear modelos.

Abstract

In the last decades several models of fishing exploitation in the Western Mediterranean have been proposed, based on documented ichthyo-archaeological evidence from fish-salting plants and from markets and consumer contexts. In addition to a perennial local fishery for self-consumption, it has been argued that the industrial fishing of tuna and mackerel, which has been active since the republican era, gradually gave way to catches of smaller fish, especially clupeids, due to the exhaustion or pressure of fishing grounds, mainly from the 3rd c. AD.

Recent archaeological excavations in *Gades* (El Olivillo project), undertaken by the University of Cadiz, have documented a halieutic Testaccio near the harbour generated as a result of waste discharges from the fishing-canning activity; in which tunas, sardines and mackerels dating back to the Augustan period and the 1st c. AD appear

together in big quantities. Together with other indicators in the *Fretum Gaditanum*, it is possible to propose a much more complex and varied exploitation strategy, attributing methodological and partly fortuitous questions to the absence of tuna in Late Antiquity and that of sardines at the beginning of the imperial era. And putting on the table the need to have a larger archaeological sample than the currently available, still insufficient, to be able to propose models.

El Testaccio haliéutico de El Olivillo: un importante indicador de las pesquerías altoimperiales romanas

Entre los años 2016 y 2018 se han realizado actividades arqueológicas preventivas en el centro histórico de Cádiz, la antigua ciudad de *Gades*, con motivo de la remodelación del edificio El Olivillo como Centro de Transferencia Empresarial de la Universidad de Cádiz. En un ámbito correspondiente desde un punto de vista paleo-topográfico con los rebordes meridionales de la isla *Erytheia*, junto al canal Bahía – Caleta (fig. 1a), en el entorno del denominado puerto exterior de *Gadir/Gades*¹. Las excavaciones han permitido localizar y excavar parte de las laderas de una montaña artificial en la cual se desecharon de manera intencional los restos de la industria pesquero-conservera, de ahí que haya sido denominado el *Testaccio* haliéutico de *Gades*, actualmente en curso de estudio². La cronología de las descargas se sitúa entre época de los Cornelios Balbos de Cádiz, es decir momentos centrales del s. I a. C. (70–50/40 a. C.) y época tardo-neroniana (60–70 d. C.), aunque no se descarta totalmente la posible continuidad posterior ya que los depósitos arqueológicos aparecen seccionados en su parte superior por afecciones moderno-contemporáneas. Son múltiples las similitudes con el *Testaccio* de Roma, como sus ingentes dimensiones (al menos 7 metros excavados de estratigrafía y más de 20 metros lineales, aunque sus dimensiones fueron mucho mayores en la Antigüedad, al estar la secuencia seccionada por todos sus lados y existir otros solares cercanos con similar estratigrafía); constituir descargas controladas en un ámbito público como era el área portuaria de la ciudad (existencia de muros de contención interiores reutilizando ánforas romanas); o la composición mayoritaria del mismo a base de ánforas de transporte, salsero-salazoneras en nuestra ocasión, de ahí al adjetivo utilizado en su denominación.

Se utilizó este *mons* artificial para el desecho de los residuos y descartes de la industria pesquero-conservera, en capas alternantes de desechos ícticos, a veces quemados ‘in situ’ para evitar problemas higiénico-sanitarios, como luego veremos y de ánforas para *garum* y salazones de pescado de producción local-regional (familias de la Dressel 7/11 y de la Beltrán II casi con exclusividad; fig. 1b). Además de restos de peces se han documentado descargas de miles de conchas de gasterópodos marinos (*Hexaplex trunculus*), resultado de la producción del afamado tinte púrpura; junto a la malacofauna, se han localizado restos de cefalópodos (sepia), de algunas ánforas de *garum* desechadas con los restos de su paleocontenido interior (posiblemente resultado de la



Fig. 1: Localización del *Testaccio* haliéutico de *Gades* en el solar de El Olivillo (A), y detalle de las descargas de ánforas de *garum* y de desechos pesqueros en la ladera de este monte artificial (B).

descomposición del mismo, de ahí su traslado a vertedero) y algunos depósitos singulares como los restos del procesado de un cetáceo. De ahí la importancia de este nuevo yacimiento gaditano, en fase de estudio actualmente por parte de un equipo de la Universidad de Cádiz, para el conocimiento de la industria pesquero-conserva del Círculo del Estrecho. En este trabajo presentamos una caracterización inicial del muestreo realizado sobre las ictiofaunas arqueológicas, con el objetivo de aproximarnos a los recursos pesqueros utilizados por estas comunidades en época fundamentalmente julio-claudia.

Múltiples taxones ícticos en El Olivillo: ejemplos del muestreo arqueozoológico

Es muy difícil cuantificar los restos ícticos recuperados en El Olivillo de Cádiz, ya que son miles los kilos de sedimento excavados y múltiples los estratos conformados casi en exclusividad por restos de peces. De toda la muestra recuperada en la excavación se ha realizado un estudio de 9245 NR, claramente representativos ya que proceden de los tres tipos de depósitos localizados: paleo-contenidos de ánforas (fig. 2a); niveles deposicionales relacionados con el procesado piscícola (fig. 2b); y restos del despiezado selectivo o “ronqueo” de atunes, que como hemos indicado fueron quemados ‘in situ’, generando capas negras con los huesos semi-calcinados y con restos del combustible utilizado – al menos piñones (fig. 2c). Una pequeña parte de este estudio es el que presentamos a continuación. Se han seleccionado cuatro muestras de ictiofaunas arqueológicas, procedentes respectivamente de los denominados Sondeo 2 (U.E. 2019) y Sondeo 3 (U.E. 3019). La primera de ellas (U.E. 2019) se corresponde con un vertido anfórico – el 90% de los materiales arqueológicos recuperados son ánforas (fig. 3a) – cuyo contexto material ha permitido fecharlo en época augustea avanzada – primeros años del s. I d. C. Así parece demostrarlo la convivencia de ánforas salazoneras de la familia de las Dressel 7/11, junto a otras del Valle de Guadalquivir (Haltern 70 y antecedentes de las Dressel 20), habiéndose documentado algunos fragmentos de producciones más arcaicas: Dressel 2–4, ánforas tipo urceus y ejemplares tardo-púnicos de la serie 7 – a lo que tenemos que sumar la presencia de sigilata itálica, cerámica itálica de cocina y paredes finas³; la segunda (U.E. 3019) se trata igualmente de un gran vertido relacionado con las descargas generadas en el marco de las actividades pesquero-conservas que debieron haberse llevado a cabo en el entorno de El Olivillo, tal y como han demostrado los numerosos fragmentos de ánforas salsarias altoimperiales así como los abundantes restos ictiológicos recuperados (fig. 3b). A pesar de la heterogeneidad de los materiales arqueológicos documentados, los fragmentos de ánforas ocupan el porcentaje más alto, habiéndose detectado las mismas tipologías que en la U.E. 2019 – Dressel 7/11, Haltern 70, Dressel 20 (algunos ejemplares de las series más arcaicas) – así como ánforas Dressel 1 que, junto a una lucerna de volutas (Dressel 9 A), ha permitido fechar este vertido asimismo en época augustea.



Fig. 2: Diferente tipología de los estratos con ictiofaunas arqueológicas: restos de ánforas con paleocontenido piscícola (A. – U.E. 8009); niveles deposicionales con multitud de pescado asociado a ánforas (B. – U.E. 3019); y restos del despiece de atunes en niveles termoalterados (C. – U.E. 3019).

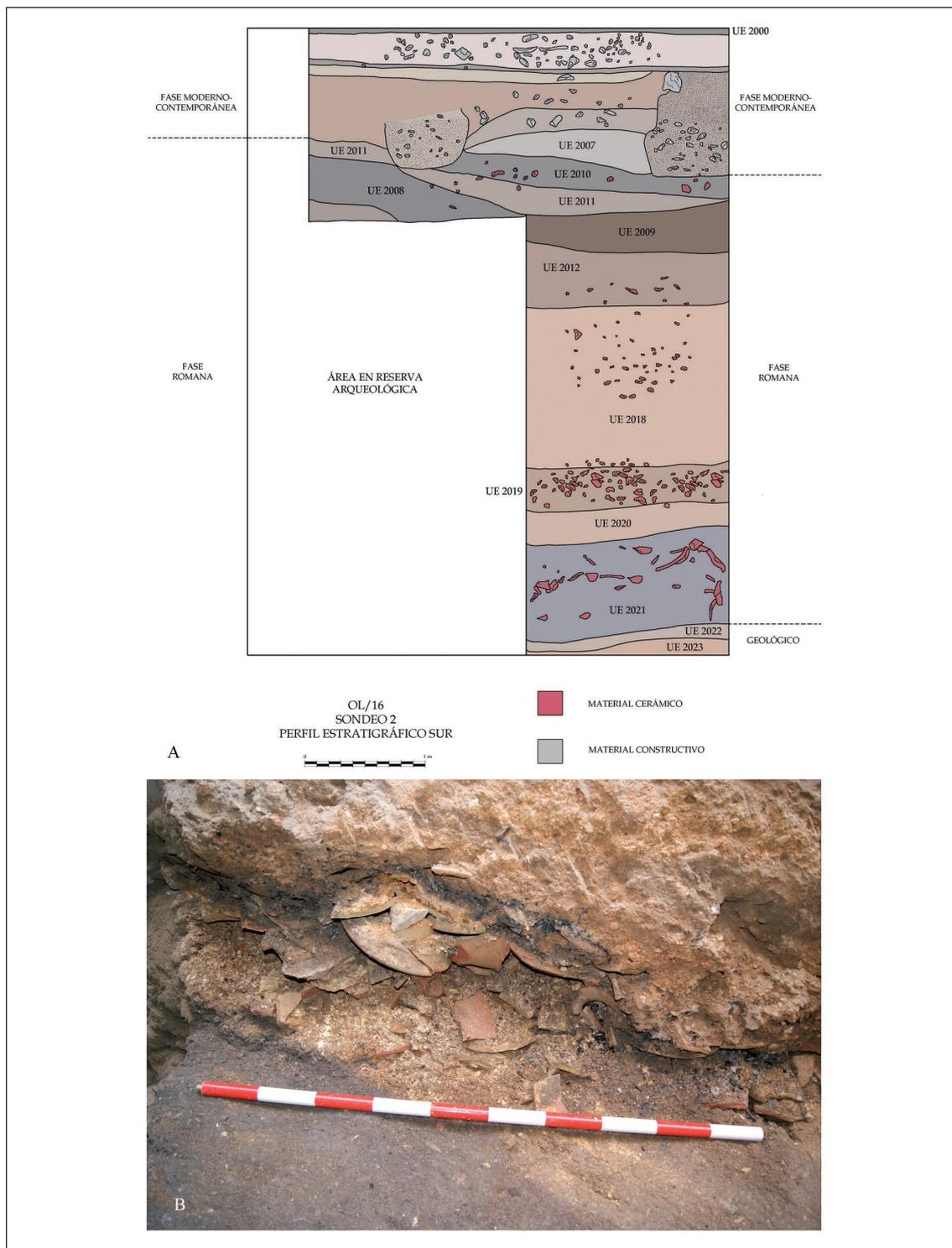


Fig. 3: Sección del Sondeo 2 con la ubicación de la 2019 en los niveles basales (A); y detalle de la U.E. 3019 donde se recuperaron las muestras ilustradas (B).

Caballas, sardinas y boquerones (Sondeo 2, U.E. 2019, muestra 1, nº 17–68; muestra 2, nº 69–255)

En el sondeo 2 se recogieron, entre otras, dos muestras de sedimentos procedentes del mismo nivel estratigráfico, la U.E. 2019. En el primer caso se trata de 355 gr. de tierra de textura arenosa y color marrón oscuro, con evidencias claras de la presencia de restos ictiológicos de tamaño medio, habiéndose procesado todo el sedimento recogido (fig. 4a). Los restos recuperados se pueden definir como dos conjuntos claramente diferenciados: por un lado tenemos los restos de parte del cuerpo de estornino (*Scomber japonicus*), representados solo por algunas vértebras precaudales, en un caso es la sexta vértebra la que aparece cortada (fig. 4b). A estas hay que sumar los restos de algún hueso craneal, y sobretodo fragmentos óseos de las agallas de esta especie (fig. 4c). Lo que indica la presencia de agallas y de cabezas cortadas, con mínima o nula presencia del cuerpo de estos peces: es decir, que el cuerpo y las cabezas se separaron mediante un corte, y que la parte central – cuerpos – no formarían parte del producto aquí documen-



Fig. 4: Ictiofauna de la U.E. 2019 (muestra 1). Sedimento sin triar (A); vértebras (B) y elementos de las agallas (C) de estornino; y restos de sardina (D, dcha.) y de boquerón (D, izda.).



Fig. 5: Ictiofauna de la U.E. 2019 (muestra 2, n° 69–255). Sedimento recogido sin procesar (A); restos de estornino de la muestra: Neurocráneo (B), vértebras (C), huesos craneales (D) y restos de las agallas (E); y restos de sardina (F) y de boquerón (G).

tado. Por otro lado, se han recuperado algunas vértebras y otros restos de sardina (*Sardina pilchardus*; fig. 4d dcha.), y en menor número de boquerón (*Engraulis encrasicolus*; fig. 4d izda.), de pequeñas dimensiones.

De este mismo nivel estratigráfico se estudió otra muestra de sedimento, de 150 gr., con las mismas características que la anterior: textura arenosa y color marrón oscuro, y también con múltiples restos ictiológicos de tamaño medio (fig. 5a). El material recuperado dibuja exactamente el mismo panorama que la muestra anterior: por un lado, los restos de estornino (*Scomber japonicus*), que en esta ocasión está representado por un neurocráneo entero (fig. 5b), al que se le cortó la zona de la boca (este tratamiento aparece en otros contextos, como los estorninos documentados en el interior de ánforas en salazón⁴). Además, se han recuperado vértebras de al menos dos individuos, de 40 y 45 cm de LT. En un caso son las cinco primeras vértebras (fig. 5c), con un corte en la primera, el atlas, que separaría el cuerpo de la cabeza; y en otro caso aparece también la segunda vértebra de otro ejemplar cortada. Si a ello añadimos la aparición de muchos restos craneales (fig. 5d), así como gran cantidad de huesos de las agallas de estos pescados (fig. 5e), sin rastro de otras vértebras caudales, podemos concluir que el objetivo era la de incluir básicamente las cabezas de estos en el preparado. El segundo grupo lo forman de nuevo pequeñas sardinias (de entre 7–15 cm de LT; fig. 5f) y en menor número boquerones del mismo tamaño (fig. 5g).

Atunes (Sondeo 3, U.E. 3019, nº 5789–5844)

El siguiente conjunto está formado por unos elementos muy poco comunes hasta ahora en los yacimientos arqueológicos: casi exclusivamente huesos de atunes. Se han recuperado 887 restos de atún (sin contar los restos más fragmentados y pequeños), de los que 513 son vértebras. Aparte de algunos restos recuperados de forma individual, debido a su singularidad, se han estudiado estos elementos siguiendo los grupos identificados en el yacimiento, ya que dado el alto número de vértebras, un acercamiento diferente sería dificultoso y nunca aseguraría que los resultados, en este caso una aproximación al Número de Individuos, fuera correcto. Por cuestiones de espacio únicamente ilustramos un ejemplo, correspondiente a un conjunto de vértebras y otros restos de atún, en el que 33 de las vértebras están quemadas (fig. 6). Pertenecen al menos a nueve ejemplares diferentes:

- Dos vértebras precaudales y seis caudales (todas quemadas menos una), con *urostylus*, de atún de 110 cm de LT.
- Siete vértebras precaudales y dos vértebras caudales, una con corte, de atún de 120 cm de LT.
- Dos vértebras precaudales y siete vértebras caudales de atún de 145 cm de LT.
- Cuatro vértebras precaudales y cinco vértebras caudales de atún de 120 cm de LT.
- Dos vértebras caudales de atún de 135 cm de LT.

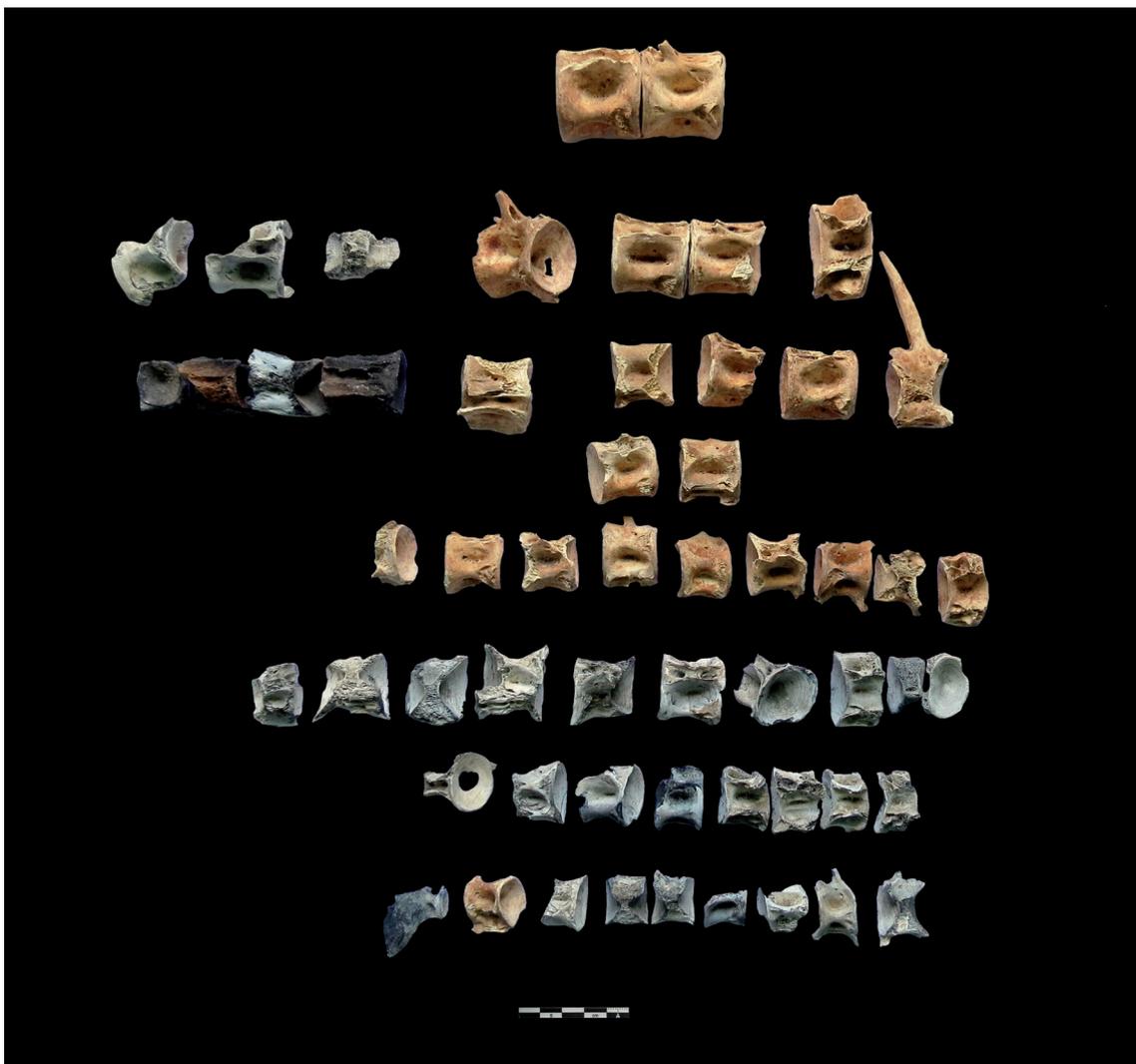


Fig. 6: Vértebras de atunes de la U.E. 3019 (n° 5789–5844).

- Una vértebra precaudal y cuatro vértebras caudales de atún de 140 cm de LT.
- Cuatro vértebras caudales quemadas (cola) de atún de 140 cm de LT.
- Una vértebra precaudal y tres vértebras caudales de atún de 150 cm de LT.
- Tres vértebras quemadas caudales de atún de 150 cm de LT.
- Dos vértebras caudales con marcas de descarnado de un atún de 165 cm de LT.

Jureles y sardinas (Sondeo 3, U.E. 3019, Muestra 8, n° 7079–7292)

Por último, otro conjunto que cabe diferenciar de los anteriores, corresponde a una muestra de 5 gr. recogida directamente de uno de los perfiles que, como se aprecia en la imagen, son fundamentalmente restos de ictiofauna, con apenas algo de sedimento, que provienen con seguridad del interior de las ánforas entre las que se encontraba (fig. 7a). Se trata de un residuo muy rico, formado por los peces descompuestos, con sus restos en general muy fragmentados. En este caso, se han podido identificar un total de 213 restos, de los cuales 152 pertenecen a una especie de carángido, ya sea el jurel real (*Caranx ronchus*) o el jurel (*Trachurus trachurus*). Se han recuperado todo tipo de huesos, aunque como es normal se han identificado un mayor número de vértebras (fig. 7b y c), entre las que hay 21 de individuos de 13–15 cm de LT; 31 de individuos de 10–12 cm de LT, y 55 de individuos de 8–9 cm de LT. Por otra parte, se han recuperado restos de sardina (*Sardina pilchardus*), con 39 vértebras de individuos de unos 15 cm de LT (fig. 7d). A pesar de tratarse de un compuesto de dos especies, claramente domina el jurel, que debía ser en realidad el protagonista de la salsa aquí documentada. Se trata además de una composición de peces más bien pequeños, de entre 8 y 15 cm de LT, la mayoría alevines de jurel.

Valoración general de la ictiofauna de El Olivillo

En espera del estudio definitivo de todos los restos ictiológicos recuperados en el yacimiento, parcialmente desarrollado actualmente,⁵ podemos plantear el debate en torno a los dos grupos de restos identificados en la muestra: los restos de salsas provenientes de las ánforas y las vértebras de los atunes.

En cuanto a los restos relacionados con las salazones identificadas en las diferentes muestras de sedimento y de ánforas, estas ofrecen un panorama realmente muy homogéneo, que podría definir gran parte de las producciones presentes en el yacimiento. El primer aspecto a resaltar es que estas salsas estarían centradas fundamentalmente en una especie, la sardina (*Sardina pilchardus*). En casi todos los sedimentos y muestras recogidas, la sardina es claramente la protagonista. Este taxón se ha podido identificar en prácticamente todos los casos gracias a la presencia entre los restos de operculares enteros o fragmentados que permiten definir claramente a esta especie. Las dimensiones de las sardinas, de entre 7 y 15 cm en general, advierten del tipo de preparado: salsas, y no salazones, para las que se buscarían ejemplares mayores. Además, asociados a estos restos de sardinas, en un porcentaje siempre muy inferior, se encuentran otras dos especies, el boquerón (*Engraulis encrasicolus*) y un pequeño carángido, probablemente el jurel real (*Caranx ronchus*). La presencia de estas dos especies en el producto podría deberse más a su coexistencia en los grandes bancos de sardinas, que serían el principal objetivo de pesca, que a una voluntad de crear preparados con diferentes especies



Fig. 7: Ictiofauna de la U.E. 3019 (Muestra 8). Imagen del residuo recuperado antes del triado (A); vértebras de carángidos por grupos de tallas (B), otros restos de carángidos (posttemporale, placas escatoides, keratohyale, maxilare, operculare, premaxilares y dentale) identificados (C); y detalle de los restos de sardina (D, arriba operculare y neurocráneo, abajo las vértebras).

pescadas en diferentes lances. Se trata de un hecho ya bien documentado en otros contextos y conservas piscícolas, donde a la sardina la suelen acompañar estas especies u otras, pero en un porcentaje muy inferior. Si se trata de un hecho casual o no, tampoco parece que tenga gran relevancia, ya que generalmente constituyen porcentajes muy pequeños. Solo en alguna ocasión, como sucede en el caso presentado anteriormente, las sardinias tienen un papel secundario en la salsa, donde predomina entonces alguna especie de carángido.

Dicho esto, hay que resaltar la documentación en dos casos de una asociación prácticamente desconocida hasta ahora pero muy interesante. Se trata de los restos de sardinias asociados a las cabezas y agallas de un pequeño escómbrido, el estornino (*Scomber japonicus*), que en algunos casos llegan a adquirir una alta representatividad. En dos muestras de sedimento (Sondeo 2), se recuperaron restos que parecen responder a un mismo tipo de producto, compuesto por un lado de pequeñas sardinias y boquerones, y por otro por cabezas y agallas de estornino. Una de las producciones más conocidas de la Antigüedad, de hecho teóricamente la de mayor calidad, era el *garum haimation*, una salsa que se realizaba en base a intestinos, agallas y sangre de atún (Geoponica 20, 46, 6). En nuestro caso, pensamos que en las muestras recuperadas en El Olivillo, se perfila un producto probablemente muy similar, en el que las cabezas y agallas de un familiar menor del atún, el estornino, tendrían un papel fundamental. Hasta el momento, las evidencias de *haimation* son mínimas, destacando los restos localizados en Jordania⁶.

En definitiva, todas las salsas identificadas, que contendrían las ánforas Dressel 7/11 de El Olivillo parecen *garum* y derivados producidos fundamentalmente con sardinias de pequeño tamaño, no superior a los 15 cm en su mayoría. Algunas producciones, identificadas solo en el Sondeo 2, podrían pertenecer a un tipo de salsa de más calidad, emparentada al *haimation*, mal documentado aún arqueológicamente.

Por lo que hace al otro gran grupo de la muestra estudiada, los restos de atunes, hay un hecho muy significativo que llama la atención, como son las medidas de los atunes representados en la muestra, que reflejan una población relativamente joven. Los rangos determinados están situados entre los 80 y 180 cm de LT. Para estos rangos, se suponen, siguiendo los estudios de Rodríguez-Roda⁷ unos pesos de entre 10–15 K y 95–110 K respectivamente. Hay que decir que estamos ante una muestra en la que están representados atunes juveniles, de entre 2 y 7 años, que llegarían a los 95 k. básicamente, pero no aparecen representados los grandes atunes, de hasta unos 11–15 años, de longitudes de hasta 240 cm por ejemplo, y de pesos de unos 200 k. Sin duda, hay que preguntarse por qué no aparecen restos de estos atunes mayores, ya que con toda seguridad también se pescaban. En nuestra opinión, dadas sus dimensiones, a los más grandes pudieron haber sido “ronqueados” (despiezados) en otro lugar, quizás en la misma playa, para no tener que cargar con tanto peso, y los desechos quedarían allí mismo, donde se quemarían, como conocemos por grabados del s. XVI (Hoefnagel) y por la evidencia arqueológica en otros yacimientos (Camarinal en la ensenada de Bolonia). Por otra parte, también

cabe pensar que estos grandes atunes eran destinados a un tipo de consumo o preparado específico, o quizás incluso que estamos ante restos provenientes de un consumo más doméstico, para los que se destinarían atunes menores. Sea como fuere, queda claro que en esta zona llegaron los atunes ya sin las cabezas, y que estos eran de dimensiones pequeñas y medianas. La pesca indiscriminada de todos los atunes, sin tener en cuenta edad y fase de crecimiento, no beneficia en absoluto a la supervivencia de la especie, pero evidentemente estamos ante unos parámetros y tipo de pesca que no parece que pudiera resultar una amenaza grave en este sentido.

Por último, recordar que es la primera vez en la que se documentan arqueológicamente niveles de cremación de restos de atunes en época romana en el Círculo del Estrecho, pues el único paralelo conocido – el Teatro de Andalucía de Cádiz – se retrotrae a época púnica⁸.

Perspectivas: Roma y la complejidad de los modelos pesquero-conserveros

El estudio de las ictiofaunas arqueológicas de El Olivillo ha revelado la coexistencia de una notable diversidad de especies, que alternan desde los atunes – posiblemente la más importante a tenor de la presencia abrumadora de restos, a las caballas o los jureles, desembocando en las sardinas y boquerones (fig. 8). Demostrando, por tanto, que las mismas se pescaron de manera abundante y sincrónicamente (especialmente los atunes y las sardinas).

Ello permite replantear los modelos pesqueros considerados hasta la fecha, que atribuían una pesca selectiva centrada en el atún y las caballas desde época republicana al Alto-Imperio, la cual habría dado paso a partir de época medio imperial a la pesca masiva de especies más pequeñas (engráulidos y clupeidos), por un progresivo agotamiento de los caladeros: así parecían demostrarlo los restos de conservas en las fábricas salazoneras de época tardorromana, centrados en la aparente fabricación, casi exclusiva, de *garum* de sardinas y boquerones, como en Troia y Olisipo⁹. Incluso se ha llegado a plantear que el binomio atún/estorninos dio paso a las sardinas/boquerones en la Antigüedad Tardía debido a fenómenos de sobre-pesca¹⁰. El registro íctico de El Olivillo ha demostrado una activa pesca de sardinas en los caladeros gaditanos en época augustea y julio-claudia inicial, conviviendo con las rentables pesquerías del atún, por lo que hay que reflexionar sobre los modelos hasta ahora planteados, basados en la ausencia de datos empíricos sobre ictiofaunas arqueológicas altoimperiales, limitadas a los contenidos de las ánforas y no al estudio de (residuos procedentes de) centros de procesado piscícola, como es el caso de El Olivillo.

Otro aspecto de interés es la fecha en la cual se datan los depósitos analizados, centrada en época augustea (los dos contextos aquí publicados) y en general entre Augusto y el decenio 60/70 d.C. en la totalidad de la secuencia de El Olivillo. Aunque sea este uno de los momentos del *floruit* económico de las pesquerías en *Baetica*, prácticamente

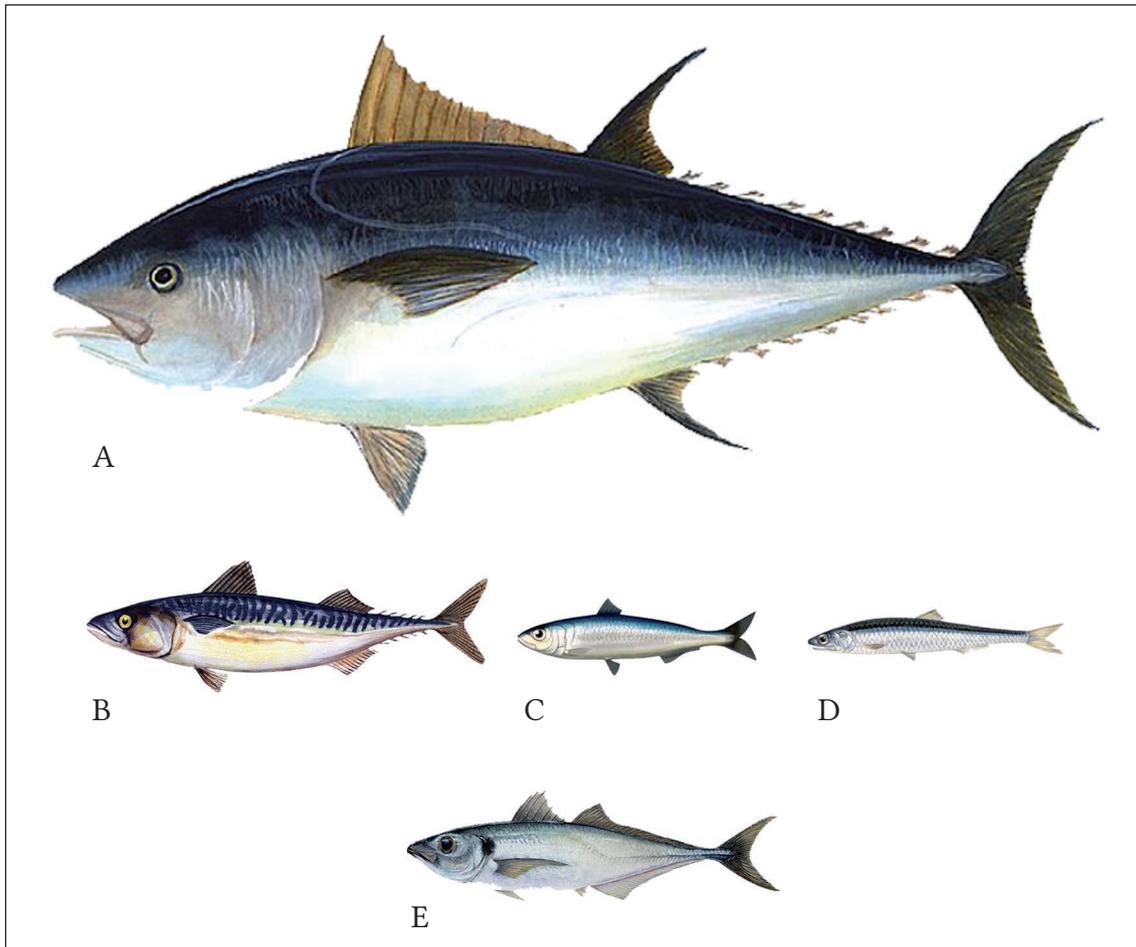


Fig. 8: Representación de los principales taxones identificados en El Olivillo: atún (A. – *Thunnus thynnus*), estornino (B. – *Scomber japonicus*); sardina (C. – *Sardina pilchardus*), boquerón (D. – *Engraulis encrasicolus*) y jurel (E. – *Trachurus trachurus*).

no hay evidencias sobre ictiofaunas arqueológicas de estos momentos procedentes de contextos productivos – apenas Cerro del Mar y Tienen¹¹; lo cual multiplica exponencialmente el interés de los hallazgos de El Olivillo.

Asimismo, incidir en la escasa visibilidad de las artes de pesca, pues prácticamente no han sido recuperados restos de instrumental de pesca en El Olivillo, si bien las amplias capturas de atunes de pequeñas/medianas dimensiones y especialmente sardinas, verifican su asiduo empleo en estos yacimientos hispanorromanos.

Por último, indicar que la coexistencia de atunes, caballas, jureles, sardinas y boquerones en El Olivillo de *Gades* constituye una interesante llamada de atención respecto a la diversidad y complejidad de las técnicas de pesca de los caladeros hispanorromanos, siendo éste uno de los primeros depósitos de entidad con restos ictiológicos del s. I d. C. asociados a pesquerías de carácter artesanal-industrial, de ahí su interés.

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Créditos de las figuras

Todas las figuras son de los autores del artículo (Universidad de Cádiz).

Notas

¹ Bernal 2012; Bernal – Lara 2012.

² Bernal – Vargas 2017 y 2019; Bernal et al. 2017 y 2018.

³ Criterios de datación precisados en Bernal et al. 2018; Bernal – Vargas 2019.

⁴ Desse – Desse-Berset 2000.

⁵ Bernal et al. 2019.

⁵ Van Neer – Thomas 2008.

⁷ Rodríguez-Roda 1964.

⁸ Bernal et al. 2014.

⁹ Una síntesis de estos planteamientos en García Vargas 2006; García Vargas – Bernal 2009.

¹⁰ Trakadas 2006

¹¹ García Vargas et al. 2018

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**The Rise of Bling: Charting the Incredible Increase
in the Consumption of Decorative Metal Objects
in the Roman Empire**

Panel 3.13

Organized by

Stefanie Hoss

The Gold of Phanagoria (Bosporan Kingdom): A Complex Archaeo-metallurgical Study

Mikhail Treister

Gold Objects in the Context

Phanagoria, founded ca. 543 BC, took its name after one of the colonists from Teos, Phanagoras and was the Asian capital of the Bosporan Kingdom and a large emporium for all the traffic between the coast of the Maeotian marshes and the countries on the southern side of the Caucasus (fig. 1, 1).¹ At least 1300 burials were excavated in the necropoleis since the first half of the 19th century, which are situated along the main roads leading from the city, and 78 of them contained gold objects (fig. 1, 2).²

The study of the gold objects from the excavations and chance finds of Phanagoria was undertaken in 2013–2014.³ There are ca. 300 individual finds and groups of objects, dating from the late 4th century BC to the 5th century AD, which are kept in four institutions in Russia. Of these, 164 objects were analysed with the help of 284 RFX-analyses, while 67 samples were studied optically. The composition of gold was also studied with electron probe microanalyzers (fig. 2).⁴ The technology of the manufacture of the majority of the artefacts was also studied.⁵

The material under discussion was found in 6% of all the recorded burials. However, if we take into account the fact that first of all the rich burials had been looted, then these statistics need a significant correction, increasing the percentage of burials with gold items.⁶ Of the 78 complexes ca. 25% belong to the Hellenistic period, including 4 of early Hellenistic date and 11 (or more than half of all the Hellenistic burials with gold objects) – belong to the late Hellenistic period. More than a half of all burials with gold items date to the first three centuries of our era (ca. 56%). Among them is a significant predominance of burials dating from the 1st – the first half of the 2nd century AD, the number of which is more than three times higher than that of the burials with gold objects of the second half of the 2nd and the 3rd centuries (ca. 13%). A small increase in the number of funeral complexes with gold is attested for the 4th and 5th centuries AD (ca. 17%, see fig. 1, 3).⁷ If we extrapolate from these statistics and assume that burials with gold items of different chronological periods were looted with approximately the same intensity (which, incidentally, is not necessarily so), it cannot be overlooked that the peak of the use of gold items in funerals lies in a relatively narrow period from the late 2nd/early 1st century BC to the mid-2nd century AD. Other data, including anthropological studies, testify that this was the period of the highest prosperity of the city and statistics shows that 70% of all the burials dating from the 1st century BC to the 5th century BC belong to that period⁸.

In the burials of the second half of the 4th to the 2nd century BC, the proportion of the funeral gold items specially made for the burial is not high.⁹ However, from the 1st cen-

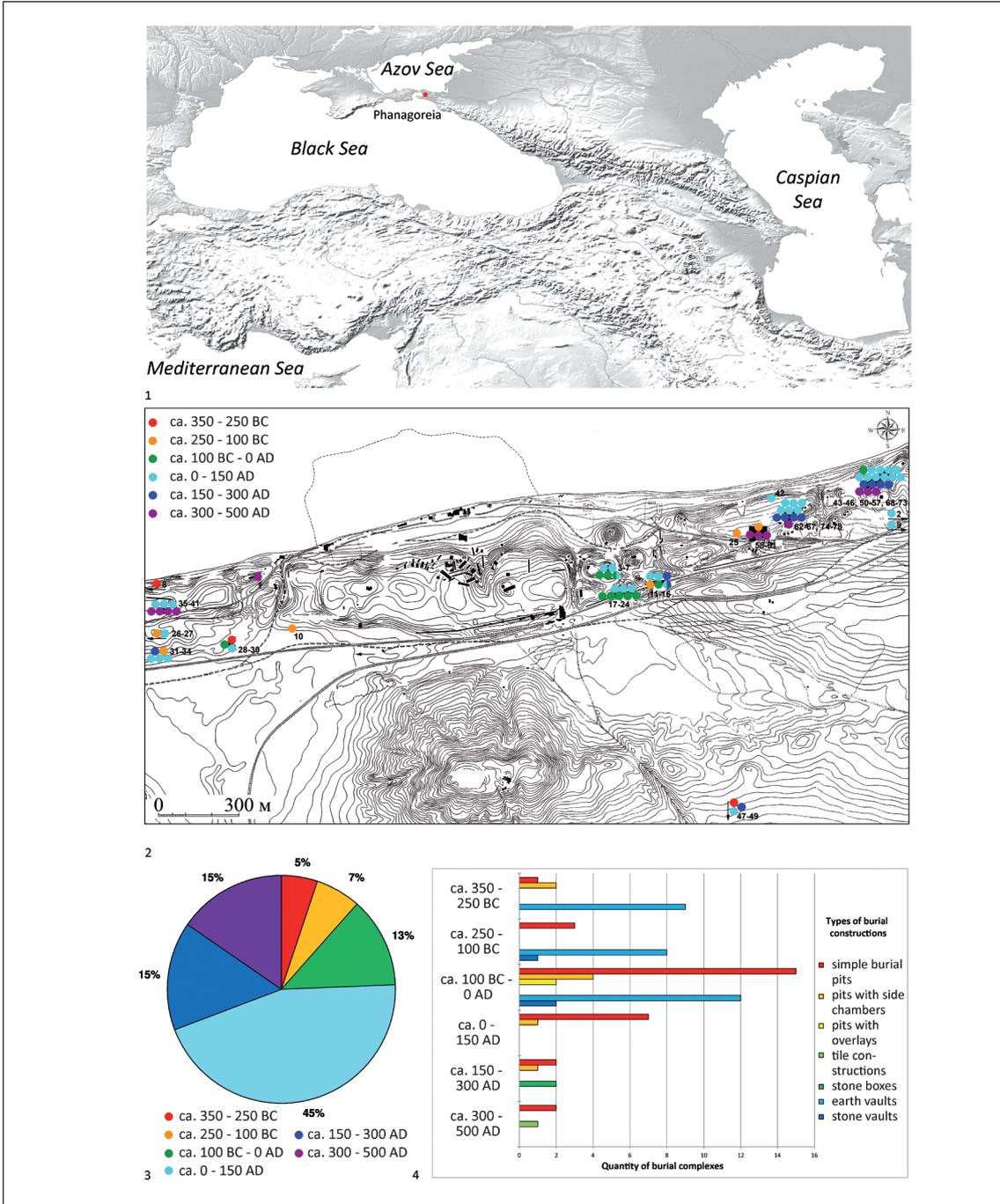


Fig. 1: 1 – map of the Pontic area with the location of Phanagoria; 2 – map of Phanagoria with location of the burials, which yielded the finds of gold objects; 3 – diagram with the chronological distribution of burials in Phanagoria, which yielded the finds of gold objects; 4 – chronological distribution of the types of burials in Phanagoria, which yielded the finds of gold objects.

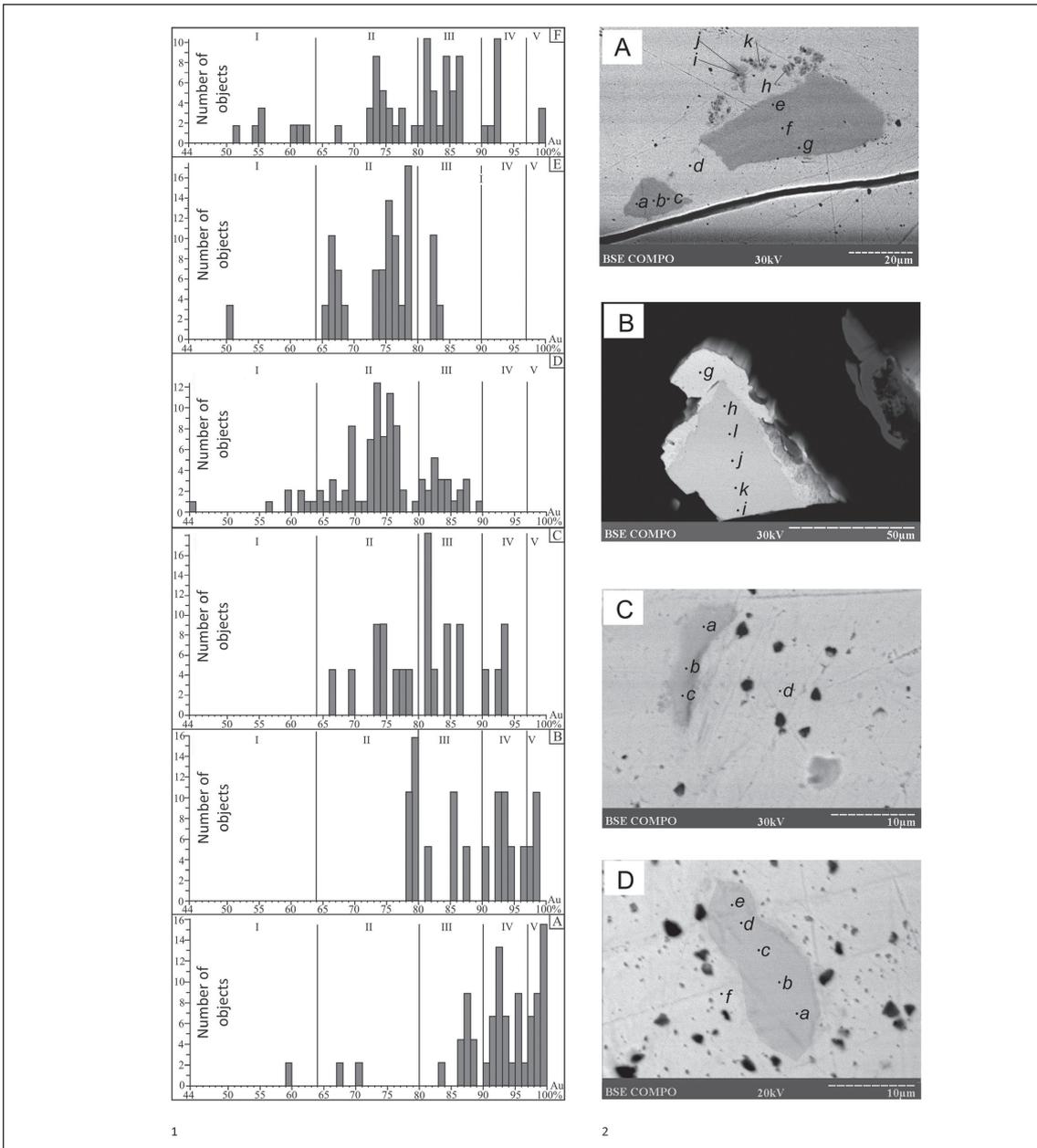


Fig. 2: 1 – Histograms of distribution of gold composition in the finds from Phanagoria. F – 4th–5th centuries AD, 58 analysis; E – second half of the 2nd–3rd centuries AD, 29 analysis; D – 1st–first half of the 2nd century AD, 97 analysis; C – late 2nd–1st century BC, 22 analysis; B – second half of the 3rd–late 2nd century BC, 19 analysis; A – second half of the 4th–first half of the 3rd century BC, 45 analysis. I – electrum; II – low-karat gold; III – medium-karat gold; IV – high-karat gold; V – refined gold. 2 – Micro-inclusions of osmium in the leaves of a golden wreath cat. no. 138 (secondary electron images).



Fig. 3: Southern necropolis: burial mound “Sennoi 231”/2003. Burial no. 5: 1 – necklace cat. no. 139; earring cat. no. 140A; 3–9 – wreath cat. no. 139. Moscow, Institute of Archaeology.



Fig. 4: South-Eastern necropolis: burial no. 15/1978: 1 – necklace or diadem cat. no. 79; 2 – earring cat. no. 80A; 3 – finger ring cat. no. 78. – Western necropolis: burial mound, burial no. 1/1954: 4 – earring cat. no. 33B; 5 – bead cat. no. 35; 6 – finger ring cat. no. 34. Section “Upper town”/1978: 7 – fragmentary necklace terminal cat. no. 85. Moscow, Institute of Archaeology.

ture BC onwards specially fashioned gold items such as wreaths and diadems,¹⁰ ghost money (fig. 8, 6), indications and imitations of coins,¹¹ elements of burial belts¹² (fig. 8, 1–5), as well as some ornaments that could not be worn in real life, including earrings and even torcs¹³ (fig. 7, 1), predominate.

It is worth noting, that practically all the complexes of the late Hellenistic period included finds of funeral diadems in the form of ribbons with hooks at the ends,¹⁴ while the finds of “real jewellery” (earrings, finger rings, all partly melted) of that time originate from the burned layer on the city’s acropolis, probably associated with the destruction of the city in 63 BC (fig. 5).¹⁵ Phanagoria was an important outpost for the Pontic King Mithridates VI on the Asian side of the Bosphorus (App. *Mithr.* 108). The Phanagorians revolted against Mithridates VI. Apparently, the fire was so fierce and dangerous that Artaphernes, the eldest son of Mithridates, surrendered in order to save his younger brothers and sister. The fact that the excavations revealed the ruins of that very building (or palace?) is proven not only by the traces of a huge fire, but also by the find of the epitaph on the marble base for the bronze statue of Hypsikrateia, the wife of Mithridates VI, who probably died during the Phanagorian revolt against Mithridates.¹⁶

In the 1st – first half of the 2nd century AD, the richest burials contain gold articles made especially for the burial, but only in minimal amounts. Among the numerous decorations and metal elements of the dress from the burial of a girl of the second half of the 1st century AD (figs. 6–7),¹⁷ only the torc (fig. 7, 1) was made especially for the burial; all the other objects, among them appliqués (fig. 7, 4–7), a finger ring (fig. 7, 2), a bracelet (fig. 7, 3) and details of the necklace (fig. 6) belong to “real” jewellery. Usually the intact graves of that time contained much less gold jewellery and only some gold leaves of the funeral wreaths or diadems.¹⁸

In the second half of the 2nd–3rd centuries AD, as in the late Hellenistic period, “funeral gold” predominates, however, as a rule, the intact graves also contain finds of separate gold leaves.¹⁹ A rare exception is the vault no. 54/2006 of the Eastern necropolis, in which a faceted ring with a glass inlay was also found.²⁰

In late Antiquity, a certain balance is established between the funerary and real ornaments, and together with elements of funeral wreaths and belts, ‘real’ necklaces, earrings, rings, as well as details of garment embroidery are found.²¹

To whom belonged the burials with gold? The observations presented above demonstrate that gold items were one of the markers of the elite burials, at least in the early Hellenistic period, when gold objects were given as grave goods for burials under burial-mounds (fig. 1, 4). It is exactly these burial mounds in which the most valuable objects – both in the material and in the artistic sense – were found, as examples from the Sennoi burial mound no. 231 show.²² They include a standard set of quality gold beads (fig. 3, 1),²³ earrings with lion heads (fig. 3, 2)²⁴ as well as a gold wreath with a tube-shaped frame of the type well known in Macedonia and Thrace (fig. 3, 3–9).²⁵ The destroyed burial in the tile construction under the burial mound of the Western necropolis also contained gold objects (fig. 4, 4–6),²⁶ including a finger ring with a scaraboid

of late Achaemenid type (fig. 4, 6),²⁷ together with red-figured vases.²⁸ However, during the following period, the proportion of burials in simple graves containing gold objects gradually increases, reaching 73% in the late Hellenistic period. Especially interesting is the “splash” of the variety of types of burial structures in which gold objects were found, in the 1st and in the first half of the 2nd century AD and a stable absolute predominance of gold finds in earth vaults, as in the second half of the 2nd and in the 3rd centuries (80%), and in the 4th – 5th centuries (ca. 69%) with a significant reduction in the variations in the types of funerary structures in which gold articles were found (fig. 1, 4).²⁹

The fact that the material for almost all periods is mostly “ordinary” is evidenced by the fact that there are no combinations or ‘sets’ of jewellery, defined as several objects made in a single artistic style using the same techniques of manufacture and decoration.³⁰ Nevertheless, for some periods more or less typical combinations of jewellery items were in use, for instance those of earrings with lion heads and small biconical beads for the early Hellenistic time.³¹

In any study of antique jewellery, an important place is occupied by the attempt to distinguish between the products of local workshops and imports, which is not always easy. The following *criteria* could help in the allocation of local types of jewellery: 1) the uniqueness of the shape, 2) the distribution mainly in the given territory. At the same time, it would be logical to consider items of supposedly non-Bosporan production as imports.³²

A significant part of them is dated into the early Hellenistic period and comes from three complexes: a cremation in the bronze hydria in the burial mound Sennoi 231³³ (fig. 3), a tiled grave in the burial mound of the Western necropolis (1954) (fig. 4, 4–6)³⁴ and the burial no. 15/1978 of the South-Western necropolis (fig. 4, 1–3). The second group, which conventionally could be considered imports as they have parallels in the Treasure found on Delos and in the shipwreck of Antikythera, were found in the burnt layer of 63 BC in the acropolis of Phanagoria.³⁵ Thus, virtually all the gold objects of the Hellenistic period that could be imports come from the contexts associated with the elite of Phanagoria.

However, as mentioned above, the majority of the gold artefacts from Phanagoria are items made of thin foil especially for burial purposes. It is hard to imagine that such products were imported. Of course, there were exceptions, but these are extremely rare. But as the finds of “funeral gold” in Phanagoria are represented by items that have close parallels in other centres of the Bosporan Kingdom (with some rare exceptions), it would be difficult to define them as products of the Phanagorian workshops, rather than more generally the Bosporan workshops.³⁶

In this regard, special attention should be paid to two kinds of finds of allegedly North Pontic origin, which are mainly concentrated in the Bosporan territory, like the medallions with Eros and a butterfly (fig. 6, 1),³⁷ or the finger rings with the inscription XAPA on the bezel³⁸ (both found in the child burial no. 38/2003 of the Eastern necropolis, see fig. 7, 2), which were found rather often in the burials of children, and those



Fig. 5: Section "Upper town"/1999, Object no. 85: 1-3, 5 – earring pendants, fragments of earrings cat. nos. 123-126; 4, 6 – drops of melted gold cat. nos. 127-128; 7-8 – finger rings cat. nos. 129-130. Moscow, Institute of Archaeology.

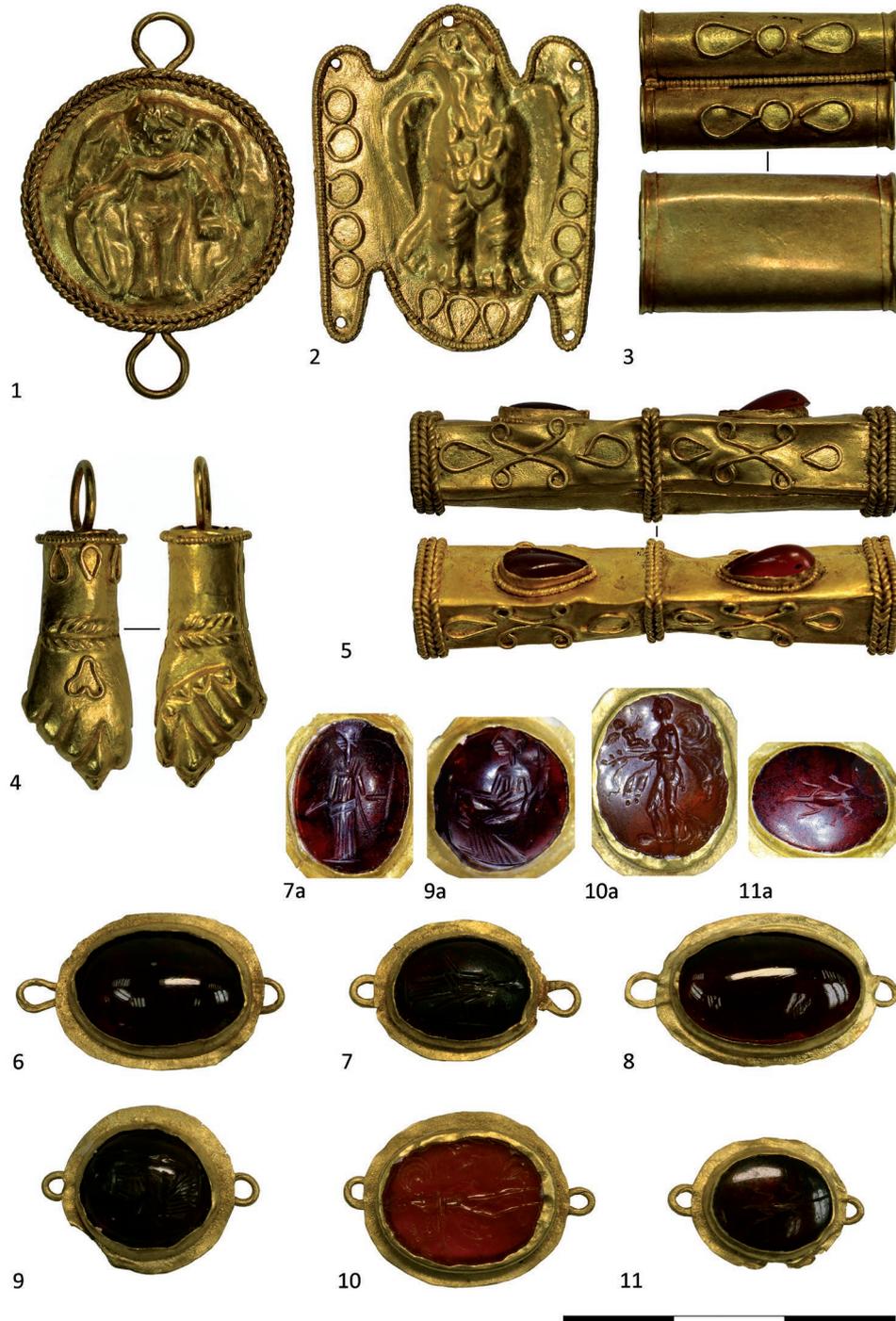


Fig. 6: Eastern necropolis: burial no. 38/2003. 1 – medallion – a sleeve fastener (?) cat. no. 159B; 2 – a pendant reworked in an appliqué cat. no. 143; 3 – double-tube divider cat. no. 148; 4 – fica pendant cat. no. 149; 5 – tube bead cat. no. 147; 6–11 – necklace settings with inlays cat. nos. 150–155. Moscow, Institute of Archaeology.



Fig. 7: Eastern necropolis: burial no. 38/2003. 1 – funeral torc cat. no. 156; 2 – finger ring cat. no. 158; 3 – bracelet cat. no. 157; 4 – appliqué cat. no. 145; 5 – appliqué cat. no. 142; 6 – appliqué cat. no. 144; 7 – appliqué cat. no. 146. Moscow, Institute of Archaeology.



Fig. 8: Western necropolis (“MTF”); vault no. 1/1991. Coffin no. 4. 1-3 – funeral buckles cat. no. 115; 4-5 – funeral belt tips cat. no. 116; 6 – ghost coin cat. no. 117. Moscow, Institute of Archaeology.

items of allegedly Bosphorus manufacture, the finds of which are concentrated mainly in the territory of the Asian part of the state. In the case of necklaces composed of bezels in the form of two triangles with a diamond-shaped central part, the finds of which are known from Phanagoria³⁹ (fig. 4, 1–1a) and also from the Tsukur-Liman, as well as the necropolis of Gorgippia, the burial-mound near Maikop in the Kuban basin, as well as the necropolis of Tanais in the estuary of the Don river,⁴⁰ there are no convincing reasons to attribute all of them to the products of the Phanagoria workshops – they could have been manufactured also in Gorgippia and Tanais.⁴¹ However the situation is different with the elements of funeral belts from Phanagoria. All of them were found in the burials of the late 4th–early 5th century AD, and most of the bezels of buckles, appliqués and belt tips imitate inlays in settings. Outside the Asian part of the Bosphoran Kingdom, similar funeral belts of the Late Antique period are unknown. In this case, the concentration of finds in the Asian part of the Kingdom and the absence of such items in the European side of the state are possible arguments in favour of considering them as products of the Phanagorian workshop.⁴² It is worth to note that some of them were made by embossing on matrices, whereas as for others, real belt fittings were used as matrices.⁴³

In the absence of finds of tools for the manufacture of gold items in Phanagoria, an important role is played by finds of gold ornaments, which could be considered scrap.⁴⁴ In my opinion, we can consider the fragment of the necklace terminal with filigree and granulation (fig. 4, 7), which was found in 1978 at the section “Upper Town”⁴⁵ and which belongs to the type discussed above, to have been scrap.⁴⁶ It is difficult to assume, that a massive fragmentary gold plate was torn by accident and was simply lost. Rather, it was scrap determined for smelting and reuse. If this is the case, we have a proof of jewellery production, which can be dated from the late 4th to the 2nd century BC, when the necklaces to which the fragmentary terminal could relate, were in use. It is also worth noting that this type of necklaces, as was shown above, was very likely made in the workshops of the Asian part of the Kingdom and in Tanais.⁴⁷

Given the micro-inclusions of osmium in the objects of the Early Hellenistic period (fig. 2, 2a–d),⁴⁸ it is likely that placer deposits served as source for their manufacture, whereas the jewellery was usually made of high-karat gold, which was often refined (fig. 2, 1a).⁴⁹ It is also possible that high-karat solders could have been used, probably of the same type of metal from which the gold objects were made, sometimes with the addition of some copper.⁵⁰ Mercury was detected in the gold of the solder, used for soldering halves of large biconical beads from the cremation in the bronze hydria⁵¹. Most likely, the joining of the two halves of the beads occurred as a result of the amalgamation of the surface.⁵²

During the Hellenistic period, the fineness of the gold gradually decreased and low- and medium-karat alloys were increasingly used (fig. 2, 1b–c). The source of the metal could be widespread gold-quartz and gold-polysulfide-quartz deposits.⁵³ Gradually, gold items in burials cease to be an unambiguous marker of the elite. Techniques used to

make gold items in the High Hellenistic period did not undergo significant changes in comparison to the previous period.⁵⁴ The main quantity of gold items of the late Hellenistic period is represented by funeral diadems, which, judging by the nature of the defects along the edges could be cut out with scissors.⁵⁵ For one of the finger rings found in the destruction layer of 63 BC on the Acropolis, the use of a special reflective gold foil in the form of a circle, lining the tray under the inlay is attested (fig. 5, 7).⁵⁶ The use of this technique in the ring of the shape typical for the late Hellenistic period, which was widespread in the Mediterranean and in the Black Sea regions,⁵⁷ allows us to reconsider the genesis of this method, which until now was associated with the jewellery of the Late Antique period.⁵⁸

During the Hellenistic period, the proportion of the Bosphoran products gradually grows, among which there were also most likely those manufactured directly in Phanagoria – this is proven both by observations on the distribution of finds, and by the fragment of the necklace terminal mentioned above (fig. 4, 7), found in the settlement layer, which may have been scrap collected for smelting.⁵⁹

Characteristic for the 1st–3rd centuries AD is the predominance of low-karat gold (fig. 2, 1d). Most probably the sources of gold changed in the beginning of the Christian era – it is possible that deposits with low-karat gold were used, such as gold-pyrite-polymetallic deposits of the Trans-Caucasus and Asia Minor.⁶⁰ Since the turn of the Christian era, certain changes in technology happened.⁶¹ With rare exceptions, items of jewellery from the 1st – first half of the 2nd centuries AD were made of a triple alloy with a consistently high silver content (primarily of 20–30%) and stable copper content (up to 3–4%).⁶² At this time, there was a surge in the use of gold items in Phanagoria, and the largest variety of types of funerary structures in which gold items were found (fig. 1, 3–4), which indicates a relatively broad social and ethnic base of this phenomenon and a relatively high standard of living in this period. It is worth noting that in the richest burials with gold objects of this time, items of funerary gold are extremely rare.⁶³

In the second half of the 2nd – 3rd centuries AD the total number of burials in which gold articles were found decreases more than thrice in comparison with the previous period, while the variety of types of burial structures is considerably narrowed (fig. 1, 3–4). As in the late Hellenistic period, the “funerary gold” of local work prevails.⁶⁴ In Late Antiquity, gold of various compositions, from electrum to refined gold, was in use, while its sources were probably supplemented with copper-zinc-pyrite deposits with the typical gold-bearing zone of oxidation. In this time, gold characterized by a great variability of silver content was primarily used, probably due to the use of scrap jewellery (fig. 2, 1f). On the whole, the period is characterized by an extraordinary variety of metal compositions: from electrum to refined high karat gold and a certain balance established between the funerary and real ornaments.⁶⁵

Notes

- ¹ Kuznecov 2002, 59–68; Kuznetsov 2010, 431–469; Kuznetsov 2013, 12–39.
- ² Voroshilov – Voroshilova 2015, 29–31 fig. 1.
- ³ The book in Russian has been published: Treister (ed.) 2015.
- ⁴ Zaikov et al. 2015, 266–310; Saprykina – Pel’gunova 2015, 311–321.
- ⁵ Saprykina 2015, 208–265.
- ⁶ Voroshilov – Voroshilova 2015, 76.
- ⁷ Voroshilov – Voroshilova 2015, 73–75 figs. 16, 17; Treister 2015b, 326.
- ⁸ Treister 2015b, 329f.
- ⁹ Abramzon – Treister 2015, 194–199 fig. 1.
- ¹⁰ Treister 2015a, 81–103 figs. 3–18.
- ¹¹ Abramzon 2015, 182–193; Abramzon – Treister 2015, 194–201; Abramzon et al. 2016, 7–23; Abramzon et al. 2017, 282–290.
- ¹² Treister 2015a, 166–173 fig. 40; Treister 2017, 310–322.
- ¹³ Treister 2015a, 116 fig. 21, 5; 117–119 fig. 23, 2.
- ¹⁴ Treister 2015a, 101 figs. 12, 2–10; 16–18.
- ¹⁵ Abramzon – Kuznetsov 2011a, 78, 79 fig. 1; Abramzon – Kuznetsov 2011b, 16, 74 fig. 5; Treister 2013, 12–21; Treister 2015a, 105–107 fig. 19; 148–149 fig. 33, 5, 6; Treister 2015d, 440–444 nos. 123–130, pls. 34, 35.
- ¹⁶ Kuznetsov 2007, 238–243 figs. 5–9; Kuznetsov 2010, 448 f. fig. 16; Abramzon – Kuznetsov 2011a, 103 f.; Abramzon – Kuznetsov 2011b, 16, 74 fig. 2.
- ¹⁷ Voroshilov – Voroshilova 2015, 56 no. 52; Treister 2015d, 458–477 nos. 142–159 pls. 44–50.
- ¹⁸ Treister 2015a, 97 fig. 14, 1; 101–103; Treister 2015b, 327; Mordvintseva et al. 2015, 537–539 nos. 237–241 pl. 76.
- ¹⁹ Treister 2015b, 327; Treister 2015d, 492 f. no. 222 pl. 58, 3, 4.
- ²⁰ Voroshilov – Voroshilova 2015, 62 no. 62; Treister 2015a, 153 fig. 34, 10; Treister 2015b, 327; Treister 2015d, 492 f. no. 177 pl. 58, 2.
- ²¹ Treister 2015a, 84–89 figs. 5–7; 116 fig. 21, 20, 21; 153 fig. 34, 12; 157 f. fig. 36; 166–173 fig. 40; Treister 2015b, 327.
- ²² Kuznetsov 2010, 452 fig. 30; Voroshilov – Voroshilova 2015, 54 no. 48; Treister 2015b, 328; Treister 2015d, 450–458 nos. 137–142 pls. 38–42.
- ²³ Treister 2015a, 119–122, fig. 24, 1; Treister 2015d, 453, 456 no. 139 pl. 42, 1–3.
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- ²⁶ Marchenko 1960, 22–28; Nikulina 1965, 192–195; Pfrommer 1990, 285, FK 159; Treister – Tugusheva 2014, 393–405 figs. 1, 2; Voroshilov – Voroshilova 2015, 35 no. 8; Treister 2015c, 367–371 nos. 32–35 pl. 11.
- ²⁷ Marchenko 1960, 25–28; Nikulina 1965, 186 fig. 1, 11; 192–195; Treister 2015c, 368 f. no. 34 with complete bibliography pl. 11, 3–5.
- ²⁸ CVA Pushkin Museum 6, p. 34, pls. 22; 28; Treister – Tugusheva 2014, 399 f. fig. 2.
- ²⁹ Voroshilov – Voroshilova 2015, 73–75 fig. 17; Treister 2015b, 328.
- ³⁰ Cf. Treister 2016, 50–56.

- ³¹ Treister – Tugusheva 2014, 393–405.
- ³² Treister 2015b, 330 f.
- ³³ See above note 22.
- ³⁴ See above note 26.
- ³⁵ Voroshilov – Voroshilova 2015, 41 no. 20; Shavyrina 1983, 71–73; Treister 2015d, 404–409 nos. 78–83. See on the parallels to the earrings and finger rings: Treister 2013, 13–14; Treister 2015a, 105–107. 148 f.
- ³⁶ Treister 2015b, 331 f.
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- ³⁸ Treister 2015a, 154 f. fig. 34, 2; Treister 2015d, 474 f. no. 158, pl. 49, 3. 4.
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- ⁴⁰ Treister 2007, 61 map 19.
- ⁴¹ Treister 2015b, 332.
- ⁴² Treister 2015a, 166–173 fig. 40; Treister 2015b, 332; Treister 2017, 310–322.
- ⁴³ Saprykina 2015, 252 f.
- ⁴⁴ Treister 2015b, 333 f.
- ⁴⁵ Treister 2015a, 125 fig. 26, 2; 126; Treister 2015d, 410 f. no. 85 pl. 24, 4.
- ⁴⁶ See above note 44.
- ⁴⁷ See above note 41.
- ⁴⁸ Zaikov et al. 2015, 278 f. fig. 3A.
- ⁴⁹ Zaikov et al. 2015, 285–289.
- ⁵⁰ Saprykina – Pel’gunova 2015, 312–315.
- ⁵¹ Treister 2015a, 119–122, fig. 24, 1a; Treister 2015d, 453. 456 no. 139 pl. 42, 1. 2.
- ⁵² Saprykina – Pel’gunova 2015, 313.
- ⁵³ Zaikov et al. 2015, 278 f. fig. 3B–C.
- ⁵⁴ Saprykina 2015, 259–261.
- ⁵⁵ Treister 2015a, 101 figs. 12, 2–10; 16–18; Saprykina 2015, 261.
- ⁵⁶ Treister 2015a, 148 f. fig. 33, 5; Treister 2015d, 443 no. 129, pl. 35, 1. 4.
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- ⁵⁸ Adams 2006, 12; cf. Saprykina 2015, 244, 261.
- ⁵⁹ Treister 2015b, 335 f.
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- ⁶³ Voroshilov – Voroshilova 2015, 73–75 figs. 16. 17; Treister 2015b, 336.
- ⁶⁴ Voroshilov – Voroshilova 2015, 73–75 figs. 16. 17; Treister 2015b, 337.
- ⁶⁵ Zaikov et al. 2015, 278 f. fig. 3F.

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Fig. 1: 1 – M. Treister, 2018; 2 – after Voroshilov – Voroshilova 2015, 30 fig. 1; 3 – after Voroshilov – Voroshilova 2015, 31 fig. 2; 4 – after Voroshilov – Voroshilova 2015, 75 fig. 17. – Fig. 2: 1 – after Zaikov et al. 2015, 279 fig. 3; 2 – after Zaikov et al. 2015, 286 fig. 7. – Fig. 3. Photo: M. Treister (2013). – Fig. 4. Photo: M. Treister (2013). – Fig. 5. Photo: M. Treister (2012). – Fig. 6. Photo: M. Treister (2013). – Fig. 7. Photo: M. Treister (2013). – Fig. 8. Photo: M. Treister (2013).

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Young Ladies with Their Writing Equipment. Indications of Literacy in Roman Tombs

Josy Luginbühl

The Romans introduced reading and writing on a larger scale to their provinces, which is recognizable by the increasing numbers of mostly Latin monumental inscriptions, graffiti and legal documents. As writing equipment is essential to writing, it was distributed similarly to these testimonies. The equipment, incorporating *stili*, inkpots and wax-spatulas, was widely spread throughout the Roman Empire.

As grave goods these objects were found in the tombs of men, children and women and are linked directly to the buried person. In combination with other grave goods, the anthropological information and the geographical localisation, we are able to draw some conclusions about the abilities of the person in question and their social world.

This investigation is part of my PhD project at the University of Bern. My work focuses on the literacy of Roman women by inquiring the archaeological material such as *instrumenta scriptoria* in grave contexts, grave inscriptions and iconographic depictions in funerary context. It is based on published material.

The area under investigation is the Latin west including Italy, with a time frame from the 1st century BC to Late Antiquity; although the specific historical situation in Italy also supplied earlier examples mainly in the south. While the focus lies on women, their situation is compared to that of men and the relevant archaeological findings.

In this area, I located 345 graves containing writing equipment as grave goods. 81 of these graves can be assigned to female individuals, 75 to males and 189 graves are of persons with an unknown gender. The gender was assigned partly with the help of the grave goods and partly through anthropological investigations.

The general geographic distribution of the graves with writing equipment shows a concentration along the limes. In Heidelberg, Köln, Bad Reichenhall and Wederath-Belginum we see a high density of graves. All these places are linked to the Roman army or are located on important long-distance roads. Therefore the inhabitants were likely to be in closer contact to the Roman culture and trade than the people in more isolated and civil settlements. There are no graves containing writing equipment in the *Gallia Lugdunensis* and hardly any in *Aquitania*, *Tarraconensis* and *Baetica*.

Instruments to write in wax, such as stylus and wax-spatula or writing tablets were used more often (187 graves) than the ones to write in ink such as inkwell, pen and penknife (97 graves). Sometimes the two techniques are combined (58 graves). In some excavation reports, the instruments were just listed as writing instruments and not described in detail, consequently it was not possible to assign them to a technique.

It is striking that deceased women were often equipped with precious objects and valuable materials. We can see this most clearly in the group of the young girls under the age of 18. Their grave goods consist among others of jewellery made of gold, silver

and precious stone as well as small objects of ivory, amber and rock crystal. The writing equipment mostly contains a stylus, made of iron, bronze, bone, silver or with golden ornaments.

One example is the sarcophagus of Antestia Marciana from Aquileia.¹ She was buried with a small *balsamarium*, a little jewel case and fruits, all these objects being made of amber. Two *stili* were made of bronze. She died in the 2nd half of the 2nd century AD. The small amber objects are likely to be *crepundia*, some kind of lucky charms with an apotropaic effect.² They protected the child and were, according to literary sources, dedicated to the gods before marriage.³ The appearance as grave goods could be a sign of an unattained marriage of the deceased. The inscription gives us her name and the age of 12 years. Her loving parents set up her grave. That probably means that she was not yet married and supports the interpretation of the *crepundia*. The normal age of marriage for girls started at 12 years, but most girls married in their late teens.⁴ Therefore Antestia Marciana may be seen as a young girl that passed away shortly before she reached her intended role as wife and mother. The precious grave goods can therefore be seen as a symbolic dowry. The *Antestii* or in its older form *Antistii* were a plebeian family, known in Rome from the 2nd century BC.⁵ Even if Antestia Marciana was buried in Aquileia, it is possible, that she belonged to this *gens*. The grave goods document the wealth of her family.

8 out of 12 graves of girls or young women show a similar richness in the grave goods and most of them are from Italy (Rome/Puglia/Aquileia).⁶ The earliest dates to the early 1st century AD, the latest to the 4th. There is a peak in the 2nd century. It is likely that they all belong to the group of the “*mors immatura*”, girls who died before their age, that is, their marriage.⁷ The writing equipment is probably a sign of their literacy. If we look at their age in death, some of them would already have finished their early education.⁸ They all belonged to the Roman upper class, as indicated by the wealth and number of their grave goods and the elaborate form of the burials. This fits in with the image of the written sources, which sometimes mention women from the upper classes in passing as being able to read and write.⁹

Golden rings with inscriptions were included in three of the graves, perhaps these were engagement rings: a ring with agate cameo from Flerzheim shows a *dextrarum iunctio* and the Greek word HOMONOIA – unity/harmony.¹⁰ Therefore it is likely that the girl was able to understand Greek. The *dextrarum iunctio* is a very common motive for marriage. The second ring bears the inscription FILETUS in its cameo: this may have been the name of the fiancé of Crepereia Tryphaena.¹¹ According to her name she was probably the child of a freedman and lived in Rome. The third ring seems to have been a present, as the inscription IVNONI MEAE suggests and had been given to the women buried in the Simpleveld sarcophagus.¹²

Not only girls but also adult women were often buried with objects made of precious materials. The male burials are generally much simpler. Particularly rich burials for adult people are located in the Dutch-Belgian region. Several tombs are from Nijmegen,¹³ the

principal town of the *civitas Batavorum* and later a *municipium* in relation to a military camp. The high number of grave goods has its roots in the local funerary tradition, but a lot of the objects are from the Roman culture, such as the writing equipment, Samian vessels and *balsamaria*. Burial 1 is outstanding due to its exceptional richness.¹⁴ The cremated individual was anthropologically determined as a female, aged between 20 and 30 years. The grave goods consisted of approximately 80 objects. Among them are various objects of amber, a ring made of rock crystal and gold, glass beads and a bone box with silver frame and lock. A bronze inkwell, two iron *stili*, an iron wax spatula, a fragment of what may have been an iron pen knife and a burnt rest of a bone object, probably a ruler, formed her writing equipment. The amber objects in the form of shells, fishes and spindle rods resemble the *crepundia*. According to her age, the woman was likely to have been married, but there is no possibility to be sure.

Wax tablets are a special category. Most archaeological finds are located south of the Alps. They show a clear division connected to gender: Three examples are from male burials, 8 from female.¹⁵ While the wax tablets for men are all made of wood, the ones for women are mostly of ivory or bone. Two wax tablets from burials of unknown gender are made of the same material.¹⁶ They are smaller than the wooden examples (ca. half the size; 8.5 × 4.7 × 0.2–0.5 cm vs. 15 × 10 × 1 cm). Unfortunately, the wax layer is very fragile and as ivory is much harder than wood, it is not possible to find any traces of the writing once scratched in the tablets.

The *instrumenta scriptoria* testify almost all writing skills. Only the wax tablets can be written on or be read. Other written texts are found in the form of short inscriptions or *graffiti* on small finds. There is no evidence for longer texts or to be more precise, no evidence for the content of possible longer texts. But in Egypt there is a grave recorded, where the first two books of the Iliad written on papyrus were placed under a women's head.¹⁷ This probably testifies to her skills in reading, not writing.

I did not try to collect all the graves with small finds with inscriptions.¹⁸ But one quarter of the graves with writing equipment also contains such objects. The largest group is formed by the stamps of producers and or simple *graffiti* such as “X” or numbers. These are not very informative about the literacy of the deceased. More interesting are inscribed names and longer inscriptions on small objects. While the first category is a sign of at least very basic literacy,¹⁹ the second requires more skills. The small texts were certainly written by the manufacturer of the object, but the additional effort to add carefully crafted details probably made the price rise and the item was chosen on purpose. The inscriptions often speak in an active way to the reader; for example they greet the person (AVE, SALVE) or invite him/her to do something, mostly in relation to drinking or love. We find such inscriptions on cups or often on “female” objects such as spindle whorls, fingerings or brooches. They are said to be love tokens. The three rings mentioned before belonged to this category. Only one male grave from Taraneš contained objects with inscription: a drinking vessel saying “VIVAS” and a precious golden crossbow-brooch, probably given to a high military officer by the emperor.²⁰

The writing equipment presented so far was made of precious material. If we look at the chronological distribution, we can see some changes in the materials used (fig. 1. 2).

The oldest tombs in my study date back to the 3rd century BC and are located in southern Italy.²¹ The grave goods are clearly influenced by the culture of the Magna Graecia. The shapes and materials of the writing equipment had an effect on the earliest Roman specimens. In general, the writing equipment of the tombs dating to before the present era consists of a ceramic inkwell or a bone stylus. In the 1st century BC, the graves with writing equipment spread towards the north and, starting in the 1st century AD, are found north of the Alps and in the northern provinces. The number increases and peaks in the second century AD. Bone *stili* and ceramic inkwells are still in use, but in the 1st century bronze inkwell and iron *stili* are dominant. Sometimes they are decorated with other metals (copper and copper alloys). In the second century AD, we can see a higher variety, more combinations and an increased value of the materials

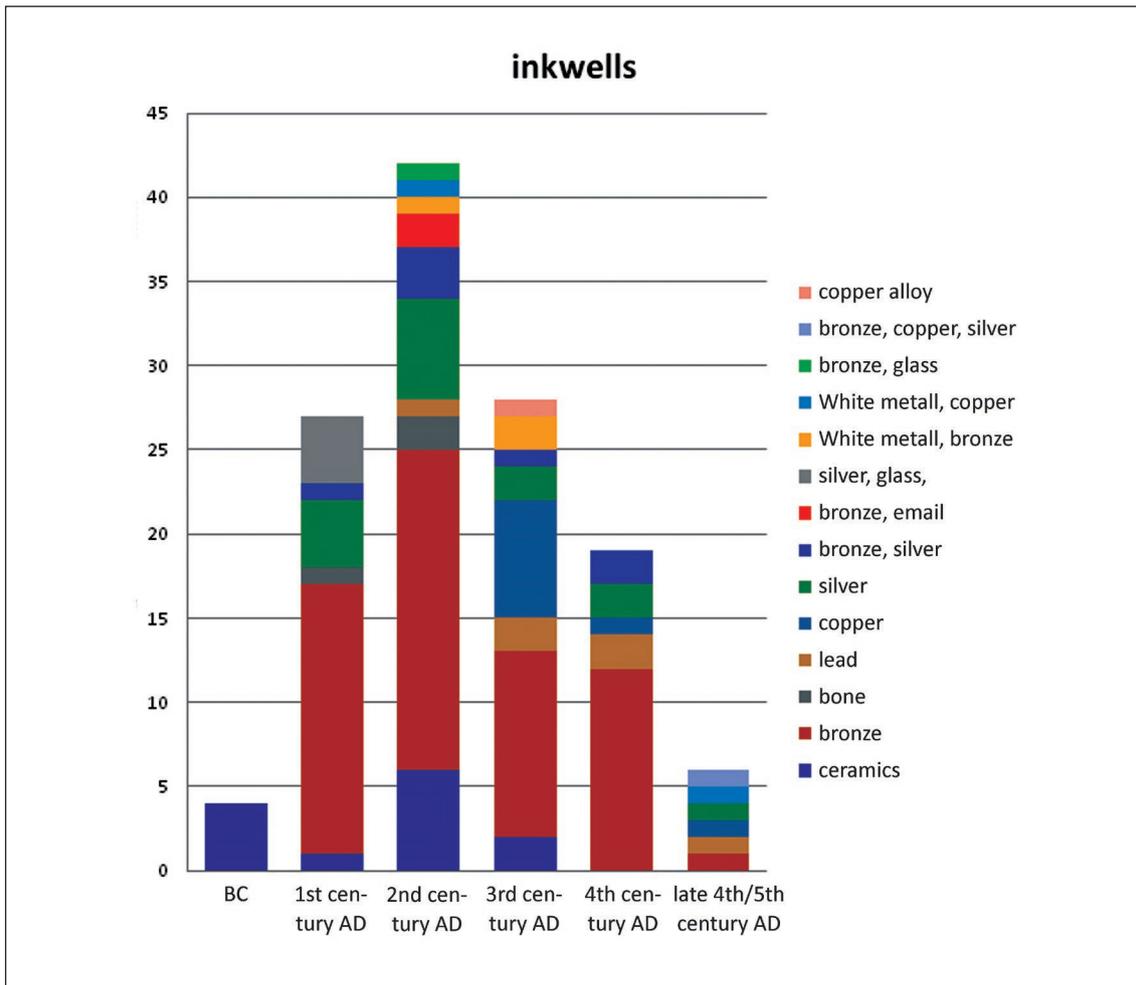


Fig. 1: Materials used for inkwells.

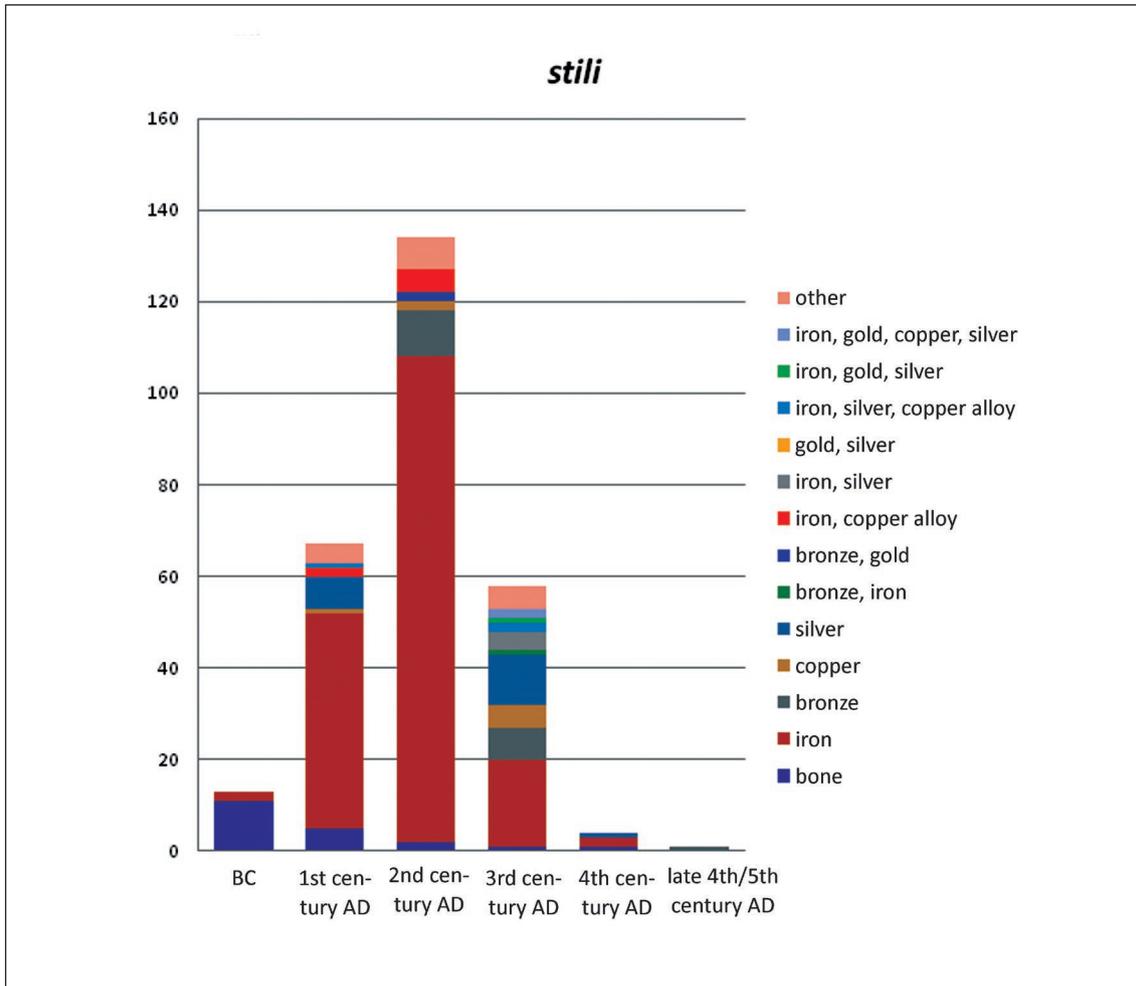


Fig. 2: Materials used for *stili*.

used, such as bronze and copper alloy for *stili*, bronze, copper alloy, silver and white metal for inkwells.

The total number of graves decreases in the 3rd century AD, but the writing implements in them are still of a high quality. Most *stili* are simply made of iron, but some are decorated with silver and – as an innovation – with gold. The geographical distribution shows a shift to the east in the 4th and 5th centuries. These finds are clearly linked to the military, as the silver inkwells are often combined with a crossbow-brooch. Most of them were found in male or ungendered graves, as the one from Taraneš with the golden crossbow brooch.

Finds of writing equipment are not only a sign of the spread of literacy in the Roman Empire, but also objects of a specialized trade. Often it is not easy to trace the place of production or even the workshop. While simple iron *stili* cannot be attributed to a specific place and may well have been produced locally, the Samian inkwells have

well-known places of production. Steven Willis²² collected the occurrence of Samian inkwells produced in Gaul in Roman Britain in his 2005 study. The sites are mostly associated with the military and frequently with major civil centres. He noticed just one ceramic inkwell known to come from a grave and it's probably not Samian. In relation to the overall distribution of Samian vessels, the inkwells are a very infrequent form. As Great Britain is not very close to the major centres of the Empire, the finds testify to the long distance trade of objects connected to literacy.

There are other objects that were not produced locally and had to come from trade. The ivory writing tablets were always imports from the south, as well as the papyrus used to write upon.

In rare cases we know more about the producers. The stamp of Longinus Socrates was found on several inkwells in nowadays Great Britain, the Netherlands, Germany and Serbia.²³ They vary in their appearance, but are all made of bronze. Some have a precious silver and niello decoration. The workshop itself was probably located in Italy and maybe owned by a freedmen of Greek origin.²⁴

The writing equipment in graves often testifies to the wealth of the richer parts of society, especially women. The objects themselves but the additional grave goods, too, are often made of precious materials and traded over long distances. It is still difficult to find evidence of the lower classes but the picture of the literate social classes given in the written sources can be enlarged and diversified by the study of grave goods.

Notes

¹ Giovannini – Feugère 2000, 36 f.

² Martin-Kilcher 2000, 67.

³ Eg. Persius, Satura 2. 69f.; D'Ambra 2014, 319.

⁴ Hemelrijk 1999, 9. The average age at marriage varied according to social status and location.

⁵ DNP 1 (1996) 795–798 s. v. Antistius (K.-L. Elvers – W. Will – W. Eck – T. Giaro).

⁶ Rome, Via Ostiense (Bordenache Battaglia 1983, 92–95); Rome, so-called “Kindergrab des Berliner Antiquariums” (Platz-Horster 1978, 184–195); Rome, grave of Crepereia Tryphaena (Griesbach 2014, 262f.); Aquileia, grave of Antestia Marciana (Giovannini – Feugère 2000 36 f.), Puglia, a girls grave (Scarpellini Testi 1987, 161); Bonn, Josefstrasse (Haberey 1961, 319–332); Rheinbach-Flerzheim (Lösch 2011, 117–122); Augst (Schwarz 1997, 75–83); Ptuj, grave 24/1973 (Tomanič-Jevremov et. al. 2001, 111–115). The simpler graves are from Heidelberg, grave 62/25 (Hensen 2009, 264f.; pls. 117. 118 no. 62/25); Bregenz, grave 506 (Konrad 1997, 69. 93. 139. 173. 217 pl. 28, A) and Köngen, grave 128 (Luik 1994, 357–381).

⁷ For the *mors immatura* see Martin-Kilcher 2000.

⁸ Bonner 1977, 56 f. Cf. DNP 11 (2001) 263–268 s. v. Schule (C. Johannes), 263; Marrou 1957, 391 f.

⁹ Agrippina was said to have been talented even in rhetoric. Suet. Aug. 86. And Cicero addressed various letters to his wife Terentia, asking her to write back. Cic. fam. 14, 2, 4.

¹⁰ Lösch 2011, 117–122.

¹¹ Griesbach 2014, 262 f.; Martin-Kilcher 2000, 64 f. fig. 7, 1; 69 f. fig. 7, 7.

¹² Galestin 2001, 63–76.

¹³ Koster 2013, 46–49. 53–67; 71–73 graves 1. 8. 9. 11. 21; Künzl 1983, 93–96.

¹⁴ Koster 2013, 46–49. 389–394 pls. 6–14.

¹⁵ Female graves are from Aquileia, Necropoli di Ponterosse, grave 7 (Giovannini 1991, 48–52; 71 f. pl. 2) and via Annia, grave 3 (Brusin 1941, 63 f. no. 3, fig. 24); from Rome the already cited so-called “Kindergrab des Berliner Antiquariums” (Platz-Horster 1978, 184–195) and the grave of Crepereia Tryphaena (wooden tablets: Griesbach 2014, 262 f.); a cluster of objects probably from an Italian grave, now in the Fitzwilliam Museum in Cambridge (Vassilika 1998, 118 f. no. 57); Nîmes, grave 130 (Espérandieu 1928, 165 f.), Durrës, grave 14 (Tartari 2004, 17. 24 f. 65. 67. 73. 75 pls. 6; 40, 93; 42, 127) and the above mentioned grave 24/1973 from Ptuj (Tomanič-Jevremov et. al. 2001, 111–115). Male graves are from Giubiasco, grave 527 (Pernet et. al. 2006, 89 f. 96. 155. 162. 243. 253. 283. 285. 333. 345. 347 tab. 12.6; pl. Tombe 527), Budapest-Óbuda, Testvérhegy, lot 20.539/7 (Nagy 1935, 4. 35) and Dunaújváros-Intercisa, grave 1993 (Bilkei 1980, 65. 73. 81 nos. 113–115; 90 pl. 4)

¹⁶ Ungendered are grave 413 from Alghero, Necropoli di Monte Carru (Fragola 2015, 247–256) and a grave from Aquileia, S. Egidio (Fünfschilling 2012, 169 f.).

¹⁷ Cavallo 1995, 523.

¹⁸ For such objects see Pfahl 2012; Dondin-Payre 2006; Thüry 1994.

¹⁹ There are only three names on objects in the catalogue of my thesis, all of them are male. “ITALI” on a small bowl in a grave from Mérida, el Disco (Hidalgo Martín 2014, 16 f.) and “PRIMI” on a casserole in an inhumation burial from Locarno, Solduno (Donati 1979, 170–177). Both deceased are unsexed. “MARCI” was written on a bowl in a double burial from Günzenhausen and associated with a women. The second, juvenile person is unsexed (Fasold 1987/1988, 183 f. 190. 198–211).

²⁰ Ivanovski 1987, 81–91. The inscription of the brooch is “IOVI AVG(VSTE) VINCAS/IOVI CAES(AR) VIVAS”. The grave dates to the 1st half of the 4th century AD. One drinking vessel with the inscription “DAMI” was found in an ungendered grave from Bonn, Rheinstrasse. Lindenschmit 1911, 308.

²¹ E. g. a grave from 17. 8. 1957 from Taranto: Juliis 1984, 427 f. no. 88.

²² Willis 2005.

²³ Eckardt 2018, 63 f. with distribution map; Koster 2013, 158.

²⁴ Eckardt 2018, 63 f.; Koster 2013, 158.

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The Economic Centre of Pompeii Revealed by Roman Cash Keeping

Espen B. Andersson

Ancient economies in general relied strongly on their accessibility to currency. The distribution of cash resources within the urban topography of Roman cities is therefore a topic that deserves attention.

A group of archaeological monuments hardly ever discussed in this context is Roman money chests, or *casseforti*, specially made to contain coins and valuables.¹ These money chests are striking items of furniture (fig. 1). However, the following investigation does not focus on the chests themselves, but rather on the pattern in which they occur in the urban landscape.



Fig. 1: Cassaforte preserved in situ, Casa di M. Obellius Firmus (IX 14. 4). Photo Soprintendenza Speciale per i Beni Archeologici di Napoli e Pompei.

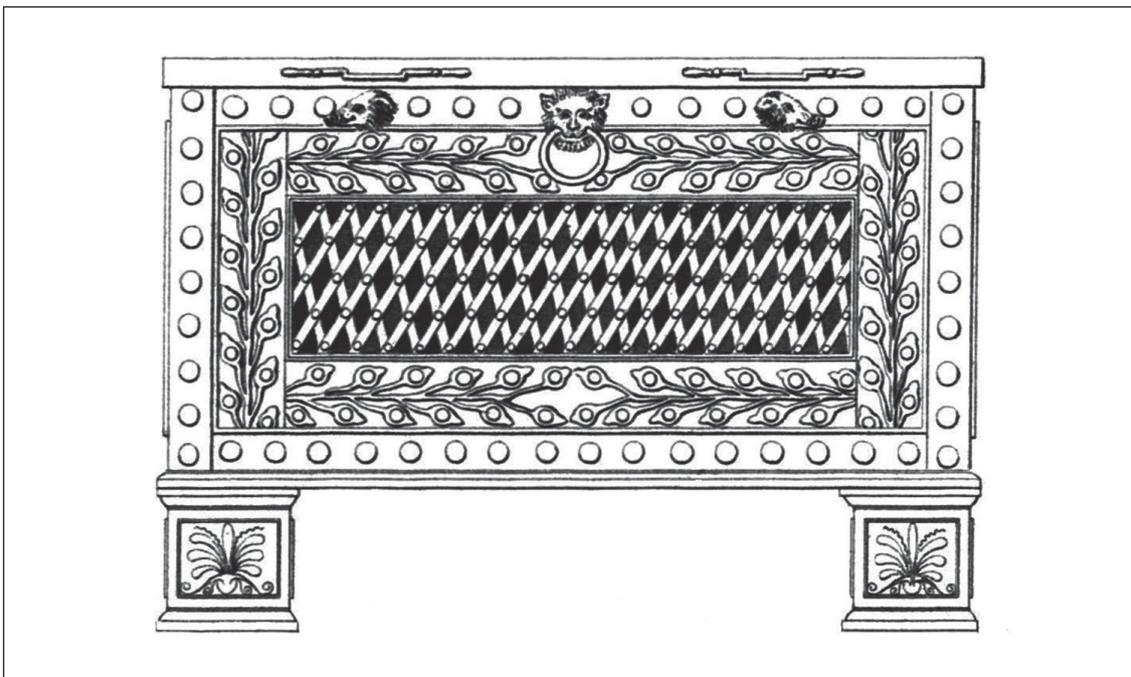


Fig. 2: One of two casseforti in Casa dei Dioscuri (VI 9. 6).

Surprisingly, research has never been conducted on whether the casseforti *in situ* could offer knowledge of where the core areas of economic activity in Pompeii were situated.

At the start of the horrific disaster that struck the Campanian cities in AD 79, money chests were emptied in panic, but the chests themselves remained in their habitual places. Strongboxes were heavy and installed with the intention of not being easy to move (fig. 2). Unlike other furniture, casseforti were firmly secured to a platform of stone or concrete by an iron bolt in the centre of their underside (fig. 3).²

The archaeological evidence is most commonly divided into two parts: There are a number of preserved money chests and there are the platforms that the chests stood on.

Not all the money chests have proved possible to save during excavations. On the other hand, nearly all of the carrying platforms/bases made of stone or Roman concrete have survived,³ which is something of a gift for this investigation.

Despite this fortunate situation, the evidence concerning the positions of the money chests in the urban structure has earlier been left untouched by research.

One fact established through centuries of archaeological research is that the money chests had no physical connection to the storage of wax tablets, which were used as receipts for economic transactions. Although heaps of money are depicted above wax tablets on the legendary wallpainting (fig. 4) from the property of Julia Felix (II 4.1–12), archeologically speaking, money has never been found near wax tablets.



Fig. 3: Platform with central iron bolt for cassaforte in Casa dei Dioscuri (VI 9. 6).



Fig. 4: Wallpainting from Praedica di Julia Felix (II 4). Museo Archeologico Nazionale di Napoli.

In Casa di L. Caecilius Iucundus (V 1, 26), for instance, the famous wax tablets were found on the north side of the peristyle, belonging to a room on the first floor.⁴

The money chest, on the other hand, was found in the atrium a good distance away.

Updated Figures of Money Chest Findings

A new count of the remains of casseforti found through centuries of excavation determines that the casseforti, or their platforms, stem from 30 locations. This increases the known number of casseforti threefold, since the most commonly quoted estimate is about 10.

The money chests' stone platforms are regarded as belonging to the Samnite Pompeii, while concrete platforms are considered Roman. If this dating of stone platforms is correct, the considerable number of such platforms indicates that Samnite Pompeii was a society in control of great financial resources. When we put this information into the historical context, it may provide an additional reason for the military conquest of the city in the 1st century B.C.

It is natural to expect that the temples in the city have had at least one cassaforte each for storing valuables, particularly votive gifts of gold. Such chests located in temples must have been rescued shortly after the eruption since none of them have emerged during the excavations. Although the details about the temple chests remain unknown, there was supposedly little difference in both type and use between the public money chests and the most lavish private money chests.

Campania as an area was possibly a production centre for elaborate Roman casseforti, which is indicated by the important find of one comparable money chest as far away as in Turiaso (Tarazona), Spain.⁵

Money Chests in the Public Sphere

Only one money chest in the city of Pompeii has been discovered in a public context. This cassaforte was located in the Macellum (VII 9. 7–8),⁶ inside the meat market at the Forum (fig. 5).⁷

During the excavation in May 1822, the early archaeologists must have experienced a double surprise. The money chest remained untouched, yet the intact coins it contained were of a lesser value than one should expect. There were more than eleven hundred bronze coins,⁸ but only 35 small silver coins. Uncharacteristic was the total absence of gold coins.

In sum, the coins in the Macellum chest had a monetary value of 577 *sestertii*⁹, an amount that in comparison is less than what has been found in an ordinary Caupona in the city (see below). Most likely, the quantity and variety of bronze coins indicates a

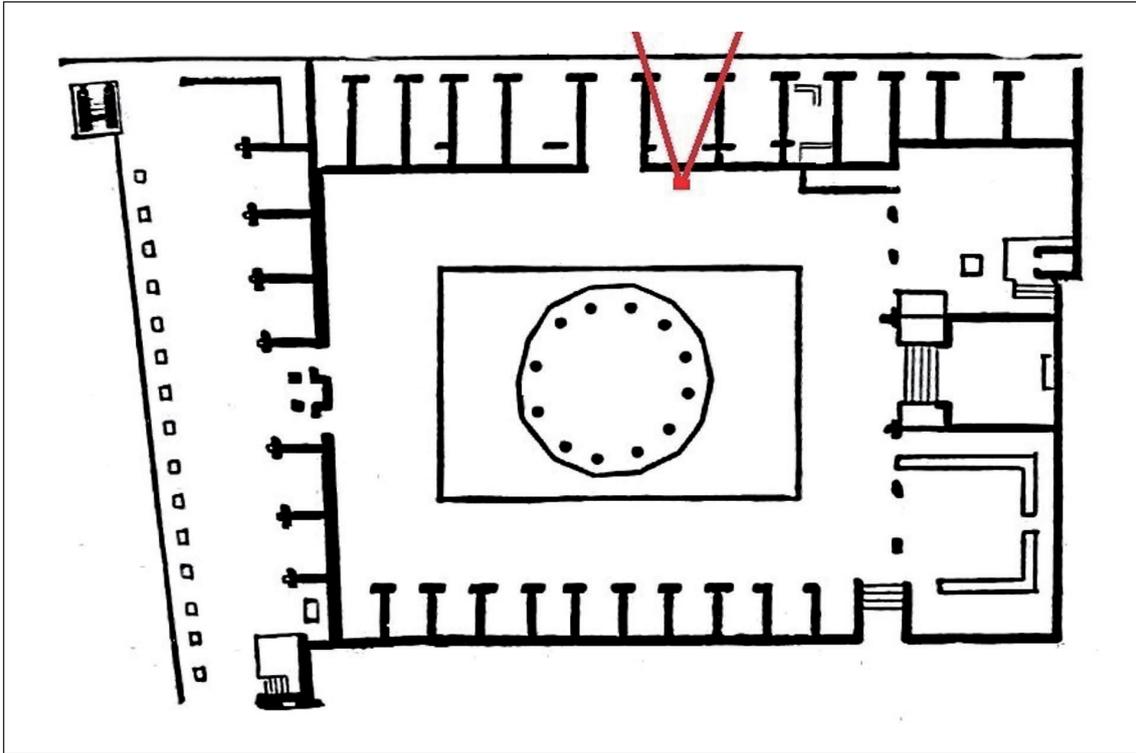


Fig. 5: Reconstructed find-spot of the cassaforte in the Macellum, Forum.

money chest that was used to keep the daily income and change necessary for trade in the Macellum.

Money Chests Used in Trade or Commerce: the Evidence from Casa del Fauno

As regards cash keeping in private houses, Casa del Fauno (VI 12.5) demonstrates some unparalleled features connected to one of its two casseforti. In the last years of the city, this vast house was in the hands of a wine grocer, a fact that, at the time of excavation, was proven by large groups of different wine amphorae stored all over the property.¹⁰

The house contained two casseforti, both of which were found in the domestic part of the house. What is astonishing here is the unique arrangement pertaining to one of the chests, which stood in the northeast corner of the tetrastyle atrium (fig. 6 and fig. 7).¹¹

What was observed here in Casa del Fauno, and never seen anywhere else, was an unexpected hole in the wall of a side-room (no. 45), leading directly to the inside of the money chest (no. 42). Coins could therefore be dropped into a channel running into the cassaforte from room no. 45.

The cassaforte in this domestic setting seemingly received money from local sale of wine in the city.¹² There was no need to unlock the chest to feed it with the incoming

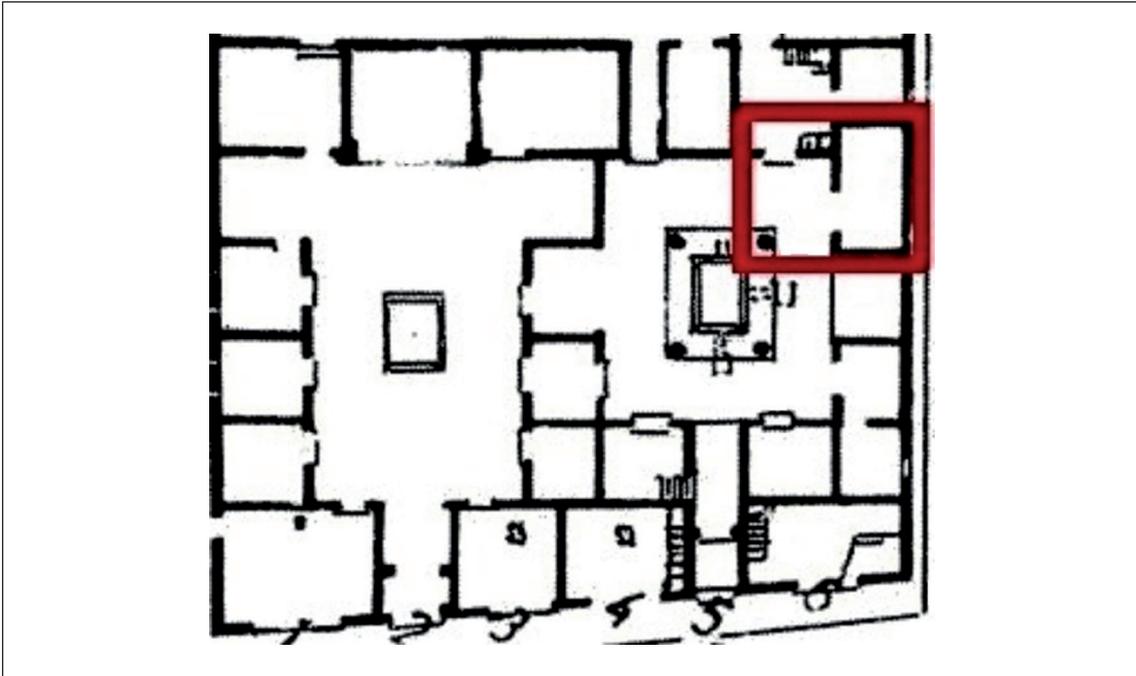


Fig. 6: Plan of atria in Casa del Fauno (VI 12.5) with marked northeast corner of tetra-style atrium.

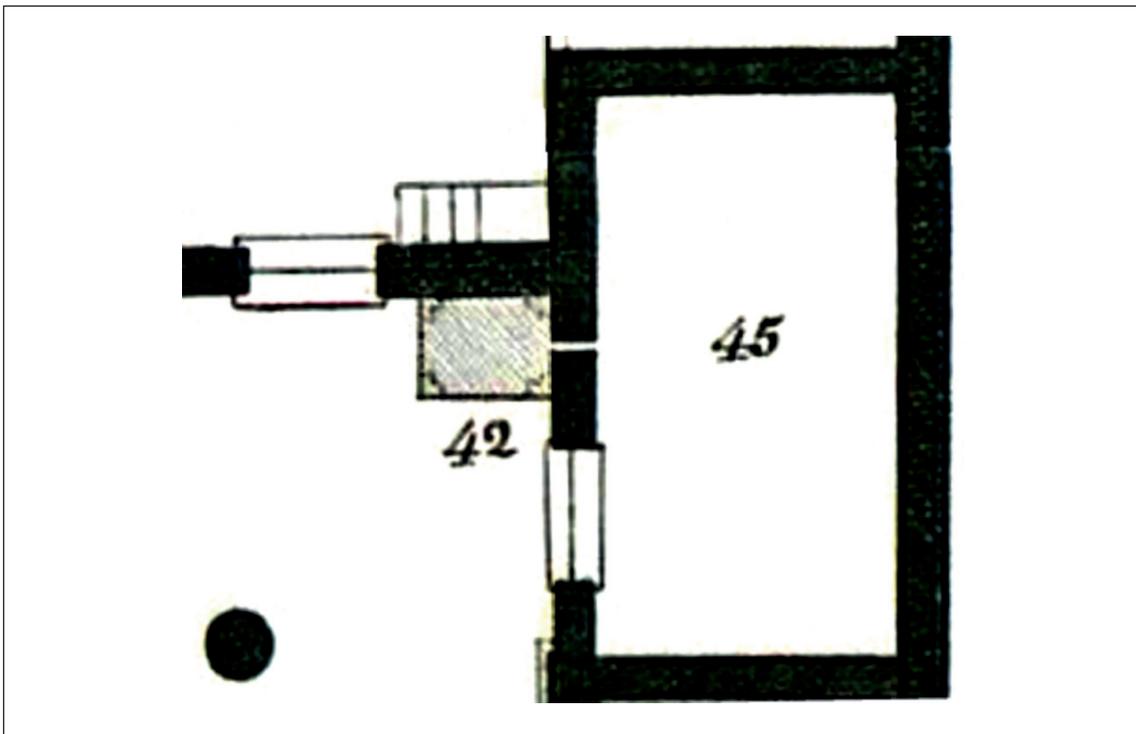


Fig. 7: Hole in the wall between cassaforte no. 42 and room no. 45, Casa del Fauno.

cash. Another detail concerning the construction of the cassaforte was that anybody standing in the atrium could hear when coins were thrown into it since the chest was lined with iron.¹³

It is conceivable that the cassaforte was either fed money after each transaction, or that it functioned as something similar to a night safe. The side-room to the right of the cassaforte, no. 45, where the channel started, must have been the accounts room. This room was simple and demonstrated one very crucial feature: its walls had no decoration.¹⁴ The bare walls clearly indicate that slaves took care of the coins and monetary exchange for their master, as well as keeping the accounts. The whole process may actually have been in their hands.

In 1831, at the time of excavation, the hole in the wall into the cassaforte was documented¹⁵ and commented on.¹⁶ Later, research has forgotten these features, and the hole seems to have been camouflaged by restoration work.

The Matter of Money Chests in Shops

As regards trade, an interesting question is whether any money chests were recovered in shops. Hypothetically, one could expect numerous finds of simpler money chests in the context of shops. However, this appears to be a concept belonging to more modern periods rather than describing the general use of money chests in antiquity.

When it comes to the usual kinds of street-level shops, it appears that ancient shopkeepers kept their cash in more informal or secret spaces. This was observed in the shop of the Caupona (I 8. 8). Here, the money was found hidden in the bottom of a dolium in the sales counter. The bronze coins amounted to 683 *sestertii*.¹⁷ Compared to the coins in the cassaforte of the Macellum at the Forum, this represented a hundred *sestertii* more in value.

The public trade of the Macellum required a cassaforte, but in most ordinary shops, it appears that they were not a necessity. After examining the excavation reports, with particular focus on chests in shops, the only money chest to be found was located in the so-called Shop of Ceratus (VII 1. 26) situated on the Strada Stabiana. This cassaforte was described as an iron chest of not very large dimensions.¹⁸

Iron chest supposedly means that it was a wooden chest covered with iron. The chest itself was found empty. Disappointingly, published archaeological data does not go further, and the remains of the chest are not preserved. What was sold from this shop is unknown, and nor were any signs of production activity recorded.

Interpretation of the Urban Distribution of Money Chests

An examination of a map of the city with the find-spots of the cassaforte marked shows that 24 of the 29 private money chests are situated in a well-defined central segment crossing the city, running in a north to south direction.¹⁹ Interestingly enough, this long, stretched segment does not point towards the Forum.

The Probability of Two Economic Centres in one City

What can be deduced on the basis of where the money chests appear on the map is that Pompeii as an urban structure seems to have had two economic centres. The long segment appears to divide itself into two sectors.

There is one sector at the top between Via del Mercurio in the west and Via Vesuvio in the east. The other sector is along the Strada Stabiana following the city's falling landscape to the south (fig. 8).

The Centre of the Lower Area

Through the discoveries of casseforti in lower parts of the city, one becomes aware of the importance of Strada Stabiana in relation to money circulation, in terms of both the street and the *insulae* adjoining it.

Using the perspective of Roman city planning, Strada Stabiana is above doubt the *cardo maximus*, running north to south. The fact that the *cardo maximus* represented the core of urban life is a characteristic shared by many Roman cities.

In this context, Strada Stabiana had several important public buildings along its course, including two baths, both of the city's two theatres, and two temples; the Temple of Aesculapius and the Temple of Isis. Outside the Forum, no other area had a similar density of public buildings.

This street is also unique in its diversity. Here, ceremonial religious activities meet with pure entertainment and personal spending. Along the street of Strada Stabiana, at least 115 shops, 7 bakeries and 23 *thermopolia* can be counted, in addition with a variety of other activities.

A considerable number of citizens must have spent substantial amounts of their money in this area. Strada Stabiana formed the urban heart²⁰ of the populations' needs and day-to-day consumption. The conclusion is that Strada Stabiana was the main street of Pompeii, and in addition to the adjoining *insulae*, was characterised by continuous economic activity.



Fig. 8: Map and topographical catalogue of casseforti and platforms.

The Centre Furthest North in the Topography

The distribution of casseforti clearly points to another economic centre, which is very dissimilar to the first. In this sector towards the north, a square drawn on the map will encompass the highest density of casseforti in the entire urban landscape. Many of the houses belong to the insula VI.

A group of four houses owning two casseforti each reveals the ultimate prosperity.

How much capital the casseforti in these wealthy houses may have contained is demonstrated by one noble house, Casa dei Dioscuri (VI 9, 6). On excavation, gold coins worth 4,520 *sestertii* remained in one of the house's two money chests, even though it had been looted in antiquity.²¹ It is reasonable to estimate that the original content could easily have been the double, about 9,000 *sestertii*.²² In addition, the second cassa-forte in the house would also have contributed further value.

Why have casseforti in City Houses?

It is difficult to agree with the traditional interpretation that derives from Giuseppe Fiorelli, suggesting that money chests were needed for the "*domestico peculio*".²³ This may be seen as a misunderstanding based on a more modern perspective. The money chests contained far greater resources than were needed for running a household.

The answer must be as detached from modern projections as possible. In Roman society, where bankers and lenders existed, but not banks, the protection of capital resources in cash, whether great or small, had to be undertaken by individuals.²⁴

The casseforti of a city tell us about capital and its urban distribution. They can, however, only tell us how the money was earned in very few cases. It must be assumed that the majority of the wealth in the upper part of the city came from profit from land and property, some of which could be far from Pompeii. As an extension of this interpretation, the last owner of Casa del Fauno (VI 12. 5), situated in the same economical centre, seems to have been part of a more extensive Mediterranean wine commerce, not only a local wine trade.²⁵

Larger Sums of Money near Volcano Victims likely Stemming from Money Chests

One could also consider the great sums of money kept by the fleeing volcano victims in order to get an indication of what the casseforti may have contained. Of particular interest are four different victims that are recorded as carrying from 4,700 and up to 7,380 *sestertii*, all in gold coins.

In one single discovery made outside Regio III, near Porta di Sarno, a victim was carrying 6,296 *sestertii*.²⁶ I am personally convinced, after considering a possible flight route, that this is the content of the cassaforte in Casa di M. Obellius Firmus (IX 14.4), shown in Figure 1.

Wealthy Citizens with no Money Chest

I would like to conclude with another interesting question; who were the rich individuals who had similar amounts of money, but did not display their wealth by having a cassaforte in their atrium? Pompeii also provides examples here.

It is possible, for instance, to refer to Casa del Bracciale d'oro (VI 17, 42) where 4,696 *sestertii* were found in a box.²⁷ Another example is Casa di Marcus Lucretius (IX 3.5), which did not have a cassaforte either. However, just outside on the street victims carrying coins with a total (minimum) value of 3,550 *sestertii* were found.²⁸ Both houses were huge and well equipped with dwelling luxury; they possessed fountain structures for cooling, and had newly finished wall decorations of impressive scale.²⁹

In the matter of who among the wealthy had a cassaforte and who did not, one factor to consider is the relation to private clients, and another is whether the house owner kept a public office or not. Individuals who kept a public office had to run most of the activity from their own house. In such case, it is not certain that all the money inside the chests needed to be private. Furthermore, there are many factors that we do not know, such as family traditions and personal aspirations, whatever these may have been.

In any case, Pompeii gives us the most detailed material on which we can base our research. Traditionally, the economy is one approach, and the display of wealth and status is another. However, in this case they may unite. Casseforti contained hard cash resources and, at the same time, this gleaming item of furniture positioned its owner in a hierarchy of status.

Notes

¹ The first money chest recorded in Pompeii was excavated on 13 May 1822 in the Macellum, Forum. No chests have come to light recently and the last one was discovered in IX 14.4 Casa di Obellius Firmus on 11 June 1911; Della Corte 1911, 271, fig. 2).

² Lead was used to fasten iron bolts to platforms. First researcher to observe the value of iron bolts as a precaution against moving chests was de Longpérier 1868, 59, Pl. XX.

³ Pernice 1932, 72–76.

⁴ Camodece 2009, 18.

⁵ Beltrán Lloris 2004, 143–186. Note especially the conclusion, 186.

⁶ Excavated on 13 May 1822, Amicone 1822, 31.

⁷ Nissen 1877, 283: “Es verdient endlich Erwähnung, dass unmittelbar l. neben dem Eingang von der Augustalen-strasse eine grosse Geldkiste (...) gefunden ward; man sieht noch im Boden Spuren des Eisens.”

⁸ Amicone 1822, 32, and Fiorelli 1875, 264 under “Augusteum”.

⁹ In addition to the 35 silver coins; 354 asses, 188 sestertii and 586 quadrants were discovered, see, Breglia 1950, Tabella B, no. 7.

¹⁰ Bechi 1832, 15.

¹¹ The other money chest was placed in a sort of tablinum, a short distance from the atrium, Bonucci 1832, 7. This chest was likely in a better state of preservation than the one in the atrium. Avellino 1837, 47f., mentions a chest in Casa del Fauno, which after excavation was possible to keep and preserve in the place it was found.

¹² It is natural to believe that even a wine grocer would sell wine amphorae in retail from his property. The market for quality wine was surely of some scale, taken into account not only the city but also the needs of many suburban villas.

¹³ “(...) foderata di ferro”, Bonucci 1832, 7.

¹⁴ There were other rooms in this section of the house without any decoration. Bare walls, with no colour at all, demonstrate the extreme contrast between the different parts of Casa del Fauno.

¹⁵ Bechi 1832, Tav. A.B.

¹⁶ Bechi 1832, 14. In the first report by G. Bechi, the cassaforte with the hole in the wall was thought to be a machine for improving the taste of wine.

¹⁷ Unpublished, but listed by Breglia 1950, Tabella B, no. 59.

¹⁸ Strada Stabiana No. 53. Bull. Arch. Nap. 1853, 60: “(...) presso sopra un piccolo rialto di fabbrica vedonsi i residui di una cassa di ferro di non molto grandi dimensioni, ove forse il padrone della bottega serbava il danaro ritratto dalla sua industria.” This shop is mentioned by Fiorelli 1875, 170 as “26 Bottega”.

¹⁹ A small number of chests do not follow this rule. For instance, close to Porta Marina, there is a cluster of three money chests in two houses, which may have a connection with Pompeii as harbour, or be related to maritime activities.

²⁰ Today’s overestimation of Via dell’Abbondanza ought to be shifted to investigation of the richer, and more complex, Strada Stabiana as the main street of the city.

²¹ Bechi 1829, 7.

²² The sum that was actually found (4,520 sestertii) were only coins that had slipped through the bottom of the cassaforte and escaped the looting in antiquity, Gell 1832 II, 31

²³ This always seems to be Fiorelli’s idea when a cassaforte appears. As proven by Fiorelli 1875, 242: “(...) la cassa di ferro pel domestico peculio”, which is his remark on the discovery of the cassaforte in Casa di Trittolemo (VII 7.5) on 29 October 1864.

²⁴ For public capital, the situation was different, where sanctuaries, offered a secure place to deposit money under normal circumstances.

²⁵ There were wine amphorae with both Greek and Roman inscriptions, likely indicating a wider commerce in the Mediterranean. Bechi 1832, 15, promised that these inscriptions would be published later, but disappointingly, this does not seem to be the case.

²⁶ Cantilena 2005, 678.

²⁷ “(...) in una cassetta”, Cantilena 2005, 678.

²⁸ Breglia 1950, Tabella A, no. 18, with further reference.

²⁹ On the rich embellishment of Casa di Marcus Lucretius (IX 3.5), see Tammisto/Kuivalainen 2008.

Image Credits

Fig. 1: Courtesy by Parco Archeologico di Pompei. – Fig. 2: Drawing by Sir William Gell. After Gell 1832 II, 14. – Fig. 3: Photo by T. Warscher DAI-ROM-WAR-00790. – Fig. 4: Photo by Wolfgang Rieger [Public domain], via Wikimedia Commons. – Fig. 5: Drawing by the author. – Fig. 6: Detail of map, H. Eschebach, revised Müller-Trollius. – Fig. 7: Detail of plan, G. Bechi 1832, Tav. A.B. – Fig. 8: Map base of H. Eschebach, revised Müller-Trollius.

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**The Logistics and Socio-Economic Impact
of Construction in Late Republican
and Imperial Rome**

Panel 3.16

Organized by

Dominik Maschek – Ulrike Wulf-Reidt (†)

Construir una ciudad *ex novo* en *Hispania*. Una actualización cuantitativa sobre el primer urbanismo de *Corduba* (s. II a. C.)

Christopher Courault

Introducción

Córdoba es una ciudad *ex novo* que se edificó o bien en los años 169/168 a. C. o 152/151 a. C. Actualmente, la investigación arqueológica no permite aquilatar con mayor precisión la fecha de fundación que es muy discutida por la investigación local. Evaluar el proceso de construcción del primer urbanismo puede ser una indicación, para ello cabe tener en cuenta la explotación de las canteras hasta la puesta en obra. El estudio cuantitativo de la muralla republicana ha sido ya abarcado en algunas ocasiones,¹ dichos primeros resultados ofrecen una primera perspectiva sobre los esfuerzos de la construcción con recursos locales, de lo que debió ser el primer edificio público monumental. De ahí, la importancia de actualizar los datos de los distintos aspectos que se pueden ir cuantificando.

Recordamos que según el *De se ad Patriam*, los lusitanos llevados por Viriato maltrataron las murallas de la ciudad “*Non, Lusitanus quateret cum moenia latro, Figeret et ortas lancea torta tuas*”, y que *Corduba* fue elegida en distintas ocasiones para hibernar como lo describen las fuentes escritas (Appiano, Iber. 65, 66) en el caso de *Fabius Maximus Emilianus* cónsul y procónsul del Ulterior (144–141 a. C.), y *Quintius* durante el otoño de 143 a. C. En otras palabras, entre la fecha 152/151 años y los ataques de Viriato son sólo 7 años durante los cuales las murallas de *Corduba* tuvieron que ser ya edificadas. Sin embargo, el estudio cuantitativo anterior no permitió determinar entre las dos fechas anteriores de modo claro, aunque nos hemos inclinado para la fecha de 169/168 a. C. porque el campamento militar de invierno de Claudio Marcelo debió existir en el año 152/151 a. C., lo que implicaría que el general tuvo que fundar la ciudad antes de establecer su campamento de invierno.²

De acuerdo con la documentación arqueológica, el recinto amurallado es un proyecto vinculado al resto del urbanismo intramuros puesto que lo condiciona; y más concretamente con el sistema de desagüe. Por lo tanto, proponemos en este trabajo un estado de la cuestión sobre el urbanismo republicano, así como una actualización del estudio cuantitativo de la muralla republicana teniendo en cuenta un conjunto de elementos arquitectónicos, tales como las canalizaciones.

Un estado de la cuestión sobre el urbanismo republicano

La imagen de Córdoba en la segunda mitad del siglo II a. C. sigue siendo una incógnita desde la perspectiva arqueológica. De hecho, El origen de *Corduba* es un tema muy complejo por la carencia de argumentos arqueológicos y el peso de la tradición historiográfica que ve en su fundación los rasgos de un campamento militar. De hecho, se utilizaron todo un vocabulario que hace referencia a una instalación militar: *praesidium*, *castellum*, *canaba*, *propugnaculum*.³

Es mediante un estudio ceramológico que se permite entrever la presencia de un campamento militar, basándose en los residuos de cerámica, y más concretamente en la campaniense A de barniz negro. En este sentido, merece la pena mencionar el estudio de una pieza⁴ de la serie M5422 (Lamboglia 59) que fue encontrada en la necrópolis prerromana, su datación por Morel se fecharía entre 210–190 a. C.⁵ Otra pieza fue encontrada en una tumba localizada en el Parque Cruz Conde,⁶ pero su cronología es más amplia entre el siglo VII a. C. y II a. C. Mucho del material analizado es oriundo de excavación antigua,⁷ espoliación,⁸ depósitos antiguos y de origen desconocido. Pese a ello, la interpretación dada fue que una parte de la cerámica de barniz negro se fecharía entre la segunda mitad del siglo III a. C. y la primera mitad del siglo II a. C.⁹ La cerámica aparece ser la única fuente que permitiría entrever aquella interpretación, pero en muchos casos se desconocen el contexto estratigráfico y las proporciones, aunque un estudio puso en relieve que 5 % de la cerámica sería anterior al s. II a. C., mientras que 25 % pertenecería a la primera mitad del s. II a. C.¹⁰ Así que existía una relación de intercambio entre los turdetanos y romanos antes de la fundación de Córdoba.

Hasta ahora, cabe señalar que todavía la investigación arqueológica no ha sacado a la luz estructuras pudiendo ser asimiladas a un campamento; y, de otra parte, no nos han llegado fuentes antiguas utilizando un vocabulario dejando entrever la presencia de un campamento. La imagen de *Corduba* a mediados del s. II a. C. es bastante austera sin sistema de desagüe¹¹ y con casas hechas con las mismas técnicas edilicias que las del *oppidum* prerromano;¹² en otros términos, prevalece la imagen definida hace 20 años por los Profesores Ángel Ventura, Pilar León y Carlos Márquez:

“The remaining finds of the 2nd c. B. C. suggest that early Corduba was a city of humble buildings. Foundations were constructed from rubble and river pebbles bonded with mud, supporting sun-dried bricks and mud-brick walls, with floors of modest material or beaten earth. The absence of tegulae in 2nd-c. levels shows that roofs were made of perishable materials such as wood, branches and mud. These construction techniques were similar to those at the contemporary Colina de los Quemados. The structures were organized austere without paved streets or sewers. Nevertheless, at this date the main alignments of buildings and streets were fixed, and they persisted into later centuries with few modifications. The ceramics were mostly imports from Italy, including a large quantity of wine amphorae (Greco-Italic and Dressel

1A forms), Campanian (A and B) Black Gloss finewares, lamps, thin-walled wares, and coarse-wares, together with lesser proportions of Iberian painted-wares. Such high proportions of imported to indigenous pottery are the opposite of those found at the Colina de los Quemados. (...). Early Roman Corduba is thus almost exclusively defined by its defensive perimeter...¹³

El trazado del perímetro amurallado en época republicana puede ser discutible en ciertos sectores de acuerdo con la historiografía que propone varias interpretaciones; no obstante, se propuso en una recién investigación, una nueva visión de la imagen urbanística de Córdoba y su evolución (fig. 1). El nuevo trazado se caracteriza por un chaflán en el sector nororiental, así como una mayor amplitud del sector meridional, siendo la localización de la Puerta meridional entorno al final de la actual calle Jesús María. En otros términos, el nuevo trazado implica un aumento del perímetro por una estimación total de 2710 m.

La planificación urbanística consiste en una multitud de proyectos que se relacionan. En este sentido, cuando nos referimos a la edificación de la muralla sería equívoco abarcar su proceso constructivo sólo como elemento arquitectónico aislado. Su tiempo de construcción depende de otro proyecto vinculado tales como las puertas, el tramo viario, la red de canalizaciones. En el hecho de que las canalizaciones pasan por debajo de la muralla, su cronología es contemporánea a la cerca (fig. 2). La documentación de esta



Fig. 1: Representación de *Corduba* en el siglo II–I a. C. (A la izquierda hipótesis divulgada por la historiografía; a la derecha nuevo planteamiento).

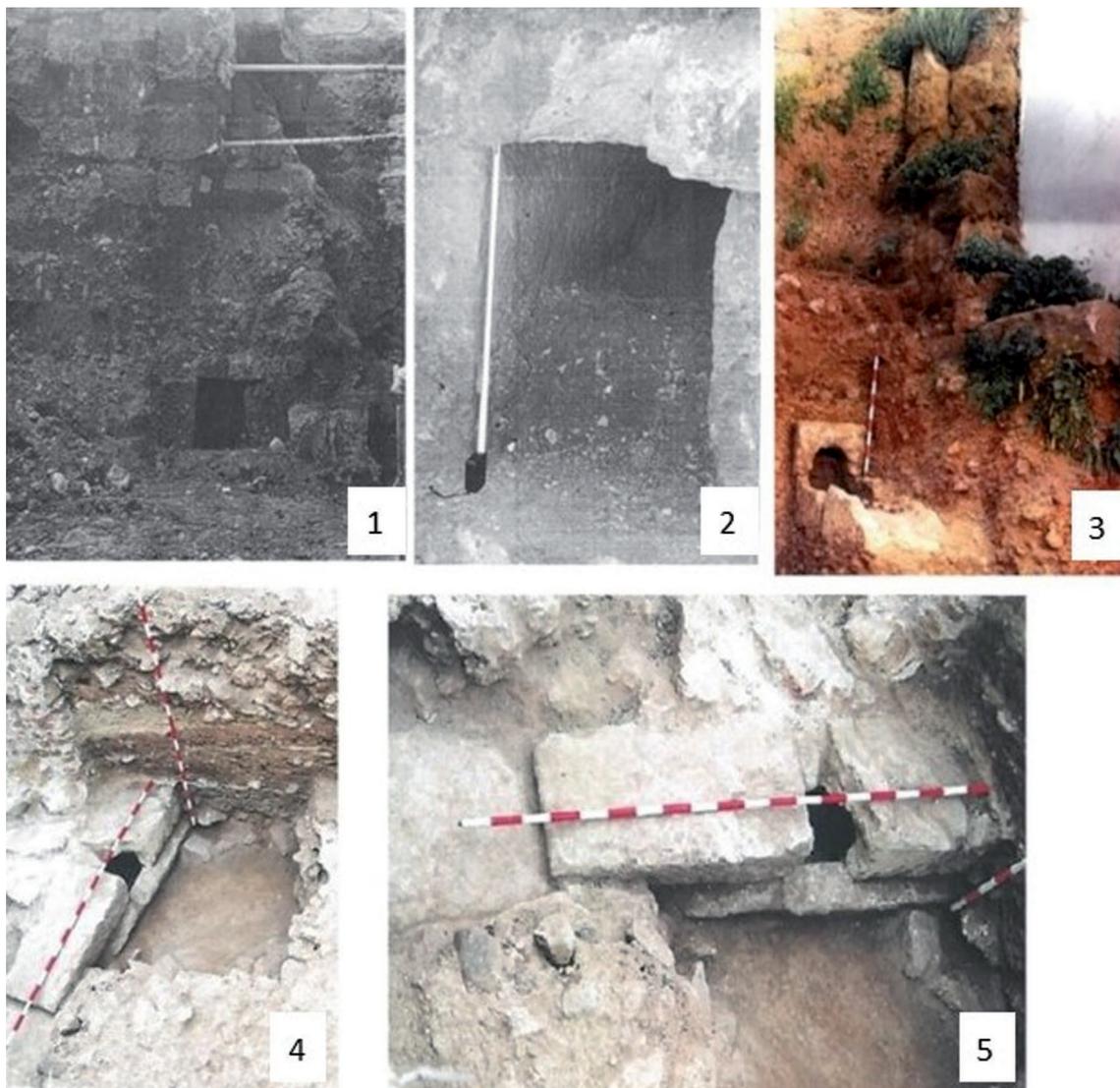


Fig. 2: Restos del sistema de desagüe de época republicana pasando por debajo de la muralla.

estructura permite ya matizar los susodichos propósitos. Por lo tanto, cabría preguntarse si la instalación del sistema de desagüe dependía o no de la misma fuerza laboral que la del recinto.

Para su realización se excava la parte interna del sillar antes de superponer dos sillares. En Córdoba, se sacaron a la luz tres ejemplos de época republicana documentados por debajo de la muralla, y un cuarto ejemplo a proximidad del templo de la Calle Claudio Marcelo. Si suponemos que el sistema de desagüe sigue el mismo esquema que la trama viaria a finales de la época republicana, y una separación de 2 *actus* en el siglo I a.C (fig. 1,1); llegaríamos a una red de distribución de unos 7000 m intramuros.

Algunas precisiones sobre el estudio cuantitativo. Muralla y sistema de desagüe

El estudio cuantitativo que presentamos aquí se diferencia por no focalizarse únicamente en la calcarenita, sino se tiene en cuenta todo un compendio de elementos que define también las etapas del proyecto urbanístico. Nos basamos sobre las mismas dimensiones que en nuestros anteriores trabajos.¹⁴ El recinto republicano ya ha sido objeto de definición,¹⁵ pero apuntamos aquí sus principales características. Es el sector septentrional de Córdoba que ha ofrecido mayor documentación arqueológica, pudiendo definir la muralla republicana como sistema de defensa con una anchura de más de 20 m. Los restos conservados en Ronda de los Tejares nº9, nº13 y Paseo de la Victoria nº5 apuntan que la altura del sistema defensivo alcanzaría por lo menos 5 m (fig. 3). Pensamos que la muralla podría llegar hasta los 8 m de altura con facilidad. Refiriéndose a Vitruvio (*De Architectura*, Libro I, capítulo V) las torres deben ser más altas que las cortinas, por lo tanto, añadimos 2 metros a estas estructuras.

Delante de la muralla, existía un foso paralelo de unos 10–15 m de ancho con una profundidad de 5 m. El volumen del foso se estima¹⁶ entre 18'550 y 25'200 m³. El tramo

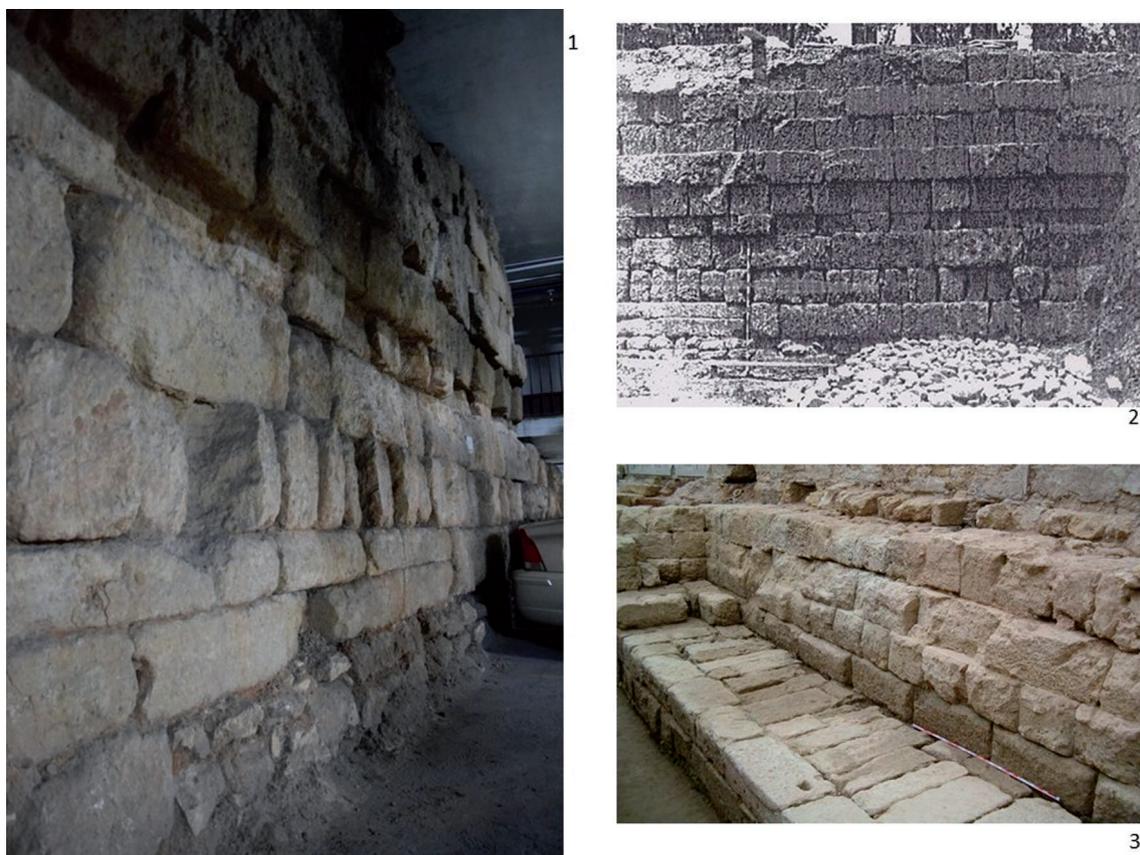


Fig. 3: Cortina principal.

principal mide 1,30 m de ancho en su base, pero se reduciría a un 1,10 m en altura en Ronda de los Tejares n°13 (fig. 3). Para el muro de contención la anchura¹⁷ es de unos 0,5 m, por una altura de 4 m.

En el recinto republicano se encuentran dos morfologías de torres, una semicircular, y otra cuadrangular a talón (fig. 4). Su organización consiste en una alternancia de dos torres rectangulares a talón con una semicircular, y cada una separada de 22 pies romanos (fig. 5). Las torres semicirculares tienen un diámetro externo de 7,23 m, mientras que el interno es de 4,45 m, lo que da una superficie de unos 12,31 m² o sea un volumen de 123,1 m³. Las torres cuadrangulares a talón miden unos 6 m de lado por una superficie de 12,96 m² o sea un volumen de 129,6 m³. Cabe mencionar que el número de torres responde a una estimación ideal tras extrapolar una situación en el sector septentrional entre Ronda de los Tejares n°13 y Plaza de Colón n°8. No obstante, es probable que el número de torres podría reducirse, puesto que las intervenciones arqueológicas no han sacado a la luz en los sectores oriental y occidental (menos en Plaza de Colón n°5); además la presencia de dos arroyos en cada lado de la ciudad hubiera sido, tal vez, un motivo para reducir el número de torres. Frente a este aspecto, preferimos conservar el número de 46 torres semicirculares y 100 torres rectangulares a talón.

A continuación, contextualizamos algunos aspectos metodológicos basándose en las pautas de los principales estudios cuantitativos:

- Utilizamos aquí únicamente la figura de Pegoretti como principal referente, por lo tanto, adoptaremos sus distintas fórmulas por cada fase del proceso de edificación. Cabe hacer hincapié que sólo distinguimos dos etapas en la transformación de la calcarenita, la primera consiste en la extracción de la piedra local, (17,5h/m³);¹⁸ luego se efectuaba el aparato rústico o escuadratura¹⁹ (116h/m³) que tiene como objetivo dar la forma casi definitiva, la tercera fase conocida como aparato semielaboración corresponde a los componentes arquitectónicos ornamentales;²⁰ por lo cual para los sillares, se salta la susodicha fase para pasar directamente a la última etapa *finitura* o acabado que consiste en labrar el bloque al pie de obra para una mayor colocación (9,17h/m²);²¹. El día laboral es de 10/h por día.
- Hemos considerado que cada una de las estructuras pétreas se asienta sobre una preparación a base de mampostería tal como se encuentra en Ronda de los Tejares n°13 (fig. 3).
- Para la estimación de las trincheras, hemos cogido la anchura de la estructura y hemos aumentado de 0,5 m por cada lado.²² Para la excavación de la tierra, cogemos la referencia de Pegoretti 0,75h/m³. Este valor se suele utilizar para una rasa de cimentación profunda de 1,5 m²³ como máximo, pero también corresponde a una tierra fácil de extraer.
- Hemos seguido la manera más común para evaluar el tiempo de trabajo, a modo de ejemplo, en el caso de la extracción de la calcarenita se hace una estimación del volumen del edificio y se aplica la fórmula de Pegoretti. Pero, dicho volumen no corresponde realmente a la extracción sino a un producto terminado, en otras palabras, se

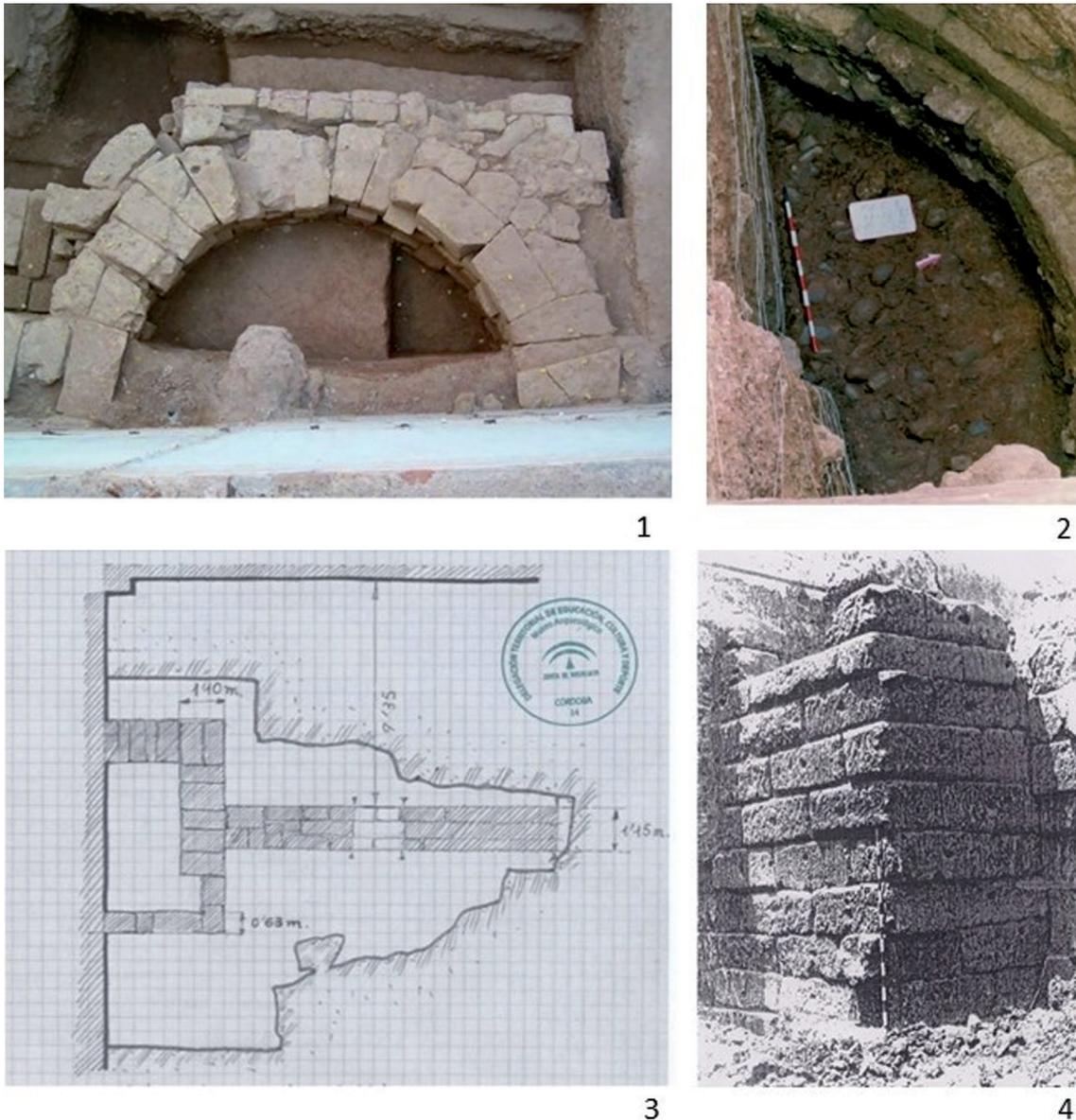


Fig. 4: Representación de las dos morfologías de torres.

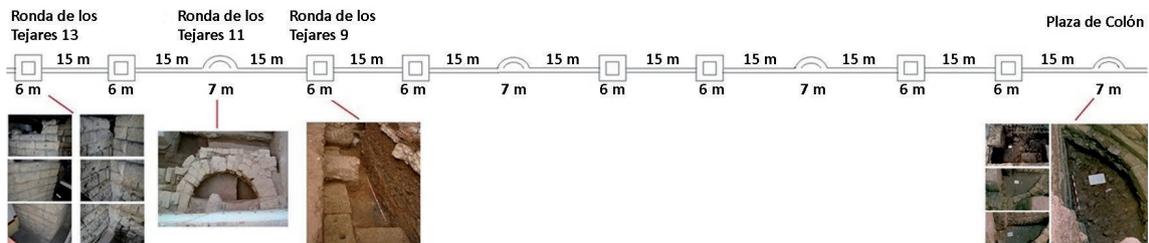


Fig. 5: Organización defensiva en época republicana en el sector septentrional entre Ronda de los Tejares nº13 y Plaza de Colón nº8.

debería considerar la producción del desgaste como el verdadero tiempo de trabajo puesto que son todas aquellas etapas que permiten pasar de una materia bruta a un producto finiquitado. En este sentido, hemos determinado que las proporciones de desgaste pueden ser más o menos equivalente (unos 20 % de diferencia como mucho) al volumen del edificio.²⁴

- Todas las piedras no son iguales pese a que encontramos una cierta homogeneidad en sus dimensiones, Roldán identifica que las longitudes están comprendidas entre 0,90 m y 1,10 m, 0,4 m y 0,6 m para las alturas, mientras que las anchuras oscilan entre 0,30 m y 0,60 m.²⁵ Tras volver a medir *in situ* en Ronda de los Tejares n°13 y Plaza de Colón n°5, hemos identificado volúmenes comprendidos entre 0,22 m³ y 0,3575 m³. No obstante, para el presente estudio adoptaremos la idea de que la media sea de 0,26 m³ (1,30 m × 0,5 m × 0,4 m).
- El acabado²⁶ consiste labrar *in situ* los sillares antes de colocarles en la obra. Así, era común documentar picaduras de sillar en las distintas intervenciones arqueológicas. Para ello, se puede añadir 5 cm a las medidas de los sillares, así que se labraría por sillar (1,35 m × 0,55 m × 0,45 m) – 0,26 m³ = 0,074 m³. Sin embargo, la unidad utilizada por esta etapa no es el m³ sino el m², por lo tanto, antes de ser labrado, un sillar dispone de dos caras midiendo 1,35 m × 0,45 m = 0,6075 m², dos caras de 1,35 m × 0,55 m, y dos caras que miden 0,55 m × 0,45 m = 0,2475 m², o sea un total de 3,195 m². Para evaluar el tiempo de esta etapa, cabe coger la diferencia con un sillar labrado (2,74 m²), es decir 0,455 m². A este valor se le multiplica el número de sillares y el tiempo de 10,67h/m².
- Una de las características de la muralla republicana atañe el muro de contención (fig. 6), porque en su cara intramuros aparecen sillares almohadillados, pero únicamente a partir de una cierta altura estimada a 2 m. El uso de sillares almohadillados permitiría un ahorro de trabajo. No obstante, esta idea nunca ha sido cuantificada. En este sentido, hemos medido en Ronda de los Tejares n°13, la almohadilla de los sillares del muro del *agger*. En algunos casos, la almohadilla representa entre 17–23 % de la superficie (de la cara en la que aparece), es decir de una superficie no labrada. En general, la almohadilla suele ser entre 30–34 %, pudiendo llegar hasta los 38 %. Es decir que se ahorraría unos 30 % de esfuerzo para la cara intramuros. Sobre 4 m de altura, sólo 2 m tendrían sillares almohadillados, entonces evaluamos a unos 1'626 m² de superficie no labrada. De otra parte, la cara extramuros del muro de contención en Ronda de los Tejares n°13 aparece con un acabado poco cuidado, por lo que habíamos pensado que dicha cara no era bien labrada para ahorrar tiempo.²⁷ Es conveniente matizar ese aspecto, puesto que ese sector ha sido objeto de reparación tal como lo demuestra la torre cuadrangular a talón (fig. 4,4), además ese criterio no parece repetirse en los otros yacimientos dónde se halló el muro de contención (fig. 6)
- Existen indicios de que la cantera Castillo de Maimón fue explotada en época imperial, pero que su origen pudo ser tardorepublicano.²⁸ Por lo tanto, si consideramos



Fig. 6: Restos del muro de contención en el trazado republicano.

que un bloque de $1 \text{ m}^3 = 2'400 \text{ Kg}$, y que un par de bueyes puede transportar $1'500 \text{ kg}$ desplazándose con esta carga a 4 km/h (6 km/h sin esta), convendría a una ida y vuelta por hora. Así una pareja de bueyes puede efectuar una ida y vuelta en una hora; lo que supondría unos 8 trayectos al día por una pareja de bueyes. Los sillares que se llevan a pie de obra, aún no han pasado por una última fase de transformación, por lo cual pesan más. Así, un bloque de $0,334 \text{ m}^3$ equivale a 835 Kg lo que implicaría que por viaje se puede transportar 2 o 3 bloques.

- Con este peso inferior a menos de una tonelada, se puede aplicar la fórmula²⁹ de Pegoretti $t + 0,6t(a - 1)$ para el levantamiento. Así que un bloque de $0,26 \text{ m}^3$ pesaría unos 624 Kg
- El núcleo interno de las torres tiene un relleno que alternan distintas capas de arcilla, picaduras de sillares y cantos rodados tal como es el caso en la torre semicircular de Plaza de Colón n°8 (fig. 4,2). Disponemos de escasas informaciones respecto al espesor de las capas, pero podrían variar en torno de $10-15 \text{ cm}$ en media o hasta más. Al tratarse de un volumen poco indicativo, no nos ha parecido esencial entrar más en detalle sobre la alternancia de las capas visto que no poseemos suficientes informaciones al respecto. En nuestra estimación consideramos el relleno como una misma

unidad. En lo que concierne el *agger*, su cuantificación resulta más complicada, pero se puede proponer una estimación.³⁰

- Pesa a que no se hayan documentado restos contundentes, pensamos que es probable que se aplicó un enlucido en la cara extramuros. El objetivo no sería meramente estético sino un artilugio para luchar contra la erosión.³¹ Frente a esta carencia de documentación, planteamos de que se trate de una sencilla capa, así se necesitaría unos 13 min para aplicar un enlucido de 1 cm de espesor sobre 1 m².³²

A modo de conclusión

Tras analizar de nuevo toda la documentación que está en nuestra posesión, la construcción del primer urbanismo (muralla y sistema de desagüe) llegaría a un total cerca de unos 747'677 días de trabajo (tab. 1). A partir de esta cifra, la interpretación depende del número de colonos presentes, tal vez unos 3000 si se tiene en cuenta el estatuto de *colonia latina*³³ y en comparación con otros entes urbanos de época similar.³⁴ A esto se puede añadir igualmente la relación con los indígenas ¿Participaron en la edificación de *Corduba*? Los comienzos urbanísticos de *Corduba* siguen siendo un enigma, sin embargo, las intervenciones arqueológicas han permitido documentar que el del tramo viario, sistema de desagüe y fortificación forman parte de un mismo planteamiento urbanístico, lo que deja entrever un ente menos austero.

Matemáticamente es factible que la edificación de la muralla, así como el sistema de saneamiento se haga en poco tiempo (más o menos un año y medio). A modo de ejemplo, 2000 trabajadores trabajando durante 7 meses (cada uno de 30 días) durante 10 horas equivale a 4'200'000 horas laborales o sea 420'000 días de trabajo. A nuestro modo de ver, sería equívoco zanjar un debate mediante esa mera ecuación. Cabría determinar de qué modo se organizaba el trabajo en función de las distintas etapas del proceso constructivo, así como la continuidad entre todos los susodichos aspectos y el personal implicado. Deben existir límites logísticos que no podemos tener en cuenta en esta última ecuación. En otras palabras, de acuerdo con los conocimientos actuales, el estudio cuantitativo puede ser una clave en el debate sobre la fecha de fundación, pero no permite zanjar el tema.

De ahí, surge una pregunta ¿si fuese tan rápido/fácil por qué *Corduba* no se haya dotado de infraestructuras más monumentales visto el poco tiempo necesario, al cambio, desde una perspectiva arqueológica prevalece una imagen austera? A La fundación de *Corduba* no se le puede quitar su carácter simbólico y su fuerte carga simbólica,³⁵ tal vez se pueda encontrar aquí el inicio de una respuesta, es decir la falta de urgencia podría ser un motivo por el cual se tratase de un proyecto paulatino con una profunda reflexión sobre la organización de la ciudad.

Los resultados de este estudio cuantitativo representan evidentemente una aproximación, pero no se debe confundir la estimación con una realidad; es decir, existen ele-

Fase	Estructura	Descripción	Fórmula	Días
Extracción	Cortina	La longitud de la cortina - quitando las torres - es de 1777,2 m. Así, su volumen es 8 m (altura) × 1777,2 m (longitud) × 1,3 m (anchura) = 18'441 m³	$m^3 \times 17,5 \text{ h/m}^3:10 \text{ h}$	32'272
	Muro de contención	La longitud es de 2710 m × 0,5 m de ancho × 4 m de altura = 5'420 m³		9'485
	Torres semicirculares	El volumen de una torre es de 123,1 m³ × 46 torres = 5'662,6 m³		9'909
	Torres cuadrangulares a talón	El volumen de una torre es de 129,6 m³ × 100 torres = 12'930 m³		22'628
	Canalizaciones	7000 m × 0,5 m de altura × 0,4 m de ancho = 1400 m³ × 2 (porque son sillares superpuestos) = 2'800 m³		4'900
		Si suponemos que la parte interna excavada tiene una altura de 0,4 m por una anchura de 0,20 m por 1,30 m de largo = 0,104 m³ × 10'770 sillares = 1'120 m³		1'960
	Subtotal			
aparato rústico o escuadradura	Cortina	18'441 m³	$m^3 \times 116 \text{ h/m}^3:10 \text{ h}$	218'556
	Muro de contención	5'420 m³		62'872
	Torres semicirculares	5'662,6 m³		65'686
	Torres cuadrangulares a talón	12'930 m³		149'988
	Canalizaciones	2'800 m³		32'480
	Subtotal			
Transporte de los sillares	Cortina	18'441 m³ / 0,26 = 70'927 sillares / 2 sillares por trayecto = 35'463,5 trayectos / 8 trayectos al día = 4'434 días		4'434
	Muro de contención	5'420 m³ / 0,26 m³ = 20'846 sillares / 2 sillares por trayecto = 10'423 trayectos / 8 trayectos al día = 1'303 días		1'303
	Torres semicirculares	5'662,6 m³ / 0,26 m³ = 21'780 sillares / 2 sillares por trayecto = 10'890 trayectos / 8 trayectos al día = 1'361 días		1'361
	Torres cuadrangulares a talón	12'930 m³ / 0,26 m³ = 49'730 sillares / 2 sillares por trayecto = 24'865 trayectos / 8 trayectos al día = 3'108 días		3'108
	Canalizaciones	7000 m / 1,30 m de largo = 5'385 sillares × 2 (sillares superpuestos) = 10'770 sillares / 2 sillares por trayecto = 5'385 trayectos / 8 trayectos al día = 673 días		673
	Subtotal			10'879

Table 1: Descripción cuantitativa del primer urbanismo de Corduba (muralla y canalizaciones).

Fase	Estructura	Descripción	Fórmula	Días
Excavación trincheras	Cortina	Para la colocación correcta de los sillares, se necesitaría por lo menos 0,50 m por cada lado, o sea 2,30 m. La profundidad es por lo mínimo de 0,50 correspondiendo a la mampostería, pero se puede considerar que las 4 primeras hiladas formaban parte de la cimentación ($4 \times 0,5 \text{ m} = 2 \text{ m}$), o sea un total de 2,5 m. $1777,2 \text{ m} \times 2,30 \text{ m} \times 2,5 \text{ m} = 10'218,9 \text{ m}^3$	$\text{m}^3 \times 0,75 \text{ h/m}^3: 10 \text{ h}$	766
	Muro de contención	Para la colocación correcta de los sillares, se necesitaría por lo menos 0,50 m por cada lado, o sea 1,5 m de ancho. La profundidad podría corresponder sólo a dos hiladas ($0,5 \text{ m} \times 2 = 1 \text{ m}$), más la preparación de mampostería (0,5 m), o sea una profundidad de 1,5 m. $2710 \text{ m} \times 1,5 \text{ m} \times 1,5 \text{ m} = 6'097,5 \text{ m}^3$		457
	Torres semicirculares	Siguiendo la misma lógica proponemos aumentar el radio de la torre semicircular de 0,5 m, lo que daría una superficie más amplia, por un total de 26,6 m ² . La profundidad deber ser similar a la de cortina 2,5 m. $26,6 \text{ m} \times 2,5 \text{ m} = 66,5 \text{ m}^3 \times 46 \text{ torres} = 3'059 \text{ m}^3$		229
	Torres cuadrangulares a talón	En la misma que lo descrito, se puede plantear unas dimensiones aumentadas de 0,5 m por cada lado, lo que daría una superficie de ($7 \text{ m} \times 7 \text{ m}$) 49 m^2 . Así, $49 \text{ m}^2 \times 2,5 \text{ m} = 122,5 \text{ m}^3 \times 100 \text{ torres} = 12'250 \text{ m}^3$		919
	Canalizaciones	Se estima que para colocar bien los sillares se necesita por lo menos 0,50 m de margen por cada lado del sillar, o sea 1,5 m de ancho. La altura de los sillares superpuestos es de 1 m, así que podemos proponer 1,5 m de profundidad. $7000 \text{ m} \times 1,5 \text{ m} \times 1,5 \text{ m} = 15'750 \text{ m}^3$		1'181
	Foso	Se estima entre 18'550 y 25'200 m ³ , así que conviene conger la media o sea 21'875 m ³		1'641
Subtotal				5'193
Mampostería	Cortina	$1'777,2 \text{ m} \times 0,50 \text{ m de alto} \times 1,30 \text{ m de ancho} = 1'155,18 \text{ m}^3$	$3 \text{ h} \times \text{m}^3 \times 5 \text{ operarios}: 10 \text{ h}$	1'733
	Muro de contención	$2710 \text{ m} \times 0,50 \text{ m de alto} \times 0,50 \text{ m de ancho} = 677,5 \text{ m}^3$		1'016
	Torres semicirculares	La superficie de una torre al nivel de la planimetría es de $20,53 \text{ m}^2 \times 0,50 \text{ m de alto} = 10,265 \text{ m}^3 \times 46 \text{ torres} = 472,19 \text{ m}^3$		708
	Torres cuadrangulares a talón	La superficie de una torre al nivel de la planimetría es de $36 \text{ m}^2 \times 0,50 \text{ m de alto} = 18 \text{ m}^3 \times 100 \text{ torres} = 1'800 \text{ m}^3$		2'700
Subtotal				6'157

Table 1 (continued)

Fase	Estructura	Descripción	Fórmula	Días
Acabado	Cortina	$70'927 \text{ sillares} \times 0,455 \text{ m}^2 = 32'272 \text{ m}^2$	$\text{m}^2 \times 10,67 \text{ h/m}^2:10 \text{ h}$	34'434
	Muro de contención	$20'846 \text{ sillares} \times 0,455 \text{ m}^2 = 9'485 \text{ m}^2 - 1'626 \text{ m}^2 = 7'859 \text{ m}^2$		8'385
	Torres semicirculares	$21'780 \text{ sillares} \times 0,455 \text{ m}^2 = 9'910 \text{ m}^2$		10'574
	Torres cuadrangulares a talón	$49'730 \text{ sillares} \times 0,455 \text{ m}^2 = 22'617 \text{ m}^2$		24'132
	Canalizaciones	$10'770 \text{ sillares} \times 0,455 \text{ m}^2 = 4'900 \text{ m}^2$		5'228
Subtotal				82'753
Levantamiento	Cortina	$70'927 \text{ sillares} \times 624 \text{ Kg} = 44'258'448 \text{ Kg} / 100 = 442'584 \times 0,06 = 26'555,04 = \text{t. Al ser la cortina alta de } 8 \text{ m, su media es } 4 \text{ m} = a$	$t+0,6t(a-1)$	7'435
	Muro de contención	$20'846 \text{ sillares} \times 624 \text{ Kg} = 13'007'904 \text{ Kg} / 100 = 130'079,04 \times 0,06 = 7'807,74 = \text{t. Al ser el muro alto de } 4 \text{ m, su media es de } 2 \text{ m} = a$		1'249
	Torres semicirculares	$21'780 \text{ sillares} \times 624 \text{ Kg} = 13'590'720 \text{ Kg} / 100 = 135'907,2 = 8'154,4 = \text{t. Al ser las torres alto de } 10 \text{ m, su media es } 5 \text{ m} = a$		2'773
	Torres cuadrangulares a talón	$49'730 \text{ sillares} \times 624 \text{ Kg} = 31'031'520 \text{ Kg} / 100 = 310'315,2 = 18'618,9 = \text{t. Al ser las torres alto de } 10 \text{ m, su media es de } 5 \text{ m} = a$		6'330
	Subtotal			
Relleno	Torres semicirculares	El radio interno es de 2,125 m, entonces la superficie unitaria es de $8,49 \text{ m}^2$, y el volumen de $84,9 \text{ m}^3 \times 46 \text{ torres} = 3'905 \text{ m}^3$	$1 \text{ h} = 1 \text{ m}^3$	391
	Torres cuadrangulares a talón	La superficie interna es de $12,96 \text{ m}^2$, entonces el volumen es de $129,6 \text{ m}^3 \times 100 \text{ torres} = 12'960 \text{ m}^3$		1'296
	Agger	Al tener en cuenta en cuenta las alturas del muro de contención y del tramo principal, cuya separación es de 7 m, y que todo aquello tiene una distancia de 2710 m, llegaríamos a un volumen de $113'820 \text{ m}^3$		11'832
Subtotal				13'519
Enlucido	Cortina	La superficie es de $1'777 \text{ m} \times 8 \text{ m} = 14'216 \text{ m}^2$	$13 \text{ min por } 1 \text{ cm de espesor por m}^2$	308
	Torres semicirculares	La superficie externa $113,57 \text{ m}^2 \times 46 \text{ torres} = 5'224,22 \text{ m}^2$		113
	Torres cuadrangulares a talón	Se calcula únicamente la superficie extramuros, es decir 3 caras, la cara frontal tendría una superficie de 60 m^2 , mientras que los laterales serían $(2,35 \text{ m} \times 10 \text{ m}) \times 2 \text{ caras} = 47 \text{ m}^2$, o sea un total de 107 m^2 por torre $\times 100 \text{ torres} = 10'700 \text{ m}^2$		232
Subtotal				653
TOTAL				747'677

Table 1 (continued)

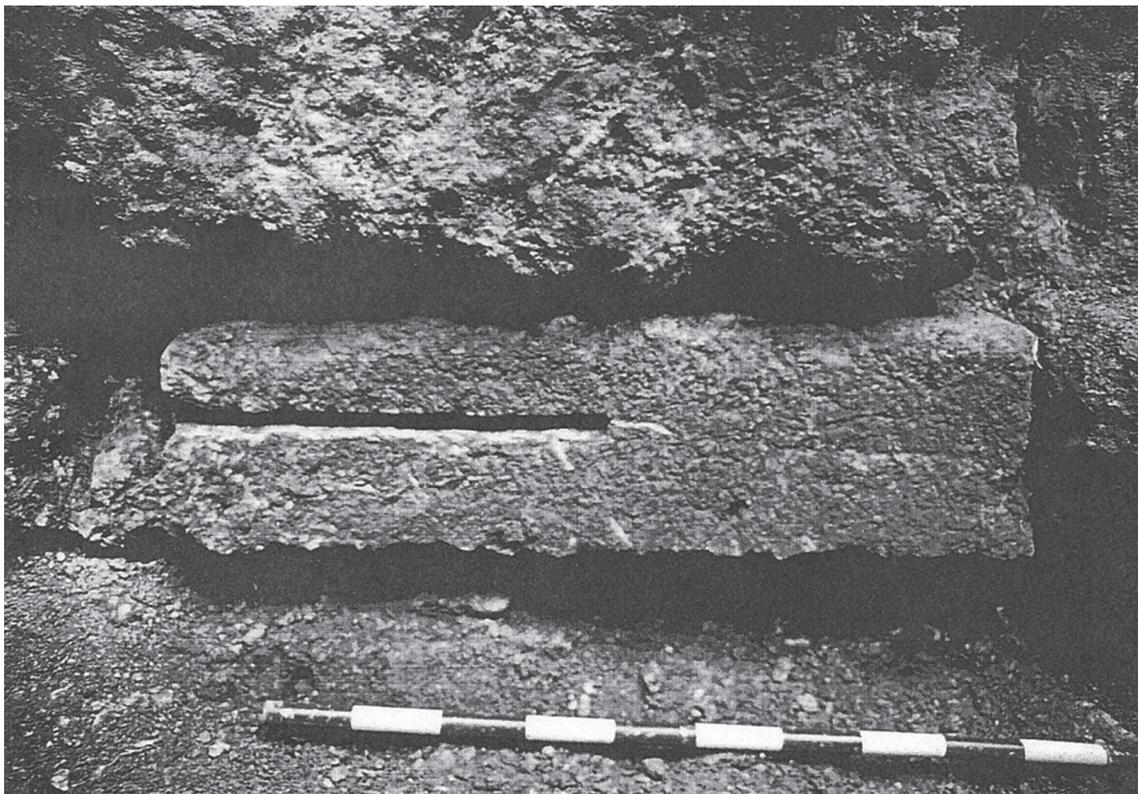


Fig. 7: Huella del uso de una sierra en un bloque de calcarenita.

mentos que no manejamos sobre la organización laboral, lo que significa que se tomó su tiempo para construir, pero debido a varios factores. En efecto, lo que va a aumentar el tiempo de trabajo es la organización del proceso de construcción³⁶ en sí (preparación de las canteras,³⁷ abastecimiento en agua, cisternas, forjar herramientas, gestión de los recursos animales, condicionar los caminos secundarios, el consumo de la madera ...), e igualmente toda la vida social (política, agricultura etc.). A todo ello, se le puede añadir una fase de experimentación, a modo de ejemplo, se documentó en la cimentación de la muralla un sillar con una hendidura en su mitad, correspondiendo a la marca de una sierra (fig. 7). El uso de la sierra no parece haber sido una herramienta utilizada en la construcción puesto que no se ha documentado más huellas en los sillares de la muralla republicana.

Bajo esta perspectiva, existen un número de factores anterior a la construcción de la ciudad *ex novo* que va a influir sobre su materialización, pero que al día de hoy resulta complejo cuantificarlos. Pero si la muralla y el sistema de desagüe forman parte de un mismo programa, pese a que la investigación lo había considera como dos aspectos separados, es probable que otros estuviesen también relacionados – ¿el abastecimiento del agua? –. Tampoco se puede descartar que las canteras fueron explotadas para la edificación – al mismo tiempo – de otros aspectos urbanos lo que aplazaría un poco más el

tiempo de construcción. Por todo ello, confirmamos nuestra inclinación hacia la fecha de 169–168 a.C.³⁸ para la fundación de *Corduba*.

Notas

¹ Courault 2015, 2016a, 2016b.

² Canto 1997, 262–266; García Fernández 2014, 174.

³ De Ruggiero 1900, 1208; Murillo – Vaquerizo 1996, 43; Murillo – Jiménez 2002; Jiménez – Carrillo 2011, 57; Vaquerizo 2005, 170 s.

⁴ Murillo, Jiménez 2002 “*Se trata de una vasija de reducidas dimensiones, de cuerpo esferoidal, gollete desarrollado con un baquetón central, borde ligeramente biselado, pie anular y asa de cinta. Presenta un barniz negro intenso, de calidad, aplicado a la totalidad del recipiente salvo en la parte interna de la base. La pasta es de color castaño rojizo, muy depurada, percibiéndose sólo algún fino desgrasante micáceo.*”.

⁵ Dicha pieza significaría la existencia de un intercambio comercial entre indígenas y romanos 50 años antes de la fundación por Claudio Marcelo (Murillo – Jiménez 2002, 186).

⁶ Murillo, Jiménez 2002 “*(...) la sepultura se encontraba a menos de un metro de profundidad, consistiendo en un simple hoyo cubierto con una laja de piedra caliza y en cuyo interior se depositó una urna con decoración de bandas que contenía los restos de la cremación junto al vaso de barniz negro y un fragmento de un supuesto ‘cuchillo’ de hierro, en la actualidad perdido. Un plato decorado en su borde con una banda de pintura roja cerraba, al parecer, la boca de la urna.*”.

⁷ Vaquerizo 2005, 168.

⁸ Murillo – Jiménez 2002.

⁹ Carrillo et al. 1999.

¹⁰ Hita et al. 1993.

¹¹ Sánchez Velasco 2011, 125.

¹² Jiménez – Carrillo, 2011, 58–60.

¹³ Ventura et al. 1998, 89.

¹⁴ Courault 2015, Courault 2016a, Courault, 2016b.

¹⁵ Courault 2015.

¹⁶ Esta diferencia se explica por el hecho de que no se conoce las inclinaciones de las paredes del foso.

¹⁷ En Ronda de los n°13 la anchura es más importante, llegando a 1,10 m, mientras que en el Paseo de la Victoria n° 5 y n°44, es de 0,5 m. Esta diferencia puede explicarse por el hecho de que el sector septentrional fue objeto de rehabilitación en el Alto imperio, y pudo afectar también el muro de contención.

¹⁸ Pegoretti 1843, 78.

¹⁹ Pegoretti 1869, 429 s.

²⁰ Domingo 2012, 395.

²¹ Mar, Pensabene 2010, 521.

²² Fulvio Giuliani 2016, 169.

²³ Domingo 2012, 408.

²⁴ Courault 2016b, 33 tabla 5.

²⁵ Roldán 1992, 259.

²⁶ La estimación en día laborales es problemática para dicha fase, pero la metodología que proponemos permite tener en cuenta el número de días más endeble; por lo consiguiente, aquel resultado se puede asimilar a un número mínimo necesario de labor (Courault – Ruiz en prensa).

²⁷ Courault 2016b, 27.

²⁸ La cantera Castillo del Maimón se encuentra a 2,4 km, mientras que la de las cuevas romanas está a 2,5 km en línea recta. Existen otros frentes de explotación un poco más alejados en Santa Ana de la Albaida. Por lo tanto, conviene guardar como referencia la distancia más corta.

²⁹ Pegoretti, 1869, II, 216. $t = 0,6$ horas por 100 Kg, $a =$ altura a la que se debe elevarse los sillares (cogemos la media de la estructura). Domingo. $T = 0,06$ por 100 Kg, y a'' corresponde a la altura. La altura media es de 4 m para la cortina principal, 2 m para el muro de contención y 5 m para las torres.

³⁰ Proponemos abarcar el *agger* a través de un corte transversal en el cual se dibujaría dos figuras geométricas un rectángulo y un triángulo rectángulo.

³¹ Courault 2017, 189.

³² Hacemos referencia al póster de Francesca Bologna intitulado *Painters and workshops in Pompeii: quantifying production*. Sólo cogemos como etapa la aplicación sobre la superficie de la muralla, aunque no se trate de un tiempo significativo, no se debe perder de vista que existe también una preparación del enlucido. Visto la superficie de los distintos componentes, el tiempo de preparación podría llegar a varias decenas de días.

³³ García Fernández 2014, 177.

³⁴ Pelgrom 2007, 338.

³⁵ Vaquerizo 2005, 171.

³⁶ Un dato que podría ser interesante sería determinar el número de cantero, proponiendo un área de actividad de unos 5 m² (agradecemos a J. C. Bessac por este dato). Merced al estudio petrográfico mencionado, sabemos que los frentes que fueron objetos de extracción en época republicana podían encontrarse en el sector oriental del Castillo de Maimón. Por desgracia, la situación actual de dicho yacimiento no permite delimitar los frentes de extracción. Sin embargo, que éste dato tendría una repercusión trascendental. De otra parte, Vitruvio (*De Architectura*, II, 7, 2–5) recomienda extraer los bloques durante el verano, y dejar los sillares al aire libre para que pierdan su humedad, un proceso que puede durar hasta dos años.

³⁷ Tal como lo hemos señalado, no se descarta que dos canteras fueron explotadas para la muralla de *Corduba*. Si más adelante, se confirma esta hipótesis, convendría aumentar el tiempo laboral de todo el proceso pre-explotación por repetir toda la preparación logística.

³⁸ Aceptar dicha fecha permitiría entender la presencia de barniz negro durante la primera mitad del siglo II a.C.

Índice de figuras

Fig. 1: Courault, 2016a, 440 fig.196. – Fig. 2: 1 y 2: Costa Palacios 2000 fotografías 26 y 28; 3: foto facilitado por López Rey; 4 y 5: López Rey 2001: lám. XXII y VI. – Fig. 3: 1 y 2: fotografía 2 en Morena 1996; 3: Molina Mahedero, 2009, 632, lám.II. – Fig. 4: 1: Molina Mahedero 2009, 629; 2: fotografía facilitada por

Daniel Botella Ortega; 3: Museo Arqueológico de Córdoba, Caja 185, Diario IX, página 6, el 1 de junio de 1981; 4: Morena López 1996. – Fig. 5: Courault 2016a 356 fig.156b. – Fig. 6: 1: Costa Palacios 2000, fotografía 15; 2: Ronda de los Tejares n°13; 3: Bermúdez Cano 1992, fotografía 1; 4: Lazaro 2012 lám.69. – Fig. 7: Courault. – Fig. 8: Bermudez Cano 1992, fotografía 20.

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Una propuesta de reconstrucción de los costes de los teatros: el caso de Leptis Magna

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El presente estudio se enmarca en la línea de investigación que estamos desarrollando acerca de la generación de una metodología de cálculo que permita reconstruir los costes del proceso constructivo en el mundo antiguo. Partiendo de una tradición de estudios precedentes,¹ en los últimos años hemos focalizado nuestra atención en la verificación de la fiabilidad de esta metodología mediante su aplicación a edificios de los que conocemos su coste real, como es el caso del Templo C y del Capitolio de Volúbilis, del templo de la Victoria de Caracalla en Dougga o del Arco de Caracalla en Theveste.²

En este sentido, el estudio del teatro de Leptis Magna presenta un especial interés, pues permite afrontar el análisis de un edificio construido mayoritariamente en mármol, a diferencia de los ejemplos precedentes levantados con piedras locales.

El Teatro de Leptis Magna

Una inscripción grabada sobre el arquitrabe del I orden del frente escénico (IRT 534) (fig. 1 y 2) informa que el teatro, construido entre el 1 y 2 d.C. (IRT 321, 322, 521)³ y terminado en época de Tiberio (IRT 269), fue remodelado en tiempos de los Antoninos, entre el 157–159 d. C. La inscripción indica que el frente escénico, originalmente en calceña, fue sustituido por otro de mármol (fig. 3), articulado en tres ábsides,⁴ y que tal remodelación fue financiada con el dinero procedente de dos donaciones (de 200.000 y 300.000 HS respectivamente) además de una cantidad indeterminada procedente del erario público.⁵

Proscenium // columnis [e]t marmoribus // ex HS (ducentibus milibus) a Marcio Vitale itemque ex HS (trecentibus milibus) a Iunio Galba in eam rem // [legatis, datis item / tetrastylis] lac[un]ar[um], // pecunia publica exornatum, dedicatum est L. Hedio Rufo [Lo]lliano Avito // proco(n)s(ule) C. Vibio Gallione Clau//dio Severo leg(ato)

Existen, sin embargo, dudas acerca de qué partes del edificio fueron remodeladas con dicha inversión:

- la palabra *tetrastylis*, un añadido propuesto por J. Guey,⁶ podría hacer referencia, según este autor y A. Di Vita, a los ábsides del *frons scaenae*, decorados con grupos de cuatro columnas.⁷ Por el contrario, G. Caputo supone que haría referencia a las columnas del pórtico *in summa cavea*,⁸ que por tanto habría que incluir entre las obras financiadas con la suma citada en la inscripción.



Fig. 1: Leptis Magna, teatro. Columnas del tetrastylum delante del ábside noroeste de la escena. Arquitrabe con inscripción “*columnis [e]t marmoribus*”.



Fig. 2: Leptis Magna, teatro. Columnas en la esquina noroeste de la escena. Arquitrabe con inscripción “*proscenium*”.



Fig. 3: Leptis Magna teatro.

- la palabra *lac[um]* podría identificarse con los *tetrastylis* de las *valvae*, en cuyo caso la remodelación del pórtico *in summa cavea* no estaría incluida en la partida citada en la inscripción.
- sabemos que en este momento fue remodelado también el frente del púlpito y que la *orchestra* fue dotada de un nuevo pavimento marmóreo,⁹ pero desconocemos si se utilizó para ello parte de la suma citada en la inscripción.
- la inscripción no explicita qué sector del edificio fue remodelado con la suma procedente del erario público, cuyo montante además desconocemos. A. Di Vita sugiere que quizás los tetrástilos fueron financiados con esta partida.¹⁰

Son muchas, por tanto, las dudas que plantea la lectura de la inscripción, motivo por el que aplicaremos la metodología de cálculo del coste a cada una de las partes del edificio, buscando de este modo determinar la solución más factible en base a los resultados obtenidos (Tab. 1).

MATERIAL	Orden	Tipo	Material	Costo	Canti- dad	Altura (m)	Diámetro (m)	Lado (m)	Altura co- lumna (m)	Volumen 1 ejemplar (m ³)	Volumen total (m ³)	Volumen total (p ³) (1 m ³ = 38,5 p ³)	Costo total (HS)
	Podio	Podio bajo columnas	Piedra local	1,5 HS/p ³	1	3,03 y 0,534		88,07			344,64	13.268,64	19.902
	Podio	Muro de fondo	Piedra local	1,5 HS/p ³	1	3,03					91,5	3.522,75	5.284
	Orden I	Capitel	Proconnesio	15,5 den./m ³	20	0,709	0,54	0,91	6,38	0,58	11,64		721
	Orden I	Fuste	Pavonazetto	77 den./m ³	8	5,32	0,63	0,73	6,38	2,83	22,62		6.966
	Orden I	Fuste	Cipollino	38,5 den./m ³	8	5,32	0,63	0,73	6,38	2,83	22,62		3.483
	Orden I	Fuste	Fior di pesco	48 den./m ³	4	5,32	0,63	0,73	6,38	2,83	11,31		2.171
	Orden I	Basa	Proconnesio	15,5 den./m ³	20	0,355		0,91	6,38	0,29	5,83		361
	Orden I – Tetrástilo	Capitel	Proconnesio	15,5 den./m ³	12	0,987	0,75	1,26	8,88	1,57	18,86		1.169
	Orden I – Tetrástilo	Fuste	Pavonazetto	77 den./m ³	12	7,4	0,87	0,97	8,88	7,03	84,42		25.999
	Orden I – Tetrástilo	Basa	Proconnesio	15,5 den./m ³	12	0,493		1,26	8,88	0,79	9,42		584
	Orden I	Entablamento	Proconnesio	15,5 den./m ³	1	1,60		0,80 × 87,02			133,62		8.284
	Orden I	Muro de fondo	Pavonazetto	77 den./m ³	1	7,97		54,74 × 0,15			60,26		18.560
	Orden I	Muro de fondo	Piedra local	1,5 HS/p ³	1	7,97		54,74 × 0,50			257,13	9.899,51	14.849
	Orden II	Capitel	Proconnesio	15,5 den./m ³	20	0,552	0,42	0,71	4,97	0,28	5,50		341
	Orden II	Fuste	Pavonazetto	77 den./m ³	8	4,14	0,49	0,59	4,97	1,44	11,53		3.550
	Orden II	Fuste	Cipollino	38,5 den./m ³	8	4,14	0,49	0,59	4,97	1,44	11,53		1.775
	Orden II	Fuste	Fior di pesco	48 den./m ³	4	4,14	0,49	0,59	4,97	1,44	5,76		1.106
	Orden II	Basa	Proconnesio	15,5 den./m ³	20	0,276		0,71	4,97	0,14	2,75		170
	Orden II – Tetrástilo	Capitel	Proconnesio	15,5 den./m ³	12	0,552	0,42	0,71	4,97	0,28	3,30		204
	Orden II – Tetrástilo	Fuste	Pavonazetto	77 den./m ³	12	4,14	0,49	0,59	4,97	1,44	17,29		5.326
	Orden II – Tetrástilo	Basa	Proconnesio	15,5 den./m ³	12	0,276		0,71	4,97	0,14	1,65		102
	Orden II	Entablamento	Proconnesio	15,5 den./m ³	1	1,24		0,60 × 87,27			68,95		4.274

Tabla 1: Reconstrucción del coste del teatro de Leptis Magna. Resultado: 546.090 HS.

Orden I	Fuste	Cipollino	Obrero especializado	2,5	210,00	22,62	474,98					1.187
Orden I	Fuste	Fior di pesco	Obrero especializado	2,5	157,50	11,31	178,12					445
Orden I	Basa	Proconnesio	Obrero especializado	2,5	210,00	5,83	122,39					306
Orden I – Tetrástilo	Capitel	Proconnesio	Obrero especializado	2,5	210,00	18,86	396,13					990
Orden I – Tetrástilo	Fuste	Pavonazzetto	Obrero especializado	2,5	157,50	84,42	1.329,54					3.324
Orden I – Tetrástilo	Basa	Proconnesio	Obrero especializado	2,5	210,00	9,42	197,86					495
Orden I	Entablamento	Proconnesio	Obrero especializado	2,5	210,00	133,62	2.806,02					7.015
Orden I	Muro de fondo	Pavonazzetto	Obrero especializado	2,5	157,50	60,26	949,10					2.373
Orden II	Capitel	Proconnesio	Obrero especializado	2,5	210,00	5,50	115,56					289
Orden II	Fuste	Pavonazzetto	Obrero especializado	2,5	157,50	11,53	181,58					454
Orden II	Fuste	Cipollino	Obrero especializado	2,5	210,00	11,53	242,11					605

Tabla 1 (continúa)

Orden II	Fuste	Fior di pesco	Obrero especializado	2,5	157,50	5,76	90,79						227
Orden II	Basa	Proconnesio	Obrero especializado	2,5	210,00	2,75	57,78						144
Orden II – Tetrástilo	Capitel	Proconnesio	Obrero especializado	2,5	210,00	3,30	69,33						173
Orden II – Tetrástilo	Fuste	Pavonazetto	Obrero especializado	2,5	157,50	17,29	272,37						681
Orden II – Tetrástilo	Basa	Proconnesio	Obrero especializado	2,5	210,00	1,65	34,67						87
Orden II	Entablamento	Proconnesio	Obrero especializado	2,5	210,00	68,95	1.447,95						3.620
Orden II	Muro de fondo	Pavonazetto	Obrero especializado	2,5	157,50	46,95	739,46						1.849
Orden III	Capitel	Proconnesio	Obrero especializado	2,5	210,00	1,51	31,77						79
Orden III	Fuste	Cipollino	Obrero especializado	2,5	210,00	7,52	157,92						395
Orden III	Fuste	Fior di pesco	Obrero especializado	2,5	157,50	1,88	29,61						74
Orden III	Basa	Proconnesio	Obrero especializado	2,5	210,00	0,75	15,84						40

Tabla 1 (continúa)

Orden III – Tetrástilo	Capitel	Proconnesio	Obrero especializado	2,5	210,00	0,91	19,06						48
Orden III – Tetrástilo	Fuste	Pavonazzetto	Obrero especializado	2,5	157,50	5,64	88,83						222
Orden III – Tetrástilo	Basa	Proconnesio	Obrero especializado	2,5	210,00	0,45	9,50						24
Orden III	Entablamento	Proconnesio	Obrero especializado	2,5	210,00	27,60	579,60						1.449
Orden III	Muro de fondo	Pavonazzetto	Obrero especializado	2,5	157,50	30,70	483,53						1.209
Orchestra	Pavimento	Pentélico	Obrero especializado	2,5	157,50	29,03	457,22						1.143
Pulpitum	Pulpitum	Pavonazzetto	Obrero especializado	2,5	157,50	10,28	161,95						405
Pórtico in summa cavea	Capitel	Pentélico	Obrero especializado	2,5	157,50	5,66	89,18						223
Pórtico in summa cavea	Fuste	Cipollino	Obrero especializado	2,5	210,00	33,54	704,30						1.761
Pórtico in summa cavea	Basa	Pentélico	Obrero especializado	2,5	157,50	2,83	44,59						111
TOTAL													32.948

Tabla 1 (continúa)

SEMIELABORACIÓN	Tipo	Material	Tipo de obrero	Sueldo/jornada (HS)	Tiempo (horas/m ²) (Fórmula general)	Tiempo (horas/m ²) (Fórmula adaptada)	Tiempo (horas/m ²)	Superficie total (m ²) (1 ejemplar)	Jornadas (1 elemento)	Cantidad	Jornadas (total)	Costo total (HS)
Orden I	Capitel	Proconnesio	Marmolista	2,5	$a(1 + 0,25 / x)$	$5,8(1 + 0,25 / 0,54)$	8,48	2,57	2,18	20	43,58	109
Orden I	Fuste	Pavonazetto	Marmolista	2,5	$a(2 + 0,25 / x)$	$4,33(2 + 0,25 / 0,63)$	10,38	10,26	10,65	8	85,20	213
Orden I	Fuste	Cipollino	Marmolista	2,5	$a(2 + 0,25 / x)$	$5,8(2 + 0,25 / 0,63)$	13,90	10,26	14,26	8	114,09	285
Orden I	Fuste	Fior di pesco	Marmolista	2,5	$a(2 + 0,25 / x)$	$4,33(2 + 0,25 / 0,63)$	10,38	10,26	10,65	4	42,60	106
Orden I	Basa	Proconnesio	Marmolista	2,5	1/3 capitel	1/3 capitel			0,73	20	14,53	36
Orden I – Tetrástilo	Capitel	Proconnesio	Marmolista	2,5	$a(1 + 0,25 / x)$	$5,8(1 + 0,25 / 0,75)$	7,73	4,98	3,85	12	46,22	115
Orden I – Tetrástilo	Fuste	Pavonazetto	Marmolista	2,5	$a(2 + 0,25 / x)$	$4,33(2 + 0,25 / 0,87)$	9,90	19,84	19,64	12	235,70	589
Orden I – Tetrástilo	Columna	Proconnesio	Marmolista	2,5	1/3 capitel	1/3 capitel			1,28	12	15,41	38
Orden I	Entablamento	Proconnesio	Marmolista	2,5	5,8 horas/m ²	5,80		105,10	60,96		60,96	152
Orden I	Muro de fondo	Pavonazetto	Marmolista	2,5	4,33 horas/m ²	4,33		401,71			173,94	435
Orden II	Capitel	Proconnesio	Marmolista	2,5	$a(1 + 0,25 / x)$	$5,8(1 + 0,25 / 0,42)$	9,25	1,56	1,44	20	28,84	72
Orden II	Fuste	Pavonazetto	Marmolista	2,5	$a(2 + 0,25 / x)$	$4,33(2 + 0,25 / 0,49)$	10,87	6,21	6,75	8	54,00	135
Orden II	Fuste	Cipollino	Marmolista	2,5	$a(2 + 0,25 / x)$	$5,8(2 + 0,25 / 0,49)$	14,56	6,21	9,04	8	72,33	181
Orden II	Fuste	Fior di pesco	Marmolista	2,5	$a(2 + 0,25 / x)$	$4,33(2 + 0,25 / 0,49)$	10,87	6,21	6,75	4	27,00	67
Orden II	Basa	Proconnesio	Marmolista	2,5	1/3 capitel	1/3 capitel			0,48	20	9,61	24

Tabla 1 (continúa)

Orden II – Tetrástilo	Capitel	Proconnesio	Marmolista	2,5	$a(1 + 0,25 / x)$	$5,8(1 + 0,25 / 0,42)$	9,25	1,56	1,44	12	17,30	43
Orden II – Tetrástilo	Fuste	Pavonazetto	Marmolista	2,5	$a(2 + 0,25 / x)$	$4,33(2 + 0,25 / 0,49)$	10,87	6,21	6,75	12	81,00	202
Orden II – Tetrástilo	Basa	Proconnesio	Marmolista	2,5	1/3 capitel	1/3 capitel			0,48	12	5,77	14
Orden II	Entablamento	Proconnesio	Marmolista	2,5	5,8 horas/m ²	5,80		80,57	46,73		46,73	117
Orden II	Muro de fondo	Pavonazetto	Marmolista	2,5	4,33 horas/m ²	4,33		313,03			135,54	339
Orden III	Capitel	Proconnesio	Marmolista	2,5	$a(1 + 0,25 / x)$	$5,8(1 + 0,25 / 0,27)$	11,17	0,66	0,74	20	14,72	37
Orden III	Fuste	Cipollino	Marmolista	2,5	$a(2 + 0,25 / x)$	$5,8(2 + 0,25 / 0,32)$	16,13	2,62	4,23	16	67,62	169
Orden III	Fuste	Fior di pesco	Marmolista	2,5	$a(2 + 0,25 / x)$	$4,33(2 + 0,25 / 0,32)$	12,04	2,62	3,15	4	12,62	31
Orden III	Basa	Proconnesio	Marmolista	2,5	1/3 capitel	1/3 capitel			0,25	20	4,91	12
Orden III – Tetrástilo	Capitel	Proconnesio	Marmolista	2,5	$a(1 + 0,25 / x)$	$5,8(1 + 0,25 / 0,27)$	11,17	0,66	0,74	12	8,83	22
Orden III – Tetrástilo	Fuste	Pavonazetto	Marmolista	2,5	$a(2 + 0,25 / x)$	$4,33(2 + 0,25 / 0,32)$	12,04	2,62	3,15	12	37,85	95
Orden III – Tetrástilo	Basa	Proconnesio	Marmolista	2,5	1/3 capitel	1/3 capitel			0,25	12	2,94	7
Orden III	Entablamento	Proconnesio	Marmolista	2,5	5,8 horas/m ²	5,80		52,52	30,46		30,46	76
Orden III	Muro de fondo	Pavonazetto	Marmolista	2,5	4,33 horas/m ²	4,33		204,70			88,64	221
Orchestra	Pavimento	Pentélico	Marmolista	2,5	4,33 horas/m ²	4,33		193,54			83,80	209
Pulpitum	Pulpitum	Pavonazetto	Marmolista	2,5	4,33 horas/m ²	4,33		22,50			9,74	24
Pórtico in summa cavea	Capitel	Pentélico	Marmolista	2,5	$a(1 + 0,25 / x)$	$4,33(1 + 0,25 / 0,30)$	7,94	0,82	0,65	54	35,12	88
Pórtico in summa cavea	Fuste	Cipollino	Marmolista	2,5	$a(2 + 0,25 / x)$	$5,8(2 + 0,25 / 0,35)$	15,74	3,26	5,13	54	277,09	693
Pórtico in summa cavea	Basa	Pentélico	Marmolista	2,5	1/3 capitel	1/3 capitel			0,22	54	11,71	29
TOTAL												4.991

Tabla 1 (continúa)

Orden I – Muro de fondo	Pavonazzetto	Marítimo	De Nicomedía a Leptis		11 den./m ³	60,26													2.651
Orden I – Muro de fondo	Piedra local	Terrestre	De la cantera al teatro	4,4	1,3 den. / (m ³ · milla)	257,13													5.883
Orden II	Proconnesio	Marítimo	De Nicomedía a Leptis		11 den./m ³	8,25													363
Orden II	Pavonazzetto	Fluvial	De Altintaş a Nicomedía	176	[1,3 den. / (m ³ · milla)] / 10,8	11,53													977
Orden II	Pavonazzetto	Marítimo	De Nicomedía a Leptis		11 den./m ³	11,53													507
Orden II	Cipollino	Marítimo	De Eubea a Leptis		6,25 den./m ³	11,53													288
Orden II	Fior di Pesco	Marítimo	De Eubea a Leptis		6,25 den./m ³	5,76													144
Orden II – Tetrástilo	Proconnesio	Marítimo	De Nicomedía a Leptis		11 den./m ³	4,95													218
Orden II – Tetrástilo	Pavonazzetto	Fluvial	De Altintaş a Nicomedía	176	[1,3 den. / (m ³ · milla)] / 10,8	17,29													1.465
Orden II – Tetrástilo	Pavonazzetto	Marítimo	De Nicomedía a Leptis		11 den./m ³	17,29													761
Orden II – Entablamento	Proconnesio	Marítimo	De Nicomedía a Leptis		11 den./m ³	68,95													3.034
Orden II – Muro de fondo	Pavonazzetto	Fluvial	De Altintaş a Nicomedía	176	[1,3 den. / (m ³ · milla)] / 10,8	46,95													3.979
Orden II – Muro de fondo	Pavonazzetto	Marítimo	De Nicomedía a Leptis		11 den./m ³	46,95													2.066
Orden II – Muro de fondo	Piedra local	Terrestre	De la cantera al teatro	4,4	1,3 den. / (m ³ · milla)	196,68													4.500

Tabla 1 (continúa)

Orden III	Proconnesio	Marítimo	De Nicome- dia a Leptis		11 den./m ³	2,27													100
Orden III	Cipollino	Marítimo	De Eubea a Leptis		6,25 den./m ³	7,52													188
Orden III	Fior di Pesco	Marítimo	De Eubea a Leptis		6,25 den./m ³	1,88													47
Orden III – Tetrástilo	Proconnesio	Marítimo	De Nicome- dia a Leptis		11 den./m ³	1,36													60
Orden III – Tetrástilo	Pavonazzetto	Fluvial	De Altintaş a Nicome- dia	176	[1,3 den. / (m ³ · milla)] / 10,8	5,64													478
Orden III – Tetrástilo	Pavonazzetto	Marítimo	De Nicome- dia a Leptis		11 den./m ³	5,64													248
Orden III – Entabla- mento	Proconnesio	Marítimo	De Nicome- dia a Leptis		11 den./m ³	27,60													1.214
Orden III – Muro de fondo	Pavonazzetto	Fluvial	De Altintaş a Nicome- dia	176	[1,3 den. / (m ³ · milla)] / 10,8	30,70													2.601
Orden III – Muro de fondo	Pavonazzetto	Marítimo	De Nicome- dia a Leptis		11 den./m ³	30,70													1.351
Orden III – Muro de fondo	Piedra local	Terrestre	De la cante- ra al teatro	4,4	1,3 den. / (m ³ · milla)	127,85													2.925
Orchestra	Pentélico	Terrestre	De la can- tera al puerto	3,5	1,3 den. / (m ³ · milla)	29,03													528
Orchestra	Pentélico	Marítimo	Del puerto a Leptis		6,25 den./m ³	29,03													726
Pulpitum	Pavonazzetto	Fluvial	De Altintaş a Nicome- dia	176	[1,3 den. / (m ³ · milla)] / 10,8	10,28													871
Pulpitum	Pavonazzetto	Marítimo	De Nicome- dia a Leptis		11 den./m ³	10,28													452

Tabla 1 (continúa)

Pórtico in summa cavea	Pentélico	Terrestre	De la cantera al puerto	3,5	1,3 den. / (m ³ · milla)	8,49								155
Pórtico in summa cavea	Pentélico	Marítimo	Del puerto a Leptis		6,25 den./m ³	8,49								212
Pórtico in summa cavea	Cipollino	Marítimo	De Eubea a Leptis		6,25 den./m ³	33,54								838
TOTAL														77.438
PUESTA EN OBRA														
Orden	Tipo	Material	Volumen 1 ejemplar (m³)	Cantidad y m³	Peso Tn./m³	Peso 1 ejemplar (Tn)	Tipo de Trabajador	Sueldo/jornada (HS)	Altura elevación (m)	Horas (1 ejemplar)	Jornadas (todos los ejemplares)	Costo total (HS)		
Podio	Podio bajo columnas	Piedra local	3 horas/m ³ × 5 obreros	344,64			Obrero × 5	4			103,392	2.068		
Podio	Muro de fondo	Piedra local	3 horas/m ³ × 5 obreros	91,5			Obrero × 5	4			27,45	549		
Orden I	Capitel	Proconnesio	0,58	20	2,7	1,57	Obrero × 4	4	10,21	55,94	111,87	1.790		
Orden I	Fuste	Pavonazetto	2,83	8	2,7	7,63	Obrero × 4	4	4,89	262,81	210,25	3.364		
Orden I	Fuste	Cipollino	2,83	8	2,7	7,63	Obrero × 4	4	4,89	262,81	210,25	3.364		
Orden I	Fuste	Fior di pesco	2,83	4	2,7	7,63	Obrero × 4	4	4,89	262,81	105,12	1.682		
Orden I	Basa	Proconnesio	0,29	20	2,7	0,79	Obrero × 4	4	4,53	17,66	35,33	565		
Orden I – Tetrástilo	Capitel	Proconnesio	1,57	12	2,7	4,24	Obrero × 4	4	9,92	147,56	177,07	2.833		
Orden I – Tetrástilo	Fuste	Pavonazetto	7,03	12	2,7	18,99	Obrero × 4	4	2,52	651,98	782,38	12.518		
Orden I – Tetrástilo	Basa	Proconnesio	0,79	12	2,7	2,12	Obrero × 4	4	2,03	73,12	87,75	1.404		
Orden I	Entablamento	Proconnesio		1	2,7	360,77	Obrero × 4	4	10,91	12.376,73	1.237,67	19.803		
Orden I	Muro de fondo	Pavonazetto	60,26	1	2,7	162,70	Obrero × 4	4	8,51	7.771,23	777,12	12.434		
Orden I	Muro de fondo	Piedra local	3 horas/m ³ × 5 obreros	257,13			Obrero × 5	4	8,51		77,14	1.543		
Orden II	Capitel	Proconnesio	0,28	20	2,7	0,74	Obrero × 4	4	16,93	75,24	150,49	2.408		

Tabla 1 (continúa)

Orden II	Fuste			1,44	8	2,7		3,89		Obrero x 4	4		12,79	136,02	108,82	1.741
Orden II	Fuste	Pavonazetto		1,44	8	2,7		3,89		Obrero x 4	4		12,79	136,02	108,82	1.741
Orden II	Fuste	Cipollino		1,44	8	2,7		3,89		Obrero x 4	4		12,79	136,02	54,41	871
Orden II	Fuste	Fior di pesco		0,14	20	2,7		0,37		Obrero x 4	4		12,51	27,19	54,38	870
Orden II - Tetrástilo	Capitel	Proconnesio		0,28	12	2,7		0,74		Obrero x 4	4		16,93	75,24	90,29	1.445
Orden II - Tetrástilo	Fuste	Pavonazetto		1,44	12	2,7		3,89		Obrero x 4	4		12,79	136,02	163,22	2.612
Orden II - Tetrástilo	Basa	Proconnesio		0,14	12	2,7		0,37		Obrero x 4	4		12,51	27,19	32,63	522
Orden II	Entablamento	Proconnesio			1	2,7		186,17		Obrero x 4	4		17,48	6.388,96	638,90	10.222
Orden II	Muro de fondo	Pavonazetto		46,95	1	2,7		126,77		Obrero x 4	4		15,60	11.770,89	1.177,09	18.833
Orden II	Muro de fondo	Piedra local		3 horas/m ³ x 5 obreros	196,68					Obrero x 5	4		15,60	59,00		1.180
Orden III	Capitel	Proconnesio		0,08	20	2,7		0,20		Obrero x 4	4		21,59	26,74	53,48	856
Orden III	Fuste	Cipollino		0,47	16	2,7		1,27		Obrero x 4	4		18,90	47,31	75,69	1.211
Orden III	Fuste	Fior di pesco		0,47	4	2,7		1,27		Obrero x 4	4		18,90	47,31	18,92	303
Orden III	Basa	Proconnesio		0,04	20	2,7		0,10		Obrero x 4	4		18,72	11,48	22,95	367
Orden III - Tetrástilo	Capitel	Proconnesio		0,08	12	2,7		0,20		Obrero x 4	4		21,59	26,74	32,09	513
Orden III - Tetrástilo	Fuste	Pavonazetto		0,47	12	2,7		1,27		Obrero x 4	4		18,90	47,31	56,77	908
Orden III - Tetrástilo	Basa	Proconnesio		0,04	12	2,7		0,10		Obrero x 4	4		18,72	11,48	13,77	220
Orden III	Entablamento	Proconnesio			1	2,7		74,52		Obrero x 4	4		21,95	2.560,43	256,04	4.097
Orden III	Muro de fondo	Pavonazetto		30,70	1	2,7		82,89		Obrero x 4	4		20,73	10.401,27	1.040,13	16.642
Orden III	Muro de fondo	Piedra local		3 horas/m ³ x 5 obreros	127,85					Obrero x 5	4		20,73	38,36		767
Orchestra	Pavimento	Pentélico		29,03	1	2,7		78,38		Obrero x 4	4		1,00	498,50	49,85	798
Pulpitum	Pulpitum	Pavonazetto		10,28	1	2,7		27,76		Obrero x 4	4		1,00	176,57	17,66	282
Pórtico in summa cavea	Capitel	Pentélico		0,10	54	2,7		0,28		Obrero x 4	4		21,92	37,67	203,41	3.255
Pórtico in summa cavea	Fuste	Cipollino		0,62	54	2,7		1,68		Obrero x 4	4		18,92	61,30	331,03	5.296
Pórtico in summa cavea	Basa	Pentélico		0,05	54	2,7		0,14		Obrero x 4	4		18,72	15,95	86,15	1.378
TOTAL																143.256

Tabla 1 (continúa)

ACABADO	Tipo	Material	Tipo de obrero	Sueldo/jornada (HS)	Tiempo	Superficie (m ²) 1 ejemplar	Jornadas 1 ejemplar	Cantidad	Jornadas total	Costo total (HS)
Orden I	Capitel	Proconnesio	Especializado	5	1.080 horas		108,00	20	2.160,00	10.800
Orden I	Fuste	Pavonazetto	Especializado	5	10 horas/m ²	10,26	10,26	8	82,08	410
Orden I	Fuste	Cipollino	Especializado	5	13,3 horas/m ²	10,26	13,65	8	109,17	546
Orden I	Fuste	Fior di pesco	Especializado	5	10 horas/m ²	10,26	10,26	4	41,04	205
Orden I	Basa	Proconnesio	Especializado	5	1/3 del capitel		36,00	20	720,00	3.600
Orden I – Tetrástilo	Capitel	Proconnesio	Especializado	5	1.440 horas		144,00	12	1.728,00	8.640
Orden I – Tetrástilo	Fuste	Pavonazetto	Especializado	5	10 horas/m ²	19,84	19,84	12	238,08	1.190
Orden I – Tetrástilo	Basa	Proconnesio	Especializado	5	1/3 del capitel		48,00	12	576,00	2.880
Orden I	Entabl. – arquitrabe	Proconnesio	Especializado	5	7,5 horas/m ²	37,37			28,03	140
Orden I	Entabl. – friso	Proconnesio	Especializado	5	370 horas/m ²	48,65			1.800,05	9.000
Orden I	Entabl. – cornisa	Proconnesio	Especializado	5	333,33 horas/m ²	19,07			635,66	3.178
Orden I	Muro de fondo	Pavonazetto	Especializado	5	5,6 horas/m ²	401,71			224,96	1.125
Orden II	Capitel	Proconnesio	Especializado	5	750 horas		75,00	20	1.500,00	7.500
Orden II	Fuste	Pavonazetto	Especializado	5	10 horas/m ²	6,21	6,21	8	49,68	248

Tabla 1 (continúa)

Orden II	Fuste	Cipollino	Especializado	5	13,3 horas/m ²	6,21	8,26	8	66,07		330
Orden II	Fuste	Fior di pesco	Especializado	5	10 horas/m ²	6,21	6,21	4	24,84		124
Orden II	Basa	Proconnesio	Especializado	5	1/3 del capitel			20			2.500
Orden II – Tetrástilo	Capitel	Proconnesio	Especializado	5	750 horas		75,00	12	900,00		4.500
Orden II – Tetrástilo	Fuste	Pavonazetto	Especializado	5	10 horas/m ²	6,21	6,21	12	74,52		373
Orden II – Tetrástilo	Basa	Proconnesio	Especializado	5	1/3 del capitel			12			1.500
Orden II	Entabl. – arquitrabe	Proconnesio	Especializado	5	7,5 horas/m ²	28,65			21,49		107
Orden II	Entabl. – friso	Proconnesio	Especializado	5	370 horas/m ²	37,30			1.380,10		6.900
Orden II	Entabl. – cornisa	Proconnesio	Especializado	5	333,33 horas/m ²	14,62			487,33		2.437
Orden II	Muro de fondo	Pavonazetto	Especializado	5	5,6 horas/m ²	313,03			175,30		876
Orden III	Capitel	Proconnesio	Especializado	5	500 horas		50,00	20	1.000,00		5.000
Orden III	Fuste	Cipollino	Especializado	5	13,3 horas/m ²	2,62	3,48	16	55,75		279
Orden III	Fuste	Fior di pesco	Especializado	5	10 horas/m ²	2,62	2,62	4	10,48		52
Orden III	Basa	Proconnesio	Especializado	5	1/3 del capitel			20			1.667
Orden III – Tetrástilo	Capitel	Proconnesio	Especializado	5	500 horas		50,00	12	600,00		3.000
Orden III – Tetrástilo	Fuste	Pavonazetto	Especializado	5	10 horas/m ²	2,62	2,62	12	31,44		157

Tabla 1 (continúa)

Orden III – Tetrástilo	Basa	Proconnesio	Especiali- zado	5	1/3 del capitel				12					1.000
Orden III	Entabl. – arqui- trabe	Proconnesio	Especiali- zado	5	7,5 horas/m ²	18,67					14,00			70
Orden III	Entabl. – friso	Proconnesio	Especiali- zado	5	370 horas/m ²	24,31					899,47			4.497
Orden III	Entabl. – cor- misa	Proconnesio	Especiali- zado	5	333,33 horas/ m ²	9,53					317,66			1.588
Orden III	Muro de fondo	Pavonazzetto	Especiali- zado	5	5,6 horas/m ²	204,70					114,63			573
Orchestra	Pavimento	Pentélico	Especiali- zado	5	5,6 horas/m ²	193,54					108,38			542
Pulpitum	Pulpitum	Pavonazzetto	Especiali- zado	5	5,6 horas/m ²	22,50					12,60			63
Pórtico in summa cavea	Capitel	Pentélico	Especiali- zado	5	360 horas			36,00	54		1.944,00			9.720
Pórtico in summa cavea	Fuste	Cipollino	Especiali- zado	5	13,3 horas/m ²	3,26		4,34	54		234,13			1.171
Pórtico in summa cavea	Basa	Pentélico	Especiali- zado	5	1/3 capitel				54					3.240
TOTAL														101.731

Tabla 1 (continúa)

Material

Para establecer el coste de esta partida nos basaremos en la reconstrucción de las dimensiones y tipos de mármoles utilizados en el teatro realizada por P. Barresi¹¹ – algunas medidas han sido reconstruidas de manera aproximada,¹² a la vez que hemos generado un modelo 3D del frente escénico para facilitar el cálculo de los volúmenes y superficies (fig. 4 y 5). Por otro lado, sabemos que el *pulpitum* tenía una altura de 1,5 m¹³ y que fue revestido con placas de pavonazzetto;¹⁴ que la *orchestra* fue pavimentada con placas de mármol pentélico que generaban grandes paneles rectangulares encuadrados con listeles de verde antico;¹⁵ que el pórtico *in summa cavea* estaba formado por 54 columnas monolíticas de cipollino, con basas y capiteles en pentélico¹⁶ (encima de estas columnas fue conservado el entablamento original de época augustea);¹⁷ y que el muro de fondo del frente escénico fue revestido con un tipo de mármol que desconocemos y que suponemos pavonazzetto.

Por lo que respecta al coste de los materiales utilizados, es Edicto de Diocleciano la principal fuente de información: proconnesio = 40 denarios/p³ del s. IV d. C. (= 15,5 denarios/m³ o 1,6 HS/p³ del s. I–II d. C.);¹⁸ pentélico = 29 den./m³ en el s. II d. C.;¹⁹ cipollino = 38,5 den./m³ en el s. II d. C.;²⁰ y Fior di Pesco = 100–150 denarios/p³ del s. IV d. C.²¹ (= 48 denarios/m³ del s. II d. C.). Respecto a la piedra local, suponemos que su coste no sería muy distinto al de otras ciudades norteafricanas, como Volúbilis, Dougga o Theveste, cuyo valor se ha reconstruido en 1,5 HS/p³.²²

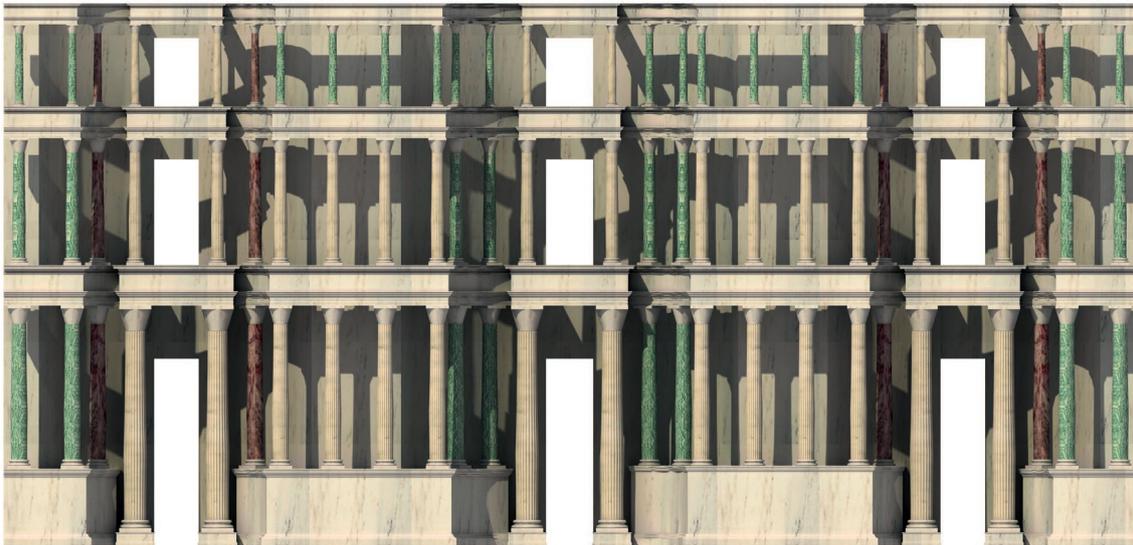


Fig. 4: Leptis Magna, teatro. Frons scaenae, reconstrucción.

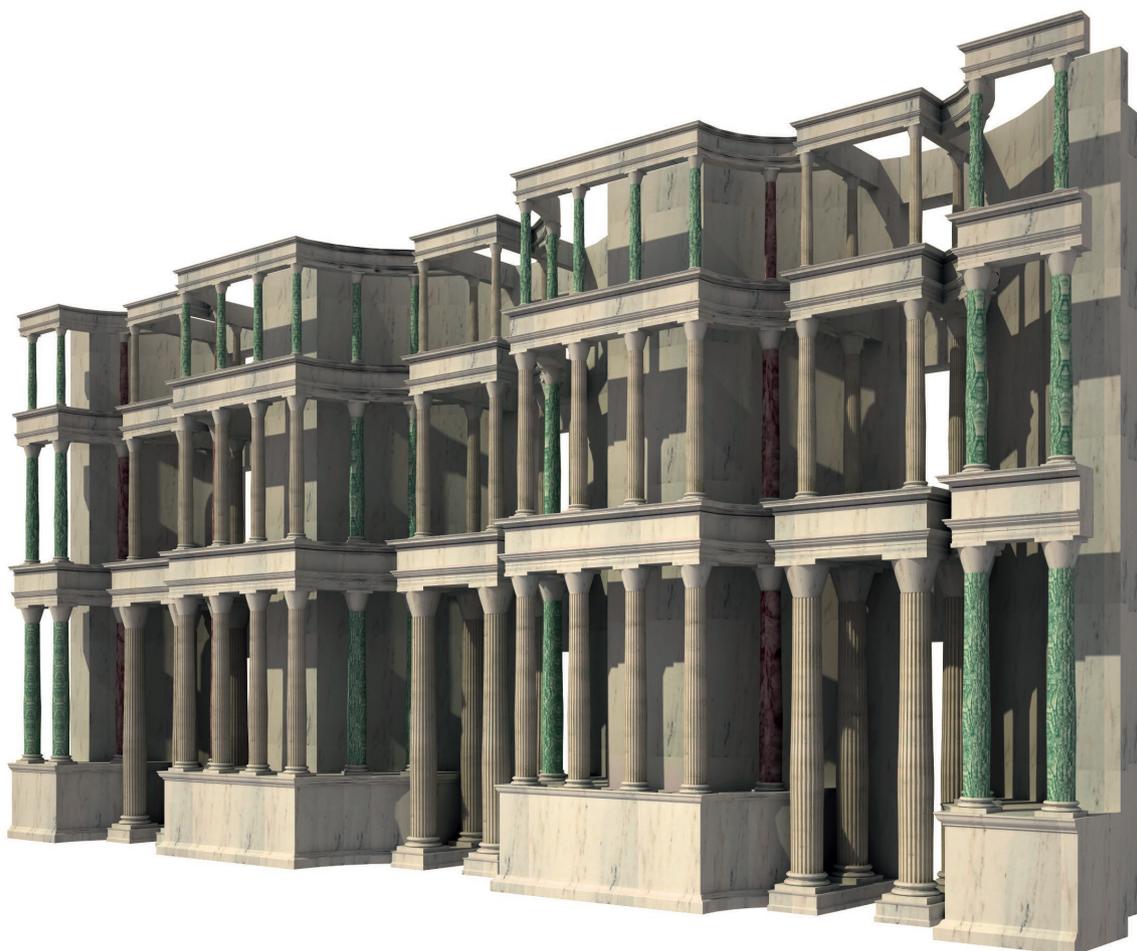


Fig. 5: Leptis Magna, teatro. Frons scaenae, reconstrucción.

Mano de obra

Es el Edicto de Diocleciano también la principal fuente para reconstruir esta variable. En él se establece un sueldo de 50 denarios/jornada para un obrero no cualificado de la construcción (= 0,5 modios castrenses de grano) y 60 denarios/jornada para un marmolista, además de una ración de comida en ambos casos.²³ La evolución del precio del modio castrense de grano permite extrapolar los sueldos a diversos periodos históricos, aunque es necesario tener en cuenta también en este proceso la zona geográfica de aplicación, pues el nivel de vida no era uniforme en todo el imperio.²⁴

Partiendo de estas premisas se ha calculado para Italia un sueldo de 4 HS/jornada para un obrero no cualificado en el s. II d. C., y de 5 HS/jornada para un marmolista.²⁵ De todos modos, los sueldos en el norte de África serían ligeramente inferiores (Tab. 2): un trabajador no especializado, a mediados del s. II d. C., percibía un sueldo de 1,1–2 HS/jornada = ± 1,5 HS/jornada + una ración de comida diaria. Si comparamos estos datos

Cronología	Tipo	Egipto		Italia		Dacia		Edicto de Diocleciano		Bibliografía
		Salario	HS/día	Salario	HS/día	Salario	HS/día	Salario	HS/día	
s. I a. C.	Obrero (Roma)			12 as/día	3					Cic., <i>Pro. Q. Rosc. X</i> , 28; West 1916, p. 295
Augustea	Obrero			3,5; 4 y 6 as/día	0,9-1-1,5					West 1916, p. 294-295
s. I d. C.	Obrero	4 ób./día	0,6							O. P. 985; West 1916, p. 304
s. I d. C.	Obrero (Pompeya)			1 den./día	4					CIL IV 6877 y 8566; Mrozek 1975, pp. 70-75
s. I d. C.	Obrero (Pompeya)			1,25 HS/día	1,25					CIL IV 4000; Mrozek 1975, pp. 70-75
105 d. C.	Obrero	6 ób./día	0,9							Fayum Towns 102; West 1916, p. 304
125 d. C.	Obrero	9 ób./día	1,3							Fayum Towns 331; West 1916, p. 304
140-145 d. C.	Obrero (M. Claud)	47 dr./mes + comida	1,5 + comida							Serafino 2009, pp. 43-52
143 d. C.	Obrero	8 ób./día	1,1							B. G. U. 99; West 1916, p. 304
154 d. C.	Obrero	8 ób./día	1,1							B. G. U. 391; West 1916, p.304
160 d. C.	Obrero	8 ób./día	1,1							P. B. M. 296; West 1916, p. 304
162 d. C.	Obrero	8 ób./día	1,1							B. G. U. 704; West 1916, p. 304
163 d. C.	Minero (Albur. M)					1,5 HS/día + comida	1,5 + comida			Serafino 2009, pp. 43-52
163 d. C. apx.	Minero (Albur. M)					2,5-3 HS/día	2,5-3			Serafino 2009, pp. 43-52
164 d. C.	Minero (Albur. M)					1,5 HS/día + comida	1,5 + comida			CIL III, p. 924-959; Mrozek 1975, pp. 70-71
168 d. C.	Obrero	8 ób./día	1,1							P. B. M. 337; West 1916, p. 304

Tabla 2: Sueldos de los trabajadores vinculados a la edilicia.

Cronología	Tipo	Egipto		Italia		Dacia		Edicto de Diocleciano		Bibliografía
		Salario	HS/día	Salario	HS/día	Salario	HS/día	Salario	HS/día	
172 d.C.	Obrero	40 dr./1000 ladrillos = 2 dr./día	2							P. Teb. 42; Barresi 2000, p. 338
178–9 d.C.	Obrero	8 ób/día	1,1							B.G.U. 359; West 1916, p. 304
s. II d.C.	Tallador piedra	4 dr./día	4							P. Oxy. 488; Johnson 1936, p. 308
s. II d.C.	Ayudan. construc.	2 dr./día	2							B.G.U. 699; Johnson 1936, p. 308.
s. II d.C.	Transp. piedras	1,5 dr./día	1,5							B.G.U. 699; Johnson 1936, p. 308.
s. III d.C.	Carpintero	3 dr. 3 ób./día o 4 dr./día	3,4–4							C.P.H. 127; Johnson 1936, p. 310
215 d.C.	Albañil	2,5 drac./día	2,5							B.G.U. 362; Segre 1922, pp. 116–117
215 d.C.	Asistente albañil	2 dracmas/día	2							B.G.U. 362; West 1916, pp. 297, 305
255 d.C.	Albañil	6–9 drac./día	6–9							B.G.U. 14; West 1916, p. 305
258–259 d.C.	Obrero	2 drac./día	2							P.B.M. 1170; West 1916, p. 305
Fin. s. III d.C.	Obrero	4 dr./día	4							Wessely Pal. St. V 127; Segre 1922, pp. 118–119
301 d.C.	Obrero							25 den./día	100	Edict. Dioclet. 7.1
301 d.C.	Albañil							50 den./día	200	Edict. Dioclet. 7.2
314 d.C.	Obrero	400 drac./día	400							Pap. Rainer, E. 2000; West 1916, pp. 300, 305

Tabla 2 (continúa)

Cronología	Tipo	Egipto		Italia		Dacia		Edicto de Diocleciano		Bibliografía
		Salario	HS/día	Salario	HS/día	Salario	HS/día	Salario	HS/día	
314 d. C.	Obrero	500 drac./día	500							Pap. Rainer, E, 2000; West 1916, p. 305
314 d. C.	Obrero	650 drac./día	650							Pap. Rainer, E, 2000; Segre 1922, pp. 118-119
314 d. C.	Albañil	500 drac./día	500							Pap. Rainer, E, 2000; Segre 1922, pp. 118-119
314 d. C.	Albañil	400 drac./día	400							Pap. Rainer, E, 2000; Segre 1922, pp. 118-119
340 d. C.	Obrero	12 talentos/mes	80							B. G. U. 21; West 1916, p. 305
340 d. C.	Obrero	15 talentos/mes	100							B. G. U. 21; West 1916, p. 305
340 d. C.	Obrero	25 talentos/mes	166							B. G. U. 21; West 1916, p. 305
s. IV d. C.	Asistente obrero	60 talentos/mes	400							Pap. Rainer, AN, 295; West 1916, p. 305
s. IV d. C.	Obrero	200 talentos/mes	1333							Pap. Rainer, AN, 289; West 1916, pp. 300, 305
s. IV d. C.	Asistente obrero	60 talentos/mes	400							Pap. Rainer, AN, 289; West 1916, p. 305

Tabla 2 (continúa)

con el coste del modio castrense de grano en Egipto en esta época – recordemos que el sueldo percibido en metálico por un obrero no especializado equivale a la mitad de un modio castrense – observamos que éste tenía un coste medio de 3 HS/modio (Tab. 3), ajustándose por tanto a los valores precedentes.

Por lo que respecta al valor de una ración de comida, éste debía ser similar al sueldo percibido en metálico por un obrero no cualificado.²⁶ Por tanto, el sueldo percibido por un obrero en Egipto en época antonina sería de 1,5 HS/jornada + 1,5 HS/jornada = 3 HS/jornada, valor que se aproxima al sueldo que sabemos percibía un tallador de piedra en este momento en Egipto (4 HS/jornada) (Tab. 2). Estos valores – 4 HS/jornada para un obrero no especializado y 5 HS/jornada para un obrero especializado – se aproximan además a los documentados no muchos años más tarde, en época de Caracalla, en las ciudades norteafricanas de Volúbilis, Dougga y Theveste: 5 HS/jornada y 7,5 HS/jornada.²⁷

Finalmente, es necesario señalar que muy probablemente la remuneración percibida por los trabajadores de las canteras imperiales estaba sujeta a determinadas disposiciones estatales, percibiendo muy probablemente todos ellos un mismo sueldo independientemente del área geográfica en la que ejerciesen su profesión.²⁸ Este sueldo ha podido ser establecido en unos 2 HS/jornada en el s. II d. C., para un obrero no especializado, y en 2,5 HS/jornadas para un obrero especializado.²⁹

Aparato rústico

Consistía en dar a los bloques de piedra la forma geométrica de la pieza acabada.³⁰ Sabemos que en el caso de bloques de mármol de grano fino (pavonazzatto, pentélico y fior di pesco) esta operación tenía un coste de 157,5 horas/m³, mientras que en el caso de bloques de mármol de grano medio (proconnesio y cipollino) el coste era de 210 horas/m³.³¹

Semielaboración

Consistía en marcar sobre la superficie de los bloques destinados a contener elementos decorativos las líneas básicas de su desarrollo. El coste de esta operación era: para los capiteles $a(1 + 0,25 / x)$ y para los fustes $a(2 + 0,25 / x)$, donde “a” corresponde en ambos casos a 4,33 horas de trabajo para el mármol de grano fino y a 5,8 horas de trabajo para el mármol de grano medio (proconnesio),³² y donde “x” corresponde al diámetro del elemento analizado. El resultado obtenido corresponde a horas de trabajo/m² de superficie.³³ Las basas tenían un coste equivalente a 1/3 del de sus respectivos capiteles.³⁴ Los elementos con superficies lineales (arquitrabes, frisos y cornisas), tenían un coste si eran de mármol de grano fino de 4,33 horas/m² de superficie decorada, y un coste de 5,8 horas/m² de superficie decorada si eran de mármol de grano medio.³⁵

Transporte

Es necesario distinguir el transporte realizado por tierra, mar o río. El coste del transporte terrestre puede calcularse mediante la fórmula 0,85 den. del s. I d.C. / (m³ · milla)³⁶ (= 1,3 den. del s. II d.C. / (m³ · milla), en base a la evolución del precio del modio castrense: 2 HS en el s. I d.C. y 3 HS en el s. II d.C.) (Tab. 3). El transporte fluvial era 5,5 veces más económico que el terrestre cuando realizado a contracorriente y 10,8 veces más económico cuando realizado en el mismo sentido de la corriente.³⁷ Y, finalmente, el coste marítimo puede reconstruirse a partir de los datos proporcionados por el Edicto de Diocleciano³⁸ del siguiente modo:

Mármol proconnesio: procedente de la costa norte de la isla de Mármara,³⁹ aunque muy probablemente los mármoles eran transportados en un primer momento a la ciudad de Nicomedia.⁴⁰ El coste del transporte de Nicomedia a África era de 14 denarios por modio castrense en el s. IV d.C.⁴¹ = 11 denarios del s. I–II d.C. por m³ de carga transportada.⁴²

Mármol pavonazetto: procedente de los distritos de Iscehisar (Docimium), junto a la antigua Synnada (Frigia), y Altıntaş (Aizanoi), a 150 km al norte de Docimium. Los mármoles alcanzaban la costa a través de dos posibles rutas: por el río Sangarios hasta Nicomedia o por el río Maeander hasta Mileto.⁴³ Podemos suponer que los mármoles destinados al teatro de Leptis Magna fueron extraídos en el distrito de Altıntaş, el más próximo a Nicomedia, puesto que ya con Antonino Pío la producción de este distrito fue destinada principalmente a obras de promoción privada, reservando la producción del distrito de Iscehisar a construcciones imperiales.⁴⁴ La distancia entre Altıntaş y la desembocadura del río Sangarios es de unos 260 Km⁴⁵ = 176 millas (1 milla = 1.481 m). El coste del transporte fluvial cuando realizado en el mismo sentido que la corriente puede calcularse mediante la fórmula: ([1,3 den. del s. II d.C. / (m³ · milla)] / 10,8.

Mármol Cipollino: procedente de la parte sur de la isla de Eubea.⁴⁶ La distancia entre Leptis Magna y Eubea es similar a la que separa Alejandría de Éfeso, cuyo coste de transporte era de 8 denarios del s. IV d.C. por modio castrense⁴⁷ = 6,25 denarios del s. I–II d.C. por m³.

Mármol Fior di Pesco: procedente de unos 20 km al sur de Calcide (Halkida), a pocos km al norte de la antigua Eretria.⁴⁸ Podemos considerar un coste de transporte similar al mármol cipollino.

Mármol Pentélico: procedente del margen meridional del monte Pentélico,⁴⁹ a unos 5 km de la costa = 3,5 millas (1 milla = 1.481 m). Podemos considerar un coste de transporte similar al mármol cipollino.

Piedra local, podría proceder del distrito de Wadi Gadatza, a unos 6,5 Km de Leptis Magna. Esta piedra fue utilizada en época severiana en diversos monumentos de la ciudad, como en el pórtico *post scaenam* del teatro.⁵⁰ La distancia recorrida por vía terrestre sería por tanto de unas 4,4 millas.

Cronología	Egipto			Bibliografía
	Área	Precio	HS/modio castrense*	
18 a.C.	Euhemeria	3 dr. 2 ób./art.	1	Johnson 1936, 310–312; P. Fayum 101; Segrè 1922, 102–103.
13 a.C.	Alto Egipto	4 dr./art.	1,2	Johnson 1936, 310–312
10 a.C.	Thebas	2 dr. 3 ób./art.	0,7	Johnson 1936, 310–312
9 a.C.	Alto Egipto	2 dr. 3 ób./art.	0,7	Johnson 1936, 310–312
5 a.C.	Tebtynis	2 dr./art.	0,6	Johnson 1936, 310–312; P. Tebt. II, 459; Segrè 1922, 102–103
4 a.C.	Coptos	3 dr. 3 ób./art.	1	Johnson 1936, 310–312
3 d.C.	Philadelphia	3 dr./art.	0,9	Johnson 1936, 310–312
45–46 d.C.	Tebtynis	8 dr./1 5/6 art.	1,3	Johnson 1936, 310–312
45–46 d.C.	Tebtynis	20 dr./3 ½ art.	1,7	Johnson 1936, 310–312
45–46 d.C.	Tebtynis	8 dr./1 1/10 art.	2,2	Johnson 1936, 310–312
45–46 d.C.	Tebtynis	16 dr./2 1/10 art.	2,3	Johnson 1936, 310–312
45–46 d.C.	Tebtynis	12 dr./1 ½ art.	2,5	Johnson 1936, 310–312
46–47 d.C.	Tebtynis	16 dr./1 5/6 art.	2,7	Johnson 1936, 310–312
56 d.C.	Tebas	4 dr. 2 ób./art.	1,3	Johnson 1936, 310–312
56 d.C.	Tebas	5 ób./1/6 art.	1,3	Johnson 1936, 310–312
65 d.C.	Coptos	2 dr. 1 ób./art.	0,6	Johnson 1936, 310–312
69–79 d.C.	?	20 drac./art	6,1	P. B. M. 896; West 1916, 307
78–79 d.C.	?	11 drac./art	3,4	P. B. M. 131; West 1916, 307
78–79 d.C.	?	10 drac./art.	3	P. B. M. 131; West 1916, 307
79 d.C.	Hermoupolis	8–11 dr./art.	2,4–3,4	Johnson 1936, 310–312; Segrè 1922, 102–103; P. Lond. I, 131
99 d.C.	?	16 dr./art.	4,9	Duncan-Jones 1990, 146
s. II d.C.	Hermoupolis	7 dr./art.	2,1	P. Amherst, 113; Segrè 1922, 102–103
s. II d.C.	?	8 dr./art.	2,5	Preisigke Sammelb. 2088; Segrè 1922, 102–103
120–121 d.C.	?	7 dr. 1 ób./art.	2,2	B. G. U. 834; Segrè 1922, 102–103
125 d.C.	¿	7 drac. 1 ób./art.	2,2	B. G. U. 834; West 1916, 307
149 d.C.	¿	7 drac./art.	2,1	Segrè 1922, 102–103; Tebt. Pap. 3094; West 1916, 307
153 d.C.	Tebas	12 dr./art.	3,7	Johnson 1936, 310–312
155 d.C.	Theadelphia	8 dr./art.	2,5	Johnson 1936, 310–312
138–161 d.C.	Heracleopolite	6 dr./art.	1,8	Johnson 1936, 310–312
183 d.C.	?	8 dr./art.	2,5	B. G. U. 200; West 1916, 307

Tabla 3: Evolución del precio del grano en Egipto (Abreviaturas: art. = artaba; den. = denario; dr. = dracma; HS = sestercio; mod. = modio; ób. = óbolo; tal. = talento).

Cronología	Egipto			Bibliografía
	Área	Precio	HS/modio castrense*	
191–192 d.C.	Karanis	18–20 dr./art.	5,5–6,1	Johnson 1936, 310–312; Duncan-Jones 1990, 145; P. Goodspeed col. 15
246 d.C.	?	24 dr./art.	7,3	Duncan-Jones 1990, 147
254 d.C.	Theadelphia	12 dr./art.	3,7	Johnson 1936, 310–312; P. Lond. III 1126; Segrè 1922, 102–103
255 d.C.	Memphis	16 dr./art.	4,9	Johnson 1936, 310–312; West 1916, 307
255–300 d.C.	?	19 dr./art.	5,8	Grenfell, Gk. Pap. I, 51; West 1916, 307
256 d.C.	Theadelphia	12 dr./art.	3,7	Johnson 1936, 310–312
s. II–III d.C.	Tebas	8 dr./art.	2,5	Johnson 1936, 310–312
s. II–III d.C.	Tebtynis	12 dr./art.	3,7	Johnson 1936, 310–312
s. II–III d.C.	?	19 dr. 3 ób./art.	5,9	P. Grenf. II, 51; Segrè 1922, 102–103
s. III d.C.	?	12–20 dr./art.	3,7–6,1	Johnson 1936, 310–312
s. IV d.C.	?	1 aureus/13 art.	2,4	Palladius, <i>Ascetikum</i> 11; West 1916, 307
s. IV d.C.	?	1 aureus/5,5 art.	5,6	Palladius, <i>Ascetikum</i> 11; West 1916, 307
s. IV d.C.	?	26–30 tal./art.	1591–1836	Pap. Rainer AN 289, 295; West 1916, 307
301 d.C.		100 den./modius	400	Edicto Diocleciano
314 d.C.	Hermoupolis Magna	10.000 drac./artaba	3060	PER E 2000; Segrè 1922, 104–105; West 1916, 302, 307
330–340 d.C.	Hermoupolis Magna	20 talentos	1224	PER AN 289 col. III; Segrè 1922, 104–105
330–340 d.C.	Hermoupolis Magna	26 talentos	1591	PER AN 295 I.6 y I.13; Segrè 1922, 104–105
338 d.C.	Oxyrrinco	24 talentos	1469	P. Oxy. I 84 col. IV; Segrè 1922, 104–105
350 d.C.	?	50 talentos/art.	3060	P. B. M. 427; Segrè 1922, 104–105; West 1916, 307

* Para la conversión de los distintos valores a HS/modio se han tomado las siguientes equivalencias: 1 dracma de plata de Egipto = 1 HS (Segrè 1922, 119; Barresi 2000, 339; Serafino 2009, 48); 1 tetradracma = 1 denario (Barresi 2000, 339); 1 talento = 200 dracmas (Segrè 1922, 119); 1 dracma = 7 óbolos (West 1916, 295); 1 as = 0,25 HS; 1 denario = 4 HS; 1 aureus = 100 HS; 1 artaba Ptolemaica = 4,5 modii Italicí → proporción reducida por los romanos a 1 artaba = 3 3/11 modii castrenses = 4,5 modii Italicí → 1 modii castrenses = 1,5 modii Italicí (Boyaval 1974, 173–178; Duncan Jones 1976a, 43–52; Duncan Jones 1976b, 53–62. Hultsch 1864–1866, 165 considera la relación 1 artaba = 3 1/3 modii Italicí, una proporción que, sin embargo, presenta problemas interpretativos ya expuestos por R. Duncan Jones).

Tabla 3 (continúa)

Puesta en obra

El costo, expresado en horas de trabajo, de la puesta en obra de los elementos con un peso inferior a una tonelada era de $t + 0,06t(a - 1)$, donde “t” corresponde a 0,6 horas por cada 100 Kg de peso y donde “a” corresponde a la altura de elevación de la piedra, expresada en metros; una operación realizada por dos obreros, un tallador de piedra y un peón.⁵¹ El costo de los elementos con un peso superior a una tonelada, expresado en horas de trabajo por cada tonelada, era de 0,20 (embrague) + 0,33 por m de distancia (acercamiento) + 0,2 por m de altura (elevación) + 0,1 (posicionamiento) + 1 (grapasp); una operación realizada por cuatro obreros a la vez.⁵² Hay que tener presente que los fustes son monolíticos.⁵³

Acabado

El acabado, que consistía en dar los últimos retoques a los elementos decorativos, era realizado por obreros altamente cualificados. Es necesario distinguir los mármoles con un grano fino (pavonazzetto, pentélico y fior di pesco) de los mármoles con un grano medio (proconnesio y cipollino), teniendo en cuenta las dimensiones y el tipo de material de cada uno de los elementos analizados.⁵⁴

Conclusiones

El cálculo de cada una de las partes del edificio por separado (Tab. 4) permite verificar qué sectores pudieron haber sido restaurados con la suma citada en la inscripción: 500.000 HS además de una cantidad procedente del erario público que desconocemos. Al mismo tiempo, permite comprobar que los datos obtenidos con la metodología de cálculo se ajustan a la realidad.

Si agrupamos, por ejemplo, el coste de todos los sectores del edificio que fueron restaurados en este momento (Tab. 5, col. 1), la suma obtenida alcanza los 550.000 HS (probablemente haya que añadir unos 25.000–30.000 HS pertenecientes a la decoración con lesenas del muro de fondo de la escena, de la que nada sabemos).⁵⁵ Este valor se aproxima al citado en la inscripción, puesto que aún no conociendo la suma invertida procedente del erario público, el Arco de Marco Aurelio en Leptis Magna nos ofrece un valor que podría ser orientativo: este arco fue erigido gracias a un legado testamentario de 120.000 HS además de una cantidad procedente del tesoro municipal estimada en unos 60.000 HS.⁵⁶ Si excluimos de la remodelación la *orchestra* y el *pulpitum*, el coste alcanzaría los 535.000 HS + las lesenas del muro de fondo (Tab. 5, col. 2).

	Material	Aparato rústico	Semielaboración	Transporte	Puesta en obra	Acabado	TOTAL
Podio	19902,96	0	0	7885,36	2067,84	0	29856,16
I Orden Columnas	13703,89	3440,37	749,98	4528,62	10765,16	15561,43	48749,46
I Orden Tetraestilo	27753,67	4808,84	743,30	12112,27	16755,15	12710,40	74883,63
I Orden Entablamento	8284,44	7015,05	152,39	5879,28	19802,77	12318,69	53452,62
II Orden Columnas	6944,98	1719,55	479,47	2279,78	7630,58	10702,97	29757,34
II Orden Tetraestilo	5633,48	940,94	260,19	2444,30	4578,35	6372,60	20229,86
II Orden Entablamento	4274,90	3619,88	116,83	3033,80	10222,33	9444,58	30712,31
III Orden Columnas	1659,61	587,85	249,67	334,75	2736,75	6997,83	12566,46
III Orden Tetraestilo	1821,48	293,49	124,08	785,96	1642,05	4157,20	8824,25
III Orden Entablamento	1711,20	1449,00	76,15	1214,40	4096,68	6155,68	14703,11
Muro de fondo – piedra	38874,99	0	0	15401,90	4038,96	0	58315,85
Muro de fondo – mármol	42476,28	5430,21	995,29	17754,64	47909,43	2574,43	117140,28
Pórtico summa cavea	6150,10	2095,18	809,80	1205,37	9929,44	14130,67	34320,55
Orchestra	3367,48	1143,06	209,51	1254,10	797,61	541,91	7313,66
Pulpitum	3167,01	404,87	24,36	1323,78	282,51	63,00	5265,53
TOTAL	185726,47	32948,28	4991,02	77438,30	143255,60	101731,40	546091,07

Tabla 4: Costo de cada una de las partes remodeladas del teatro de Leptis Magna.

	Columna 1	Columna 2	Columna 3
Columnas y entablamento de la escena	189941,30	189941,30	189941,30
Tertástilos	103937,74	103937,74	103937,74
Columnas del pórtico <i>in summa cavea</i>	34320,55	34320,55	
Muro de fondo – núcleo de piedra local	58315,85	58315,85	58315,85
Muro de fondo – revestimiento de mármol	117140,28	117140,28	117140,28
Podio	29856,16	29856,16	29856,16
<i>Orchestra</i>	7313,66		
<i>Pulpitum</i>	5265,53		
TOTAL	546091,07	533511,88	499191,33

Tabla 5: Hipótesis de los diversos sectores del teatro que pudieron ser remodelados con la cifra citada en la inscripción.

Podríamos suponer por tanto que los 500.000 HS citados en la inscripción sirvieron para remodelar la escena del teatro, mientras que la partida procedente del erario público pudo haberse destinado a la remodelación del pórtico *in summa cavea* (Tab. 5, col. 3).

Notas

¹ DeLaine 1997; Barresi 2003; Mar – Pensabene 2010, 509–537.

² Domingo 2012a, 381–418; Domingo 2012b, 144–170; Domingo, Domingo 2017, 35–53.

³ Cenerini 2014, 79.

⁴ Di Vita 1989, 828.

⁵ Di Vita 1990, 138.

⁶ Guey 1941, 307–317.

⁷ Di Vita 1990, 145; Barresi 2017, 736 s.

⁸ Caputo 1987, 145.

⁹ Di Vita 1990, 139.

¹⁰ Di Vita 1990, 146.

¹¹ Barresi 2017, 735–742.

¹² Según el esquema A de Wilson Jones, cuando la altura del fuste es 5, la altura total de la columna es 6, cuando la altura del capitel es igual a 1, la altura de la columna es igual a 9, la altura del fuste es igual a $15/2$, la altura de la base es igual a $1/2$ y el diámetro inferior del fuste es igual a $9/10$ (Wilson Jones 1989, 42). Por otro lado, podemos calcular la longitud del plinto de la basa partiendo de su altura tomando como ejemplo las proporciones de una basa procedente del teatro de Leptis Magna: ésta presenta una altura de 0,34 m, un diámetro superior de 0,65 m y una longitud de plinto de 0,87 m (Bianchi 2009, 60). Finalmente, la diagonal del ábaco del capitel coincide generalmente con la diagonal del plinto de la basa, por lo que la longitud del plinto es igual a la longitud del ábaco, mientras que la diagonal del ábaco corresponde al do-

ble del diámetro inferior del fuste (Wilson Jones 1991, 96. 104). Sin embargo, tras aplicar estas normas de proporcionalidad a las dimensiones de los fustes documentados por P. Barresi (Barresi 2017, 737–740) no siempre se obtienen resultados ajustados a las dimensiones de los capiteles conservados y estudiados por F. Bianchi: a los fustes de las columnas del primer orden, con una altura de 5,32 m, les corresponderían capiteles con una altura de 0,71 m; F. Bianchi identifica como pertenecientes a este orden algunos capiteles con una altura de 0,58 m (Bianchi 2009, 58 fig. 23), medida que en realidad coincide con la que deberían tener los capiteles del segundo orden. A los fustes de las columnas dispuestas en los tetrástilos del primer orden, con una altura de 7,4 m, les corresponderían capiteles con una altura de 0,99 m; F. Bianchi identifica como pertenecientes a este lugar algunos ejemplares con una altura de 0,85 m, aunque, como ya señala la autora, su procedencia del teatro no es segura puesto que proceden en realidad de las termas del “edificio stellare da Vergara Caffarelli”, donde fueron reutilizados (Bianchi 2009, 58 fig. 24). A los fustes de las columnas del segundo orden, con una altura de 4,14 m, les corresponderían capiteles con una altura de 0,55 m, medida que coincide con los ejemplares identificados por Bianchi, con una altura de 0,54 m (Bianchi 2009, 58 fig. 25. 26). A los fustes de las columnas del tercer orden, con una altura de 2,69 m, les corresponderían capiteles con una altura de 0,36 m, medida que coincide con los ejemplares identificados por Bianchi, con una altura de 0,38 m (Bianchi 2009, 59 fig. 27. 28). Finalmente, podemos reconstruir la altura del entablamento en base a la relación que se establece con la altura de la relativa columna, en una proporción que varía entre 1:4 y $1:4^{2/3}$, con un valor medio de $1:4^{1/4}$, y al hecho que muchas veces la altura del arquitrabe es igual a la del friso, Wilson Jones 1989, 48.

¹³ Caputo 1987, 96. 114.

¹⁴ Caputo 1987, 86.

¹⁵ Caputo 1987, 81; Bruno – Bianchi 2015a, 32.

¹⁶ Mar – Beltrán-Caballero 2010, 304.

¹⁷ Caputo 1987, 78 s.

¹⁸ Barresi 2003, 168 s.; Barresi 2004, 265.

¹⁹ Barresi 2003, 168–198; Lazzarini 2010, 488.

²⁰ Barresi 2003, 168 s.

²¹ Lazzarini 2010, 488.

²² Domingo 2012b, 161; Domingo – Domingo 2017, 43.

²³ Giaccherio 1974, 276 s.; *Edictum* 7,2–7,31.

²⁴ Arnaud 2007, 321; Domingo 2013, 119–143.

²⁵ Domingo 2013, 132.

²⁶ Domingo 2013, 126–132.

²⁷ Domingo 2012b, 161–165; Domingo – Domingo 2017, 43.

²⁸ Domingo 2013, 128 s.

²⁹ Domingo 2013, 128 s.

³⁰ Pensabene – Bruno 1998, 2; Barresi 2003, 171; Pensabene 2007, 390.

³¹ Pegoretti 1869, I, 402.

³² P. Barresi considera este mármol dentro del grupo de los catalogados por G. Pegoretti como de grano medio, Barresi 2004, 265.

³³ Pegoretti 1869, I, 403, 430.

- ³⁴ Barresi 2000, 362; Soler 2012, 216 tab. 5.
- ³⁵ Pegoretti 1869, I, 403.
- ³⁶ DeLaine 1997, 210 s.; Barresi 2003, 175; Mar – Pensabene 2010, 527. 531.
- ³⁷ Russell 2013, 96.
- ³⁸ Giacchero 1974, 310–312; Arnaud 2007, 321–336.
- ³⁹ Pensabene 2013, 315.
- ⁴⁰ Ward-Perkins 1980, 329; Pensabene 2013, 315.
- ⁴¹ Giacchero 1974, 311; Arnaud 2007, 336.
- ⁴² La conversión se basa en la equivalencia de 1 modio castrense = 0,0128 m³, o lo que es lo mismo 1 m³ = 78,125 modios (Barresi 2002, 78; Duncan Jones 1976, 53–62) [18 denarios del s. IV d.C. por 1 modio castrense = 18 denarios del s. IV d.C. por 0,0128 m³ = 1.406,25 denarios del s. IV d.C. por 1 m³]. Para la extrapolación de los costes de época de Diocleciano al s. I–II d.C. partimos de la relación entre el precio de un modio castrense de época de Diocleciano, 100 denarios, y en el s. I d.C., 1 denario (DeLaine 1997, 146) [1.406,25 denarios del s. IV d.C. por 1 m³ = 14 denarios del s. I–II d.C. por 1 m³].
- ⁴³ Ward-Perkins 1980, 329.
- ⁴⁴ Waelkens 1986, 642–644; Padilla Monge 2002, 443. Cfr. Pensabene 2010, 76 s.
- ⁴⁵ Fuente: Google Maps.
- ⁴⁶ Pensabene 2013, 298–301.
- ⁴⁷ Giacchero 1974, 301; Arnaud 2007, 336.
- ⁴⁸ Pensabene 2013, 301 s.
- ⁴⁹ Pensabene 2013, 265–267.
- ⁵⁰ Bruno – Bianchi 2015, 35–42.
- ⁵¹ Pegoretti 1864, II, 217; Barresi 2003, 186.
- ⁵² Barresi 2000, 363; Mar – Pensabene 2010, 527; Pegoretti 1864, II, 217 s.
- ⁵³ Caputo 1987, 102.
- ⁵⁴ Capiteles (Pegoretti 1863, 408), Fustes (Pegoretti 1863, 404), Arquitrabes, Frisos, Cornisas y elementos con superficies lisas (Pegoretti 1863, 406 s.). El acabado de las basas era equivalente a 1/3 del costo de su respectivo capitel (Barresi 2000, 362).
- ⁵⁵ Esta cifra se ha obtenido considerando un volumen de piedra equivalente a 1/8 respecto a las columnas de la escena y una superficie trabajada equivalente a ¼ de estas columnas.
- ⁵⁶ Di Vita-Evrard 1963, 389–391; Pensabene 2003, 353–362.

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Forme e funzioni degli antichi magazzini romani: dalla costa tirrenica all'entroterra di Roma. Gli esempi di *Portus* e *Lucus Feroniae*

Simone Mulattieri

Ricerche sui magazzini¹ antichi sono già presenti per la città di Roma² e dell'Impero.³ Nel Lazio invece, solamente per Ostia⁴ e *Portus*⁵ vi sono studi approfonditi, per i quali manca però ancora una visione completa, che consideri anche altri centri importanti della regione. I tipici magazzini romani sono i cosiddetti *horrea*. Per *horreum* s'intende in genere il magazzino con una struttura a più piani collegati da scale, distribuite sul lato interno; ogni piano è caratterizzato da una fila di *cellae* disposte intorno a un cortile centrale oppure un corridoio, unite tra loro da porte.⁶ Distinti dagli *horrea*, esistevano ambienti di dimensioni inferiori, simili ai «retro-bottega» degli attuali piccoli alimentari e negozi di artigianato, utilizzati come deposito per le merci.⁷ Tali ambienti avevano una dimensione di ca. 10–15 m², dunque di dimensioni troppo ridotte per essere magazzini.

La differenza tra retro-bottega e *horreum* è identificabile in base alle: dimensioni, collocazione e funzione. Per analizzare questi due tipi di ambienti e mostrare le loro differenze, sono stati presi in considerazione *Portus* e *Lucus Feroniae*, che presentano casi peculiari di tale studio.

Le due città, non solo avevano due tipi d'impianti urbani molto differenti tra di loro, essendo disposte in aree geografiche diverse: *Portus* era una città costiera e *Lucus Feroniae* una città dell'entroterra, ma, soprattutto, esse si differenziavano per la dimensione e per la varietà di attività commerciali che vi si svolgevano.

Portus aveva una funzione pressoché di stoccaggio rapido e di strategia dinamico-logistica, perché, grazie ai suoi canali, le imbarcazioni erano messe in diretto collegamento con il Tevere; tali connettori rapidi, consentivano ai battelli di trasportare velocemente le merci in arrivo o in partenza da Roma.⁸

L'imperatore Traiano ampliò in maniera sostanziale il porto (109–120 d. C.), con la costruzione di un bacino esagonale.⁹ Almeno quattro dei sei lati del bacino traiano erano dominati da grandi edifici con funzione di magazzini. In base alla pianta catastale del 1979¹⁰ (fig. 1), notiamo che il lato sud-est (lato V) è la zona con maggior funzioni logistiche, perché qui sono situati i c. d. Magazzini di Traiano e di Settimio Severo. È interessante notare come già questi due complessi si differenzino tra di loro, a livello architettonico e funzionale in base alla merce che era conservata al loro interno.

I «Magazzini di Traiano», hanno una forma che ricorda la lettera E (fig. 2) e coprono un'area di circa 1500 m².¹¹ Il complesso era connesso con un ampio spiazzo per lo scarico delle merci sulla banchina di sinistra al canale d'ingresso del bacino traiano, caratterizzato dall'impiego di volte a crociera, sia nei vani di stoccaggio (che sono in totale 150), sia nell'ampio corridoio di distribuzione. L'impianto si articola su almeno due piani, la parte settentrionale è costituita da una serie di ambienti, probabilmente ma-

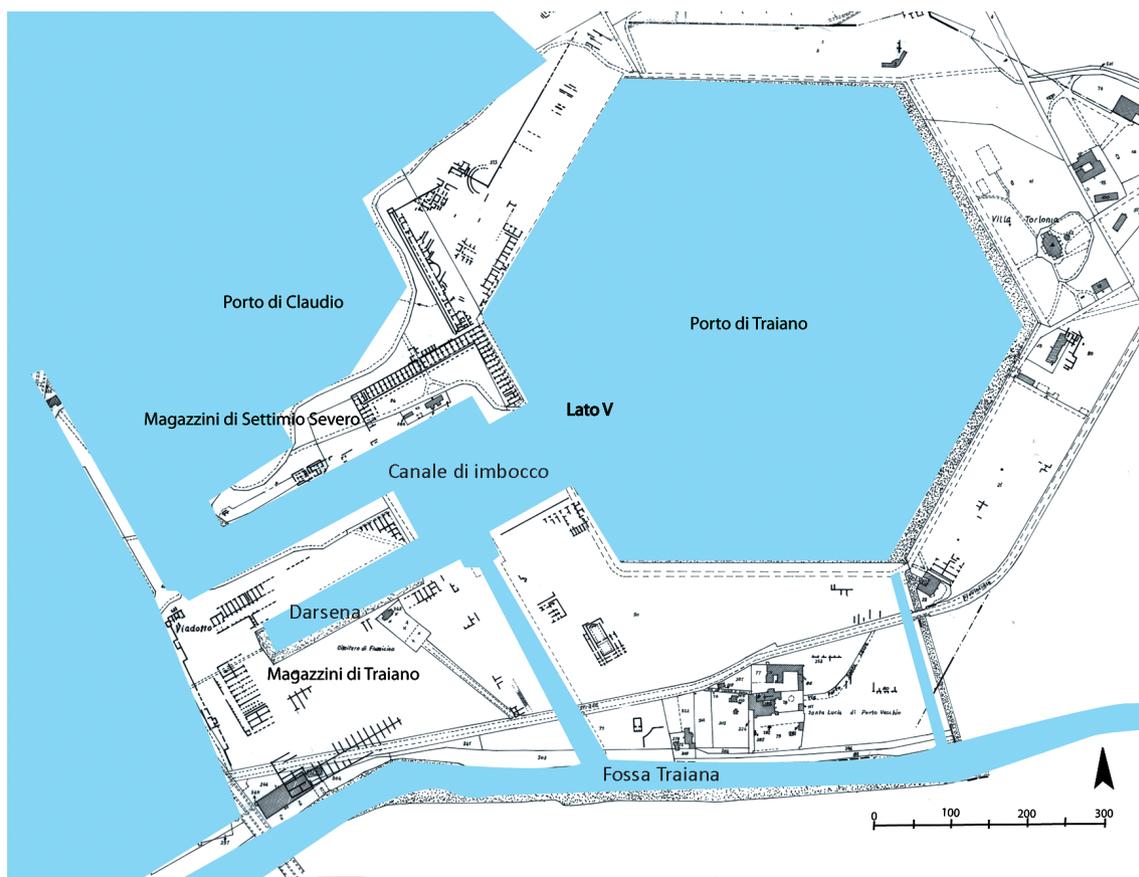


Fig. 1: Zona archeologica della città di Porto. Modifica grafica dello scrivente.

gazzini; che gravitano lungo un corridoio centrale, coperto da volta a botte, elemento che ricorda la copertura dell'impianto dei «Mercati Traianei» a Roma da cui deriva il nome convenzionale. Questa parte dell'edificio è collegata attraverso un cortile centrale a corpi scala, che consentono l'ingresso al piano superiore.

Dall'esame di strutture dell'elevato e dei materiali di riempimento delle fondamenta, svolto nella testata settentrionale, è emerso che la costruzione dell'edificio fu realizzata per blocchi modulari, non contemporanei.¹² Dei vani di stoccaggio, solamente una trentina sono attualmente accessibili.

Dalle indagini su diciotto di essi si è potuto rilevare un sistema diversificato di vespai, necessari a contrastare l'umidità del terreno.¹³ Tale diversità è senza dubbio legata alle diverse funzioni prestate dagli ambienti, che servivano per la conservazione e le varie fasi del trattamento del grano.

A differenza di quella dei «Magazzini di Traiano», la planimetria dei c. d. «Magazzini di Settimio Severo» ricorda una C¹⁴ (fig. 2). Contrariamente al nome, il complesso è di epoca antonina. Il lato corto è parallelo alla banchina meridionale del bacino esagonale e quello lungo è parallelo al canale d'ingresso, gravitante attorno al piazzale nord-est.

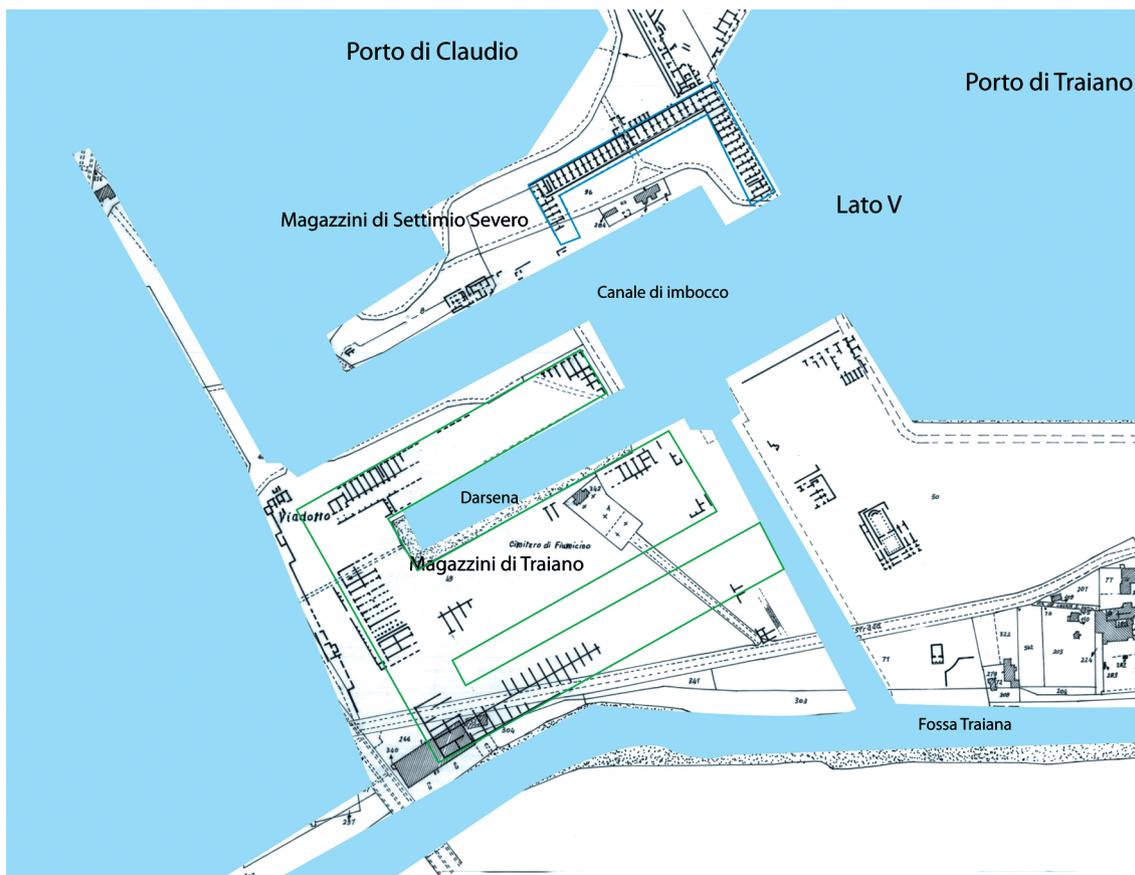


Fig. 2: Particolare dell'immagine precedente, dei Magazzini di Traiano (in verde) e di Sestimo Severo (in blu). Modifica grafica dello scrivente.

Sulla base della capacità portante dei muri e dei pilastri ancora conservati, l'edificio era costituito da tre piani e i vani erano voltati a due e a tre campate.

Il diverso impianto è indizio di una diversa funzione svolta da questo edificio: le grandi dimensioni, gli ambienti affittabili, il diretto collegamento con i canali confluenti nel Tevere, la mancata presenza di *tabernae* nell'immediata vicinanza, ma soprattutto la dimensione allungata della maggior parte delle stanze rispetto a quelle del corpo centrale sembrano indicare che in esso si praticasse un sistema di veloce distribuzione delle derrate. Infatti, è probabile che nei primi ambienti, dei c.d. magazzini traianei, la merce venisse immagazzinata a lungo termine, mentre nei secondi fosse smistata più velocemente.

Per passare al secondo *study-case*, svolgeremo qualche considerazione su un sito caratterizzato da tutt'altro tipo di ambienti di conservazione delle merci, e in particolare su una cittadina dell'entroterra che offre parecchi spunti di riflessione: la colonia *Iulia Felix Lucus Feroniae*.

Essa si trova lungo la via Tiberina e domina da nord-ovest la valle del Tevere. La città, più antica di *Portus*, si sviluppò nell'area di un santuario sabino dedicato a una dea complessa, protettrice delle donne e dell'agricoltura, la dea Feronia, venerata, non a caso, anche a Terracina, dove sono stati rinvenuti *horrea*.¹⁵ La città ha un'architettura ben strutturata in funzione mercantile-emporica, della quale si hanno attestazioni in Livio¹⁶ e Dionigi di Alicarnasso¹⁷ già dal VII secolo a. C.

In quest'intervento mi limiterò a prendere in considerazione le fasi cronologiche del centro città, dalla fine del I sec. a. C. al II d. C.¹⁸

Sul portico nord-occidentale del Foro di *Lucus Feroniae* si trovano gli isolati II e III delle *domūs* del Foro, divisi dalla via di collegamento tra il Foro e la via Tiberina; gli edifici, con murature in *opus incertum* in tufo e travertino, avevano almeno un piano superiore, data la presenza della scala esterna che si apre sul portico della piazza (fig. 3); la loro datazione risale alla seconda metà del I secolo a. C. e hanno subito una serie di ristrutturazioni tra il I e il II secolo d. C. Ciascun blocco comprendeva al piano terra botteghe, con relative retrobotteghe, un corridoio di collegamento con gli ambienti re-

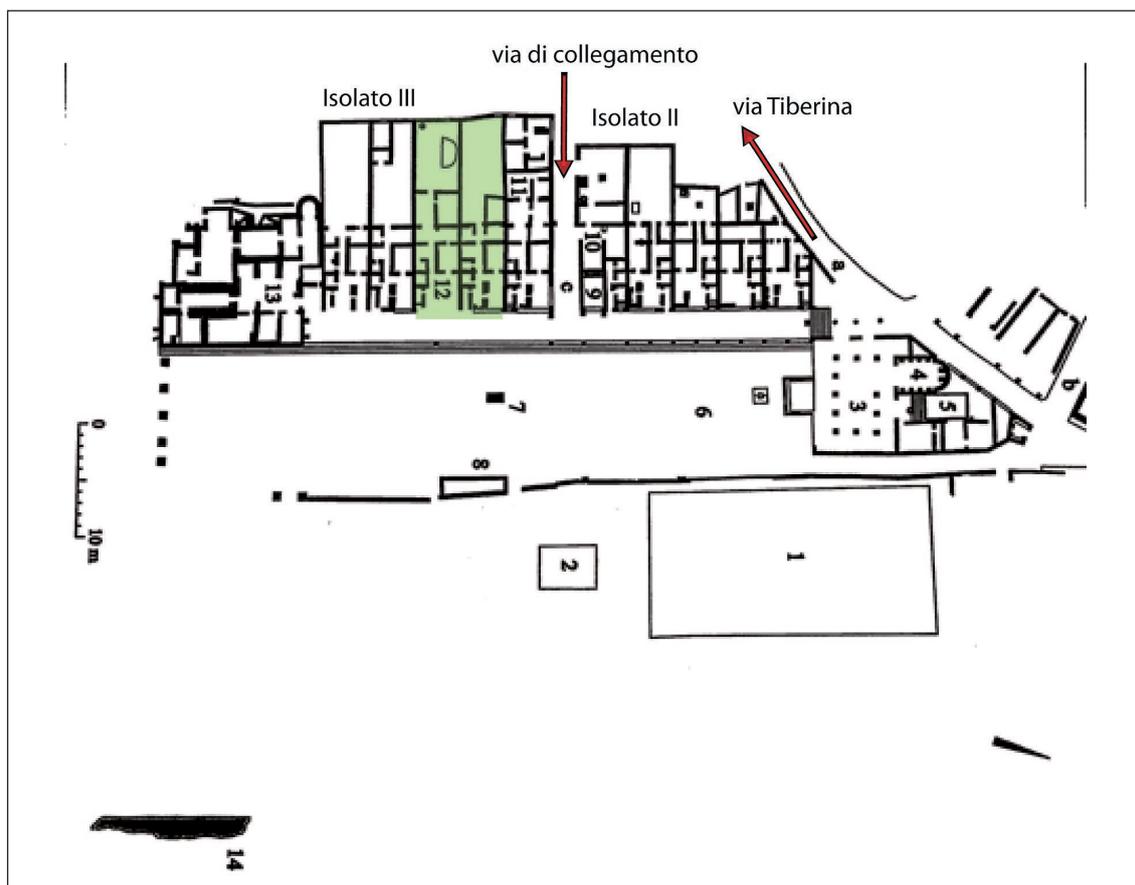


Fig. 3: Area centrale. Lucus F.

sidenziali e l'ampia corte alle spalle, aperta sul lato retrostante, probabilmente connessa alla viabilità secondaria che doveva correre nell'area non ancora scavata alle spalle degli isolati.¹⁹

Tali piccoli depositi o retrobottega erano ambienti per la conservazione finale dei prodotti, prima della loro vendita. La disposizione degli ambienti era anch'essa legata alla sicurezza delle merci, perché erano posti al centro della casa; la parte produttiva si trovava sul lato retrostante e invece le strutture che danno sul portico prospiciente il Foro possono essere identificate come *tabernae* quindi legate alla vendita.²⁰

Più in particolare esaminerò gli esempi di retro-bottega di due *domūs*: quella di Polifemo e Galatea e quella del Fiore.

La «domus di Polifemo e Galatea», è l'unità abitativa 2 del corpo 1 dell'isolato III (fig. 4), con impianto canonico di epoca augustea; la parte prospiciente il portico forense e la via di collegamento tra il Foro e la via Tiberina è strutturata sulla *taberna* (a), con adiacenti ambienti di servizio (d, c, e ed f), l'annesso retrobottega (g) e un vano di accesso (b) alla parte abitativa. La corte retrostante (a", b" e c"), che comunica, mediante un ingresso sul lato posteriore, con una via, è dotata anche di un'entrata sulla via laterale (a').²¹ Probabilmente tutto il piano terra viveva in funzione della *taberna*. Probabilmente gli ambienti abitativi, a differenza degli esempi pompeiani,²² erano relegati al piano superiore.

L'altra *domus*, detta del Fiore (Reg. I, Is. III, 3), costituisce la III unità abitativa dell'isolato III (fig. 5); essa presenta un impianto analogo che permette anch'esso uno sbocco sugli assi viari e presenta anche un retrobottega (g) alle cui spalle c'è la parte residenziale con gli ambienti di servizio (d-f) e la relativa corte (n), comunicante con la strada retrostante mediante una porta.

Il retrobottega (g), che si apre a nord del corridoio di passaggio, è di dubbia interpretazione perché presenta un pavimento musivo (fig. 6), incorniciato da una larga balza costituita da tessere bianche e nere disposte senza alcun ordine, con la metà anteriore a motivo isodomico. La parte posteriore del pavimento aveva tessere bianche ordinate diagonalmente, probabilmente era nascosto da suppellettili, mentre la parte anteriore restava scoperta.²³ Questo tipo di separazione decorativa fa pensare a una doppia funzione dell'ambiente oppure a differenti fasi di utilizzo. Probabilmente la pavimentazione musiva è stata realizzata nel I secolo a.C. e poi ristrutturata nel II secolo d.C., quando l'ambiente da funzione abitativa assume quella commerciale.

L'attività di vendita a *Lucus Feroniae* era concentrata generalmente negli ambienti di piccole o medie dimensioni, a forma quadrangolare, rivolti verso la piazza del Foro.

Né *Portus* né *Lucus Feroniae* sono esempi tipici per la questione dei magazzini commerciali. Attraverso l'esempio di *Portus*, unico nel suo genere, abbiamo potuto vedere la singolarità delle sue dimensioni e le sue capacità logistico-funzionali, basate su una distribuzione organizzata per la maggior parte destinata a Roma, già molto differente dalla vicina Ostia, dove il maggior numero delle merci era fatta per fermarsi e sostenere la stessa città. *Lucus Feroniae*, anche se di dimensioni molto ridotte, aveva un approccio

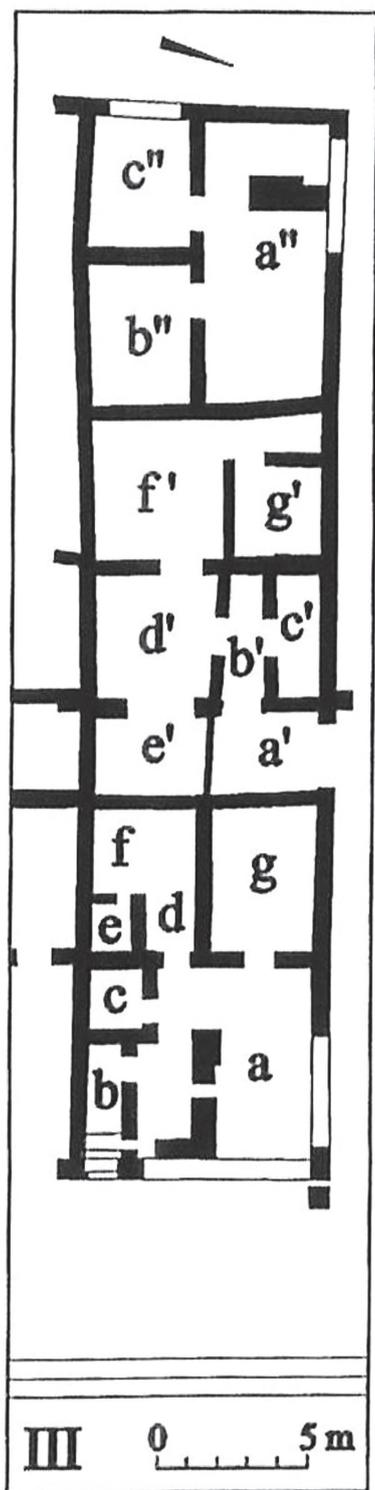


Fig. 4: Domus di Polifemo e Galatea. Isolato III. Fase III (II secolo d. C.)

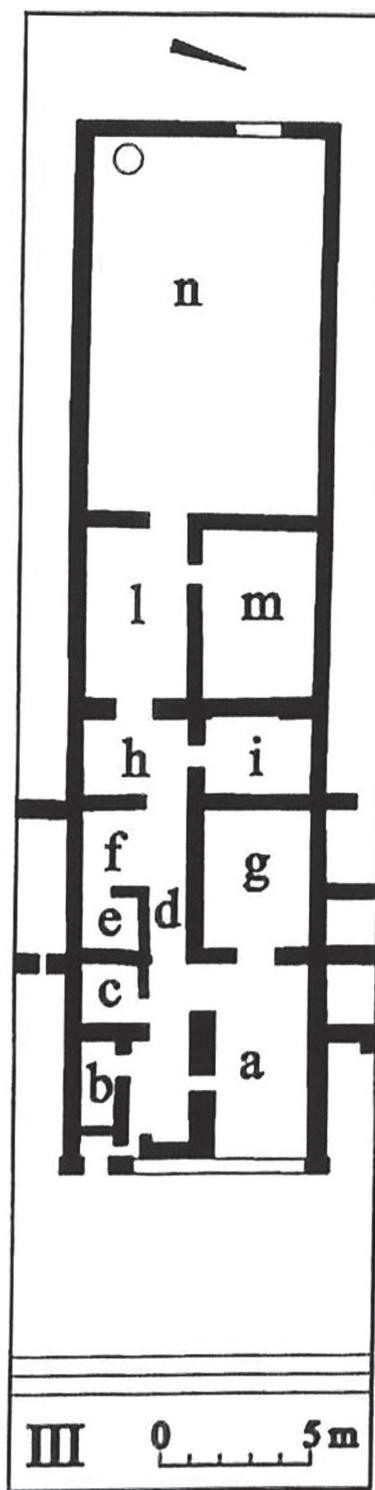


Fig. 5: Domus del Fiore. Isolato III. Fase di II secolo.



Fig. 6: Domus del Fiore. Isolato III.

commerciale più simile a quello ostiense, basato anche sulla vendita diretta dei prodotti. Difatti, molte strutture potevano servire allo stoccaggio di beni, ma non ci si può riferire a tali strutture genericamente come a magazzini.

Dai due casi presi in esame, emerge la necessità di distinguere la tipologia degli ambienti di conservazione delle merci in base alla loro funzione specifica. La grande linea di demarcazione è costituita ovviamente dalle dimensioni del volume commerciale, diremmo oggi, dalla grande distribuzione alla vendita al dettaglio.

Note

¹ Termine generico che identifica un luogo per l'immagazzinamento delle merci.

² Mimmo 2014; Bruno 2012a; Bruno 2012b; Carafa – Pacchiarotti 2012; Capanna 2012; D'Alessio 2012; Filippi 2012; Sebastiani – Serlorenzi 2011; Mimmo 2011; Della Ricca 2011.

³ Wawrynek 2014; Rico 2011, 41–66; Rickman 1971.

⁴ Pensabene 2007; Paroli 2011; Pavolini 1991; Pavolini 2016; Boetto et al. 2016.

⁵ Keay et al. 2005; Keay 2012; Keay 2015.

⁶ L'etimologia del vocabolo *horreum* non risulta chiara; se si tratta di strutture private esse sono definite solitamente con un aggettivo e al singolare: *horreum rusticum* per la campagna oppure *urbanum* per la città; se si tratta di un apprestamento pubblico, ossia statale, si usa il plurale *horrea*. Tali edifici, denominati anche *ὄρειον*, *σιτοφυλακεῖον*, *ἀποθήκη*, *granarium*, avevano funzione commerciale e contenevano derrate alimentari e/o liquidi. Romanelli 1922, 972; Staccioli 1961, 767; Rickman 1980, 138.

⁷ Ambiente di dimensioni modeste, posto nella parte retrostante di una bottega e con funzione di deposito delle merci. Cfr. Bascià et al. 2000, 137.

⁸ Il *Portus Ostiensis*, a 3 Km a nord-ovest di Ostia fu voluto dall'imperatore Claudio; la sua fondazione si data al 46 d.C. sulla base dell'iscrizione commemorativa, rinvenuta a *Portus* nel 1836 (CIL XIV 85 = ILS 207 = Thylander 1952, B310). L'imponente struttura venne inaugurata da Nerone nel 64 d.C. e celebrata da una splendida emissione monetale (RIC I 178). La sua realizzazione permise di semplificare l'arrivo di gran parte delle merci destinate a Roma, sostituendo il complicato sistema di distribuzione delle grangie dall'Egitto, che dovevano giungere a *Puteoli*, e da lì, poste su imbarcazioni più piccole, costeggiare il Tirreno fino a Ostia per poi risalire il Tevere tramite alaggio fino a Roma.

⁹ Com'è noto, per la grande richiesta di beni dell'Urbe, il *Portus Augusti* fu da subito insufficiente; si decise quindi di costruire il *Portus Traiani Felicis* (cfr. ad es. Plin, *Panegyricus* XXIX, 2; RIC II 631). Sul porto cfr. anche Keay 2015; Keay 2012; Keay et al. 2005.

¹⁰ Consistenze archeologiche e dati catastali. 1:2000, gennaio 1979, tav. N.O., N. Inv. 1203, foglio 739. Prot. N. 001/79. Dis. Geom. P. Olivieri e A. Burgarella. Colgo l'occasione per ringraziare il responsabile dell'Archivio Disegni, dott. Marco Sangiorgio, per la preziosa disponibilità.

¹¹ Il complesso traiano si può datare in base ai bolli laterizi tra il 125 e il 141 d.C. Tuttavia, a una fase precedente va ascritta la rampa della Darsena al centro di tali magazzini, datata da bolli di *Lucius Iulius Rufus* (CIL XVI 633c), console nel 67 d.C.

¹² Mannucci – Verduchi 1995, 376.

¹³ La pavimentazione sopraelevata è stata qui distinta in tre tipi: trasversali (principalmente di epoca antonina), longitudinali (inizio del II secolo A15–20; antonini F5; severi F44–F45; rimaneggiati in epoca severiana, ma di fattura più antica A9–C9; di restauro tardoantico A11–F46–F47) e a tipologia mista (F6–F38 sono di epoca antonina). Bukowiecki et al. 2016, 240.

¹⁴ Mannucci – Verduchi 1995, 379.

¹⁵ Strab. *Georg.* 5, 2, 9; Serv. *Ad Aen.* 7, 697.

¹⁶ Liv. 1, 30, 5.

¹⁷ Dion. Hal. 3, 32, 1–2.

¹⁸ Russo Tagliente 2016, 3.

¹⁹ Bianchi-Bruno 2014, 6. Al contrario di quanto si pensava in passato [Corbella – Del Savio 1981, 366.], non si hanno attestazioni di *horrea* nell'area urbana centrale di *Lucus Feroniae*. S'interpretano come magazzini – ad uso privato – gli ambienti 52 e 60 della villa dei Volusi, situata nell'area a N-O della città (Zannini 2013, 124).

²⁰ Nel magazzino dell'*Antiquarium* di *Lucus Feroniae* si conservano molte anfore catalogate nello schedario n°9 dei cosiddetti Cataloghi di Mauro, purtroppo senza indicazione delle provenienze e quindi inutilizzabili.

²¹ Bianchi – Bruno 2014, 78.

²² Mastrobattista 2017, 79–88.

²³ Bianchi – Bruno 2014, 102.

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Figg. 1–2: Zona archeologica della città di Porto. Planimetria originale. Consistenze archeologiche e dati catastali. 1:2000, gennaio 1979, tav. N.O., N. Inv. 1203, foglio 739. Prot. N. 001/79. Dis. Geom. P. Olivieri e A. Burgarella. Le immagini, rielaborate graficamente dallo scrivente, sono fornite per gentile concessione dell'Archivio Disegni di Ostia Antica. © <pa-oant.archiviodisegni@beniculturali.it> Ministero per i beni culturali ed ambientali. Soprintendenza archeologica di Ostia. – Figg. 3–6: Da Bianchi – Bruno 2014: F. Bianchi – M. Bruno, *Lucus Feroniae. Mosaici e pavimenti marmorei*. *Studia Archaeologica* 195 (Roma 2014). © Copyright 2014 «L'ERMA» di BRETSCHNEIDER Via Marianna Dionigi, 57 – 00193 Roma <www.lerma.it> <-lerma@lerma.it>. Le immagini sono fornite per gentile concessione dell'Erma di Bretschneider.

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**The Production
of Portrait Statuary in Roman Cities.
An Economic Factor?**

Panel 3.20

**Organized by
Thoralf Schröder**

Investments of Hispano-Roman Elites in Metal Statues: A First Costs Evaluation according to Epigraphy

Cruces Blázquez-Cerrato – Santiago Sánchez de la Parra-Pérez

Introduction

During the 1st and especially during the 2nd century AD, public areas were adapted according to tastes of the Imperial government. Forums, porticoes, temples, theatres among others places, were remodelled at the expense of emperors or *privati*. The statuery associated with these works was an opportunity to place certain members of the community in high social standing, fixing their memory among society.¹ Being the patron of a statue placed in a public area was the greatest honour a Roman citizen could aspire to as a model citizen, since the object was made visible to future generations.² For this reason, the destruction of metal sculptures, as well as the regrinding of stone statues, could be viewed not only as a normal process of recycling, but also as a case of *damnatio memoriae*. Proof of this can be found in written sources frequently referring to sculptures made of *av* and *ar* no longer existing, the systematic destruction or reconversion of the figures of emperors, such as Nero or Commodus,³ or the melting of Domitian statues for making coins.⁴

Our analysis has focused on statues made of metal, and in particular those made of *AV* and *AR*. The sheen, their great intrinsic value and the connotations of immortality make precious metals ideal materials for creating statuaries. The origin of this tradition comes from the Hellenistic world, as well as the other traditions borrowed from this culture by the Roman Imperial world.⁵

These sculptures are fragile and very vulnerable for obvious reasons. Very few have survived,⁶ but they were an essential element in completing the panorama of the Roman visual culture. In Hispania, there is a lack of physical evidence of sculptures made of gold or silver, although epigraphy refers to them on numerous occasions.⁷

Traditionally, statuaries has been analysed separately from the epigraphs that accompanied it. Moreover, until recently, statues have been examined fundamentally from a stylistic perspective, ignoring basic information such as the contextualization of the piece itself. For some, the metallographic composition has been analysed.⁸ However, we believe that in order to advance in research and reach solid conclusions, it is essential to contrast all available information.

We have reviewed the inscriptions with information on the weights and values of sculptures made of *AV* and *AR* in Hispania. Many epigraphs served as pedestals, and we believe their dimensions may be significant in evaluating the characteristics of the sculpture.

Standardised patterns are common in Roman productions. This is why today we know that although some *AV* and *AR* statues were made on a higher scale most were

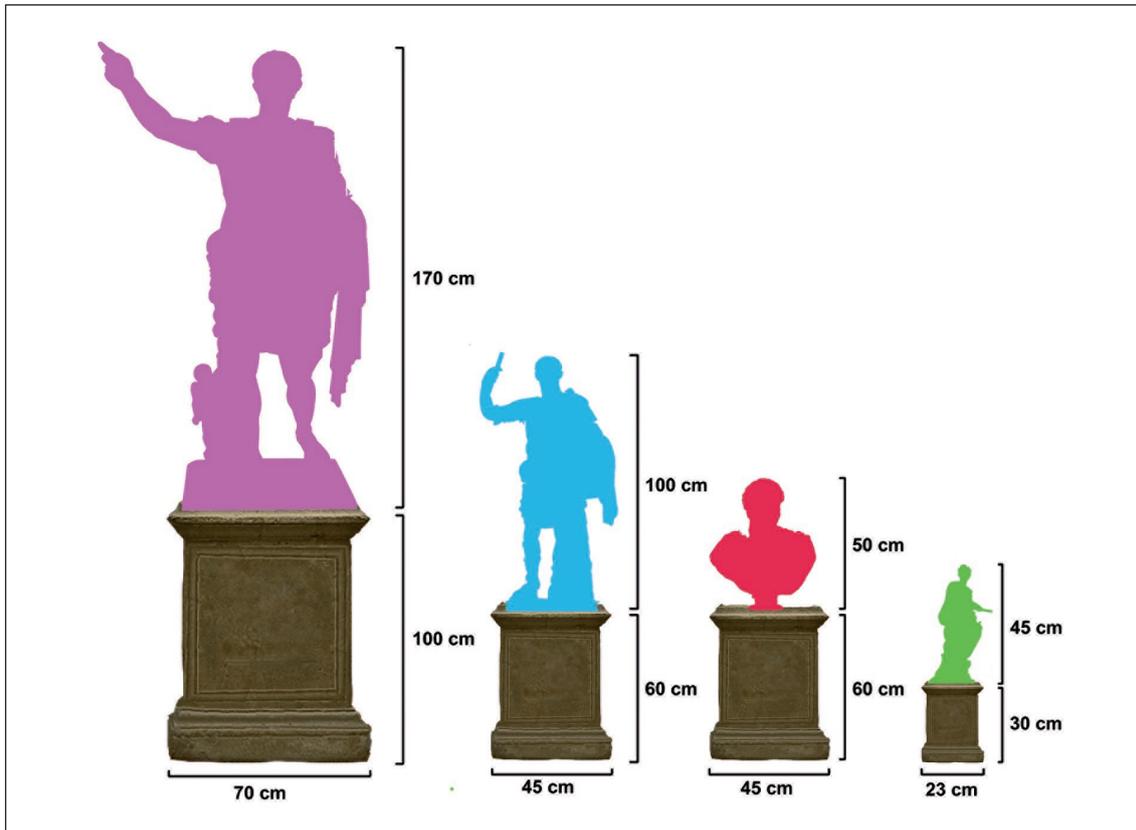


Fig. 1: Relationships between statuary and base dimensions.

life-size,⁹ as revealed by their pedestals (fig. 1), which had a height of 100–120 cm and a width of 45–60 cm when the dimensions were smaller, with a height of 60–50 cm and a width of 40–30 cm, the statues normally corresponded to a medium format, being smaller than the natural size or busts. The final block is that of figures made of noble metals with a small format, with a base of 25/30 cm in height and 19–15 cm wide.

In Hispania, we have located 29 inscriptions that refer to the number of pounds of AR or AV contained in the statues (fig. 2). All are dated in the Flavian and Antonine periods. Twenty-seven inscriptions mention statues made of AR and 2 made of AV. The AV statues weighed 5 pounds while most of the AR statues weighed between 100 to 200 pounds.¹⁰

Almost all of the epigraphs refer to statues of Imperial deities or *virtutes* and members of the *domus* imperial. Only one,¹¹ whose interpretation is doubtful, details the dedication of a 250-pound statue made of AR to *L. Aemilius Rectus* (tab. 1). The scarcity of inscriptions that collect the representation of *privati* regarding this type of statues can be explained by the very connotations of the precious metals; the link with the concept of immortality encouraged that the use of these materials was reserved only for imperial deities and figures.¹²



Fig. 2: Geographical distribution of Latin inscriptions with references of the weight of gold and silver of the statues. Legend: Green Rhombus: Silver Statues; Red Rhombus: Gold Statues. There is 1 inscription per city except in Colonia Patricia (2), Munigua (2), Italice (3) and Astigi (4).

According to literary sources, almost all emperors declined the proposal that their images be made in AV during their lifetime, since this implied the acceptance of a divine honour. For example, Marcus Aurelius and Commodus refused to be depicted using AV statues in 179 AD, when the Athens *gerusia* consulted them about what their statues should look like.¹³ The emperors asked that they be made of bronze, thus rejecting divine homage. Tiberius¹⁴, Vespasian¹⁵ and Trajan¹⁶, for example, established strict rules concerning their representations by prohibiting their statues from being cast in AV, which was only acceptable for representations made posthumously. This decision was due to two fundamental factors: ideological background associated AV with a divine nature and its use during a person's lifetime was a show of arrogance, assumed only by emperors. Additionally, there was an economic factor, since both the manufacture and the maintenance of this type of statue was excessively expensive.

Nos.	Reference	Dedicated to	Weight (AV/AR)	Town	Province	Date	Object Type	Epigraph measures
1	CIL II ² /5, 515	unspecified	** Roman pounds AR	<i>Ulia Fidentia</i> (Montemayor, Córdoba)	<i>Baetica</i>	151–200 AD	base	(25) × (43) × 23 cm
2	CIL II ² /5, 1166	unspecified	100 Roman pounds AR	<i>Astigi</i> (Écija, Sevilla)	<i>Baetica</i>	101–135 AD	base	24 × 105 × 55 cm
3	CILA II, 14	unspecified	106 Roman pounds AR	<i>Hispalis</i> (Sevilla)	<i>Baetica</i>	101–150 AD	base	13 × (42) × 28 cm
4	CIL II, 3424	unspecified	250 Roman pounds AR	<i>Carthago Nova</i> (Cartagena, Murcia)	<i>Tarraconensis</i>	71–138 AD	base	unknown

Table 1: Inscriptions without specified dedication (the bad preservation of epigraph prevents from a clear reading/it is not specified in the text). ** = without precised amount.

Imperial Statues

In Hispania we have registered four inscriptions where statues were dedicated to emperors (tab. 2). Three indicate that the weight of AR was between 5 and 10 pounds. One exception to this is the 100-pound statue supposedly dedicated to Caracalla,¹⁷ although its poor conservation prevents us from assuring that it was a statue of honour.¹⁸ Only one base makes reference to an AV statue,¹⁹ dedicated to Titus as the successor of the emperor Vespasian in 77 AD.

The weight of Spanish Imperial statues coincides with data from the Italian peninsula and North Africa.²⁰ The majority contained less than 10 pounds of AR and were dedicated by *privati*,²¹ as opposed to what is documented in Hispania. The pursuit of Imperial favour by local communities may have motivated this fact. For example, statues dedicated to Septimius Severus²² by *Norba Caesarina* (Cáceres) and *Urunia* (Fuenteguinaldo, Salamanca) in the context of the civil wars against *P. Niger* and *C. Albinus* would have been an example of loyalty to the newly established Imperial dynasty.

All supports are too small for a life-size statue, so it seems that they would be, for the most part, smaller imperial representations. An example of this is the sculpture dedicated to Titus in *Augusta Emerita* (Mérida).²³ The reduced dimensions of the base would only support a small representation of the Imperial heir.²⁴

When contrasting information on the Imperial statues made of AV and AR in Hispania using the 13 metals busts recovered from other Roman provinces, we see that the second half of the 2nd century AD is a particularly important period.²⁵ The work carried out always consisted of embossing a metal plate, more or less thick, but quite fragile. The busts were never associated with a fixed base or any other type of support, although some have traces of some type of fixing device possibly linked to processional ceremonies.²⁶

Nos.	Reference	Dedicated to	Weight (AR/AV)	Town	Province	Date	Object Type	Epigraph measures
5	CIL II, 863	Septimius Severus	5 Roman pounds AR	<i>Urunia</i> (Fuenteguinaldo, Salamanca)	<i>Lusitania</i>	193–211ad	base	unknown
6	CIL II, 693	Septimius Severus	10 Roman pounds AR	<i>Norba Caesarina</i> (Cáceres)	<i>Lusitania</i>	194 AD	base	(67) × 29 × 19 cm
7	CIL II, 1040	Caracalla (?)	100 Roman pounds AR (?)	<i>Curiga</i> (Monesterio, Badajoz)	<i>Baetica</i>	196 AD	base	*(58) × (45) cm*
8	CIL II, 5264	Titus	5 Roman pounds AV	<i>Augusta Emerita</i> (Mérida)	<i>Lusitania</i>	77 AD	base	31,6 × 19 × 11 cm

Table 2: Inscriptions referring to Imperial gold (AV) or silver (AR) statues from Hispania.

For example, the bust of Marcus Aurelius of *Aventicum* (Avenches, Switzerland), of approximately 5 pounds of AV, and the bust of Lucius Verus of the Treasury of Marengo, in northern Italy, 9 pounds of AR, have been linked to Imperial tributes in legal contexts, in military establishments and even in domestic worship.²⁷ It is evident that none of these resemble the statues that would have been placed on the pedestals we have studied, but their dimensions and weight are indicative of what could be made in AV and AR.

The enormous variety of Roman statues was commensurate with the flexibility of the manufacturing techniques used.²⁸ Therefore, we believe that the weight recorded in the inscriptions may indicate the type of statuary, to which it refers. The technical characteristics and the difficulty in making each type of sculpture conditioned the final price. Moreover, the reference to the weight of AR is in no way indicative of its dimensions. For example, in *Norba Caesarina* (Cáceres) a fragment of an Imperial statue, made of bronze but covered by a thick layer of AV, has recently been found.²⁹ In this case it would have been a life-size full body figure, although the number of pounds of AV would have less.

Statues of Deities, *Virtutes* and Civic *Genii*

In Hispania, none of the statues made in AV or AR of this type has been preserved, but according to epigraphy, these types of statues were the most abundant (tabs. 3–4). All sponsors of sculptures dedicated to deities were private, individuals who allocated a considerable part of their wealth to pay for these objects: most of the statues weighed around 100 pounds of AR – 3.4/32.7 kg. Only one in *Regina* (Casas de Reina, Badajoz),³⁰ with 50 pounds of AR, weighs less than this amount. This, added to the large dimensions

Nos.	Reference	Dedication to	Weight (AV/AR)	Town	Province	Date	Object Type	Epigraph measures
9	CIL II, 8	<i>Iuppiter Optimus Maximus</i>	** Roman pounds AR	<i>Ossonoba</i> (Faro, Portugal)	<i>Lusitania</i>	unknown	base	unknown
10	CILA II, 233	<i>Sacrum Numen</i>	** Roman pounds AR	<i>Canana</i> (Alcoléa del Río, Sevilla)	<i>Baetica</i>	1 st -2 nd centuries AD	Base?	59 × (66) × 4 cm
11	CIL II ² /7, 975	<i>Iuno</i>	50 Roman pounds AR	<i>Regina</i> (Casas de Reina, Badajoz)	<i>Lusitania</i>	2 nd century AD	base	80 × 49/55 × 37/43 cm
12	CIL II ² /5, 1164	<i>Pantheus</i>	100 Roman pounds AR	<i>Astigi</i> (Écija, Sevilla)	<i>Baetica</i>	1 st -2 nd centuries AD	base	25,5 × 101 × 52 cm
13	CIL II, 1267	<i>Iuno Regina</i>	100 Roman pounds AR	<i>Ostur</i> (Villalba de Alcor, Huelva)	<i>Baetica</i>	1 st -2 nd centuries AD	base	110 × 54 × ** cm
14	CIL II, 342	<i>Apollinus Augustus</i>	100 Roman pounds AR	<i>Italica</i> (Santiponce, Sevilla)	<i>Baetica</i>	69–170 AD	base	63,4 × 93,4 × (43) cm
15	IRPCádiz 80	<i>Iuno Augusta</i>	100 Roman pounds AR	<i>Barbesula</i> (San Roque, Cádiz)	<i>Baetica</i>	117–200 AD	base	97 × 67 × 55 cm
16	CIL II, 3386	<i>Isis Puella</i>	112 Roman pounds AR 2,5 unciae 5 scripuli	<i>Acci</i> (Guadix, Granada)	<i>Baetica</i>	98–117 AD	base	87 × 47 × 47 cm
17	CILA II, 358	<i>Victoria Augusta, Isis, Ceres and Iuno Regina</i>	132 Roman pounds AR + 2,5 unciae	<i>Italica</i> (Santiponce, Sevilla)	<i>Baetica</i>	271–300 AD	base	(12,5) × (37,5) × (36) cm
18	CIL II ² /7, 67	<i>Fortuna and Mercurius</i>	5 Roman pounds AV + 5 Roman pounds AR	<i>Urgavo</i> (Arjona, Jaén)	<i>Baetica</i>	151–200 AD	base	unknown

Table 3: Inscriptions referring to gold (AV) and silver (AR) statues of deities from Hispania (Nos. 17 and 18 are included in the Table 4 because they also refer to civic virtues).

** = without precised amount.

Nos.	Reference	Dedicated to	Weight (AV/AR)	Town	Province	Date	Object Type	Epigraph measures
17	CILA II, 358	<i>Victoria Augusta, Isis, Ceres and Iuno Regina</i>	132 Roman pounds AR + 2,5 unciae	<i>Italica</i> (Santiponce, Sevilla)	<i>Baetica</i>	271–300 AD	base	(12,5) × (37,5) × (36) cm
18	CIL II ² /7, 67	<i>Fortuna and Mercurius</i>	5 Roman pounds AV + 5 Roman pounds AR	<i>Urgavo</i> (Arjona, Jaén)	<i>Baetica</i>	151–200 AD	base	unknown
19	CIL II ² /5, 69	<i>Pietas Augusta</i>	** Roman pounds AR	<i>Tucci</i> (Martos, Jaén)	<i>Baetica</i>	2 nd -3 rd centuries AD	base	163 × 61 × ** cm
20	CILA II, 1057	<i>Fortuna Crescenti Augusta</i>	** Roman pounds AR	<i>Munigua</i> (Vva. del Río y Minas, Sevilla)	<i>Baetica</i>	2 nd -3 rd centuries AD	base	unknown
21	CILA II, 1058	<i>Genius Municipii</i>	** Roman pounds AR	<i>Munigua</i> (Vva. de Río y Minas, Sevilla)	<i>Baetica</i>	151–200 AD	public plaque	44,5 × (128) × 2 cm
22	CIL II ² /7, 227	<i>Genius Coloniae</i>	** Roman pounds AR	<i>Colonia Patricia</i> (Córdoba)	<i>Baetica</i>	71–130 AD	base	30 × (23) × 36 cm
23	CIL II, 3265	<i>Pietas Augusta</i>	** Roman pounds AR	<i>Castulo</i> (Linares, Jaén)	<i>Tarraconensis</i>	unknown	ara	unknown
24	CIL II ² /14, 819	<i>Genius Coloniae</i>	15 Roman pounds AR + 2 unciae	<i>Tarraco</i> (Tarragona)	<i>Tarraconensis</i>	117–161ad	public plaque	32 × 59 × 15 cm
25	AE 1982, 520	<i>Genius Coloniae</i> (4 statues)	100 Roman pounds AR	<i>Italica</i> (Santiponce, Sevilla)	<i>Baetica</i>	117–150 AD	base	25 × 57 × (16) cm
26	CIL II, 1278	<i>Fortuna Augusta</i>	100 Roman pounds AR	<i>Siarum Fortulianum</i> (Utrera, Sevilla)	<i>Baetica</i>	1 st -2 nd century AD	unknown	unknown
27	CIL II ² /5, 1165	<i>Pietas</i>	100 Roman pounds AR	<i>Astigi</i> (Écija, Sevilla)	<i>Baetica</i>	70–200 AD	base	63,4 × 93,4 × (43) cm
28	CIL II ² /5, 1162	<i>Bonus Eventus</i>	150 Roman pounds AR	<i>Astigi</i> (Écija, Sevilla)	<i>Baetica</i>	101–150 AD	base	unknown
29	CIL II ² /7, 228	<i>Genius Coloniae</i> (unknown amount of statues)	1.000 Roman pounds AR	<i>Colonia Patricia</i> (Córdoba)	<i>Baetica</i>	2 nd century AD	public plaque	22 × (47,5) × (22,5) cm

Table 4: Inscriptions referring to gold (AV) and silver (AR) statues of Civic Virtues and Genii (Nos. 17 and 18 are included in the Table 3 because they also refer to deities). ** = without precised amount.

of almost all the pedestals, suggests that the statues had a large format, unlike the previously mentioned Imperial statues.

With respect to the AV statues only one inscription mentions the compliance of an *ex voto* with two *signa* of *Fortuna* and *Mercurius*,³¹ both of 5 pounds and placed on pedestals decorated with 5 pounds of AR. These Hispanic weights contrast greatly with those of the Italic Peninsula, where only 4 statues, 9.3% of the total, equaled or exceeded 100 pounds of AR and only one reached 5 pounds of AV.³²

Possibly many would have been representations *in formam deorum* or *sub specie deae*, an image of deity with the physical features resembling the patron.³³ This would justify the link, traceable in some inscriptions, to female priests, the sex of the divinity and, on occasion, the use of defined terms to clarify to what the statue was consecrated (*sacrum*) and who was being honoured in the dedication (*in honorem*). The local elites would use these sculptures made in AV and AR as an object that represented them even though it was explicitly an object of veneration.

Although the archaeological context, in which most of the inscriptions were found, is unknown, the associated statues would be placed in public and semi-public contexts. Since Claudius, representations of *privati* with divine attributes have gained strength, following the ‘fashion’ of imperial representations³⁴ that, in the case of women, monopolised some types such as enthroned Juno.³⁵ Thus, divine attributes, for non-funeral purposes, transferred the character and values of the deity to the person being commemorated.³⁶ For this reason, they were placed in temples, theatres, *scholae*, house atriums... Possibly some Spanish statues had these characteristics such as those dedicated to *Ceres*, *Juno Regina*, *Apolo* and *Victoria* in the *Traianeum* of *Italica* (Santiponce, Sevilla).³⁷

We have also documented 13 inscriptions linked to the AR statues of *virtutes* and *genii* (tab. 4). All were paid for by *privati*, but only Imperial *virtutes* reached or exceeded 100 pounds of AR. Their characteristics may have been similar to those of *sub specie deae* statues, due to their similarity in weight, in the epigraphic formulas and their location in temples and semi-public contexts along with representations of *privati*.

The weight of civic *genii* was less.³⁸ Possibly they were statues with a reduced format, since the supports did not reach 1 metre in height or length,³⁹ except the one in Munigua (Villanueva de Río y Minas, Sevilla).⁴⁰

Conclusions and Cost Assessment

We have observed certain uniformity in the weight of the Spanish metallic sculptures, the majority of them weighing approximately 5 pounds in AV and approximately 100 pounds in AR. Such information and, above all, the characteristics of the pedestals allow us to estimate the size of the statues. Although this could lead us to believe that calculating their costs is relatively easy, we recognise there are serious drawbacks.

For example, the different techniques used to manufacture the sculptures remains unknown.⁴¹ Some of the sculptures could have been hollow pieces, while others were embossed or solid. In other cases it could have been possible that less expensive materials were used as the core, which was then plated with AR or AV (fig. 3). In other words, each type of statue, its size and purpose determined the quantity of metal used and also its final cost.

We have continued studying these aspects because in previous research the available information on labour costs was compared in order to establish parameters, from which the final cost of these statues could be deduced. In this respect the complaint expressed by Marcial (3.62) regarding the high cost of 1 pound of worked AR, for which they had to be paid 5,000 HS. An inscription from *Formiae* (Italy),⁴² involving a weight of 100 pounds of AR for a cart that cost 100,000 HS, has also been taken as a basis for



Fig. 3: Different kind of silver and gold statuary. From the Top/Bottom to Left/Right: *Thoracata* sculpture from *Norba Caesarina* (Cáceres, Spain); Golden Bust of Septimius Severus, from *Plotinopolis* (Didymoteicho, Greece); Silver Bust of Lucius Verus belonging to the treasure of Marengo (Italy); and Silver Bust of Gallien of *Lugdunum* (Lyon, France).

the calculations. According to Duncan-Jones,⁴³ a metal and labour cost ratio of approximately 40:60 is derived from this. However, not even the very weight of the Roman pound is recognised with a unanimously accepted value; according to some authors the pound weighed about 327 g⁴⁴ and according to others 322 g⁴⁵. This difference of 5 g, which seems unimportant, is significant when dealing with large quantities and precious metals, which have a high price.

In our opinion, the calculations carried out have been excessively standardised, because they do not take into account the type or difficulty of the order, the skill of the craftsman, or the price per pound. All of this must have generated fluctuations in the cost. But also variation in the price of the metals according to chronology is also not taken into account. This is something that can be deduced from how the Imperial AV and AR coinage evolved. That is why we have tried to establish an approximate calculation of the cost of both metals in order to have some basic parameters, from which to estimate the costs (tab. 5).

We begin by considering the amount of AR in 1 denarius, taking into account the highs and lows of the Flavian and Antonine periods.⁴⁶ Albeit these are approximate calculations, since a AR coin in the 2nd century AD, after successive devaluations, reached a higher value than the intrinsic one.⁴⁷

The cost of 100 pounds of unworked AR varied considerably: from 36,281 HS after the Domitian reform of 82–85 AD to 73,898 HS at the end of the 2nd century AD. The price range of 100 pounds of unworked AR throughout the 2nd century AD would have been 42,091–73.8 HS and the price range of 100 pounds of AR throughout the 2nd century AD would be HS 42,091–73,898. In addition, the price of manufacturing must be added to this. If we accept Duncan-Jones' calculations⁴⁸ based on the *Formiae* car, the final value of an AR statue in the 2nd century AD would have been between 105,227 and 184,745 HS.

Regarding the cost of a pound of AV, we must bear in mind that the weight of the *aureus* and its purity remained stable from the reform of Nero (64 AD) to that of Caracalla (215 AD),⁴⁹ being around 7.39 g and 99% purity. That is to say, 1 AV pound would have been equivalent to 43/45 *aurei*. From this, it can be deduced that the 5 AV pounds from the statue of Titus in *Augusta Emerita* would have cost between 21,500–22,500 HS.

Chronology	Date	Grams (g) of AR per X	1 Roman pound (327 g)	1 Roman pound (322 g)
1 st century AD	Flavian (69–96)	82–85 = 3,55 g / 1 X	92,11 X = 368,45 HS	90,70 X = 362,81 HS
		69–79 = 2,72 g / 1 X	120,22 X = 480,88 HS	118,38 X = 473,52 HS
2 nd century AD	Traianus	98–99 = 3,06 g / 1 X	106,86 X = 427,45 HS	105,22 X = 420,91 HS
	Marcus Aurelius	161–180 = 2,69 g / 1 X	121,56 X = 486,24 HS	119,70 X = 478,81 HS
	Septimius Severus	193–211 = 1,77g / 1 X	184 X = 738,98 HS	181,92 X = 727,68 HS

Table 5: Estimation of Denarii (X)/Sestertii (HS) per 1 AR Roman pound.

Some inscriptions reveal the price of silver statues whose weight is unknown. For example, in *Nemausus* (Nîmes, France) in the second half of the 2nd century, a *statuam argenteam* with a value of 50,000 HS was placed in the basilica.⁵⁰ Something similar occurred in *Hippo Regius* (Annaba, Algeria),⁵¹ where a statue of AR cost 51,335 HS. We do not know its weight in AR, but in both inscriptions reference is made to the sculpture using the term *statuam*, which was commonly used for honorary statues, those made to the true size or even greater.⁵² If we are right and this was also the same size of the Spanish statues of deities of 100 pounds of AR, the cost of these statues sharply diverges for that given by Duncan-Jones for the price of one worked pound of silver. Perhaps the *Nemausus* and *Hippo Regius* were made mainly of a cheaper material, such as stone, in which case the amount of ar would have been less than in Spanish statues. In fact, we do not believe these two statues were made of solid AR. Therefore, this type of calculation should not be done in a generic way; it is necessary to take into account the type of statue being studied.

It is evident that the Hispanic costs using this material, although approximate, are exceptional, which is even more so if we compare them with the Italian costs, where 53% of the inscriptions refer to weights less than 10 pounds of AR.⁵³

These expenses are more surprising if we compare them to the presumed wealth of the patrons. If most of the Spanish statues cost at less than 50,000 HS, the cost would be more than half of the minimum income possible for a member of the *ordo decurionalis*. In addition, the cost of the base, maintenance, manufacturing and transport would have to be added to this, generating a final figure, according to the calculations mentioned above, close to 100,000 HS. This figure represents a quarter of the minimum income of a member of the *ordo equester* in the Roman Empire.

These large amounts of AR have been associated with intense labour in Hispanic mines⁵⁴ where the donors, descendants of mine tenants, were in possession of ingots;⁵⁵ or had ideological and religious issues.⁵⁶ We believe that this was not the case of AR mines, as the exploitation of mines rich in AV did not have a similar effect. In addition, we must bear in mind that the price of both metals was maintained throughout the Empire controlled from Rome.

We believe that one of the reasons that such large amounts of money were invested in these types of statues is founded on the riches of *Baetica*,⁵⁷ resulting from commercial activity involving wine and oil. Thanks to substantial incomes, the wealthy invested in AR statues as objects that represented themselves, although in theory they were conceived as sacred representations or being connected to honouring the Empire.

Notes

- ¹ Plin. Nat. Hist. 34, 17; Cic. Phil. 9, 10.
- ² Mattusch 2015, 140. 141.
- ³ Højte 2005, 50–64.
- ⁴ Cass. Dio 58, 1.
- ⁵ de Pury-Gysel 2017, 59–60.
- ⁶ de Pury-Gysel 2017, 60.
- ⁷ Jiménez – Rodà 2015, 492.
- ⁸ Mattusch 2015, 150–151.
- ⁹ Fejfer 2008, 25–26.
- ¹⁰ Regarding the silver pieces, the poor conservation of the epigraph prevents us from knowing the exact number of pounds in eight of the cases. We have not counted CIL II, 5210 of Vila Viçosa (Évora, Portugal), nor CIL II, 4626 of *Emporiae* (La Escala, Gerona) since these might not refer to statues.
- ¹¹ CIL II, 3424 from *Tarraco* (Tarragona).
- ¹² Højte 2015, 51.
- ¹³ Oliver 1941, 111 note 24.
- ¹⁴ Suet. Tib. 26; Tac. Ann. 3, 18, 2.
- ¹⁵ Suet. Vesp. 23, 3.
- ¹⁶ Plin. Paneg. 52.
- ¹⁷ CIL II, 1040 from *Curiga* (Monesterio, Badajoz).
- ¹⁸ Stylow 2010 considers this inscription a proof of a sacred place dedicated to the *domus* imperial in *Emerita*.
- ¹⁹ CIL II, 5264 from *Augusta Emerita* (Mérida, Badajoz).
- ²⁰ Duncan-Jones 1974, 93–94 and 163–166.
- ²¹ Højte 2005, 51.
- ²² CIL II, 693 and CIL II, 863.
- ²³ CIL II, 5264.
- ²⁴ We have in preparation an exhaustive work of this imperial dedication.
- ²⁵ Cf. de Pury-Gysel 2017, with information about the characteristics of each bust, its possible function, the amount of av and ar in each one, etc.
- ²⁶ de Pury-Gysel 2017, 64–65.
- ²⁷ de Pury-Gysel 2017, 65–88.
- ²⁸ Mattusch 2015, 141.
- ²⁹ Museum of Cáceres, invent. no. D 2811.
- ³⁰ CIL II²/7, 975.
- ³¹ CIL II²/7, 67.
- ³² Duncan-Jones 1974, 163–166.
- ³³ Wrede 1981.

³⁴ In the inscriptions collected, the most frequent are *Iuno* and *Isis*. The first was strongly associated with the imperial *domus* as a counterpoint to the representation of the emperor as *Iuppiter* (Fejfer 2008, 341). The second can be justified by the widespread presence of the isiac cult in Hispania.

³⁵ Fejfer 2008, 342.

³⁶ Fejfer 2008, 127.

³⁷ CIL II, 324. 358 and AE 1982, 520.

³⁸ Although in *Italica* (Santiponce, Seville) 100 pounds of AR are financed, there are 4 statues for the *Genius Coloniae* (AE 1982, 520), while in *Colonia Patricia* (Córdoba) there are 1,000 pounds for an unknown number, which we suppose to be very high, of sculptures (CIL II2/7, 228).

³⁹ AE 1982, 520; CIL II² 14, 819; CIL II²/7, 227. 228.

⁴⁰ CIL II, 1058. We must be cautious because its poor conservation prevents a clear reading. Melchor 1994, 223 proposes that it was not a statue, but some other object of homage.

⁴¹ Mattusch 2015, 141.

⁴² CIL X, 6102.

⁴³ Duncan-Jones 1974, 126–127.

⁴⁴ Böckh 1838; Sutherland 1976.

⁴⁵ Duncan-Jones 1974; Naville 1920.

⁴⁶ Butcher – Ponting 2014, 701.

⁴⁷ Butcher – Ponting 2014, 25–26.

⁴⁸ Duncan-Jones 1974, 126–127.

⁴⁹ Butcher – Ponting 2014, 705.

⁵⁰ AE 1982, 682.

⁵¹ CIL VIII, 17408.

⁵² Oria 2000, 454; Lahusen 1982.

⁵³ Duncan-Jones 1974, 127.

⁵⁴ Curchin 1983, 231.

⁵⁵ Dardaine 1993, 60–61.

⁵⁶ Melchor 1994, 223–224.

⁵⁷ 22 of 29 inscriptions come from *Baetica*.

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Fig. 1–2: by authors. – Fig. 3, top: Museo de Cáceres: <http://museodecaceres.juntaex.es/web/view/portal/index/standardPage.php?id=104> – Fig. 3, middle left: de Pury-Gysel 2017, 12 fig. 2. – Fig. 3, bottom left: de Pury-Gysel 2017, 148, fig. 128. – Fig. 3, bottom right: de Pury-Gysel 2017, 158 fig. 155. – Table 1–5: by authors.

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Economic and Commercial Aspects of Portrait Statuary from the City of Epidauros and the Sanctuary of Apollo Maleatas and Asklepios (146 BC–3rd century AD)*

Panagiotis Konstantinidis – Marios Mylonas

The Late Hellenistic Period (from the Battle of Leukopetra to Actium 146–31 BC)

As the rest of southern Greece, the city of Epidauros fell irrevocably under Roman rule in 146 BC, after the battle of Leukopetra, fought between the Roman army, led by the consul L. Mummius and the Greek army of the Achaean Confederacy, led by general Diaios.¹ The Epidaurians participated in the battle under Diaios and suffered significant casualties.²

In contrast to the 4th and 3rd centuries BC, the late Hellenistic period is characterized by a relative inactivity towards a steadfast economic decline. Roman rule is inaugurated in the sanctuary of Apollo Maleatas and Asklepios with the reuse by the general L. Mummius of an older monument in the shape of a ship's prow, erected by the Achaean Confederacy, commemorating a naval victory. The statue of a bronze Nike standing on top of it was replaced with a bronze statue of the general.³ The appropriation of a victory monument of the Confederacy by the victor of Leukopetra points eloquently to the transfer of power in the region after 146 BC and the selection of this particular monument must not have been random.

Between the middle of the 2nd century BC to the Antonine period no new buildings were erected in the sanctuary of Apollo and Asklepios, while in the city only the reconstruction of an aqueduct and fountain-house is epigraphically attested (IG IV² 1 26). Recent excavations in the area northwest of the city's theater have unearthed a monumental fountain-house dated to the second half of the 4th century BC, with a later Roman construction phase.⁴ In addition, relics of the pillars of an aqueduct headed in the direction of the theater have survived next to the modern road.

Contrary to building activity, portrait statuary continued to be erected in the sanctuary during this transitional period.

Although the 2nd century BC was a flourishing period for the sanctuary, the number of surviving monuments is limited. Furthermore, the attribution of monuments specifically to the second half of the century, based solely on epigraphic criteria proves extremely difficult, sometimes even impossible. Only eight monuments can be tentatively dated after the battle of Leukopetra until the turn of the century. Despite of these restrictions, some general observations can be made. The economic state of the city remains relatively healthy. Prominent local families are still able to commission votive

portrait statues of members of their family,⁵ while five statues were commissioned by the city and paid by public funds. The Panhellenic popularity of the cult and the games of the *Asklepieia* remained strong as attested by the erection of portrait statues of foreign rulers displayed in prominent areas of the sanctuary by Epidaurian citizens, such as Arcestratos, son of Arcestratos, a *philos* of the king Nikomedes III of Bithynia (IG IV² 1, 591, 128/6–94 BC).⁶ The Epidaurians honor an ambassador to Rome (IG IV² 1, 63, 115/4 BC), and, probably owing to their participation to the local games, an Athenian comedic poet (IG IV² 1, 626, 106–97 BC?),⁷ and a native professional athlete with a significant career abroad (IG IV² 1, 629).⁸

As far as the artistic output of the city is concerned, there seems to be a predilection for bronze statues, while, in continuance with earlier tradition, itinerant artists come almost exclusively from the Peloponnese and Attica. During the second half of the 2nd century BC only four sculptors are epigraphically attested to have worked at Epidauros, Eunous, son of Eunomos, and the Argives Xenophilos, son of Straton, Straton, son of Xenophilos (who sometimes worked in collaboration), and Toron, son of Apellion, who had also worked in neighboring Troizen.⁹ As is known, marble is absent from the geology of the region,¹⁰ so all commissions must be either executed on the spot in imported marble (predominantly Pentelic, and to a lesser extent Parian), or imported ready-made. The latter is probably true for the only surviving portrait statue of the second half of the 2nd century BC. from the sanctuary and the city, that of a priestess in Parian marble, dressed in typical Hellenistic fashion (fig. 1).¹¹

During the 1st century BC a considerable decline in artistic activity is observed in the sanctuary and the city, attributed to specific historical circumstances. The Mithridatic Wars, the Roman Civil Wars, piracy, and the destruction of the free port of Delos for a second time in 69 BC led to the decline and disruption of trade in the eastern Mediterranean, resulting in a considerable economical ineptness of public finances of Greek cities at the last quarter of the century. No renovation works or new constructions are undertaken in the city or the sanctuary, while literary sources inform us of two instances of pillaging of the sanctuary. In 86 BC Sulla, during the first Mithridatic War, removed a large number of statues from the *temenos* in order to further finance his campaign, while later damages in the sanctuary documented by excavations have been attributed to a raid of Cilician pirates around 67 BC, mentioned by Plutarch.¹² Furthermore, Marcus Antonius Creticus, during his campaign against Crete, stationed a Roman guard in the city, forcing the Epidaurians to pay for its sustenance (IG IV² 1, 66, 74 BC).¹³ This considerable decline is mirrored in the production of portrait sculpture. Only a small number of fourteen inscribed bases and sculptures have survived, while the reuse of earlier monuments is prominently attested. The number of dedications made by prominent families considerably declined, with only six attested examples of bronze statuary, erected upon bases and already existing *exedrae*, now re-inscribed.¹⁴ The pillaging of Sulla had probably left a lot of monuments free of their bronze statuary, now available for reuse.



Fig. 1: Epidauros Museum, without inv. no. Portrait statue of a priestess in Parian marble from the city of Epidauros.

Public dedications are almost equal in number to private ones with only eight securely dated examples. Not surprising is the fact that from them at least three can be placed with certainty to the first half of the century. Prominent male and female citizens continue to receive public honors.¹⁵ Surviving sculptures are rare but of high quality (all in Pentelic marble). A characteristic example is the cuirassed statue of a general unknown to us (later reused).¹⁶ Special cases are, on the one hand, the erection of a bronze statue of the historian Philipp from Pergamon (IG IV² 1, 687),¹⁷ who probably toured Greek cities, reciting his work in local festivals, and, on the other hand, the erection of the bronze equestrian statue of Aristoboulos, son of Xenodokos (IG IV² 1, 630), the only one ever attested in the sanctuary, work of the Athenian Timodamos, son of Demetrios.¹⁸ During this period only one other sculptor is epigraphically attested to have worked in Epidauros, Dion, son of Damophilos from Argos.¹⁹

31 BC – 1st Century AD

During the 1st century AD the economic revival of the city is mirrored in the overall forty-four portrait statues commissioned in both the city and the sanctuary. Surviving portraits fall into two main categories. Honors bestowed on members of the Julio-Claudian Imperial family,²⁰ and honors bestowed on members of the two most prominent local families, the Statilii, and the Claudii – Corneli.²¹ As attested by their names, their members were Roman citizens and can be tentatively identified with some at least of the five portrait statues of *togati* unearthed so far in the sanctuary and the city.²² Not surprisingly, there are case when members of these two elite families commissioned portrait statues of the Imperial family. For one of the statues of Agrippina the Younger, an older base of the portrait statue of Thearidas, the son of Lycortas, brother of Polybios, was reused, while the same base was later recycled for the third time for a portrait statue of Statilia Messalina, the third wife of Nero, paid by Statilia Timosthenis, a member of the Epidaurian branch of the Statilii family (fig. 2).²³ The non-removal of the older inscriptions indicates that the statue was positioned appropriately so that they would not be visible. To the reign of Nero is also dated an impressive female portrait statue in Pentelic marble,²⁴ while to the reign of Caligula or Claudius can be dated two other surviving sculptures from the city of Epidauros, a fragmentary female portrait statue (fig. 3),²⁵ and a probably funerary relief of a youth in the ‘Hermes Richelieu’ type (fig. 4).²⁶

To sum up, although no artists’ signatures have come down to us dating from this period, the prevailing use of Pentelic marble in the sanctuary and the city probably points to Athenian artists working in the area.

(P. K.)

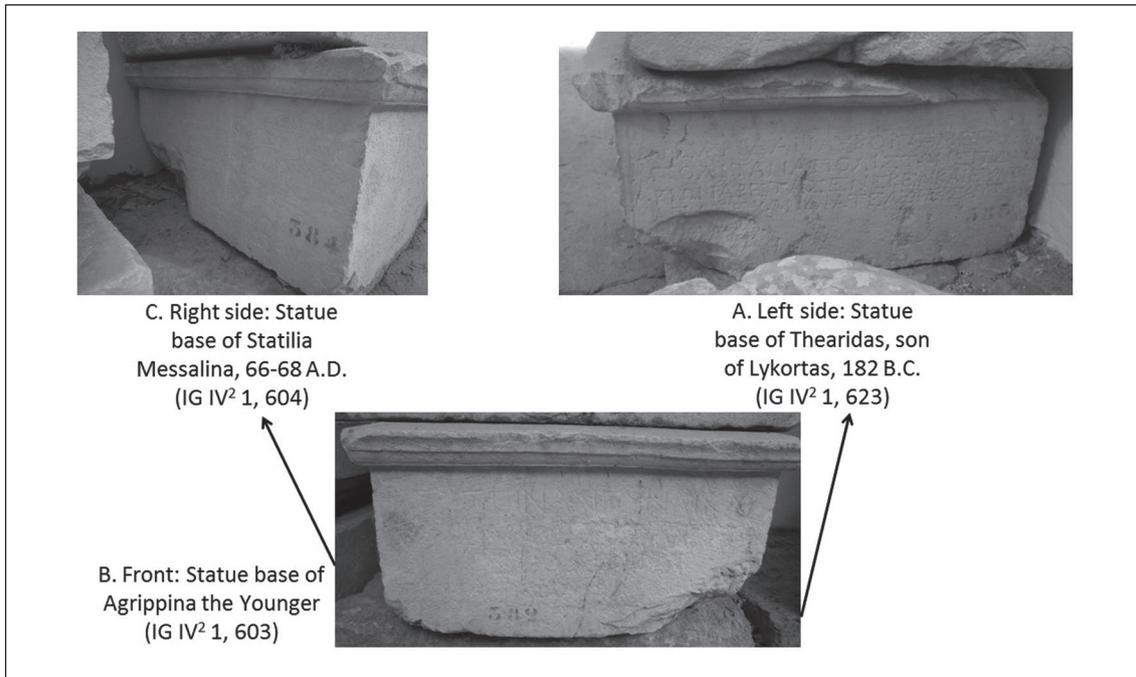


Fig. 2: Epidauros Museum. Base for the portrait statues of Thearidas, son of Lycortas (inv. no. 385), Agrippina the Younger (inv. no. 382) and Statilia Messalina (inv. no. 384).



Fig. 3: Epidauros Museum, without inv. no. Female portrait statue from the city of Epidauros.



Fig. 4: Epidauros Museum, without inv. no. Funerary relief of a youth in the “Hermes Richelieu” type.

2nd Century AD

Hadrian visited the Asklepieion of Epidauros during his first trip to the Peloponnese in 124 AD.²⁷ The only documentation that remains from his visit is a reform of the calendar system, according to which the day of the Imperial visit marked the beginning of a new calculation of dating. It is also possible that on this occasion Hadrian made a reform of religious offices in the sanctuary.²⁸ During these years there was not much building activity. However, statues were consecrated in honor of the emperor, greeted him emphatically as *σωτήρ* and *οἰκιστής*.²⁹

A fragmented portrait of Hadrian (fig. 5), of Rollockenfrisur type, probably was part of a statue that commissioned on the occasion of Hadrian's visit in 124 AD (or a little later, considering the engraved pupil and iris).³⁰ Wegner believed that it was created in Rome, though it is more likely to be a product of a Corinthian or a local workshop. Comparing the Epidaurian head to other Rollockenfrisur portraits of Hadrian from Greece, as those from Piraeus³¹ and Chania,³² we observe that it lacks in quality (fewer details in hair arrangement, low relief in beard, fleshy cheeks), while it is more differentiated from the Roman models.



Fig. 5: Epidauros Museum inv. no. 22. Portrait of Hadrian.

A Cuirassed torso possibly belongs to an honorific statue of Hadrian that was dedicated at the sanctuary in the 130s (fig. 6).³³ It is made of Pentelic marble and presents the emperor with a paludamentum and a breastplate decorated with a Gorgon's head and two panthers on both sides of a floral motive integrating an old man's head with horns (Rankengottheit). The rear view of the torso is summarily executed, while some details have been rendered coarsely. A similar statue at Athens,³⁴ which is considered as the model for the Epidaurian torso, has a thoroughly executed front side and relief decoration on the back (consisting of two griffins on both sides of a candelabra). Its superior quality is evident, which leads us to the supposition that the Athenian statue has been copied by a less skilled sculptor, possibly related to a local workshop.

The above-mentioned statues indicate that local workshops were active in Epidauros from Hadrian's time onwards, possibly occasionally staffed by sculptors trained in other sculptural centers of the Peloponnese (Corinth, Argos). A sculptor named Theophilos was probably active during this period, as indicates the inscribed base for the statue of Pythokles, an executive cult official of Asklepios.³⁵ Theophilos must have been a local artist, since there is no evidence of his activity in other areas. Unfortunately, no other inscription from the sanctuary or the city mentions either a local or a foreign artist. However, the activity of local workshops is indicated by the existence of unfinished and re-worked statues, like the statuette of Apollo³⁶ that was created during Hadrian's reign (or shortly thereafter) and repaired in a later period. The activity of local workshops during the Antonine period did not exclude imports from Athens, like the table support with a marble statue of Eros,³⁷ while commercial relations are evidenced by the fact that the vast majority of Epidaurian sculptures were carved in Pentelic marble.

After the mid-2nd century AD, Pausanias refers to a Roman senator, Antoninus, who made in his own day a bath of Asklepios and a sanctuary of the gods they call Epidotai. Antoninus is to be identified with Sextus Iulius Maior Antoninus Pythodorus, a wealthy notable from Nysa on the Meander, in Asia Minor. His interventions in Epidauros suggest the existence of a well-concerted plan of reconstruction of buildings, rituals and religious practices.³⁸ No portrait can be safely associated with this donor, though a limestone inscribed base (where he is called *ἐὐεργέτης*) shows that he was honored with statues.³⁹

3rd Century AD

The activity of Epidaurian workshops continued uninterrupted in the 3rd century AD, as shown by a fragmented unfinished male head (rear side with part of the nape is preserved).⁴⁰ This fragment confirms that large-scale works were included in the products of local workshops. Dedication of incomplete works (perhaps due to financial hardships) is confirmed in other instances, like an unfinished statuette of Asklepios, which is dated at the early 3rd century AD⁴¹. A little earlier (198 AD), as epigraphic data



Fig. 6: Epidauros Museum inv. no. 15. Cuirassed torso of an emperor.

shows, bronze statues of Septimius Severus, Julia Domna and Caracalla were erected at the sanctuary,⁴² while a pedestal of the latter was reused subsequently for a statue of Severus Alexander.⁴³

An important work of the late Severan era is a portrait of a mature bearded man, made of Pentelic marble, that possibly represents an intellectual (fig. 7).⁴⁴ Its high quality and the absence of provincial traits suggest a connection with an Attic workshop.⁴⁵ The facial features recall the characteristics of the so-called Macrinus in Copenhagen,⁴⁶ while the closely cropped hair is comparable to that of some late portraits of Caracalla.⁴⁷ On the contrary, a product of a local workshop should be considered the marble bust of a mature bearded man wearing chiton and himation, from the City of Epidauros, which is dated at the early Severan era (fig. 8).⁴⁸ This work integrates stylistic patterns from contemporary Attic works, though the execution of specific characteristics (eye asymmetries, sagging earlobes, indistinct outline of the lips) reveals its provincial origins.

In the majority of cases, money for the erection of honorary statues for emperors and individuals were offered by the *ἱερά τῶν Ἐπιδαυρίων πόλις*, sometimes in return for their substantiated virtue and support (*ἀρετᾶς ἔνεκεν καὶ εὐνοίας*).⁴⁹ The use of sacred funds for the financing of civic honors⁵⁰ is attested in Epidauros in three honorary inscriptions for Severus Alexander, Furia Sabina Tranquillina, and Trebonianus Gallus.⁵¹ In these cases the statues were paid *ἐκ τῶν ἱερῶν χρημάτων*, while the above-mentioned statues of Septimius Severus, Julia Domna and Caracalla were paid *ἐκ τῶν ἱερομνημονικῶν πόρων*.⁵² Officials called *hieromnemes* are attested in various Greek cities, where they were involved in the administration of sanctuaries, managing the sacred properties and collecting taxes and fines. Moreover, they could take charge of the execution of honorary decrees as long as the expenses were covered by the *hieromnemonikoi poroi* (special funds administered by these sacred officials). Finally, honorific statues were erected also by private individuals, occasionally with the approval of the Epidaurian *βουλή* and *δῆμος*.⁵³

The study of Epidaurian portrait statuary so far reveals the absence of stylistic homogeneity, so despite the fact that the majority of statues are carved in Pentelic marble, only few of them can be attributed to an Attic workshop. The relations between the artists who worked at Epidauros and workshops of neighboring areas remain unclear, however it is certain that local workshops were active in the area of the Asklepieion as early as the 1st century AD, as unfinished and repaired works imply. Extensive was the recycling of material throughout the Roman period, especially concerning statue bases that were rededicated with the addition of a new inscription. Doubtless, several issues regarding the activity of local workshops remain unsolved or pose additional questions, so further research is needed to clarify these matters.

(M. M.)

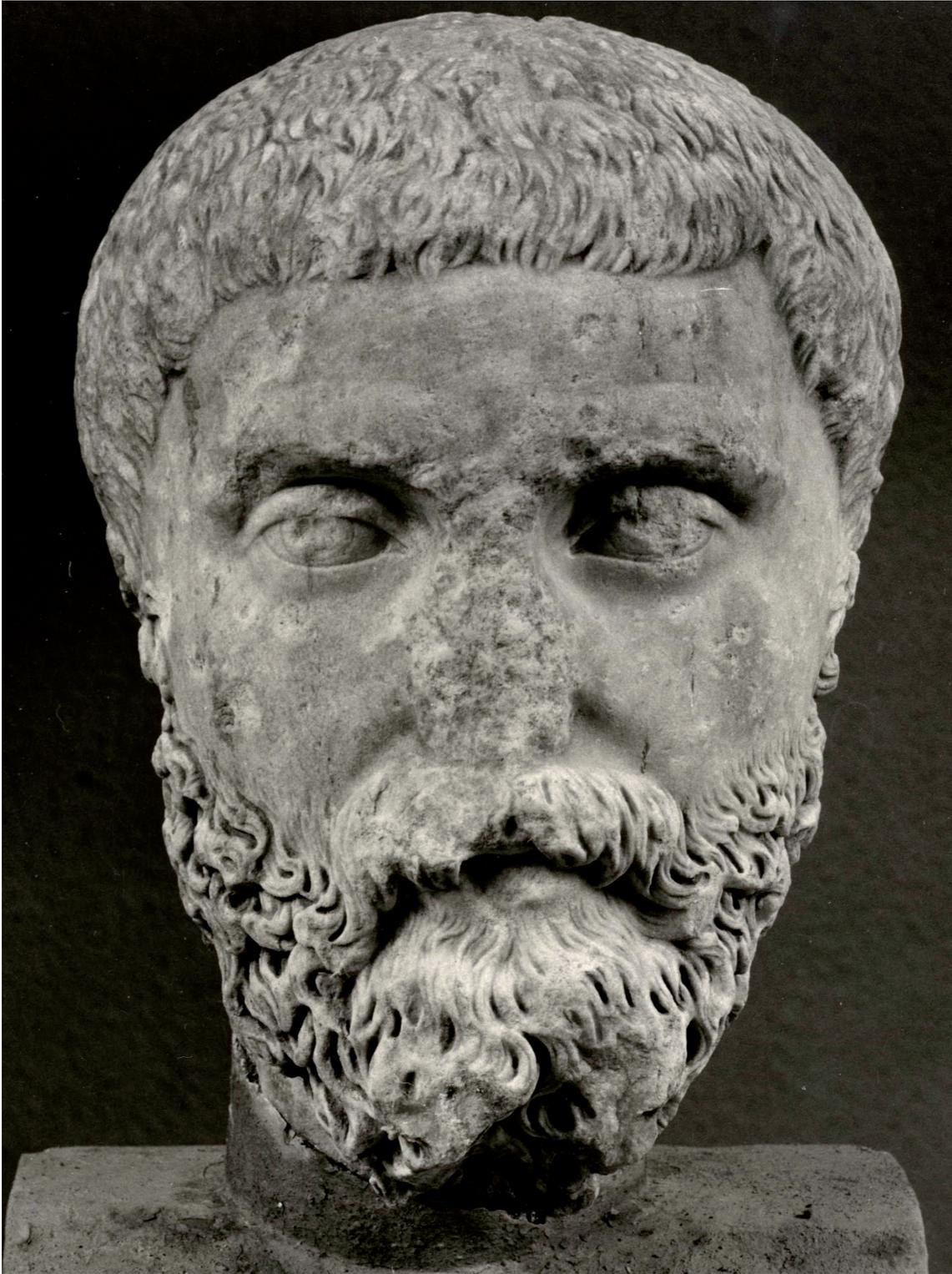


Fig. 7: Epidauros Museum inv. no. 21. Portrait of a mature bearded man.



Fig. 8: Epidauros Museum inv. no. 546. Bust of a mature bearded man.

Notes

* This article stems from the ongoing research project of the University of Athens concerning the study of sculpture from the city of Epidauros and the sanctuary of Apollo Maleatas and Asklepios, led by Associate Professor in Classical Archaeology S. Katakis.

¹ Nottmeyer 1995, 146–160; Kralli 2017, 369–398.

² Casualties list: IG IV² 1, 28; Proskynitopoulou 2011, 57.

³ IG IV² 1, 306A–D; Griesbach 2014, 59. 60, pl. 10a–b.

⁴ Lambrinouidakis et al. 2016.

⁵ IG IV² 1, 227, 229, 231 (?).

⁶ Vitucci 1953, 97. 98; Fernoux 2004, 62. 64.

⁷ Austin 1974, 210, no. 93.

⁸ Also IG IV² 1, 637; Peek 1972, no. 85.

⁹ See Kansteiner et al. 2014, nos. 3769–3772, 3779, 3780, 3787 and 3774–3777 respectively. The career of Philokles, son of Kallikrates from Megalopolis (Kansteiner et al. 2014, no. 3792) cannot be placed with certainty in the second half of the 2nd cent. BC.

¹⁰ Kokkorou Alevra et al. 2014, nos. 570–592.

¹¹ Unpublished.

¹² Plutarch Pompey 24; Melfi 2007, 67–70. 81. 82; Proskynitopoulou 2011, 57–58.

¹³ Melfi 2007, 68–70.

¹⁴ IG IV², 212. 220. 223. 224. 232 (in the early 1st cent. BC, the signature of the sculptor Dion, son of Damophilos, was added to the exedra – see Kansteiner et al. 2014, no. 3773). 234; Melfi 2007, 67.

¹⁵ IG IV², 65/630 (see also note 18), 66/657 (see also note 13), 631. 646. 647–649. 658. Also note 16 (cuirassed statue).

¹⁶ Katakis 2002, 114–115. no. 124. pls. 137–139.

¹⁷ Katsagani 2015, 252–256, no. E65.

¹⁸ Kansteiner et al. 2014, no. 3725 (early 1st cent. BC).

¹⁹ See note 14.

²⁰ Melfi 2007, 73–74; Konstantinidis 2016, nos. A.β.16. 17, H.β.4, Z.β.6. 7, ΛE.β.8 (female members of the imperial family). See also note 23.

²¹ Melfi 2007, 74–82 passim; Proskynitopoulou 2011, 58, n. 289. Also Rizakis 2001.

²² Katakis 2002, nos. 118. 119. 121. 123; Havé Nikolaus 1998, 116, no. 15.

²³ IG IV² 1, 623 (182 BC); Konstantinidis 2016, nos. Z.β.8 (reign of Claudius) and IB.β.2 (66–68 AD), respectively.

²⁴ Katakis 2002, 104. 105, no. 111, pls. 114–116.

²⁵ Unpublished.

²⁶ Maderna Lauter 1988, 229–230, no. H6; Sporn 2012/2013, 283. 284, fig. 24.

²⁷ Kornemann 1905, 48–49; Melfi 2007, 83; Lo Monaco 2014, 29.

²⁸ Melfi 2007, 83–85; Melfi 2010, 331. 332.

²⁹ IG IV² 1, 606. Cf. IG IV² 1, 607; Peek 1972, 42. 43 no. 77.

- ³⁰ Epidauros Museum 22. Wegner 1956, 96; Vermeule 1959, 56–57 no. 196; Vermeule 1968, 391 no. 5; Zoridis 1982, 121–122 figs. 5, 6; Fittschen – Zanker 1985, 50 no. 16; Evers 1994, 108, 109 no. 36, 233, 237, 239; Katakis 2002, 97, 98 no. 99 pl. 108e–f, 155–156.
- ³¹ Piraeus Museum 1197–1199. Vermeule 1968, 391 no. 3; Zoridis 1982, 115–121 figs. 1–5; Evers 1994, 153 no. 92 fig. 16; Karanastasi 2013, 327, 328, 365, 366 no. 23 pl. 7.
- ³² Chania Museum 82. Wegner 1956, 40, 62, 95; Vermeule 1968, 391 no. 7 fig. 136; Fittschen – Zanker 1985, 49–51 no. 15; Evers 1994, 98, 99 no. 24 fig. 6.
- ³³ Epidauros Museum 15. Hekler 1919, 225–226 fig. 152; Stemmer 1978, 123–124 note 349, 171 no. 146; Katakis 2002, 116–117 no. 125 pls. 140–142, 157–158, 283–286, 315; Laube 2006, 125 pls. 53.3–5, 54.1.
- ³⁴ Athens, National Museum 1667. Kastriotis 1908, 295–296; Hekler 1919, 226 fig. 153; Katakis 2002, 284–286 no. 6 pls. 143–145; Laube 2006, 125 pl. 53, 1, 2.
- ³⁵ IG IV² 1, 460. Schörner 2003, 356 no. 497; Kansteiner et al. 2014, 588 no 4193.
- ³⁶ Athens, National Museum 305. Kastriotis 1908, 69; Schmidt 1966, 34, 35 pls. 50a–b, 51a–b; Katakis 2002, 44 no. 41 pl. 49, 163, 230–231, 316.
- ³⁷ Epidauros Museum 226a, 226, 315. Stefanidou-Tiveriou 1993, 114, 115, 271, 272 no. 110 pl. 58; Katakis 2002, 125, 126 no. 138 pls. 153, 154, 164, 165, 246, 247, 291, 292, 317.
- ³⁸ Paus. 2, 27, 6, 7. Cf. Melfi 2007, 99–101; Melfi 2010, 334–339.
- ³⁹ IG IV² 1, 684. Peek 1969, 298.
- ⁴⁰ Epidauros Museum 576. Katakis 2002, 103, 104 no 110 pl. 110d–e, 313, 314.
- ⁴¹ Athens, National Museum 296. Cavvadias 1891, 22 pl. 9.24; Kastriotis 1908, 68; Meyer 1988, 141, 142 no. LE7 pl. 19.4; Katakis 2002, 8, 9 no 5 pl. 6, 183, 184, 314, 315.
- ⁴² IG IV² 1, 610. Cf. Peek 1969, 262.
- ⁴³ IG IV² 1, 612. Cf. Peek 1969, 264 I (211–217 AD), II (222–235 AD).
- ⁴⁴ Epidauros Museum 21. Katakis 2002, 99, 100 no 103 pl. 111, 180, 274, 306, 307, 326.
- ⁴⁵ For the resemblance of Attic portraits of this period with metropolitan (Roman) works, cf. Fittschen 1969, 236.
- ⁴⁶ Ny Carlsberg Glyptotek 820. Poulsen 1974, 138–140 no. 138 pls. 220, 221; Johansen 1995, 44, 45 no. 13.
- ⁴⁷ Fittschen – Zanker 1985, 110, 111 no. 94 pls. 115, 116 Beil. 78–80.
- ⁴⁸ Epidauros Museum 546. Doga-Toli 1992/1993, 324–336 figs. 1–4.
- ⁴⁹ IG IV² 1, 660, 688. Peek 1972, 80, 87.
- ⁵⁰ Camia 2017, 109–146 (esp. 126–128 with table 4.2).
- ⁵¹ IG IV² 1, 612, 613, SEG 31, 329.
- ⁵² IG IV² 1, 610. Cf. Peek 1969, 262.
- ⁵³ IG IV² 1, 686, 692.

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**Farmhouses in Macedonia from the 4th Century BC
until the Roman Era:
Rural Landscape and Rural Economy**

Panel 3.21

Organized by

Evangelia Stefani – Polyxeni Adam-Veleni

Family-oriented Farms Along via Egnatia. The Case of Ancient Lete

Katerina Tzanavari

One of the cities of Macedonia listed by Claudius Ptolemaeus (Geography 3, 12. 23) and Pliny the Elder (N.H. V, 10, 17) in the Imperial age is Lete. Although the ancient authors provide little information about this Mygdonian town, inscriptional evidence and archaeological research led to its location 12 kilometres NW of Thessaloniki. The city and its cemeteries sprawled over the hills of the Derveni pass and the western part of the fertile plain of Langadas. This strategic position on two main roads – leading from the Aegean into the central Balkans and linking the Thermaikos Gulf with eastern Macedonia – justifies the long, continuous habitation of the site, from the Middle Neolithic period. As with the other cities of the Macedonian kingdom, here too, the Roman occupation began with the defeat of its last king, Perseus, at Pydna (168 BC) and acquired a legal and systematic character 20 years later, with the establishment of the Roman province of Macedonia (148 BC).¹

The key factor in the city's economic development in the Roman age was its position on the Via Egnatia, the great Roman road running from the Adriatic Sea through northern Greece to the Bosphorus.² Gnaeus Egnatius, the Roman proconsul of Macedonia, ordered its construction in the late 140s BC. This great road, apart from serving military needs, also facilitated the movement of trade and cultural goods and the settlement of Romans along its length. Another factor in Lete's prosperity was the immediate proximity of Thessaloniki, which was the seat of the provincial governor and the province's most important centre for maritime and overland trade.³ Throughout its history, Lete controlled an extensive agricultural *territorium*, from which it derived much of its wealth. As research has repeatedly shown, cities cannot flourish without a substantial agricultural surplus to supply their markets.

The strategic place occupied by Lete in securing the province's northern borders is attested by the civic decree honouring the Roman officer Marcus Annius, whom the city honours with a wreath and the organisation of games along with other benefactions, 119/118 BC. The decree explains that he had driven back the Galatians, who were invading the province, and during a second attack had inflicted upon them a shattering defeat.⁴

There are also inscriptions documenting Roman business activity in the city. Roman *negotiatores*, who are named in Greek inscriptions as *Ῥωμαῖοι συμπραγματευόμενοι* or *Ῥωμαῖοι πραγματευόμενοι*, choose to settle in cities with an existing civic organisation and a stable economic system. While most of the evidence from Lete date from the Imperial period, merchants and businessmen, both Roman citizens and freedmen, seem to have begun settling in and around the city before the end of the Republic era, and, adopting Greek as their language, to have set up banks and commercial activities and

acquired land.⁵ Their arrival modified the demography of the place and led to the emergence of the new elite comprising both native Greeks and Roman settlers. This local aristocracy is associated with creations of an elite art depicting and naming important local personalities.⁶ Their incorporation into the social and political life of the city is attested by their presence at the gymnasium, their assumption of public office and their benefactions towards their new homeland. Inscriptions from Lete, especially from the 1st–2nd century AD, record the *gentilicia* of many Italian-Roman families, such as the Salarii, the Alfidii, the Annii, the Eppii, the Fabii, the Muttanii and the Pomponii.⁷

Further evidence of the Roman presence in the area appears to be furnished by four farmhouses, built within a short distance of one another (ca. 350 m.), which came to light during the construction of the modern Via Egnatia (fig. 1). Their excavation was a salvage process, and thus necessarily limited and incomplete.⁸

The earliest of these four dwellings was Farmhouse C (690 m²), whose two wings and other spaces were arranged around a central and a smaller courtyard (fig. 2).⁹ It is clear from the finds that Wing A, which contained dining and reception rooms and had a second storey, was the main house. Wing B served the rural economy. Fragments of pithoi on the southwest side link it with the processing and storage of agricultural products.

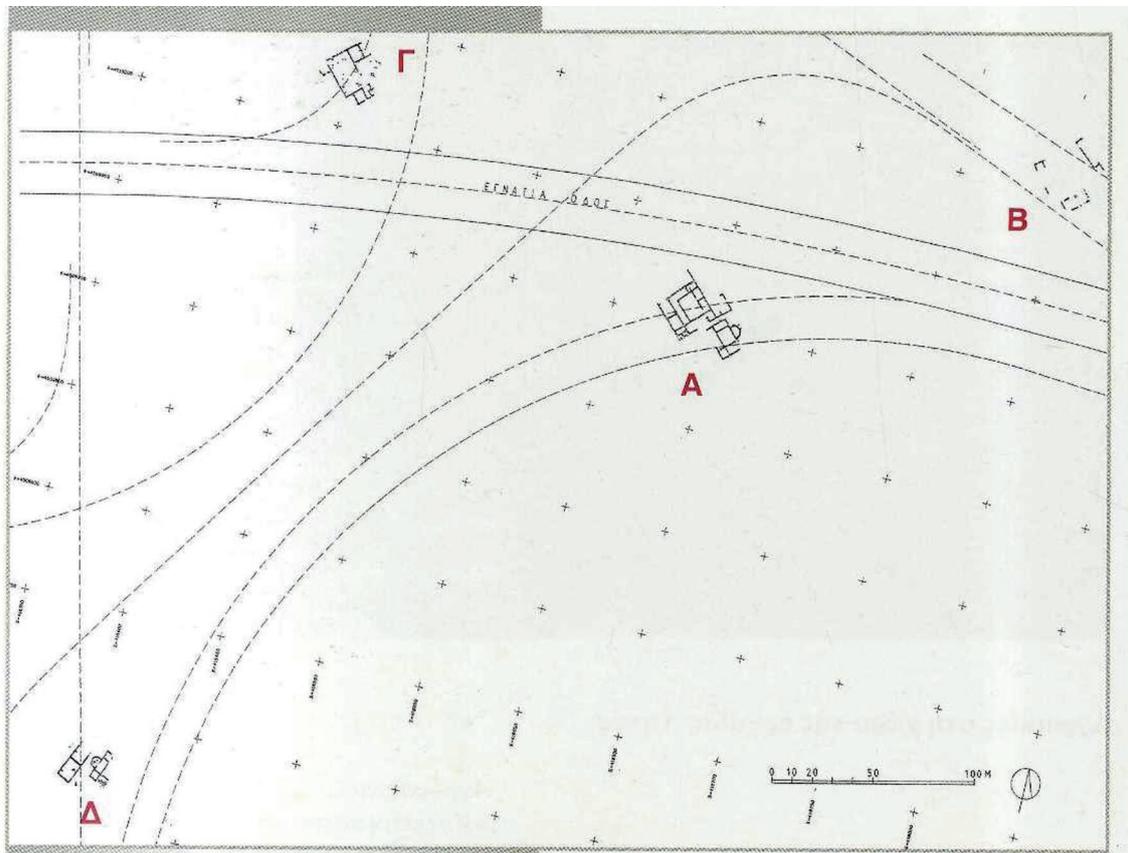


Fig. 1: Lete. Plan with the sites of the four country houses.

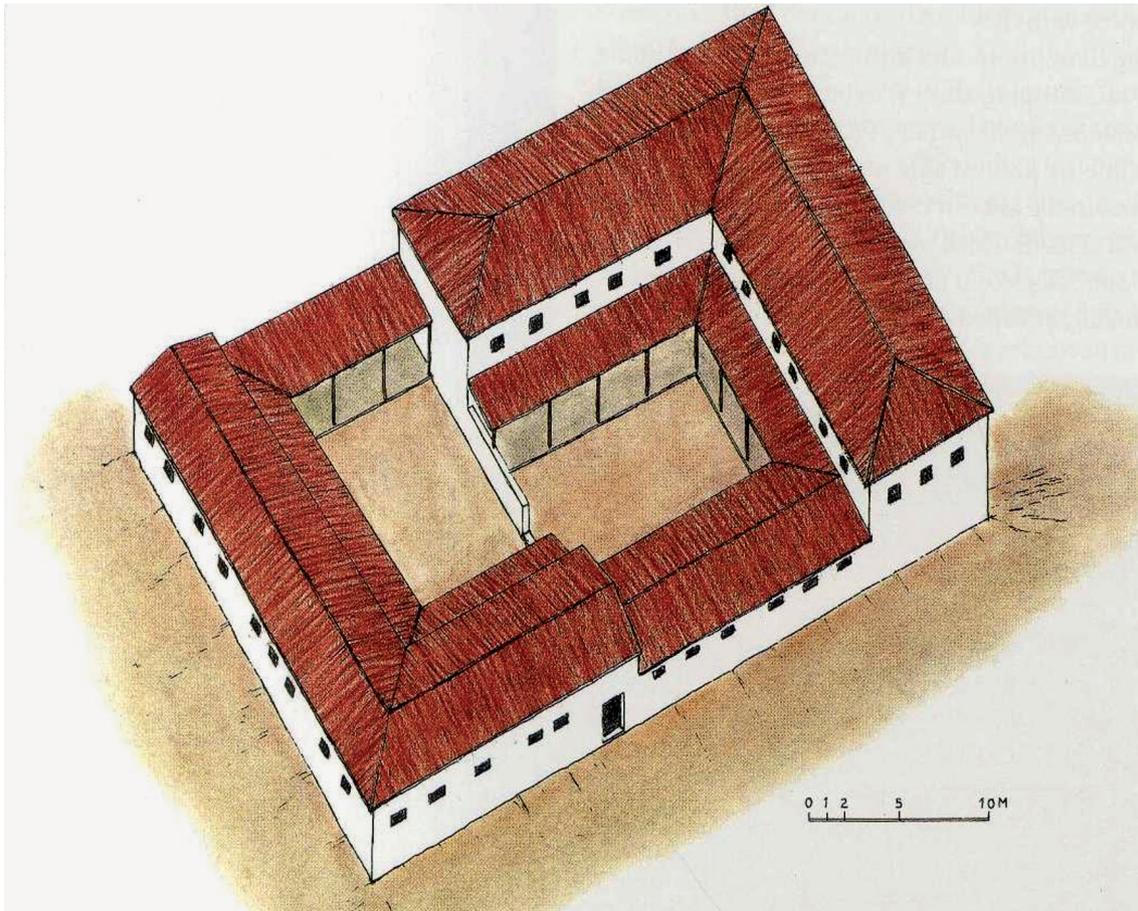


Fig. 2: Country House C. Graphic reconstruction.

The establishment of this farmstead in the late Hellenistic period coincides with the first arrivals of Roman settlers in the area. Its abandonment, around the middle of the 1st century BC, is probably connected with the civil wars between the armies of Julius Caesar and Pompey (49–48 BC) or Antony and Octavian (42 BC), which were fought in northern Greece. The disastrous effects of those wars are evident in other Macedonian cities as well.

Farmhouse B (430 m²) appears to have been in use during the period between the end of the 1st century BC and the end of the 1st century AD (fig. 3). Its main courtyard is flanked by two rectangular rooms. However, the fact that fragments of wall paintings with floral motifs were found in the lower decorative zone identifies the room on the west side as belonging to the main house (fig. 4).¹⁰ The fact that the same decorative system occurs at Pompeii and elsewhere suggests a western influence.¹¹

Farmhouse D belongs to the period between the middle of the 3rd and the end of the 4th century AD.¹² Here excavation revealed a larger homestead with two separate auxiliary buildings, one a triclinium (207 m²) and the other a two-roomed building (150 m²)

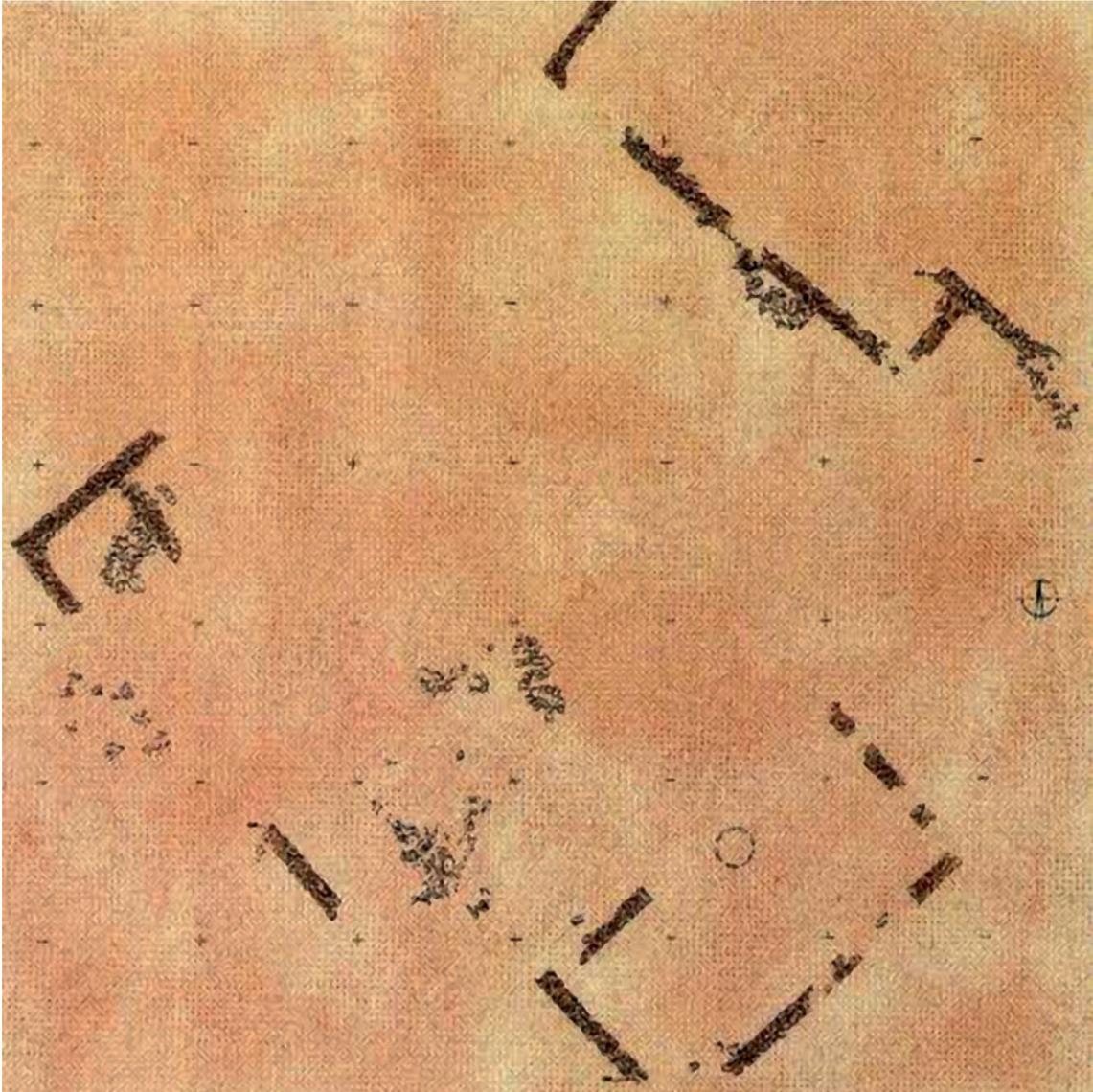


Fig. 3: Country House B. Plan.

(fig. 5). The discovery of the simultaneous burial of a pair of horses outside of the triclinium and of a warhorse inside the oblong building enables us to identify the latter with the horses' stable. Examination of the skeletal remains of the pair of horses showed them to have been male packhorses of about 15 years old, a type of animal that played an important role in economic life and land transport. From written sources, we know that large farms had stables for raising horses, mainly as draught animals.¹³

The most important finds relating to the management of the wealth produced by farming activities, however, came from Farmhouse A (total area 808 m²), which was more extensively excavated. This farmhouse was built in the middle of the 2nd century



Fig. 4: Country House B. Plasters with floral motifs.

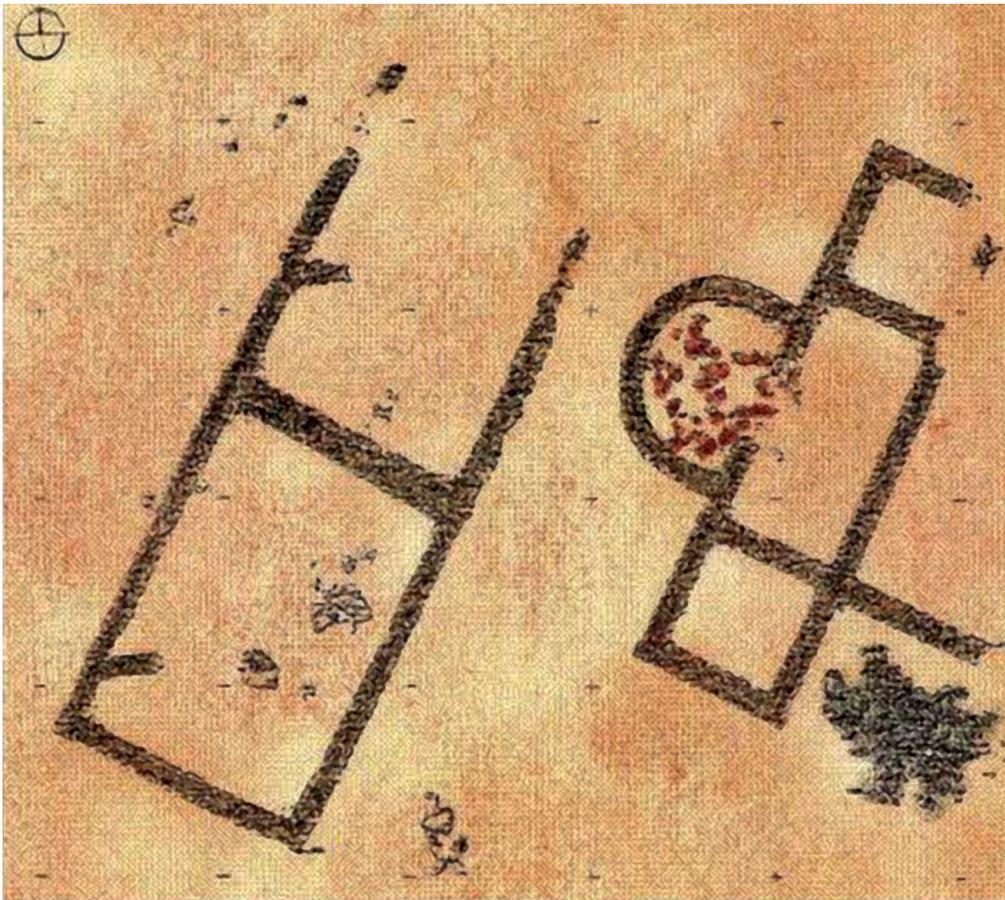


Fig. 5: Country House D. Plan. Stable and triclinium.

and abandoned temporarily a hundred years later, as indicated by the concealing of a hoard of coins of the emperor of Gordian III and his wife Tranquillina (238–244 AD).¹⁴ This is connected with the invasion of Goths and Herulians (267 AD), a time when many agricultural farms in ancient Greece were destroyed.¹⁵ Later, the house was repaired, and a triclinium (248 m²) added for receiving guests and holding banquets. It then survived until the end of the 4th century, when was finally abandoned because of a new wave of barbarian raids. In the main building (460 m²) the arrangement of rooms around a central court follows the standard pattern of the typical Greek house (fig. 6).¹⁶ But it also meets the specifications for Roman farmhouses laid down by the Roman architect Vitruvius in his treatise *De Architectura*.¹⁷ Thus, the residential part of the farmhouse occupies the north wing, while the south wing is set aside for activities connected with farm work. A continuous passageway flanks the central court and gives access to the stairway leading to the upper storey. The living and dining rooms of the house were thus quite separate from the areas associated with rural economy, the storage and the processing of agricultural products. These activities were housed in the west wing too, which had its own entrance, with a gate wide enough (3.50 m) for the transporting of items and for a farm cart pulled by a pair of animals to pass through. Also, we can assume that domestic animals were kept in the rectangular area to the west. Finally, the

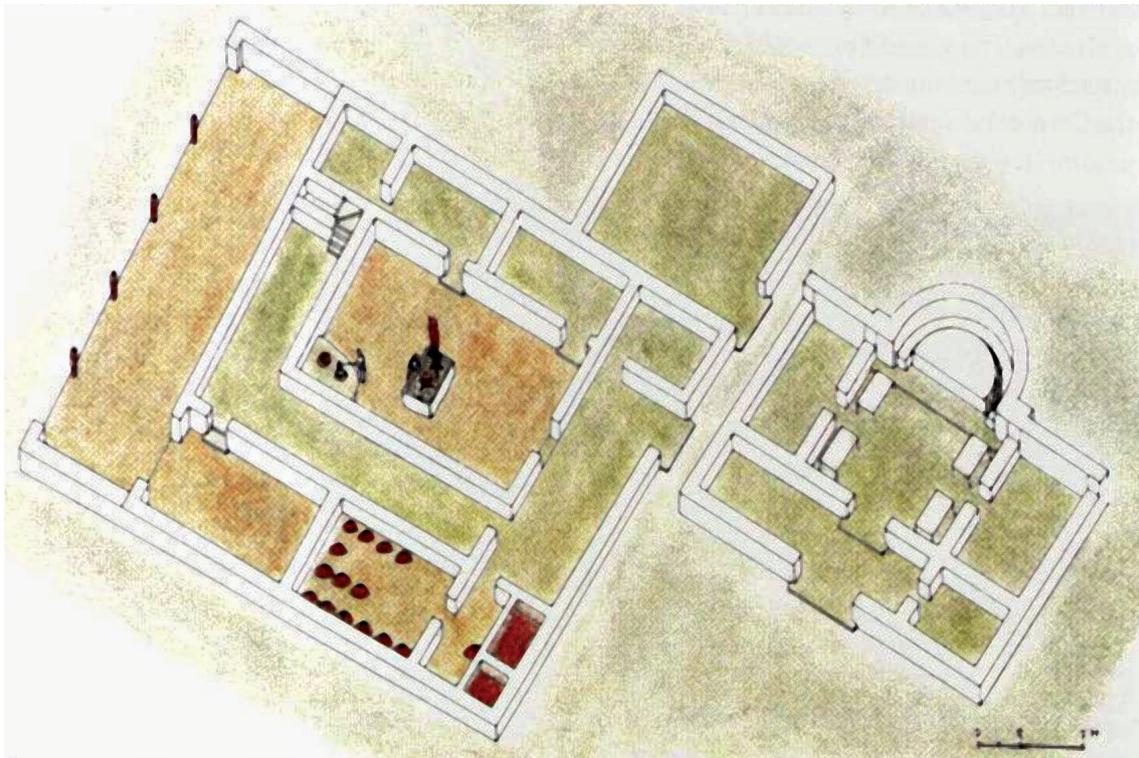


Fig. 6: Country House A. Plan. Axonometric drawing of the second building phase (late 3rd - 4th c. AD).

square room on the northeast side, with a separate entrance, was probably the kitchen of the villa.¹⁸

The archaeological evidence indicates that this farm's economy was based on household production, mainly agriculture and animal husbandry. Its economic activity was directed towards full and organised exploitation of the natural resources of the region, with the supplying and processing of raw materials. The farm buildings were equipped with everything needed to support this domestic economy, both in permanent installations and portable tools and utensils. Grain was ground in a semi-circular construction¹⁹ in the southwest corner of the court, with hand operated rotary millstones.²⁰ The hearth, placed in the centre of the court, was used for cooking or heating meals, which, judging by the wide variety of ceramic vessels must have been remarkably lavish.²¹ The items found here included cooking pots with lids, dishes and handles of frying pans, with visible traces of soot.²²

The primary processing of agricultural produce at Farmhouse A is confirmed by the discovery of a wine-making cistern for crushing grapes and extracting the must. The wine cistern, an essential piece of the farm equipment, was found in the east wing.²³ The cistern (1.60 × 4.80 m) had two compartments, lined with strong hydraulic mortar. The sloping floor allowed the must to run off, through lead pipes, into a portable vessel placed beneath it.²⁴ The small size of the cistern suggests a limited production, for family consumption. Once collected, the must was transferred into underground clay pithoi (*dolium defossum*) for fermentation. Storage jars were found arranged in rows in the wine cellar. The traditional Mediterranean triad of wheat, olive oil, and wine was supplemented by the cultivation of fruit, vegetables and pulses, while the household also made use of the forest, from which they harvested fruits and timber. The tools that were found, iron pickaxe and an axe, were used for these two purposes – cultivating the land and cutting wood. Another find associated with farm produce, was a marble mortar with a stone pestle, suitable for crushing grain, pulses and herbs.

The meat and milk required by the household were obtained from the sheep and goats they raised, an activity still practised by the local population today. Surplus milk was used to make white cheese, a common rural craft.²⁵ This activity is indicated by perforated vases of local manufacture for the production of cheese (fig. 7).²⁶ The holes are arranged in horizontal rows over the entire surface of the vase, down to its base. It is thought that the clay played an essential role in cheese-making, as an inert material that could prevent spoilage. A larger vessel of the same type found at Pharsala, in Thessaly, is thought to have been used for the same purpose,²⁷ while the same process using similar vessels persisted into the modern times.

Fishery products also accounted for a significant proportion of the household's diet.²⁸ Various species of fish and eels could be obtained from the nearby lakes of Koroneia and Volvi. Some clay loom weights that were found in the farmhouse were probably also used as weights for fishing nets. The consumption of shellfish, as *cerastoderma glaucum* and *murex trunculus*, a luxury food in the ancient world, is attested by the shells found



Fig. 7: Country House A. Perforated vases for the production of cheese, 3rd cent. AD.

at the site.²⁹ Additional meat was obtained from hunting in the hilly country north of Lete, where deer and wild boar were abundant. The tusks and bones found at the farmstead³⁰ suggest that boar was indeed a common prey.

In sum, it seems fair to say that the economy of this farm was based on a variety of activities: agriculture, viticulture and wine-making, animal husbandry, fishing, weaving and ceramic production. These activities, which have been attested elsewhere as well,³¹ were clearly intended to ensure the self-sufficiency of the household, and they express the traditional value system of the aristocratic class.³²

The data yielded by the archaeological investigation, namely the size of the villas, the luxurious decoration of the reception rooms, with their marble cladding and wall paintings, the separation of uses in different buildings, the triclinia³³ and the stables, suggest that these were permanent residences providing a very comfortable lifestyle. This is further borne out by the use of fine imported tableware (fig. 8),³⁴ glass vessels and bone small items of everyday use.³⁵ Similarly, the transport amphorae from places, like Tunisia and the northeastern Aegean, indicate a preference for particular varieties of wine to complement the household's high dietetic standard.³⁶ Diet was in any case an indicator of cultural, economic and social distinction.³⁷

The topographical diagram indicating the position of the farmhouses shows a cluster of building complexes with the same orientation. This is likely to mean that they fronted onto a main road, perpendicular to the Via Egnatia, leading into the hinterland and linking other similar farmsteads or small villages.³⁸ We know that farmhouses were generally built close to a road, a finding that also confirms the view that the Romans built new roads to serve the transport of agricultural products. One further element that should be stressed here is that the very construction of these luxurious villas would



Fig. 8: Country House A. Red-glaze dish. Eastern Sigillata B.

have invigorated the local economy. Their construction and decoration required specialised craftsmen, and we know that specialised painters of murals travelled the length and breadth of the Roman provinces, spreading motifs and techniques, as seen in the case of Lete.³⁹

While there is nothing in the archaeological data to tell us who the owners of these villas were, instead, it is possible to draw a general picture of them. The luxury of the villas we have described is hard to reconcile with the density of farmsteads in the *territorium* of Lete. The wealth of their owners cannot be derived from the limited land between the buildings. Some other source of wealth, for example mines,⁴⁰ quarries or the exploitation of forests, all factors that influenced the installation of Roman citizens and the building of rural villas,⁴¹ while not documented directly in the area of Lete, cannot be excluded.

It is more probable, however, that the owners of our farmhouses were in fact farmers, who owned and exploited large tracts of farmland in the fertile plain nearby. The existence of large estates on the plain of Langadas is documented by two inscriptions, mentioning two persons, whose duties must have been connected with the financial side of estate management.⁴² One is the steward – *actor Zosimus*, a slave, who erected an inscribed marble bust for his master *Aelius Nikopolitanus*.⁴³ The other is *Onesimus*, the overseer of the landed property of *Aelius Menogenes*, who is depicted with his family on an inscribed funerary stele.⁴⁴

There can be no doubt that the owners of the rural villas belonged to the aristocracy of Lete. The ownership of land and the wealth generated by its exploitation were hallmarks of the urban elite in the Hellenistic and even more so in the Roman period. Part of that wealth was invested in self-promotion, as reflected in the construction and decoration of those villas. The urban elite also played a leading role in civic administration. One typical representative of this aristocratic class, who also happens to be of Roman descent, is Marcus Salarius Sabinus. An inscription from Lete refers to his benefactions for the city.⁴⁵ Not only did he serve as gymnasiarch, but he also distributed grain to the people in times of shortages. In addition, he supplied troops presumably campaigning in the East with wheat, barley, broad beans and wine from his own stores.

The creation of farmsteads with the arrival of Roman settlers in the vicinity of Lete reflects the new model of organisation of agricultural land, following the Roman system and based on the land register used in the provinces for record-keeping and taxation purposes.⁴⁶ Through their production and the tax revenues they generated, moreover, those farms and rural estates constituted one of the main levers that move the state machine of the *imperium Romanum*.

Notes

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¹ Le Glay 1986, 21–37; Vanderspoel 2010.

² On Via Egnatia, Laurence 2013.

³ Rizakis 2002, 110–112.

⁴ Archaeological Museum of Istanbul. Papazoglou 1988, 213–215.

⁵ Greene 1986, 64. 65; Temin 2013, 176–189.

⁶ Burial reliefs, Despinis et al. 1997, nos. 56. 57. 62–64.

⁷ Rizakis 1996; Sverkos – Tzanavari 2009.

⁸ Tzanavari – Philis 2000; Tzanavari 2003.

⁹ Tzanavari 2003, 85–87.

¹⁰ On the role of decoration to distinguish the use of rooms, Ellis 2000, 139–141; Tzanavari 2003, 84. 85.

¹¹ Barbet 1985, 236–241 fig. 175, 62–70 BC; Ling 1990, 71–100; Thomas 1995, 112–114 fig. 62.

¹² Tzanavari 2003, 87–89.

¹³ White 1984, 128; Schareika 2007, 101; cf. Zinn 2001, 190. 231 fig. 60, 200–230 AD.

¹⁴ Tzanavari 2003, 82–83.

¹⁵ Nachtergaele 1977.

¹⁶ Tzanavari 2003, 78–82.

¹⁷ For the differences between the Greek *oἶκος* and the Roman *domus*, Hales 2003, 207–209.

¹⁸ Dupont 2004, 94.

¹⁹ Tzanavari 2003b.

- ²⁰ Amouretti 1986, 144 pls. 24. 25; Runnels 1990; Watts 2002, 11–14; Adam-Veleni 2003.
- ²¹ Koukouvou 1999, 572, 2nd – 3rd cent. AD.
- ²² Adam-Veleni et al. 2003, 198. 199 nos. 105–109, 3rd – early 4th cent. AD (K. Tzanavari).
- ²³ Matijasić 1993, 248–250. (Dalmatia); Petropoulos 2013a (Patras).
- ²⁴ White 1975, 112–115; Poulaki 2003, Petropoulos 2013a, 163 fig. 6.
- ²⁵ Brothwell 1969, 52; Dalby 1996, 39; Dalby 2003, 80. 81.
- ²⁶ Adam-Veleni et al. 2003, 199 nos. 110. 111, 3rd cent. AD (K. Tzanavari); Tzanavari 2003a, 129; cf. Gerlach 2001, 51.
- ²⁷ Karapanou – Katakouta 2000, 112–115 fig. 1 (St. Katakouta).
- ²⁸ Bresson 2010, 259–261; Déry 1998, 94–97a.
- ²⁹ Adam-Veleni et al. 2003, 251. 252 no. 416 (K. Tzanavari); Tzanavari 2003a, 128; Prummel 2003, 206; Dalby 2003, 245–247; Déry 1998, 99. 104. 105. For the importance of water resources as a factor for the choice of habitation sites, Stefani 2007, 564. 565.
- ³⁰ Adam-Veleni et al. 2003, 251 no. 415 (K. Tzanavari); Tzanavari 2003a, 128; Badel 2009, 43.
- ³¹ Percival 1988, 161.
- ³² McKay 1975, 101. 102; Percival 1988, 146; Raab 2001, 16. 17; Zoumbaki 2013, 73; Rizakis 2016, 54.
- ³³ Tzanavari 2003c, with bibliography.
- ³⁴ As Italian sigillata, Eastern Sigillata, Sigillata B, Çandarlı, Macedonian grey terra sigillata, African red-glaze ware, etc., 2nd – 4th cent. AD. For the various uses of these vases, Allison 1999, 68–70.
- ³⁵ Adam-Veleni et al. 2003, 211. 212 nos. 191–194; 214. 215 no. 209, glass vessels, 2nd–3rd cent. AD, 217 nos. 219. 220, pins, handle and spoon, 218 nos. 222. 223; cf. Deonna 1938, 228–230 pl. 75.
- ³⁶ It is well known that imported amphorae were re-used to store other types of products, Lawall 2011; Philis 2016, 787. 788 n. 4.
- ³⁷ Garnsey 1999, 113–127; Tzanavari 2003a.
- ³⁸ For the late antiquity rural settlements of Macedonia, Dunn 2004.
- ³⁹ Percival 1988, 158.
- ⁴⁰ Sverkos 2017.
- ⁴¹ Samsaris 1985/1986, 38; on the forest wealth of Chalcidice, Greene 1986, 89; Rizakis 2002, 124.
- ⁴² On the different names of these persons, as actor, dispensator, procurator, *oikonomos*, *vilicus*, *phrontistai* et al., Rizakis 2013, 48.
- ⁴³ Nigdelis – Lioutas 2009, 225–250 AD.
- ⁴⁴ Voutiras 1997.
- ⁴⁵ SEG 1 (1923) l. 1–12; Nigdelis 2006, 273, 121/122 AD.
- ⁴⁶ Rizakis – Touratsoglou 2011, 26; Vandervoel 2010; Petropoulos 2013b, 319. 324.

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Analysis of the Agricultural Management of a Hellenistic Pieria Farmhouse Based on Archaeological Evidence and Archaeological Relevance

Eleni Gerofoka

Introduction

Although the social, economic and political organization of the ancient world was largely determined by people's relations with the earth and the environment the rural landscape, rural structures, and the countryside housing organization has not been an attractive subject for ancient writers and researchers of the past decades.¹ Since most open-air settlements and rural facilities are not mentioned in the written sources, their natural remains are also the only historical testimonies. The intensive surface surveys and excavations that took place in the Greek countryside in the 1980s and 1990s discovered a large number of agricultural facilities dating back to the 4th and 3rd centuries BC.²

In the present paper, I will examine the agricultural management of a Hellenistic farmhouse that was discovered in central Macedonia, in Greece, in the framework of a rescue excavation in the late 1990s. This attempt aims to shed light in some aspects of the rural economy of Macedonia in the Hellenistic times.

I was fortunate to participate in the excavation of the farmhouse and later had the opportunity, in the context of a doctoral dissertation, to study the primary archaeological material and to examine it in relation to the results of two relevant studies about this farmhouse, the archaeobotanical elaborated by Evi Margaritis³ and zooarchaeological by Vasso Tzavelekidis⁴.

Based on this primary archaeological material I will focus on the domestic-economic activities of the farmhouse and I will examine, as far as possible, the scale of production of certain activities, in order to draw conclusions about their trading, human potential, seasonality and ultimately the economic model. A crucial element in this debate is the question whether the purpose of this farmhouse is economic self-sufficiency or, on the contrary, the production of surplus for marketing.⁵

Background Information

Geographical Location

The farmhouse is located in central Macedonia, in Greece on the southeast edge of Pieria, at the site Tria Platania, in the coastal area between Tempi valley and Mount Olympus, next to the most important road of Antiquity, which was the natural passage of Tempi, timelessly connecting Thessaly and Macedonia (fig. 1).

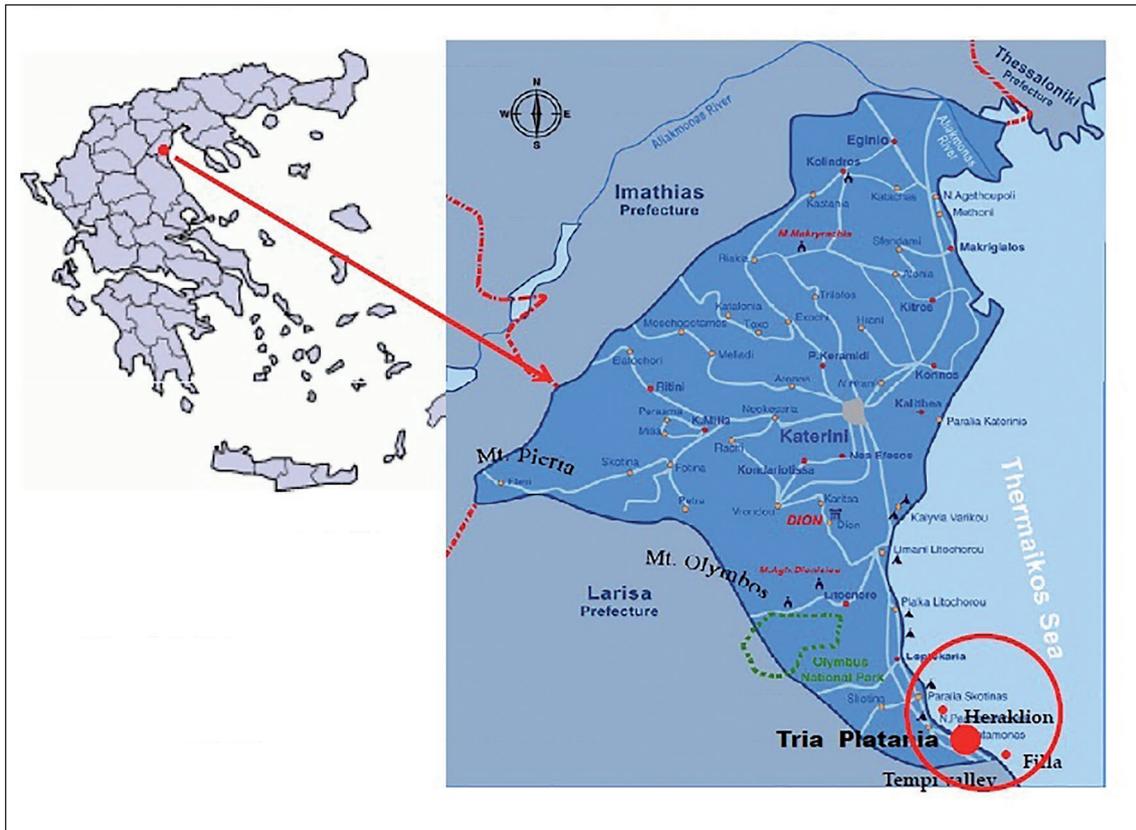


Fig. 1: Map of the North edge of Pieria, Greece.

In Antiquity the site was situated between the two southern cities of Pieria, Fila and Heraklion and belonged to the territory of Heraklion city, 4,5 km away. The significance of the location shown from the numerous archaeological remains of the wider area has been a pole of attraction over time.⁶

Archaeological Remains of the Farmhouse

The excavation revealed a large building complex, a Farmhouse, oriented NW → SE and an area of 2,400 m². However, the external enclosure, extending north, shows that the living space of the farmhouse exceeded 4,000 m² (fig. 2).

Two construction phases (I, II) were identified on the building (fig. 3). The first begins in the late 4th century BC and ends with its destruction by fire, probably from the invasion of the Gauls in 279 BC. The building was rebuilt only in the northern part of the complex in the times of Antigonos Gonatas, about 275 BC and was finally abandoned in the mid-2nd century BC.⁷



Fig. 2: Excavation plan of farmhouse at Tria Platania.



Fig. 3: Architectural remains of farmhouse at Tria Platania.

Archaeological Material

The archaeological material that came from the excavation, apart from the building remains includes numerous and varied finds that bear witness for the occupations in the farmhouse. Specifically, it includes a large number of pithoi and amphorae fragments, unpainted pots of daily use and cooking utensils, over 400 black-glazed vessels.

Moreover, it includes 1900 objects of clay, stone, lead, iron and copper, such as loom weights, grinders, millstones, lead weights, agricultural tools, spearheads and arrowheads, harness accessories, etc. In addition, 183 coins mostly cuts of Macedonian kings and a few cuts from cities of Thessaly were found.⁸

Final Architectural Plan: Organization of the Premises

Based on the aforementioned remains, we were able to form the architectural plan of the building (fig. 4). This plan concerns the early construction phase I (end of 4th century BC), which is the best attested. In this phase the farmhouse was a rectangular building with introverted organized spaces around a courtyard, had a central tower, pottery kiln, drainage ditch and a well. The building had a semi-enclosed portico⁹ in the east and an open portico in the north. The main entrance was in the SW part of the complex.¹⁰ The

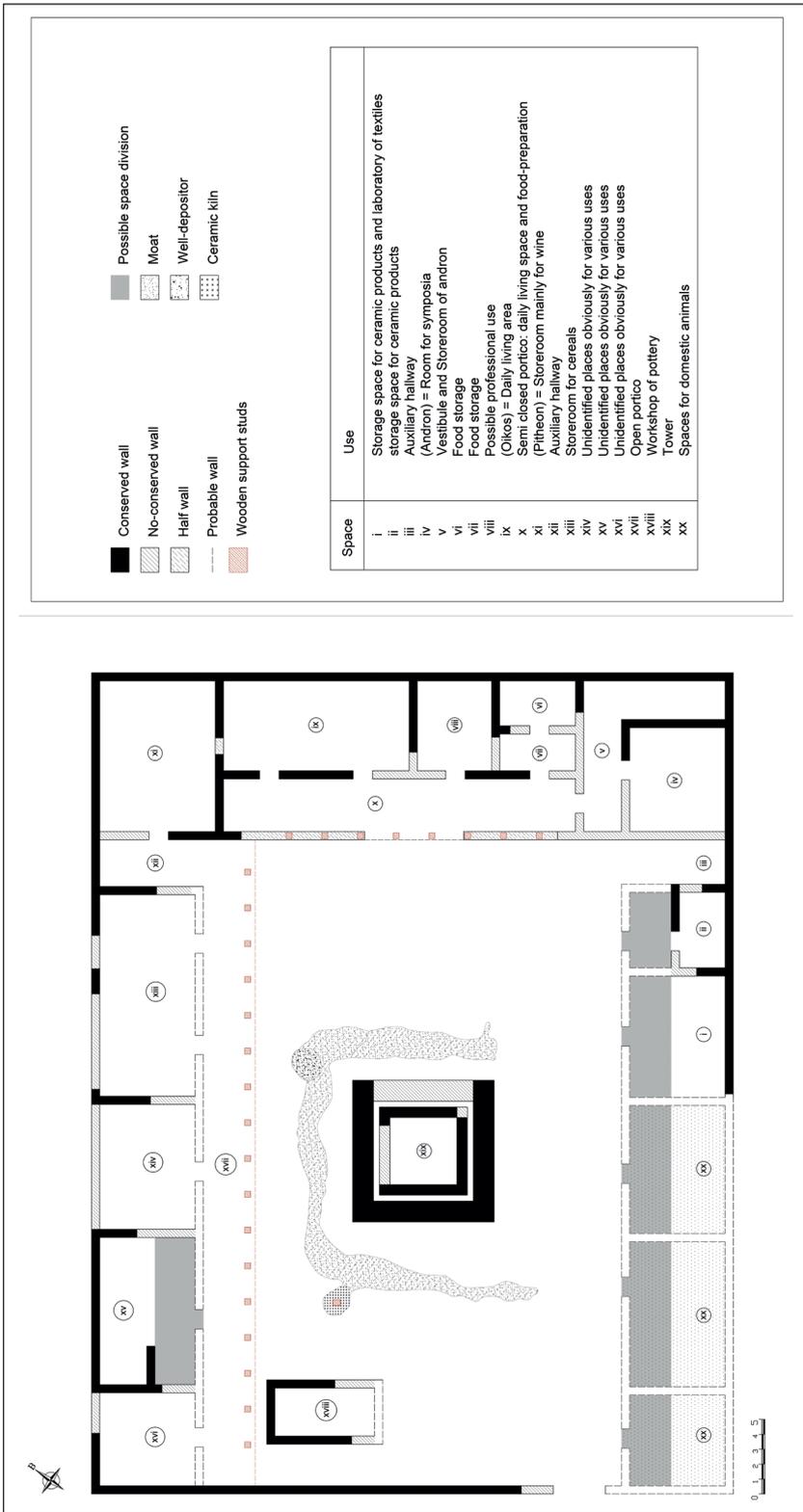


Fig. 4: Architectural plan of farmhouse at Tria Platania.

second floor was supported by the east side and perhaps the north.¹¹ The tower had more than two levels.¹²

Based on these characteristics, the building complex is typologically classified as the type of farmhouse with rectangular plan and central tower. Similar constructions are sought both in Macedonia and elsewhere.¹³

Interpretation of the Use of Spaces

Based on the architectural form of the building, the findings and their dispersion, we have reached conclusions about the operation of the premises of the farmhouse, which encapsulated several functions (fig. 4).

During the construction phase I, the south side of the complex was used as a laboratory for the production of textiles and also for the storage of the pottery kiln products. In the southwest corner, there was possibly a stable for horses. On the east side were mainly the daily living and food-preparation spaces. In the southeast corner there was an andron, in which the owner held symposia.¹⁴

On the north side were storerooms. The northeast storeroom, in which 16 pithoi were found in situ, was related to winemaking and wine storage.¹⁵ The process of wine-making is documented only by the analysis of organic residues. No equipment has been found. While the next storeroom mainly served as a storage place for cereals, and olive kernels, which served as fuel. On the west side there was a laboratory of pottery.

In the inner courtyard were the tower, the kiln, the depositor and the moat. The tower had fortification-defensive character and supervisory role for rural activities, as well as, control of the public area of the city. Moreover, the tower as shown in every day pottery found was probably living accommodation for servants and laborers.¹⁶ The kiln is associated with the production of mainly small vessels and operated only during the summer months. The moat and the well depositor functioned as a double pipe-gathering system of rainwater.

Domestic-Economic Activities and Scale of Production

This analysis is based only on the data of the first habitation phase. We use the data in part of the second habitation phase only for the production of olive oil.

The archaeological finds, the archaeobotanical and the zooarchaeological remains reveal that the inhabitants of the farmhouse were engaged in agriculture mainly (wheat, barley) and arboriculture (olive, grape), wine and olive oil production, the production of pottery and woven fabrics. The occupation of the inhabitants with animal husbandry was also of great importance.

Agricultural Products – Scale of Production

The scale of production of agricultural products mainly arises from the consideration of storage spaces and storage vessels. The likelihood of using skins or fabrics in storage makes production estimation more difficult.¹⁷ Storing products for long periods of time is one of the major rural economic strategies.¹⁸

Cereals: As mentioned before, in one of the storerooms was grain. We cannot calculate the total amount of grain stored there. But surely saved the annual needs for wheat, which was at least 4,500 liters.¹⁹ This suggests a small-medium size production. The size of the room was 87 m² which in combination with stored quantities in perishable materials,²⁰ offered great storage capabilities which could mean a larger size production.

Wine: The pithoi of the northeastern storeroom, as mentioned, were related to wine-making and wine storage. Taking into account the capacity of 100 to 350 liters each, at least 16 pithoi could store an average of 3,500 liters.²¹ This quantity indicates that wine production was medium-sized.

Olive oil: Olive growing and olive oil production in both residential phases are documented only by the analysis of the archaeobotanical remains. Residues indicate an alternative mild crushing that involves very good quality olive oil.²² The production of very good quality olive oil is likely to indicate that part of the production was (*ὀμφάκινον ἔλαιον*), that is, oil of excellent quality mainly used in medicine and in the manufacture of aromatic oils.²³

However, olive cultivation is mainly linked to the late residential phase where olive oil is the main production of the farmhouse. The fact that the exact number of amphorae has not been estimated does not help to approach the size of production in the late residential phase II.²⁴

In addition we cannot make any calculation for the quantity of olive oil produced in the early residential phase I either. Besides, the consumption of olive oil in Antiquity is difficult to calculate with precision, as the harvest of olive oil is unpredictable from year to year²⁵ and a household would have to store the supply of a good year turn to cover for the next.²⁶ One family stores about 250–300 liters of olive oil a year²⁷ for food, lighting, cleaning and grooming.²⁸

Craft Activities – Scale of Production

Pottery: The ceramic kiln is associated with the production of small and medium size vessels. According to experimental studies carried out in kilns, a ceramic kiln with a combustion chamber diameter of 1 m can accommodate up to 150 medium sized vases with a height of 0,20–0,30 m.²⁹ Compared to the above, the capacity of the kiln of the farmhouse was of around 200 medium sized vases, as its combustion chamber had a diameter of 1, 40 m.³⁰

Taking into account the time required by the vessel manufacturing process, about three weeks to complete the construction of 200 vessels,³¹ and since it only worked

during the summer months, we conclude that the kiln burned three to four times a year and produced a total of 600 to 800 vases annually.

From the above, it appears that the ceramic workshop is related to part-time production and is characterized as a small-scale domestic craft.³²

Weaving: The weaving activity is derived from the total of 138 loom weights found in different areas. The data reveals advanced weaving activity. The loom weights in three groups, of 20 weights each, indicate the existence of at least three looms.³³

The looms were medium sized with a width of about 160–180 m.³⁴ The weight of the loom weights ranging from 140 to 180 grams shows that the main activity was the weaving of woolen fabrics.³⁵ From the above we conclude that the scale of weaving production was medium-large.³⁶

Livestock

Animal husbandry is documented by the zooarchaeological remains belonging to cattle, pigs, sheep, goats, horses and dogs³⁷ and the archaeological finds, such as, the iron seal for animals (fig. 5), the scissors for sheep and goats mowing (fig. 6), the bronze flipper³⁸ (fig. 7) and the large number of loom weights.

Additional elements that prove livestock farming activity include the natural environment of the area with exceptionally mountainous and summer pastures and abundant water sources,³⁹ the need to ensure manure to improve soil fertility,⁴⁰ the need for sacrificial animals⁴¹ and finally the epigraphic testimonies, according to which the inhabitants of Heraklion during Hellenistic times were also engaged in livestock farming.⁴² All the above allows us to assume that the owner had a significant livestock. Breeding a variety of animals also indicates the multiplicity of breeding goals,⁴³ such as livestock products,⁴⁴ use in agricultural work and transport⁴⁵ as well as animals for sacrifices.⁴⁶



Fig. 5: Iron seal.



Fig. 6: Iron scissors.



Fig. 7: Bronze flipper.

Conclusions

According to the data we have drawn initial conclusions concerning the seasonality, human potential, productive model and scale of production and trading. These conclusions lead to larger-scale ones related to the economic model.

Initial Conclusions

As far as seasonality⁴⁷ is concerned, the size of the farmhouse, the large number of daily use vessels and diversity of parallel activities, indicate that the farmhouse was permanent habitation⁴⁸ but it was not necessarily the only residence of the owner.⁴⁹

Regarding the human potential, the variety and scale of activities lead to the conclusion that there was a workforce of slaves and workers, while the management of

all the tasks was under the supervision of an administrator.⁵⁰ Although it is difficult to calculate the exact number of people living within a farm, however 12 to 15 people can be estimated (family 5 to 6 members, workers and slaves also 5 to 6, the potter and the administrator). At the time of harvesting, the workforce was likely to be boosted by working peasants living in the city or in neighboring settlements.⁵¹

Regarding the productive model, the farmhouse at Tria Platania was an autonomous, economic unit based on mixed agricultural and stock raising activities and crafts. This conclusion strengthens the views that support the coexistence of agriculture with specialized livestock farming⁵² as opposed to those who support the separation of agriculture from livestock.⁵³

Concerning the scale of production and trading, the data indicate that the production of most farm products was medium-sized and associated with local trading, while only in the second phase the olive oil production was of a large scale.

Final Conclusions

Economic model: As mentioned above these conclusions lead to larger-scale ones related to the economic model. All the data, as we already have seen, describe a landscape of varied and parallel activities (wine, olive oil, weaving, pottery, livestock). The variety of activities combined with the size of their production reveals an economic model in two directions: a) self-sufficiency activities and b) profit oriented activities.

The first one is related to cereals, pottery and olive oil in the first residential phase. The second one is related to wine, textiles, olive oil in the second residential phase. There is also an element that concerns both aspects of the model, (self-sufficiency and profit), which is related to livestock farming and the need for sacrificial animals. In this case the size of livestock seems to be reaching profit margins, which may indicate that sacrificial animals were not only meant to cover religious duties (self-sufficiency) but also for generating profit. Naturally, other livestock and agricultural products could be included in this category.

Interpretation of the character of the profit oriented market and its varied activities in the Farmhouse: Finally, in an attempt to make an interpretation of the character of the profit oriented market and its varied activities, in our case, I would say that my approach coincides with the view of L. Foxhall, who asserts that the diversity is developing in unstable environments and indicates a deliberate strategy that aims to maximize potential opportunities for profit and gaining wealth in the context of occasional friendships and political alliances, unlike modern formalist theory scholars, who often characterize the diversity of activities as the irrationality of the Greek attitude to profit.⁵⁴

The reason why this argument coincides with Foxhall's aspect is strengthened by the fact that when the activities in the farmhouse are taking place is characterized by dynastic and political instability. This is associated with the period when successive crises and quarrels are developing in Macedonia among the successors of Alexander.⁵⁵

Acknowledgements

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Notes

¹ Bintliff 2012, 270; Snodgrass 1990, 114 f; van Andel – Runnels 1987, 3 f; Osborne 1985, 119.

² See Gerofoka 2015, 69–75; Especially for the Macedonian farmhouses, see Adam-Veleni 2009; Adam-Veleni et al. 2003.

³ Margaritis 2005.

⁴ The zooarcheological study is incorporated as an annex in the aforementioned dissertation see Gerofoka 2015, 317–326.

⁵ See Morris – Papadopoulos 2005, 99 f; Hanson 1999, 52.

⁶ For historical and archaeological context of the area of the farmhouse, see Gerofoka 2015, 79–93.

⁷ For the chronology of the farmhouse as indicated by stratigraphy, coins and pottery, see Gerofoka 2015, 199. 200.

⁸ For typology and interpretation of movable findings, see Gerofoka 2015, 153–197.

⁹ Graham 1953, 203–206.

¹⁰ For typological classification in houses with an internal courtyard and an entrance, see Nevett 1999; Nevett 2005, 83. 84.

¹¹ For the existence of the second floor based on the example of an Attic farmhouse in Vari, see Jones et al. 1973, 426–428.

¹² For the height and individual architectural features of the towers of the Classical and Hellenistic period, see Osborne 1986, 168 pl. 8; Morris – Papadopoulos 2005, 156 fig. 4; Morris 2001; Korres 2005.

¹³ The most congenial example from Macedonia is a farmhouse in Asprobalta at the site of Liotopi Routscheli, see Adam-Veleni et al. 2003, 101–107; For more examples from Macedonia and elsewhere, see Gerofoka 2015, 69–74.

¹⁴ For the position of the andron on the side of the daily living space, see Graham 1953, 203; Nevett 1995, 371; Jameson 1990b, 104; Antonaccio 2000, 526; For the opposite view, Mylonas 1940, 402.

¹⁵ For the contents of the jars and the assumption that the jars contained grain before their destruction, see Gerofoka 2015, 137. 138.

¹⁶ Morris – Papadopoulos 2005.

¹⁷ Davies 2001, 28.

¹⁸ Cahill 2002, 226.

¹⁹ For annual storage in wheat of a nuclear family, see Foxhall – Forbes 1982, 71. 72; Gallant 1991, 27–33.

²⁰ For storage of cereals in leather and cloth bags in the storage areas of the houses of Olynthos, see Cahill 2002, 229.

²¹ For the capacity of jars, see Cahill 2002, 227; Amyx 1958, 170–173.

- ²² Margaritis – Martins 2008, 398–399.
- ²³ Faklaris-Stamatopoulou 2004, 57. 58.
- ²⁴ The study of the amphorae that will give more information is a work in progress.
- ²⁵ Foxhall 2007, 85.
- ²⁶ Foxhall – Forbes 1982, 384. 385.
- ²⁷ Foxhall 1996b, 105. 106.
- ²⁸ For the uses of olive oil, see Margaritis 2015; Foxhall 2007, 85–95; Faklaris – Stamatopoulou 2004, 55–60; Foxhall 1996b.
- ²⁹ Hasaki 2012, 260.
- ³⁰ For the pottery kiln, see Gerofoka 2015, 113. 114. 145.
- ³¹ Hasaki 2012.
- ³² Hasaki 2000, 267.
- ³³ For vertical looms with weights, see Tzachili 1997, 156–158 fig. 69; For the mobile looms in Greek house, see Jameson 1990a, 186. 187.
- ³⁴ For the size of looms, see Cahill 2005, 58.
- ³⁵ Tzachili 1997, 181.
- ³⁶ For an example of calculation of the production capabilities of the vertical loom with weights based on experimental applications on a loom of this type, see Tzachili 1997, 252.
- ³⁷ See the zooarcheological study in Gerofoka 2015, 317–326.
- ³⁸ We mention the bronze flipper as an indication of having a horse and not as a sign of engaging in livestock farming.
- ³⁹ On the importance of water in agriculture and livestock farming, see Krasilnikoff 2002, 57; Krasilnikoff 2010; Chang – Koster 1986, 113; For the opposite view, see Isager – Skydsgaard 1992, 112.
- ⁴⁰ Forbes 1995, 328. 329.
- ⁴¹ Howe 2011, 12.
- ⁴² Arvanitopoulos 1913.
- ⁴³ Halstead 1987b; Burford 1993, 146. 147.
- ⁴⁴ Prummel 2003, 216.
- ⁴⁵ Isager – Skydsgaard 1992, 89.
- ⁴⁶ Ekroth 2007.
- ⁴⁷ On the seasonal and permanent residence, Pecirka 1973, 115; Lohmann 1992, 29–60; Osborne 1992, 22; Bintliff – Snodgrass 1985; Acheson 1997, 171–178.
- ⁴⁸ Hanson 1992, 166; For isolated permanent residence, see Jones 2004, 42–44.
- ⁴⁹ Jameson 1990a 173; Osborne 1992, 21.
- ⁵⁰ Carlsen 2002; For land management mainly in Attica, see Burford 1993, 167. 168.
- ⁵¹ To care for the vineyard that required work throughout the year, see Hanson 1992, 165.
- ⁵² Halstead 1987a; Hodkinson 1988, 35–74.
- ⁵³ Isager – Skydsgaard 1992.
- ⁵⁴ Foxhall 2007, 43.
- ⁵⁵ For historical evidence, see Hammond – Walbank 1988.

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Currency from Two Farmsteads in the Ancient Leivithra Plains in Southern Pieria

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Excavation of the past two decades has brought to light a number of rural installations at the broader area of Macedonian Olympus (Pigi Athinas, Tria Platania, Goritsa, Triantafillia, Kompoloi, Douvari I–II, Skotina Resort) (fig. 1).¹ They are located at the territory of the cities Heraklion and Leivithra and are dated at Classical and Hellenistic period.² They are classified to small, semi-mountainous farmhouses with limited production just for self-sufficiency (Goritsa, Triantafillia)³ and to large lowland farmsteads – ἀγροπαύλεις – with surplus production and commercial activity (Tria Platania⁴, Kompoloi-Douvari⁵).

The current paper examines the numismatic material of the two neighbouring country houses at Kompoloi and Douvari I site. Kompoloi was a wine production estate of about 5 acres.⁶ It was located near the coastal road connecting Macedonia with Thessaly, at a distance of about 3 km from Leivithra⁷ and Heraklion⁸. It is dated from the second half of the 4th to the early 3rd century BC when it was violently destroyed possibly during the invasion of the Gauls⁹. It consisted of two inner-facing buildings, the house to the east and the winery to the west, connecting with a roofed corridor in a compound complex of 1350 m² (fig. 2). A number of 47 pithoi and pithoi pits were found in the storage area and outdoors. The capacity of biggest pithoi for processing and storage wine is calculated up to 2000 liters each.¹⁰

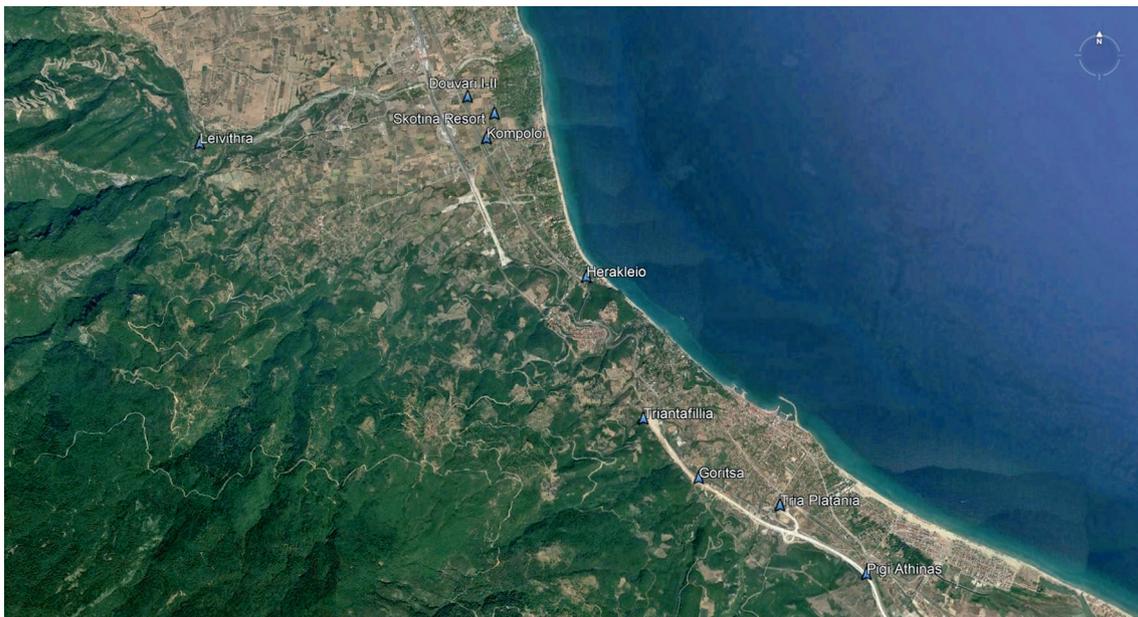


Fig. 1: Google Earth map with ancient farmhouses and cities of southern Pieria.

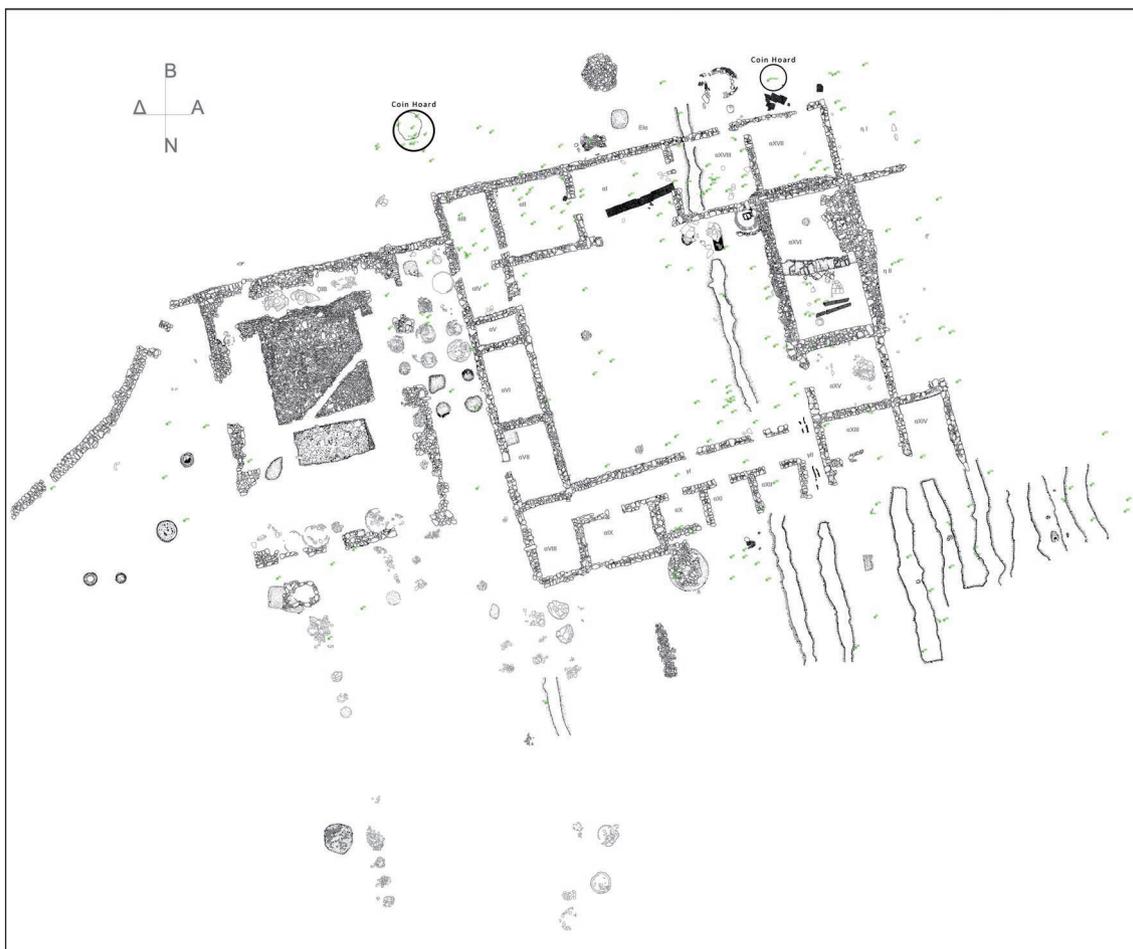


Fig. 2: Kompoloi: Plan of the farmstead with coin distribution.

A total of 230 coins derived, all bronzes except from 2 silver.¹¹ The main bulk of both royal and civic coins was found at the broader area of the house. They were mostly unearthed at the northern and eastern wing of the house, which also were the richest in fine pottery, indicating that the main living quarters and the public sections of the house were situated in that area (fig. 2). On the contrary, just a few coins and almost no other findings derived from the storage area (*pitheon*), indicating a limited accessibility perhaps as a result of the vulnerability of wine. Predictably, royal coinage forms the vast majority (c. 90%), mainly been represented by Macedonian issues (fig. 3. 4. 5). A total of 22 civic and federal coins were also found, struck by 14 mints (fig. 3). The regal coins belong to Amyntas III (1), Philip II (55), Alexander III (75), Cassander (45), Demetrius Poliorcetes (15), Antigonus Gonatas (3) and Perseus (1).

Just a few bronzes are attributed to the initial phase of the farmstead, consisting of only the western storage building – in a simpler form – along with some outdoor structures and a vineyard. They are all royal issues except from 1 civic.¹² The earliest are

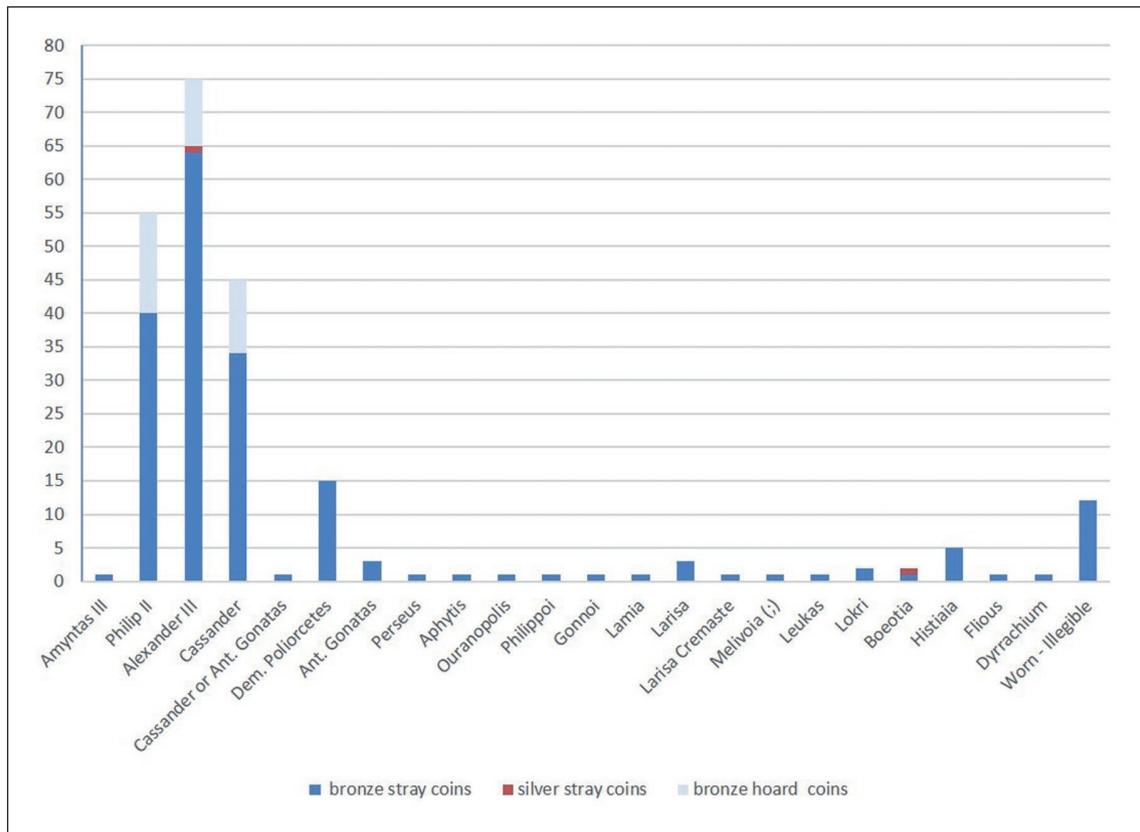


Fig. 3: Kompoloi: Coins per issuing authority.



Fig. 4: Kompoloi: Regal coins (a. Philipp II, b–d. Alexander III).



Fig. 5: Kompoloi: Regal coins (a. posthumous Alexander III, b–c. Cassander, d–e. Demetrius Poliorcetes)

1 coin of Amyntas III ('Heracles/eagle')¹³ and a few of Philip's II main type ('male head/rider')¹⁴ (fig. 4a). More than a half concern the main types of Alexander III 'Heracles/weapons *ΑΛΕΞΑΝΔΡΟΥ*'¹⁵ and 'B-A'¹⁶ (fig. 4c–d). The 'shield (thunderbolt)/helmet B-A' (fig. 4b)¹⁷ and 'male head/horse *ΑΛΕΞΑΝΔΡΟΥ*'¹⁸ types are represented with just 1 coin each. As concluded from the coins and the pottery, the wine making farmstead was founded at the time of Philip II, a period of political and economic stability that encouraged the intensive agriculture and the installation of big farm units for specialized production.¹⁹

The main phase has yielded two silver and a three-digit number of bronze coins, including two small circulation hoards (fig. 2)²⁰. "Kompoloi/2000" hoard was buried northern of the house, consisting of 25 coins, 15 of Philip ('male head/rider') and 10 of Alexander (9 'Heracles/weapons *ΑΛΕΞΑΝΔΡΟΥ*' and 1 'Heracles/weapons B-A').²¹ "Kompoloi/1997" hoard, which was scattered northern the pitheon and had been possibly concealed within it, comprises 11 coins of Cassander's 'Heracles/seated lion *ΚΑΣΣΑΝΔΡΟΥ*' primary type.²² The high proportion of Philip's hoard and stray coins can be explained by their long-term circulation and the existence of posthumous issues.²³ Alexander's coins are predominant as in the initial phase. However, there is now a significant percentage of posthumous issues, consisting of a drachm of 'Heracles/Zeus' type²⁴ and the 'male head/horse *ΑΛΕΞΑΝΔΡΟΥ*' bronze type, which, as Ch. Gatzolis has confirmed through hoard evidence, was struck by Cassander in the name of Alexander IV (fig. 5a).²⁵ If the coins within Alexander's reign are divided from the posthumous issues, the numismatic presence of Cassander prevails (fig. 6). The latest is represented with all his bronze coin types, with predominance of 'Heracles/rider'²⁶ main regal type (fig. 5c) and a high percentage of 'Heracles/seated lion' prior type

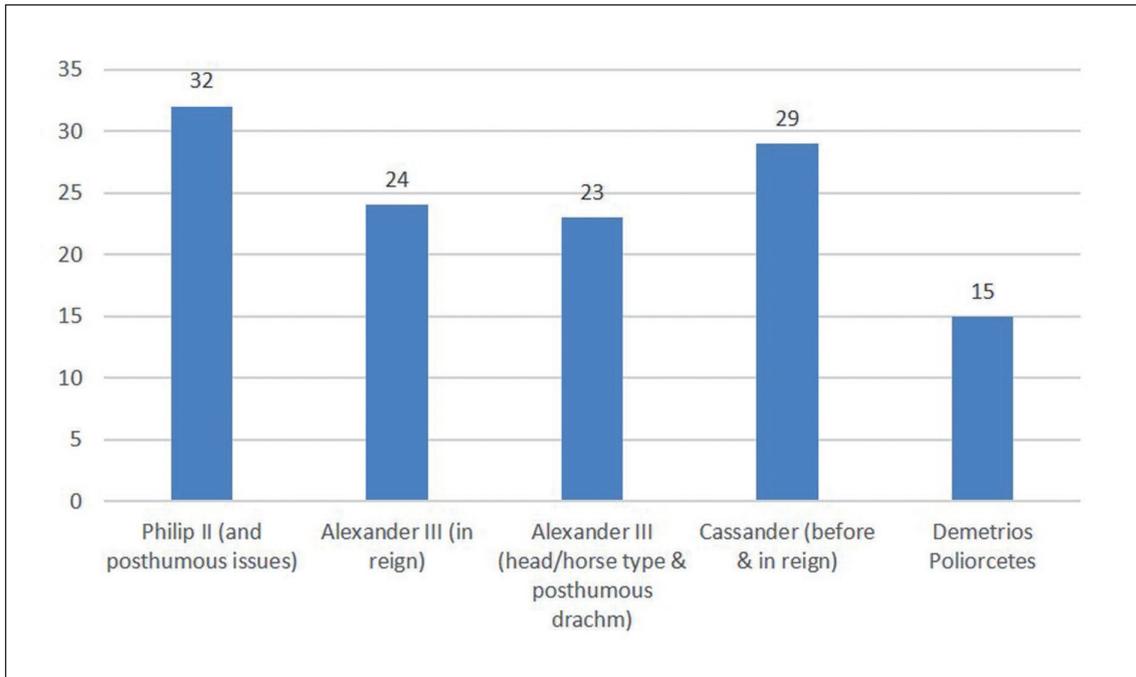


Fig. 6: Kompoloi: Regal coins from the main phase of the farmstead.

(fig. 5b). So, as coin finds indicate, the winery farmstead was expanded during Alexander's reign or in the early – post Alexandrian period and flourished in time of Cassander, when the neighboring farmhouse at Douvari as well as the farmstead at Tria Platania were established.²⁷ As based on amphora study, Kompoloi farmstead might produced a variety of Mendaian wine²⁸ confirming Athenaeus (11.784c) that Cassander favored the mass trade of wine far beyond the city origin of Mende.²⁹ The farmstead was violently destroyed in the early 3rd century BC, as is testified from Demetrius Poliorcetes' coins, which mainly belong to 'shield (ἰϛ)/helmet' Macedonian type³⁰ (fig. 5d) as well as to some non-Macedonian issues³¹ (fig. 5e). Pottery and a few coins indicate a limited use of space after the destruction until the Roman conquest.³²

The partly excavated installation at Douvari I consisted of a small farmhouse, some outdoor structures and a few wine *pithoi*.³³ In total 25 bronze coins were found, all of which regal except from two Thessalian (fig. 7).³⁴ The stray coins belong to Cassander after receiving the royal title, to Demetrius Poliorcetes and to Ptolemy Keraunos.³⁵ A small coin hoard of bronzes was buried in the farmhouse ("Douvari I/1999"). It comprises 1 coin of Alexander III ('shield/helmet'), 1 of Cassander ('Heracles/rider'), 2 of Poliorcetes ('shield/helmet') and 4 worn coins of the same type. Its concealment is possibly dated in the chaotic period from Keraunos' death to the consolidation of Gonatas' reign.³⁶

According to numismatic evidence, the farmhouse was established – probably as supporting facility to Kompoloi – in the late 4th century BC.³⁷ After its destruction in

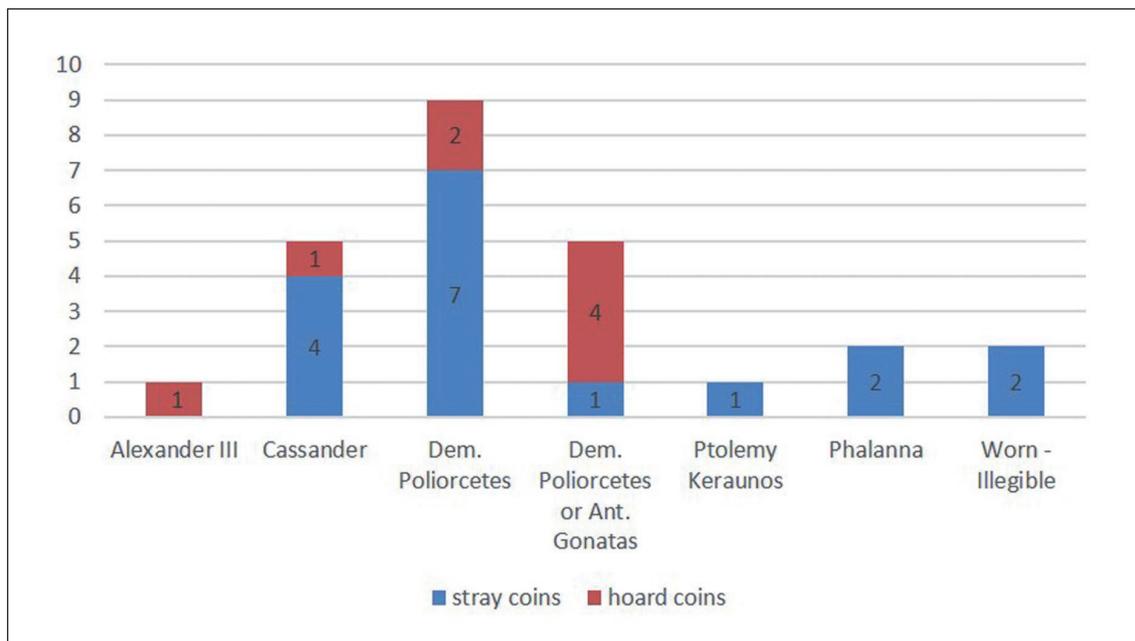


Fig. 7: Douvari I: Coins per issuing authority.

the years of the Gauls' invasion it was immediately rebuilt and remained in function possibly until the 2nd century BC as testified from the pottery, since coin evidence of this phase is lacking.

Kompoloi was a wealthy farmstead, as is mainly indicated by its size and the extended storage space that confirms a mass production of wine for large scale trade. Moreover, viticulture and wine production required a very costly investment in land, infrastructures, equipment and workforce³⁸. Regarding the market network, the neighboring cities of Leivithra and Herakleion would support the local trade of wine, as well as Dion due to the attendance of visitors and pilgrims.³⁹ Moreover, the proximity of the farmstead to the main land route connecting Macedonia with Thessaly as well as to the harbor of Herakleion, allowed the disposal of wine even to long-distance markets. The numismatic material from Kompoloi, although partial since the house was not excavated eastwards, is much more numerous than that of other published farmhouses of Classical and Hellenistic Macedonia (fig. 8), as well as of Thessaly and Attica.⁴⁰

Being comparable only to that of the large, lowland farmsteads Tria Platania and Liotopi Routsheli at Macedonia, it reflects a market oriented economy with high degree monetization.

As expected, the bulk of coins are bronzes, which according to the prevailing point of view, served mainly everyday transactions and local retail trade, whereas precious metal issues served large-scale trade.⁴¹ Wine was a risky but highly profitable product with unstable value that was influenced by a range of factors. Taking into account the lowest price, the content of only one large pithos from Kompoloi that held up to 2000

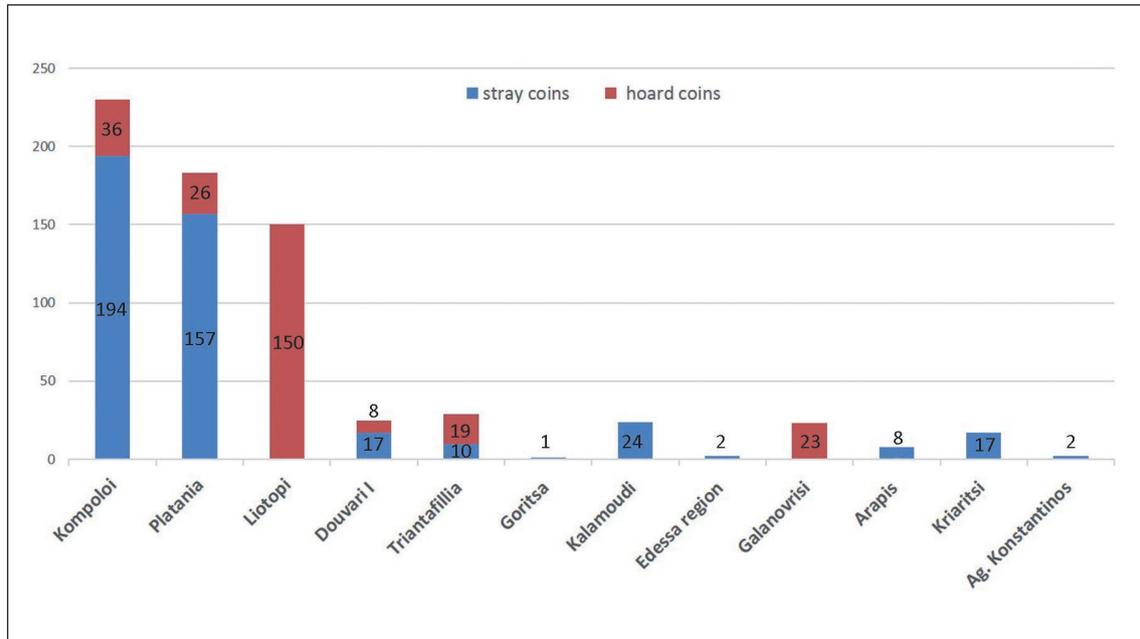


Fig. 8: Kompoloi: Coins from Macedonian farmhouses.

liters can be estimated at least to 132 drachmae, an indicative portion of annual profit.⁴² The low percentage of precious metal coins, although very close to the average value of other published sites, is in contradiction to the huge quantity and the possible mass distribution of the wine. A possible explanation is that the countryside facilities were unsafe for gathering large sums of money, which would, therefore, have been kept in the urban residence of their owners.⁴³ Moreover, the scarcity of precious metal coins and other valuable findings may indicate that the occupants took them when they abandoned the farmstead because of the Gauls' threat.

Civic and federal coins are also bronzes except from a silver fraction of the Boeotian League.⁴⁴ Despite their geographical expansion they concern isolated or limited coins per mint⁴⁵. Similar to other sites of Pieria, the main bulk belongs to Thessaly (7)⁴⁶ due to the proximity of the two regions and the annexation of Thessaly to the Macedonian kingdom.⁴⁷ The rest concern Philippoi (1),⁴⁸ Ouranopolis (1),⁴⁹ Afytis (1),⁵⁰ Histiaia (5),⁵¹ Locri (2),⁵² Boeotian League (2),⁵³ Lefkas (1)⁵⁴ and Phlious (1)⁵⁵. Furthermore, it's quite interesting that some of the issuing regions, such as Melivoia, Histiaea, Lefkas and the far distanced Phlissia were wine-making lands themselves.⁵⁶ Although bronze coins are generally considered as legal currency mainly within the territory of their issuing authority⁵⁷, it is suggested that coins of Philippoi and possibly some issues from Thessaly must have circulated within the Macedonian kingdom during the second half of 4th century BC.⁵⁸ L. Robert explained the presence of foreign bronzes at a site in terms of people's movement for various purposes, as merchants, craftsmen, artists, soldiers etc.⁵⁹ The foreign coins at Kompoloi primarily illustrate the contacts of its residents

with people from other regions through land and sea routes, whether workers, visitors or merchants. Their geographical expansion and the high proportion (circa 10%), approaching that of urban centers,⁶⁰ might be a further indication of the intensive commercial activity of the farmstead or of the widespread trade of the wine. On the contrary, the farmstead at Tria Platania with diversified surplus production for domestic consumption and limited local trade had only six foreign coins, all Thessalian.⁶¹ Furthermore, the semi-mountainous farmhouses at Triantafillia and Goritsa, with a limited production just for family consumption, had none.⁶²

The interpretation of coin finds at Kompoloi, which due to requirements of production was a permanent residence, cannot be univocal as might have been the money from the retail sale of wine, the purse of the residents, the workers, the visitors, even the traders. Monetization and coin circulation at Kompoloi seems not to have been differentiated from that of the urban sites of the Macedonian kingdom,⁶³ indicating that it was an extroverted farmstead with prosperity through an intensive commercial activity. Besides, as N. Cahill has pointed out for Olunthus, “the number of coins is less an index of wealth and more an indication of the intensity of monetary trade and participation in commercial economy”.⁶⁴

In conclusion, Kompoloi was the centre of a specialised wine production industry rather than a typical farmstead.⁶⁵ It reflects the economic growth of the Macedonian kingdom from the reign of Philip II onwards, with main features being the development of urban centers and market networks with high degree monetization, the intensification of production and trade mechanisms, the safeguarding of ownership and the encourage of private involvement in a wide range of economic activities beyond the primary production sector of land cultivation⁶⁶.

Notes

¹ I am grateful to Efi Poulaki, excavation director and Honorary Ephor of Antiquities, for her permission to study the numismatic material of current paper. I would also like to thank Alikí Moustaka, Professor of the Aristotle University of Thessaloniki, for all her valuable support and Christos Gatzolis, Director of Ephorate of Antiquities of Pieria, for his useful comments.

² A Roman farmhouse was also unearthed at Pigi Athinas, next to the Classical one (Poulaki 2003, 54–55).

³ Klinaki 2015, 34–36.

⁴ Poulaki 2003, 56–62; Gerofoka 2015.

⁵ Poulaki 2003, 63–70; Poulaki 2004, 45–56; Poulaki-Pantermali 2014, 55–67; Mourati 2014; Margaritis forthcoming. The production scale of farmhouses at Pigi Athinas and Skotina Resort is unknown due to limited excavation.

⁶ Margaritis 2016.

⁷ Poulaki-Pantermali 1998; Poulaki-Pantermali 2008; Poulaki-Pantermali 2014, 37–41.

⁸ Poulaki-Pantermali 2001, 335–340; Poulaki-Pantermali 2013, 117–123.

⁹ Douvari, Tria Platania and the harbour area of Heraklion were also destroyed but they were reconstructed and re-inhabited (Poulaki 2003, 59; Poulaki-Pantermali 2014, 67–70; Gerofoka 2015, 199, 200; Touratsoglou 2006; Poulaki 2013, 123; Bachlas – Siros 2014).

¹⁰ Mourati 2014, 64–71.

¹¹ Klinaki 2015.

¹² SNG Alpha 6, 700–702 (Locrian).

¹³ SNG Alpha 214–230. For the coinage of Amyntas III, see Westermark 1989, 307, 308.

¹⁴ SNG Alpha 349–407. For the bronze coinage of Philip II, see Bellinger 1964, 29–52; Portolos 1996; Touratsoglou 2003.

¹⁵ SNG Alpha 712–737.

¹⁶ SNG Alpha 781–815; Price 1991, 126–128 nos. 373–396 (325–310 BC); Gatzolis 2012, 385 (within Alexander's reign). For the coinage of Alexander III, see indicatively Price 1991; Liampi 1998a; Gatzolis 2012.

¹⁷ SNG Alpha, 820–848; Price 1991, 128–130, nos. 396A–418 (325–310 BC); Liampi 1998a; Liampi 1998b, 100, 101, M7 (in Alexander's reign).

¹⁸ SNG Alpha 746–779; Price 1991, 123–125, nos. 338–370 (in Alexander's reign); Gatzolis 2012, 383, 389 (posthumous).

¹⁹ Poulaki 2003, 53. For Philip's reign, see indicatively Touratsoglou 2010, 40–47.

²⁰ Small coin hoards were also found at Douvari I, Triantafillia, Tria Platania, Liotopi, Galanovrisi (see fig. 8).

²¹ Its burial can be dated in 336–316 BC or in 325–310 BC, according to the different dating of 'Heracles/weapons B-A' type. For similar hoards, see IGCH 404; CH VIII 202; CH IX 103; CH X 30; CH VIII 297; IGCH 413; IGCH 844; CH IX 82; IGCH 788; CH IX 104; CH I 45; CH II 53; CH III 26; CH X 41; Stefani 2012, 46; Gatzolis 2010, II, 426–431; Poulios 1982, 188–192, 199, 200.

²² For the type, see SNG Alpha 876–889. One hoard coin as well as one of the stray coins were overstruck on Alexander's posthumous type 'male head/horse'. Its concealment is dated in 309–306/5 or –301 BC. For similar coin hoards, see CH X 56; CH VIII 241; Polihne/2003 (Gatzolis 2010, II, 79–81).

²³ The main bulk belongs to 'male head/rider' main type (SNG Alpha 339–407), which continued to be struck for a long time after Philip's death (Gatzolis 2010, II, 455, 460; Kremydi-Sisilianou 2000, 68; Topalov 2009, 285–291). 'Heracles/rider' type (SNG Alpha 408–411) is represented with a few coins, as well as the posthumous types 'Heracles/bow' (SNG Alpha 439–454) and 'male head/rider on walking horse' (SNG Alpha 426–438). For the posthumous issues, see Bellinger 1964, 47, 48; Lazaridis et al. 1992, 51; Akamatis N. 2017.

²⁴ Price 1991, no. 1398.

²⁵ Gatzolis 2012, 383–385.

²⁶ SNG Alpha 900–936. The royal types 'Heracles/lion breaking javelin' (SNG Alpha 937–941) and 'Apollo/tripod' (SNG Alpha 890–899) are represented with a few coins each. For the coinage of Cassander, see Oikonomos 1921; Ehrhardt 1973; Valassiadis 2005; Gatzolis 2012.

²⁷ About the prosperity of the kingdom in that period, see Touratsoglou 1998; Touratsoglou 2010, 80f; Touratsoglou 2012, 36–45.

²⁸ Margaritis 2016, 199; Bachlas 2018, 861, 862.

²⁹ Papadopoulos – Paspalas 1999; contra Lawall 2004.

³⁰ SNG Alpha 960–971.

³¹ Non-Macedonian issues: 1 ‘Demetrius/prow’ of Salamis mint (Newell 1927, 20) and 2 of the same type in smaller denomination from Caria (Newell 1927, 163) or Greece (Knapp – Mac Isaac 2005, 71 n. 253; Weir 2007, 17; Gatzolis 2010, II, 476). Also, 1 coin of ‘Poseidon/prow’ type from Caria (Newell 1927, 167). For the coinage of Poliorcetes, see Newell 1927; Liampi 1998b, 105. 106.

³² Antigonus Gonatas’ 2 coins of ‘Athena/Pan’ type (SNG Alpha 1010–1038) and 1 of ‘Heracles/rider’ type (SNG Alpha 990–1000). For the coinage of Gonatas, see Poullos 2001; Furtwängler 2004. Perseus’ 1 coin of ‘Perseus/eagle’ type (SNG Alpha 1135–1142).

³³ Poulaki 2003, 63; Mourati 2014, 72–74; Margaritis forthcoming, 117. 118.

³⁴ Klinaki 2015, 46–48.

³⁵ Head 1879, 15 no. 59. For the attribution, see Psoma et al. 2008, 217–224 with earlier bibliography.

³⁶ For Makrighalos/1995 (CH IX 161) and Vergina/1994 (CH IX 162) coin hoards of the same period, see Gatzolis 2000.

³⁷ The neighboring farmhouses at Douvari II and Skotina Resort might also have been supportive installations to Kompoloi.

³⁸ Mourati 2014, 144–164; Margaritis 2016, 199; Margaritis forthcoming, 111–115. For the estimated average yield of an ancient vineyard, see Salviat 1986, 151; Steinhauer 2009, 418. For land sales, see Hatzopoulos 1991, 33–38, VI; Lilimbaki-Akamati – Stephani 2003, 166 n.46. 184 n.168; Morris – Papadopoulos 2005, 178; Hatzopoulos 2011, 60. For the acquisition cost of pithoi, see Cahill 2001, 228. 232.

³⁹ Vasiliadou 2011, 129. 130. Margaritis 2016, 199. For Dion, see Pantermalis 1999; Stefanidou-Tiveriou 1998; Pingiatoglou 2015.

⁴⁰ For farmhouses in Macedonia, see Tria Platania: Gerofoka 2015, 191–197. Liotopi: Adam-Veleni 2001; Adam-Veleni 2003, 101–107; Adam-Veleni 2009, 10 no. 5). Triantafillia: Klinaki 2015, 48. 49. 132. 133. Kalamoudi: Malama et al. 2000. Edessa region: Chrisostomou 2008, 89–100. Galanovrisi: Stefani 2002; Stefani 2012. Arapis: Stefani 2001. Kriaritsi: Asouhidou et al. 2000. Ag. Konstantinos: Karamitrou-Mentesidi – Theodorou 2011. For Tserli farmhouse at Larisa region of Thessaly, see Karapanou 2015, 28. For farmhouses in Attica, see Demakopoulos 2017.

⁴¹ Howgego 2009, 193; Touratsoglou 2010, 64; Touratsoglou 2012, 36. 37.

⁴² For the volume of amphorae, see Wallace 2002. From graffiti on amphorae of 5th cent. BC at the Athenian Agora, it is estimated that the price of Chian wine was 28 dr. and of Mendeian 15 dr. per jar (Lang 1956, 15; Lawall 2000). From the Attic Stelai it is concluded that the attic or unnamed wine valued in 4th cent. BC circa 4 dr. per metretes (Lang 1956, 14; Franke 1999, 38). From Demosthenes speeches the wholesale price of Mendeian wine in 4th cent. BC is evaluated to 2 dr. per amphora (Pritchett 1956, 199–202). The wine price at Hellenistic Delos ranged from 4 to 11 dr. per metretes (Reger 1994, 234–238).

⁴³ Touratsoglou 2013, 798.

⁴⁴ SNG Alpha Bank 6, 819–821.

⁴⁵ Most of civic and federal coins have also been found at the harbour of Herakleion (Myteletsis forthcoming) and at Dion (Paulopoulou 2016, 301. 304–306). 1 coin of Dyrrachium ‘Helios/prow’ type is dated after the destruction of the complex and thus is not further discussed (Gardner 1873, 77 nos. 180–184 for the type; 72 nos. 106. 107 for archon’s name).

⁴⁶ 1 of Gonnoi (SNG Cop. III, 53); 3 of Larisa (SNG Alpha 6, 110–118. 125); 1 perhaps of Melivoia (BCD Thessaly I, 1196); 1 of Larisa Cremaste (SNG Soutzos, 378–9); 1 of Lamia/Malieis (SNG Alpha 6, 64). More over, 2 coins of Phalanna were found at Douvari I (SNG Alpha 6, 208–223). Thessalian coins also prevail at Pella (Akamatis N. 2016, 189) and Aigai (Kremydi – Chryssanthaki-Nagle 2016, 164).

⁴⁷ For the uninterrupted production of Thessalian mints at Philip's time and on, see Martin 1985, 58. 59; Papaueaggelou-Genakou 2004, 43 n. 27; Georgiou 2004, 168; Georgiou 2007, 58. For Macedonian coins at Thessaly, see Liampi 2000.

⁴⁸ Poullos 1982, 191 no. 85.

⁴⁹ SNG ANS 7, 914–7.

⁵⁰ SNG ANS 7, 217–8. For the coinage of Chalcidic Peninsula, see Psoma 2001; Psoma 2011; Psoma 2012; Gatzolis 2011.

⁵¹ SNG Alpha 6, 934–940; SNG Alpha 6, 944. 945.

⁵² SNG Alpha 6, 700–702; BCD Lokris – Phokis 118.4.

⁵³ SNG Alpha 6, loc. cit (n. 49); SNG Alpha 6, 827.

⁵⁴ BMC Thessaly, 175 no 19 (vice versa).

⁵⁵ Mac Isaac 1988, 45–54.

⁵⁶ Melivoia (Helly 2004, 109, 113); Histiaea (Hom. II. 2, 537); Lefkas (Pliakou 2002); Phlissia (Kourakou-Dragona 2013, 91–101). For the same issue at winemaking Maroneia and Pella, see Akamatis I. 2000, 13.

⁵⁷ Gatzolis 2010, I, 9; contra Kroll – Walker 1993, 168. 169.

⁵⁸ Gatzolis 2010, II, 268. 269; Akamatis N. 2016, 199.

⁵⁹ Robert 1949, 83; Robert 1966, 113. 114. For mercenaries' payment (*sitarxia*), see Psoma 2009.

⁶⁰ Circa 8% at Pella (Akamatis N. 2016, 188) and Aigai (Kremydi – Chryssanthaki-Nagle 2016, 164). The average value of foreign coins is 3,5% at Central Macedonia and 6% at Pydna (Gatzolis 2010, II, 20–23. 303–307).

⁶¹ Gerofoka 2015, 197. 207. 213. 214; Margaritis 2016.

⁶² Klinaki 2015.

⁶³ e.g. for Pella, see Akamatis N. 2016 and for Dion, see Paulopoulou 2016, 243–245. 290–292.

⁶⁴ Cahill 2001, 268.

⁶⁵ Margaritis 2016, 198.

⁶⁶ Gatzolis 2010, II, 537–538; Touratsoglou 2010, 68–106.

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Fig. 1–2: Archive of the Ephorate of Antiquities of Pieria. – Fig. 3: Chart by Eleni Klinaki. – Fig. 4–5: Photo by Eleni Klinaki. – Fig. 6–8: Charts by Eleni Klinaki.

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Pierian-Macedonian Pitch. A Brand Name Agricultural Product of Ancient Macedonia

Ioanna Vassiliadou

Introduction

In 2005 at ancient Dion in Pieria, Greece, at the excavation of the “Bridge sector”, where most probably the harbor of the ancient city is located, many pot sherds were revealed lined with a sticky, brownish substance. Those sherds were the starting point for the research of this organic residue, which is identified with the Pierian-Macedonian pitch of the literary and epigraphical sources.

Seventeen samples taken from pitch remains originated from the archaeological sites of Pieria of both Hellenistic and Roman period were analyzed¹ by gas-chromatography-mass spectrometry and confirmed their pine origin on the one hand and on the other their production by wood pyrolysis of Pinaceae trees, which were in abundance at the slopes of Mount Olympus, exactly as Theophrastus describes. So, Pieria produced botanical, wood derived pitch.

Mineral pitch, bitumen in Greece is attested in Zakynthos by the literary sources. Bitumen is detected on the floor of the fountain of “Theagenes” at Megara² as well as in the ear of a bronze griffin protome³ from Delphi; they were both considered to originate from the east.

Pix Pierica-Pix Macedonica

Ancient Literary and Epigraphical Sources

Herodotus, in the 5th century BC, was the first, among other ancient Greek and Latin writers, to mention the pitch of Pieria “... τῆς Πιερικῆς πίσσης ...”,⁴ a brand name product well known in the Greco-Roman world. The unknown writer of *Geoponica*⁵ evaluates it as the second one in quality throughout Greece, while Pliny⁶ states it was of premium quality, of great appreciation among Greeks and therefore the first in demand.

In the 4th century BC, Aristotle,⁷ Theopompus⁸ through Pliny’s testimony, and Theophrastus,⁹ on the contrary, speak about another brand name pitch, the Macedonian one.

In addition, Polybius¹⁰ testifies the royal pitch donation of Antigonus Doseon to the Rhodians one or two years after the devastating earthquake there in 225 BC, which was the biggest known so far tar transportation in the Greco-Roman world. The king of Macedonia donated, among others, 1000 talents¹¹ of Macedonian pitch and 1000 metres¹² of raw pitch. Therefore, he sent approximately 26 tons of pitch and 39 tons of raw, liquid pitch to the Rhodians.

The aforementioned ancient sources verify two brand name pitches in Macedonia; the Pierian and Macedonian. The first obviously was produced in Pieria and the other is named with a more general term that of Macedonia. Since Pieria constitutes one of the oldest parts of Macedonia, it is evident that the pitch of Pieria was nothing but the Macedonian pitch itself. Nevertheless, the Pierian pitch remained the oldest and most famous part of the Macedonian.

Archaeological Residues of Pierian-Macedonian Pitch

Many pitched sherds were revealed at the excavation of the “Bridge sector” at ancient Dion, as well as at ancient Roman agora, in the “house of Zosas” and in the “villa of Dionysos” (fig. 1). Plenty of them belong to amphorae.

Pitched sherds of amphorae were containing wine,¹³ according to Plutarch,¹⁴ Cato,¹⁵ Collumella,¹⁶ and Geoponica.¹⁷ Two mosaic floors, one in the Roman colony of Julia Vienna, in southern France, and another at ancient Caesarea in Algeria, were depicting the wine vessel pitching process, the “πισσαλοιφήναι”, “κωνήσαι”¹⁸ of the sources.

The resin yields to wine a characteristic sour, piquant flavor and therefore the resinous wine was addressed to a specific winetasting market group,¹⁹ like the today Greek “retsina”, a type of wine processed with resin. Dikaiopolis in Aristophanes²⁰ “Acharnenses” disliked the resinous wine because he reminds him of pitch and shipbuilding. Pliny too thought that pitched vessels should contain wines strictly for medical purposes. On the contrary, the residents of Euboea drank it a lot.



Fig. 1: Dion. Pitched sherd of wine amphora. “Villa of Dionysus”. DM:8095.

Recently, in farmhouses of ancient Macedonia plenty amphorae lined most probably with the famous Pierian-Macedonian pitch of the sources were discovered, containing some kind of resinous wine. In Pieria, pitched amphorae were found at a Hellenistic villa rustica at Komboloi²¹ and at a Roman farmhouse at the site Pege Athenas. Another 43 pitched amphorae were unearthed in a winery of the Byzantine period at the site of Louloudies.²² Pitched amphorae were revealed in a villa rustica of late Classical to Hellenistic times at Asprovalta,²³ as well as, at the Hellenistic site of Petres²⁴ at Florina; seven more pitched amphorae were unearthed in a rustic villa across Via Egnatia at Hemathia.²⁵

Pitch is produced also in Chalcidice, which had a long tradition of pitch production, since the 10th–9th century BC,²⁶ as it was detected on the outside surface of a krater. An alliance between Amyntas III and the Koinon of Chalcidians in 393 BC confirms it.²⁷ At the framework of this alliance a trade treaty was concluded. The king of Macedonia granted consent for placing on the market for the next 50 years of the tar produced by the Chalcidian's Koinon. It is evident that the “pitt(ss)a”, the pitch of the inscription is identified with the organic substance we trace mainly on potsherds. As Macedonia expanded, especially during the reign of Philipp II, the pitch of Chalcidice obviously became part of the Pierian-Macedonian pitch and was brought both under its name and under the royal control as well.

With Macedonian pitch also a number of Acanthus trade wine amphorae was lined, as a stamped pitched amphora handle of Acanthus, dated in 330 BC, found at Amphipolis, demonstrates. Pitch was detected on another Acanthus amphora²⁸ revealed among other 90 in a workshop of the city.

Trade Mendeian amphorae lined with Macedonian pitch carried the famous Mendeian resinous type of wine to busy Mediterranean ports, such as Porticello (end of the 5th century to early 4th century BC)²⁹ in Italy and in Athens (second half of the 5th century BC),³⁰ as the archaeological evidence declares. A Mendeian amphora filled with pitch was also revealed at the shipwreck of Tektas Burnu.³¹

From the excavation of the “Kelepouris baths” at Dion of the Roman period was unearthed an amphora sherd with a mass of solid pitch attached to its inner side. A piece of pitch was also detected into the base of a pointed amphora found at the “Bridge Sector” of the city.

Plutarch and later Or(e)ibasius talk about pitched wine, “πισσινίτη οἶνος”,³² manufactured by mixing a piece of liquid pitch with wine at the fermentation process. Pliny³³ is aware of the method of sprinkling pitch in the must during the first nine days of fermentation, too.

Resinous kinds of wine were known to Thrace, too. One hundred eighty eight pitched amphorae were found upside down at ancient Zone.³⁴ Pitch residues have been also reported at various sites of the Greco-Roman world, such as Crete,³⁵ Cyprus,³⁶ Asia Minor,³⁷ North Africa,³⁸ southern Italy,³⁹ and France.⁴⁰ All the above pitch residues most probably come from different than Macedonia pitch production centers.



Fig. 2: Dion. Pitch lump. Dry pitch for sale. “Bridge Sector”. DM 8090.

Many free standing pitch lumps were found at Dion. One of them was intact and weights 680 grams = 1,56 attic mnae (fig. 2).⁴¹ Another one was traced at Hellenistic Petres. It weights 3,5 kilos, which corresponds to 8,027 Attic mnae. According to a diagram found at Caunus of Lycia regulating customs duties, dry pitch and resin are taxed by lumps, by “βώλος”. So, the above two intact pitch bars more likely were bought in that form.

In addition to that, carbonized preserved pieces of wood coated with pitch were found at ancient workshops of the Hellenistic period across a road near to nowadays Kate-rini.⁴² Literary and epigraphical evidence mention the coating of the wooden usually exterior parts of the buildings with pitch for protection. Those were the “πιττοκοπηθέντα” woods of the sources.

How the Macedonians Produced Pitch “Πιττοκαντεῖσθαι”

Macedonians had a unique technique they used par excellence to produce massive amounts of pitch. It is notable that Pliny,⁴³ Aristophanes⁴⁴ and mainly Theophrastus⁴⁵ knew that way. Theophrastus⁴⁶ in particular, describes with scrutiny how the Macedonians burn the pitch “πιττοκαυτοῦσιν” (fig. 3).

In springs and summers, at the slopes of Mount Olympus, among others, they prepared a threshing floor sloping towards the center, where tree trunks are positioned so as to form a pile, like a conical wood tower, with a periphery of about 100–180 feet (= 46–83 m) and height of 50–60 feet (= 23–28 m). From the center of that tower of woods they formed a corridor ending at an opening with trunks, from where they fired the woods. Before that, they covered the pile with thinner tree branches, so as to restrain a layer of soil to be thrown upon it. After they fired it, they closed the opening, so as to achieve as much as they can an incomplete combustion and to extract top quality

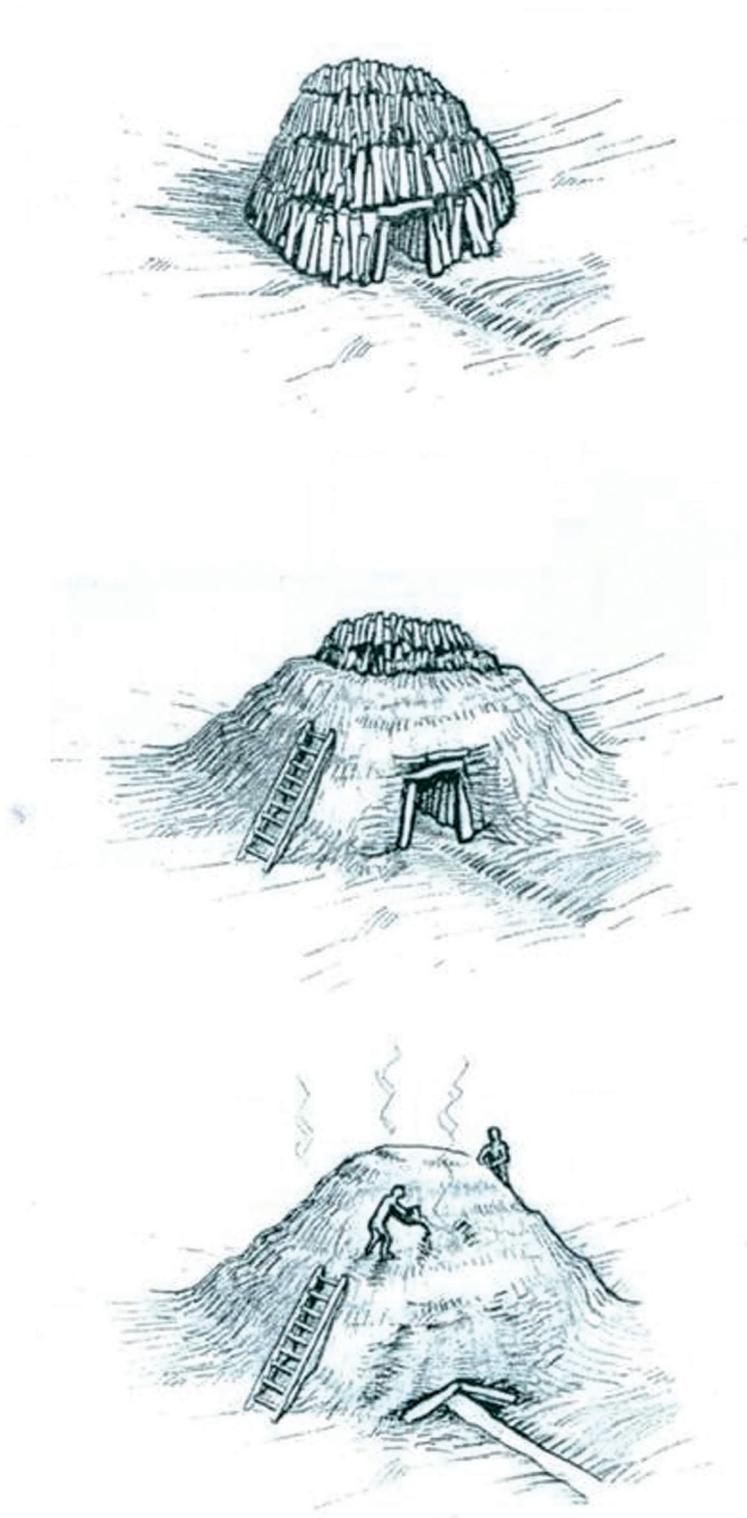


Fig. 3: Reconstruction of the Theophrastean pitch kilns of Macedonians.



Fig. 4: Modern coal kilns in Greece.

tar. This was a pitch kiln. The burning lasted two days, while workers watched it over day and night. During that process, they celebrated sacrificing to their gods, as they used to do with almost all agricultural activities.

Nowadays, in many Greek places, the ancient Macedonian pitch burning technique survived to modern coal kilns (fig. 4). After all, the traditional exploitation of the natural local sources and specifically of the forest goods is a *locus communis* through centuries.⁴⁷

Archaeological remains of pitch kilns of different types than the Macedonian have been revealed in Bruttium,⁴⁸ for the production of another brand name pitch, the *pix bruttia*. There, the double pot method was used, as in Roman Gaul⁴⁹ and in Roman Switzerland⁵⁰ too.

Management and Distribution of the Pierian-Macedonian Pitch – a Macedonian Royal Affair

By the alliance of the Macedonians with the community of Chalcidicean towns and the royal donation of tons of Macedonian pitch to the Rhodians is evident, as it was already stated by scholars,⁵¹ that the management of pitch directly associated with the Macedonian king and the income derived from its commercial circulation belonged to the royal revenues (*vectigalia regni*).

Every year, the priests in Delos, at the time of the annual celebration, bought a large amount of pitch for the coating and glazing of the famous altar, the altar of Horns, “Κερατώννα”, as pitch was used to purify⁵² it. In 1916, Glotz⁵³ was the first to support that the pitch of the forty eight Delian inscriptions he studied, was imported from Macedo-

nia, and identified it with the Pierian pitch of the sources, in his attempt to explain the sudden rise of its prize in 279 BC, which, in his opinion, was due to the Gallic invasion of Macedonia that year.

One might also conclude that the pitch used at the port of Piraeus in 377–76 BC, as an inscription⁵⁴ mentions, must have been of Macedonian origin, giving the fact that Amyntas had already allied with the Athenians one or two years before, in 375–3 BC. Nevertheless, ancient Macedonia traditionally supplied Athens with shipbuilding wood for the construction of their triremes. That is why pitch was closely linked to fir – shipbuilding wood. After all, pitch and timber were the two main economic resources of ancient Macedonia.

Of Macedonian origin must have been the pitch mentioned on the accounts of the sanctuary of Eleusis in 329–8 BC and in 327–6 BC,⁵⁵ as in the same inscription there is a reference to the cutting of Macedonian woods during the second prytany. This strongly suggests commercial affairs between the sanctuary of Eleusis, and Macedonia. The same applies probably for the pitch that was bought in 400–350 BC. at Epidaurus⁵⁶ as well as for the pitch used to waterproof the pulley at Delphi⁵⁷ harbor, in 361–343 BC.

Mapping (fig. 5) the known natural pitch production centers of the Greco-Roman world and bearing all the above in mind, it is obvious that Macedonians had the absolute supremacy and the monopoly of pitch in Greece, at least during the Classical and Hellenistic era, exactly as Plinius testifies. The literary, archaeological and epigraphical



Fig. 5: Mapping pine pitch production centers of the Graeco-Roman world according to literary sources.

evidence allow us to conclude that pitch was produced and traded continuously for about six centuries in Macedonia, from the 5th century BC until the Byzantine era.

In that context, the forested land of Mount Olympus, especially the coniferous zone, is difficult to be considered private land, since someone needed the royal license to exploit the pitch out of trees. So, since the king was the manager of the forest, is plausible to think that on the slopes of Mount Olympus a royal forest was expanded, as well as at Pangeon Mountain, where, in addition to the shipbuilding wood, the royal mines were situated.

It was Philip V⁵⁸ who raised the rent of the royal forests, along with other financial measures he took, in order to confront the Roman threat.

The Treaty of Amphipolis, in 167 BC, known as *lex aemiliana*, regulated the revenues of the royal agricultural goods. According to that, the lease of the royal lands and of the royal forests by contractors (*publicani*) was forbidden. To avoid riots, the Romans forbade the Macedonians to exploit the former royal agricultural property any longer. The measures of Aemilius Paulus signaled the end of the industrial production and consequently of the wide range trade of the Pierian-Macedonian pitch along with the shipbuilding timber of Mount Olympus, Holomon and especially that of Mount Pangeon. It is not known when the clause of Aemilius Paulus began to apply. Anyway, 158 BC⁵⁹ affixed the restart of mining in Macedonia.

Nearly a century later, in 63 BC according to Cicero's⁶⁰ speech in Rome, the former royal lands of Macedonia, the lands of Philip V and Perseus, were given by censors to contractors, and they become one of the safest income for Rome.

To summarize, the Pierian, the later Macedonian pitch was not only a brand name product in the "international" tar market of the era but it was a large scale export agricultural good, under the royal control at least from the 5th century BC until the Roman conquest of Macedonia. In that time its management and distribution were closely related to the "state", the royal economy. Pitch was certainly one of the most important economical resources of ancient Macedonia.

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Notes

- ¹ Vassiliadou 2011, Appendix H., 322. 323; Dimitrakoudi et al. 2011, 581–591.
- ² Vassiliadou 2011, notes 333. 353.
- ³ Rolley et al. 2004, 55–65.
- ⁴ Hdt. 4, 195.
- ⁵ Geoponica, 6, 5, 1.
- ⁶ Plin. nat. 14, 128.
- ⁷ Aristot. mir. Auscultationibus, 842b.
- ⁸ Plin. nat. 16, 59.
- ⁹ Theophrastus, *Historia Plantarum*, 9, 2, 2–3.
- ¹⁰ Pol. 5, 89, 6–8.
- ¹¹ DNP, s.w. Talent = 60 minai. An attic mna weights 436 grams. Consequently, a talent is equal to 26.100 grams. Attic mnae was used in transactions carried out at Dion of Pieria, Pandermalis 1990, 10–15; Pandermalis 1977, 331–342.
- ¹² Der Kleine Pauly, *Lexikon der Antike* 2 (1967) 1198. 1199 s.w.: Hohlmaße (H. Chantraine) 1 metretes = 39,39 liters.
- ¹³ Pitched potsherds did not contain always wine. There have been detected also animal fats or traces of plants or vegetables, like in France: Marshall et al. 2008, 245–254. (2nd–6th cent. AD)
- ¹⁴ Plut. symp. 5, 676.
- ¹⁵ Cato agr. 23.
- ¹⁶ Colum. 12, 18, 3–6.
- ¹⁷ Geoponica, 6, 4, t.
- ¹⁸ Μέγα Ετυμολογικό Λεξικό, s.w.: “Κωνήσαι”; Suda; Hesychius, *Lexicon*, s.w.: “Κωνήσαι”.
- ¹⁹ Plin. nat. 14, 120.
- ²⁰ Aristoph. Ach. 190.
- ²¹ Poulaki-Pandermali 2001, 331–346; Adam-Veleni et al. 2003, 63–70; Poulaki 2004, 45–56; Poulaki-Pandermali 2008, 137–145.
- ²² Marki 2008, 13–15.
- ²³ Adam-Veleni et al. 2003, cat. no. 272.
- ²⁴ Adam-Veleni 1995, 14–23; Adam-Veleni 1996, 1–22.
- ²⁵ Koukouvou 1999, 566–578.
- ²⁶ Carington-Smith 1991, 335–348.
- ²⁷ Tod 1950, 111; Hatzopoulos 1996, *Epigraphic Appendix*, 1, where all the relevant references can be found.
- ²⁸ Trakosopoulou-Salakidou 2004, 157–166, mainly 162. 163.
- ²⁹ In the Porticello shipwreck were found Mendeian pitched amphorae, with a piece of solid pitch attached to its inner wall. Jones Eiseman, 1973, 2.1, 13–23; Jones Eiseman – Ridgway 1987.
- ³⁰ A Mendeian pitched amphora was found at the Athenian Agora too; Robinson 1959, 93, fig.35; Koehler 1986, 46. 67, in particular 50–52.
- ³¹ Gibbins 2000, 19. 20; Beck Curt 2001, 248.

- ³² Plin. nat. 14, 25, 124, and 23, 45–52; Or(e)ibasius, Medical Collections 5, 25, 36.
- ³³ Plin. nat. 14, 25, 124 and 23, 45–52.
- ³⁴ Tsatsopoulou 1992, 669–675; Tsatsopoulou-Kaloudi 2001, 27, 28, fig. 30.
- ³⁵ Markoulaki 2009, 358.
- ³⁶ Beck – Borromeo 1990, 51–58.
- ³⁷ Gibbins 2000, 19, 20; Beck Curt 2001, 248; Romanos et al. 2009, 900–909.
- ³⁸ Bonifay 2004, 461–475.
- ³⁹ Costabile 1992, 169–191.
- ⁴⁰ Trintignac 2003, 239–248.
- ⁴¹ Pandermalis 1977, 331–342; Pandermalis, 1986, 10–15.
- ⁴² For further bibliography Vassiliadou 2011, 39, note 80.
- ⁴³ Plin. nat., 23, 46, 47.
- ⁴⁴ Aristoph. Vesp. 1375.
- ⁴⁵ Theopastus, Historia plantarum, 9, 2, 2, 3.
- ⁴⁶ Theopastus, Historia plantarum 9, 3, 1–3.
- ⁴⁷ Gangemi 2006, 455–460. For the resin collection and its manufacture procession specifically in Greece with references to Europe and the USA at the beginning of the 20th century: Damianos 1933.
- ⁴⁸ Cavassa 2008, 99–107.
- ⁴⁹ Orengo et al. 2013, 802–814.
- ⁵⁰ Jauch 1994, 111–119.
- ⁵¹ Tod 1950, 111; Hatzopoulos 1996, Epigraphic Appendix, 1.
- ⁵² On the use of pitch for the purification of the altars, see: Vassiliadou 2011, 87–96, mainly 93. The purifying qualities of pitch trace back to the prehistoric era. Beckmann 2012, 24–42. For its chthonic dimension in the classical period: Roussel 1934, 177–179.
- ⁵³ Glotz 1916, 281–325. For the references of the ancient sources concerning the resin and pitch production centers of the Greco-Roman world, Vassiliadou 2011, 73–81.
- ⁵⁴ IG II², 1604, 32.
- ⁵⁵ Tsountas 1883, 254–263; Koerte 1896, 234; IG II², 1672.
- ⁵⁶ IG IV² 1, 102, 245, 277.
- ⁵⁷ FdD 5 (3), 19, 55; Meiggs 1982, 467–477.
- ⁵⁸ Hatzopoulos 1996, 430.
- ⁵⁹ Larsen 1949, 73–90.
- ⁶⁰ Cic. leg. agr. 2, 50.

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Roman Control and Management of the Rural Economy in Macedonia

Kostas Ketanis

Introduction

The conquest of Macedonia by the Romans meant the end of the Macedonian kingdom in the geographical area where it was born. The changes that occurred were administrative and political as well as economic. The information we have from epigraphic and literary sources about rural policy of the Romans in Macedonia is limited. However, fertile Macedonian valleys and rich mountain pastures, together with farmhouses that have been excavated in recent years in northern Greece, show that the primary sector played an important role in the region's economy. This paper will examine only a few cases concerning the tactics followed by the Romans in the agricultural sector in Macedonia during the Republican and Imperial Period.

Administrative and Economic Changes

The Romans, immediately after conquering Macedonia (168 BC), wanted to secure their domination in this region in order to prevent any attempt at revolution. In addition to other measures, they banned the trade among the four districts (*μερίδες*),¹ they did not allow anyone to acquire land in a district other than the one they were registered in² and finally banned the lease of public land.³ However, within each district, the Macedonians were allowed to maintain their autonomy, habits and old laws. They could also own the land they had before the Roman conquest, provided they paid the taxes to the Romans.⁴

The information about Macedonia derived from literary sources of the Roman era focuses mainly on military events and the life in urban centers.

According to this information, during the Republican period, because of the rebellious attempts of the Macedonians, the civil conflicts between Romans, the invasions of tribes from the north, and the counterattacks of the Roman troops in order to preserve the borders in the Balkans, there was a contraction of urban life and an economic recession, in comparison to the Macedonian kingdom era.⁵ As a result, the economic situation of rural populations living in villages and in farmhouses was also affected.⁶

From the time of the Emperor August onwards, Macedonia became a senatorial province and the Balkan borders of the empire moved further north. As a result, a period of peace and prosperity began for the area that we study. Extensive and expensive building projects in a lot of Macedonian cities, the increase of donations and bequests of wealthy citizens to their birthplaces⁷ and the organization of costly festivals,⁸ reflect a progressively prosperous economy.

The over-all peaceful conditions that prevailed in Macedonia during the Imperial times are also reflected in the construction of *villae rusticae*, buildings often of large size with luxurious decoration.⁹ The issue that is in need of further investigation remains whether and how the Roman rural policy determined the form, function and number of these rural buildings in the countryside of Macedonia.¹⁰

Taxation

One of the regular taxes imposed by the Romans was the *tributum soli* (land tax).¹¹ It concerned landowners and growers and was paid in cash or in kind. Land tax was paid by the citizens of the subordinated cities (*civitates stipendiariae*) and from the Imperial times and onwards by the citizens of the free cities (*civitates liberae*)¹² and of the Roman colonies also.¹³

During the Republican period, taxes were collected by *δημοσιῶνες* (tax collectors). Since Augustus, the tax collectors were freelancers or inferior imperial employee (usually slaves or freedmen) under the control of Imperial commissioners.¹⁴

Payment in kind was a type of direct tax and was applied in specific cases. In an inscription from Lete (121–122 AD), near Thessaloniki, the city was obliged to cover the needs of the Roman troops passing through, mainly for wheat, barley, beans and wine.¹⁵

In addition to direct taxation, the Roman state had imposed indirect taxes to the landowners in Macedonia.

In Heraklea Lygistida landowners (*κεκτημένοι*) were forced to cover, at their own expense, two-thirds of the cost of repairing the road network in the area.¹⁶ In this way, the Roman administration reassigned the workload of road repairing to the local community.

One special case of taxation in the region of Macedonia is also worth mentioning. In an inscription from Veroia (late first half of the 2nd century AD) the proconsul of Macedonia L. Memius Rufus determined that the incomes from the operation of the city's watermills would cover the running costs of the Gymnasium.¹⁷

Property Categories

After the conquest of Macedonia by the Romans, the lands of the Macedonian king (*agri regii*) were confiscated.¹⁸ Owned by the Roman state, they were classified as public land (*agri publici*) and were rented or were given to the Romans who settled in Macedonia and became landowners.¹⁹

Another type of land was the one belonging to the cities (*δημόσια γη, δημόσιοι τόποι, locus publicus*). The profits from its exploitation went to the city's treasury.²⁰ The *civitates liberae* (free areas) of Macedonia, which had administrative autonomy, managed

the public land on their own.²¹ However, in some cases, even cities, which belonged to the territory of Roman colonies, had the freedom to manage the public land as they pleased. For example in 159 AD the city Gazoros (40 kms west of Philippi) gave to the landless people public land for cultivation under conditions.²²

During the Imperial period some emperors possessed arable lands in Macedonia. Three inscriptions from Thessaloniki and around mention officials (slaves) responsible for the administration of the emperor's property in the area.²³ Moreover, some inscriptions inform us about the emperor's representatives in Macedonia (*ταβουλάριοι*), responsible for his estate.²⁴

Also, there were Macedonian governors who were owners of arable land. Sextus Pompeius, proconsul of Macedonia during the period 8–9 AD, owned extensive lands in Macedonia.²⁵

Farmers-Soldiers and Soldiers-Farmers

As mentioned, Macedonia, up until the years of Augustus, was the geographical area where important war events took place. Wars had a significant impact on the lives of rural populations, and in particular landowners. The destruction of crops, the compulsory recruitment and the provision of large amount of crops for the maintenance of the Roman troops, were some of the difficulties the Macedonian farmers faced during that time.²⁶ From the years of Augustus and until the 2nd century AD Macedonia was largely relieved of the presence of the Roman army and its population ceased to suffer from warfare and raids.²⁷ However in the middle of the 3rd century AD, the raids of Goths in the Balkan region made it once more imperative to have Roman troops in the Macedonian region.²⁸

In addition to the regular Roman army, which was positioned in Macedonia, there were also a number of local reserve soldiers, who were often recruited unwillingly. The mandatory recruitment of Macedonians is said to have been imposed by Aimilius Paulus²⁹ as well as in the years of the Civic Wars.³⁰ Costs for the maintenance of these military forces burdened the soldiers or the cities to which they belonged.³¹ Many of those soldiers were farmers.³² In an inscription from Lete, the inhabitants honored treasurer Marcus Annius because he defeated the Skordians in Argos of eastern Paeonia (120–119 BC) without recruiting Macedonians and left them in their (rural) works.³³

Roman soldiers, who settled in areas of Macedonia, also owned part of the arable land. They were mainly veterans of the Roman army, who were rewarded with land for their services.³⁴ Also, in the years of Augustus, some Italians, who were forced to leave their lands in Italy, which were given to veterans of the Roman army, settled in Macedonia and became landowners there.³⁵

What criteria and how much of the Macedonian land was given to everyone remain unknown. It is certain, however, that such rewards were offered during both the Repub-

lican and the Imperial period, and that the number of soldiers who acquired land ownership was large.³⁶ We know that the veterans settled in various parts of Macedonia and especially in the Roman colonies.³⁷

Census Property

In the Augustan period, a census (*ἀπο-τίμησις*) of residents, properties and estates begun in all provinces. Officials of the Roman administration, called *κηνσίτωρες* (in latin *censitores*), conducted the census.

An inscription from Orestida (192/193 AD) in Upper Macedonia refers to the census that includes registered lands, which belonged to the city of Vattyna and were given for exploitation to the citizens of Vattyna.³⁸ The same inscription refers to the name of a *κηνσίτωρ* (census officer), the Macedonian proconsul Decimus Terentius Gentianus (117–119 AD).³⁹ Gentianus, a few decades before the inscription, apparently drew a commandment to regulate such issues. This commandment by Gentianus may be identical to the *παλαιά γράμματα* (old letters) of the inscription (line 36) and refers to a cadastre or a public property record.⁴⁰ Indicative is the validity of the Gentianus' orders, more than seventy years after his term in Macedonia.

As noted above, the emperors had property in the province of Macedonia. The *ταβουλάριοι* (archivists) kept data about the wealth, in particular about real estate and arable land, of the emperor in Macedonia, in a special record, called *kalendarium* or *καλενδάριο*. We are aware of the existence of two *ταβουλάριοι* from even inscriptions from Thessaloniki⁴¹ and an assistant of archivist (*βοηθός ταβλαρίου*) from an inscription from Thessaloniki also.⁴²

Cadaster

The compilation of a cadastre of Roman provinces started in the years of Julius Caesar in order to determine taxation and to remedy any past injustice concerning properties.⁴³

In the instance of Macedonia successful efforts were made to implement a cadastre for arable lands. Specific aerial photography studies have contributed to the identification of ancient field borders in the areas of Philippi, Dion, Pella and Thessaloniki.⁴⁴ We ascertain that field delimitation took place in fertile plains of the Roman colonies and in the countryside around the capital of the province.

Foreign Cultivators in Macedonia

The annexation of Macedonia to the territories of the Roman Empire attracted many foreigners who settled in its areas to seek new opportunities for professional career and improvement of their economic status.⁴⁵

Some of them settled permanently and acquired the right of land ownership. In an inscription from Beroea the latter are mentioned as *ἐνκεκτημένοι*⁴⁶ and in other inscriptions from Macedonia they are mentioned as *πραγματευτές* and actors.⁴⁷ They had the right of residence (*domicilium*) but, as far as we know, they did not take part in the political life of the cities.⁴⁸

Protection and Guarding

The *altarii* or *saltarii* (in Greek *σαλτάριοι*) were responsible for maintaining the safety in the countryside. They are referred in a macedonian inscription from Meleniko (today's Melnik of Bulgaria), dates back to 214–215 AD.⁴⁹ They could be described as field guards (in Greek *δραγάτηδες*), guardians of estates, foresters (< saltus = forest) and border guards (*ἐπόπτες* or *όροφύλακες*).⁵⁰ Their responsibilities included guarding the wealth and crops from theft and deliberate destructions.⁵¹

Territorial Disputes⁵²

The Roman administration interfered with territorial disputes between the Macedonian cities or between Macedonian cities and other neighboring areas. These areas were exploited by the inhabitants of a region, and were namely arable lands, forests for logging, fishing areas, quarries and mines.

A Latin inscription of 101 AD contains the decision of a Roman judge, following an order of the Emperor Trajan on the border dispute between Dolichi, a city of Perrevia, and the Helimiotes in Macedonia. Both regions shared the disputed lands, which were probably grazing grounds. It is noteworthy that the decision invoked an earlier verdict received by King Amyntas III (393–370 BC) for the same dispute.⁵³

Regarding land use, the relations between native Macedonians and foreigners were not always good. In an inscription from Orestida of Upper Macedonia (192/3 AD) the citizens of the town Vatunna complained about foreigners intruding public land. After the meeting between Ecclesia and the *πολιτάρχης* (chief) of Vatunna, it was decided to prosecute every foreign invader of public land. Afterwards the Roman governor of the province of Macedonia approved this decision.⁵⁴

According to another inscription (69–79 AD) a territorial difference was between the Roman colony of Philippi and Thasos.⁵⁵ The disputed area was the coastal zone opposite

Thasos, which belonged to the Roman colony of Philippi. The governor of Macedonia, Lucius Antonius, solved the difference in favor of Thasians.⁵⁶ It is considered that Lucius Antonius had personal interests in these specific fertile lands and for this reason favored the Thasians.⁵⁷

Conclusions

The agricultural policy implemented by the Romans in Macedonia was characterized by a variation determined by legislation, but also influenced by current political circumstances and, to a certain extent, by the will and interests of governors and state employees. The granting of privileges, the bans and arrangement of disputes aimed at improving the agricultural production and the well-being of the local communities. From the inscriptions we learn that the cities could make decisions concerning agricultural production; however, the implementation of such decisions was effective following the approval of the Roman state.

The foundation of the colonies in Macedonia, the establishment of Italians and army veterans as well as the allocation of arable lands to them, the interventionist role of the Roman administrative bodies, are some of the main elements of Rome's control in the area we study. A common denominator of all the above seems to be the exploitation of fertile soils with a view to reviving rural economy. The agricultural produce covered not only the needs of Macedonians in food but also provided the necessary supplies to the Roman troops in a region of paramount military importance, such as Macedonia.

The concession of Macedonian arable land to veterans shows that Rome did not mainly intend to develop the Macedonian lands for the benefit of local populations, but exploit them.

The taxation of agricultural produce, whether in cash or in kind, was implemented in accordance with Roman laws, as were in every era. Macedonia had large amounts of fertile land, the production of which yielded considerable sums to the Roman state from taxes. Special or exceptional forms of taxation (e.g. in Heraklea Lygistida and in Beroea) were applied to supply specific needs for prosperity and peace in local communities.

The preservation of old Greek institutions in cities, such as the Ecclesia of Demos and the Vouli, did not have a merely customary character, but in some cases their power seems to not have been completely determined by the central Roman administration. The decision of the city Gazoros to make public lands available for cultivation clearly shows the flexibility of Roman laws and certainly a form of freedom, which, according to the inscription, was enjoyed by this specific city.⁵⁸

As far as the landowners of Macedonia are concerned, the information we have is scarce but allows us to gain some knowledge on the subject. There were the lands that belonged to the Roman state or to the local cities, which were given to the landless people or as a form of payment to soldiers. Also, emperors and governors owned land.

Finally, owners of arable land were sanctuaries and private individuals. The sizes of land that each citizen had in Macedonia remain unknown. However, the variety of forms, sizes and decoration presented by the farmhouses excavated in Macedonia also shows the different levels of landowning.

Censuses of properties and the existence of a cadaster reveal the attempt by the Roman state to systematize agricultural production, control the cultivated land and protect the owners from transgressions. The taxation of farmers was important revenue for the Roman treasury, especially from a region like the province of Macedonia, whose economy seems to have relied mainly on agricultural production.

The Roman state intervened to regulate territorial differences between cities and regions, mainly with the aim of maintaining order and avoiding arguments and conflicts that would disturb peace in Macedonia. In many cases of such matters the Roman state respected the old local Macedonian tradition to which the local people were used to. Groups of public servants-guards (e.g. *saltuarii*) show the state's attempt for guarding fields and crops.

The attempt to investigate the Roman agricultural policy in Macedonia encounters many obstacles mainly due to the limited synthetic studies for the region. Information from the literature sources on this subject is minimal. Inscriptions provide more information, but they usually relate to local phenomena and in specific time periods. The overall study of political, social and economic developments, combined with the study of the agricultural settlements identified in Macedonia, is considered to contribute significantly to the research of the rural economy in this region during the Roman period.

Notes

* Many thanks to Antonia Mavromatidou and Anna Fitsiou for the corrections in the English text.

¹ Liv. 45, 29, 5; Strab. 7, fr. 47; Diod. 31, 8, 8.

² Liv. 45, 29, 10. Romans had imposed similar prohibitions and in other areas just after the Second Macedonian War, 200–196 BC as well as after the Achaean War, 146 BC (Larsen 1959, 279).

³ Liv. 18, 3. 4. A few years later (158 BC) the mines of Macedonia were allowed to be exploited. This led to the conclusion that at the same time the exploitation of public estates were allowed also (Cassiod. chron. min. 2, 130).

⁴ Liv. 45, 29, 4; Iust. 33, 2, 7.

⁵ Strab. 7, 327.

⁶ Cic. Pis. 34, 84: for the disasters caused in Macedonia by the invasion of the Dardanians, Bessi and Dentheletae. See also Papazoglou 1979a, 312–321. In addition, see the inscription from ancient Lete (see below, footnote 15). For the effects of the wars from 146 until 30 BC, see Larsen 1959, 422–435. For a general view of the economy in the Greek cities during the Republican period, see Rizakēs 2004.

⁷ Gounaropoulou – Hatzopoulos 1998, 200–203 (no. 117).

⁸ Sismanidēs 1983 (1st cent. A.D).

⁹ See Adam-Velenē et al. 2003 and also Ketanēs 2015/2016.

¹⁰ The farmhouses in Macedonia from the 2nd cent. BC until the 6th cent. AD are the subject of my doctoral dissertation.

¹¹ RE VII A1, v. tributum und tributes, 1–78 (Hans Philipp.).

¹² Kanatsoulēs 1955–1960, 290, 291; Kanatsoulēs 1964, 105–107.

¹³ Stevenson 1939, 150, 151.

¹⁴ For the tax system in the first years of Roman conquest of Macedonia, see Hill 1946. For the direct taxation in Macedonia in the 1st cent. AD, see also Nigdelēs 2012.

¹⁵ Picard et al. 1918/1919, 72 et seq., no. 7 [= SEG 1, no. 276].

¹⁶ Perdrizet 1897, 161, 164 [= IG X, 2 2 52]. The inscription dates back to the early 2nd cent. AD.

¹⁷ Gounaropoulou – Hatzopoulos 1998, 101–109 (no. 7). For more detailed comments, see Nigdelēs – Sourēs 2005.

¹⁸ Cic. leg. agr. 1, 5; Liv. 45, 18, 3. For land expropriation and confiscation in Achaia and Macedonia, see Rizakēs 2015.

¹⁹ Cic. leg. agr. 2, 50.

²⁰ Kanatsoulēs 1955–1960, 304.

²¹ Pappadakis 1913, 462–477, especially 469; Rizakēs – Touratsoglou 1985, 168–176 (no. 186).

²² Vatin 1962.

²³ IG X2 1 740: *Caesaris nostri servae* (2nd/3rd cent. AD); Trakosopoulou-Salakidou 1993, 1556–1560: *dispensator* (2nd cent. AD); IG X2 1 351: *ἐπίτροπος χωρίων δεσποτικῶν* (4th cent. AD)

²⁴ See also below in the subchapter ‘Census property’.

²⁵ Ovid. ex Pont. 4, 15, 15–23; see also Sarikakēs 1977a, 43–46.

²⁶ Sarikakēs 1971, 12–15, 23, 116, 143; Sarikakēs 1977a, 19.

²⁷ Sextus Aelius Catus was probably the last governor of Macedonia, who had troops in the province (Sarikakēs 1977a, 43).

²⁸ Sherk 1957, 53–60. For the events that took place in Macedonia during the Roman period, see Papazoglou 1994, 192–199.

²⁹ Liv. 45, 29, 14; Diod. 31, 8, 9; Sarikakēs 1977b.

³⁰ App. Mithr. 41; Frontin. Strat. 2, 7, 8; Caes. civ. 3, 4; App. civ. 4, 75; Cic. Phil. 10, 13.

³¹ Kanatsoulēs 1955–1960, 293–298.

³² Plut. Ant. 62, 1.

³³ Syll³, 700, line 23–26.

³⁴ Kanatsoulēs 1955–1960, 296–298.

³⁵ Cass. Dio 51, 41, 6.

³⁶ Pompeius in 49 BC recruited an entire legion of veterans who had settled in Macedonia and Crete (Caes. com. civ. 3, 4).

³⁷ Kanatsoulēs 1964–1965, 10–15; Kanatsoulēs 1964, 130. Concentrated and comparative study about the veterans who settled in Roman colonies in Macedonia does not exist. For the Roman colonies in Macedonia each separately, see Collart 1937 (Filippoï), Samsarēs 1987 (Cassandreia), Chrysostomou 1990, 226–229 (Pella), Kremydē-Sicilianou 1996, 11–22 (Dion). See also Papageorgiadou-Banē et al. 2000, a study about coinage of the Roman colonies in Macedonia with bibliography on the subject.

- ³⁸ Rizakēs – Touratsoglou 1985, 168–176 (no. 186).
- ³⁹ Pappadakis 1913, 465–466; Sarikakēs 1977a, 77–80.
- ⁴⁰ For the record of the cities, where, among other things, contracts for purchase and sale of real estate and property titles were kept, see Kanatsoulēs 1961–1963, 45. See also Sarikakēs 1977a, 143. 144.
- ⁴¹ SEG 44:553 (161–250 AD) and SEG 44:554 (2nd/3rd cent. AD). See also the comments in Nigdelēs 1994.
- ⁴² IG X, 2 1 471 (3rd cent. AD).
- ⁴³ Riese 1878, 21.
- ⁴⁴ See Santoriello – Vitti 1999 (where the oldest bibliography can be found).
- ⁴⁵ Kanatsoulēs 1964, 98. 99. See also Papazoglou 1994, 196, notes 23. 24.
- ⁴⁶ Gounaropoulou – Hatzopoulos 1998, 159. 160 (no. 59). See also Larsen 1959, 458. 459, fn. 23.
- ⁴⁷ Collart 1937, 289. 290, fn. 4.
- ⁴⁸ Kanatsoulēs 1955–1960, 259. 261.
- ⁴⁹ Mordtmann 1896; Perdrizet 1904.
- ⁵⁰ For *δραγατεύοντες* and *δραγατεύόμενα* (> *δραγάτης*) see Arvanitopoulos 1913, no. 165A. 166. *Επιστάται* and *ἐπόπται* (loc. cit. no. 166B) may also have had similar responsibilities. For *όροφύλακες*, see Sterrett 1883/1884, no. 65. 156.
- ⁵¹ For the profession of *saltuarius*, see Carlsen 2013.
- ⁵² For related Macedonian inscriptions, see Papazoglou 1979b, 240–242. For the same issue, see Sarikakēs 1986 and Pikoulas 1999.
- ⁵³ Wace – Thompson 1910/1911. For another similar case, see SEG 30.573.
- ⁵⁴ Rizakēs – Touratsoglou 1985, no. 186.
- ⁵⁵ Dunant – Pouilloux 1958, no. 186.
- ⁵⁶ Thassos, as a friend and ally of Rome, received Rome’s favor with regard to her territorial claims many times (loc. cit. no. 174. 175).
- ⁵⁷ Loc. cit. 85. 86.
- ⁵⁸ For the degree of “freedom” that Macedonian cities enjoyed during the Roman domination and the survival of the Greek identity in the region, see also in Kremydē-Sicilianou 2005, where monetary production in Macedonia is being studied.

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Villae Rusticae at the Beroia Countryside (Macedonia, Greece)

Angeliki Koukouvou

In Greece, over the past three decades or so, there has been a dramatic increase in the archaeological research carried out in the framework of major public works. These large-scale excavations – mainly in the service of road and rail transportation – have indisputably marked a new chapter in the history of archaeological research in Greece; bearing in mind the many kilometres running through unexplored regions, it is easy to understand the task and the difficulties the Greek archaeologists had to deal with. Nonetheless, the result was the exploration of regions that had never been previously investigated and the discovery of a whole series of hitherto unknown archaeological sites.

One representative example was the construction works along the route of the modern Egnatia Highway, a motorway that runs for 670 km through Epirus, Macedonia and Thrace in northern Greece, in essence a bridge between east and west. The aim of this paper is to present two interesting cases of rural establishments that were excavated in the years 1999–2002 at the periphery of Beroia, a city in Emathia Prefecture (fig. 1).¹



Fig. 1: Aerial photo of the two excavated sites (Paliomana and Asomata) at the periphery of Beroia, Emathia Prefecture (Macedonia, Greece).

1. 'Paliomana Stream' site

The first location named 'Paliomana Stream' (that means old source or old bank of river) is situated near the village Messi in the plain below the eastern foothills of Mount Vermion at about 4 km east of Beroia. The latter inhabited at least from the Iron Age



Fig. 2: Aerial photo of the excavation at Paliomana.

flourished in Hellenistic times and experienced through the Roman period a remarkable development in all aspects.

The excavation at the site revealed part of a Roman building, a farmhouse as we will argue later in detail. It is orientated N-S with preserved dimensions 32 × 25 m, approximately 800 sq.m. The north and south parts of the building were covered up by an auxiliary road and the National Highway respectively, so the research could not be continued (fig. 2. 3).

The walls indicate three successive construction phases. At the northern part of the excavated area we revealed hearths, ovens and pits cut on the rock-bed, used as storage pits, and at a later phase as depositors. The ash around the firing structures, along with other findings (fragments of cooking pots, an area covered with tiles, a fragment of millstone) allow us to assume that this area was used for food preparation and cooking.

In the centre of the excavated area we found the quite destroyed floor of a built rectangular vat (no. I). In contact with its walls, there were a stone built platform at the north and a large jar at the east. It is obvious that this installation was used as the treading platform for grape-pressing, what we call *lênos*. The runoff of grape flowed in the large jar, buried in the earthen floor (fig. 3). The well known mosaic floor from Patrai, Achaia gives us an iconographic paradigm.² The north wall of the vat continued



Fig. 3: View of the excavated villa rustica. In the centre the built rectangular vat (*lênos*) and the buried large jar for the runoff of grape.

to the east forming an oblong storage room sized approx. 3.20 × 21 m. It consisted of a series of rooms; vestiges of walls made of mudbricks were found at intervals of 3.5 m. Seven storage jars were interred up to rim height into the floor. Interred jars have been associated with the storage of wine as this positioning facilitated their use at the fermentation stage.³

Further to the east there was a double vat (no. III). The north part was smaller and its floor level lower than the south's, both of them lined inside with hydraulic mortar (fig. 4). According to their small dimensions and the mastoid cavities at their floors that facilitated the cleaning of the collected juice, they obviously acted as settling tanks for the must, called in literary sources *hypolênium*. Some finds give reasons to believe that relevant installations extended to the east, where we were not entitled to carry on the investigation. It is obvious that this was the wing of the establishment associated with the agricultural economy, the processing and storage of the goods of viticulture.⁴

Nevertheless, the most interesting feature of this farmhouse was a cistern (no. II), which unfortunately continued under the national road (fig. 3. 5). To the east of the cistern was a paved space made of small pebbles and pieces of tiles where two hearths were revealed. The cistern, 60 cm deep, was plastered with a strong hydraulic mortars and the water came by a clay pipe that ended in a lead part, vertically positioned to reach the level of the tank. The runoff was accomplished with a hole at the bottom of the east wall. Inside, embedded in the north and west walls and at a height of 20 cm from the bottom, clay pots with their open mouth in the tank formed blind openings with a diameter of 17 and a depth of 20 cm.

Cisterns are a common feature of Roman villas,⁵ but the arrangement of a series of similar cells on the walls that we described above indicates that our cistern was constructed to be used as a fishpond. Cisterns of this type have been found in Pompeii, Herculaneum, Timgad, Africa, and Tsatalaka, Bulgaria.⁶ Such constructions are described in the works of agricultural writers, as Varro and Columella. The latter advises: "there ought to be excavated in the sides of the pond what may be described as a series of similar cells, which may serve to protect the fish when they want to avoid the heat of the sun". These cells could also serve as a repository of fish fry, in line with contemporary practice in aquariums.⁷

The pottery that was gathered consisted of storage and cooking vessels, with a small number of table-ware, i.e. relief, black and red ware. Clay lamps, parts of figurines, glass vessels, loom weights, lead slags, bronze and iron tools were also found. The earlier chronological evidence of the site were eleven coins, autonomous issues of Pella, Thessaloniki and Amphipolis, coins that their circulation is dated from the 2nd third of 2nd century BC throughout the 1st century BC.⁸ To these early findings, it has not been possible to link specific architectural remains. Of the three identified construction phases, the second one, this of the 2nd–3rd century AD seems to be the more ambitious: to the farmhouse of that period belong most of the finds⁹ and the installations: the wine-press and the storage room, the collection vats, and the fish pond. The farmhouse



Fig. 4: The double vat used as *hypolênium*.



Fig. 5: The cistern, used as a fishpond, with the embedded clay pots in its walls.

must have suffered greatly after the middle of the 3rd century AD, when we know that the descending Goths and Heruli towards south Greece have swept everything at their passage, but was not abandoned until at least the late 4th century AD when it was probably hit again by the barbarian invasions. The dispersion of coins of the 4th century AD indicates that in this last phase the inhabitants used only parts of the farmhouse and constructed some new walls with re-used material. The destruction layers give us an image of abandonment and gradual decline at the late 4th–early 5th century AD.

Despite the restrictions of the short in time and space research and the partly investigated farmhouse, we should try to summarize our data and conclusions.

The revealed vestiges lie some 4 km away from Beroia, in the area where the territory, the *chôra* of the ancient city, stretched. The site is situated along the ancient S-N main route leading from Thessaly through Dion, Pydna and Beroia to Thessaloniki and near the Aliakmon River that ensured an abundance of water.¹⁰

The character of the finds and the architectural remains, i.e. the installations related to the processing and production of wine, the storage rooms with *pithoi*, the fish tank (a *vivarium*) indicate that they belong to a building complex in an agricultural property. Furthermore, the *vivarium*, a fish tank built according to the instructions of the Roman specialists, intended for the preservation of fresh fish and for their reproduction as shown by its special arrangement, is certainly in accord with the sophisticated taste

and tendency of the Roman aristocracy to wealth ostentation and suggests that this is probably not the case of a small farmhouse but the *pars rustica* of a villa in an estate.¹¹ These large complexes include the necessary immovable installations and movable implements for the industrial part of the villa (wine-presses, water tanks, kitchen, pithoi in the storage section of the villa etc.) but also the residential buildings for the owners and the workers. Some finds, such as tesserae and substrates from mosaic floors, are indications that under the nearby motorway there is the *pars urbana* of our villa, an integral part of such an installation, according to all ancient writers dealing with agricultural production.¹²

2. Asomata site

On the second site, on a natural plateau at the south-eastern slopes of Mount Bermion, near the modern settlement of Asomata – also 4 km of Beroia but now to the SE – the excavation revealed remains that covered a wide chronological range: from the late Neolithic to the post-Byzantine era (fig. 6).¹³ They consisted of grave clusters that belonged to different periods, but also the remains of buildings, workshops and quarries. In this paper, we present shortly those that date to Roman times.



Fig. 6: Aerial photo of the excavation at Asomata.



Fig. 7: The vertical, two-story rectangular kiln. The clay floor was pierced by four regularly spaced double series of vents that drew the high temperatures from the lower level of the combustion chamber to the upper level of the firing chamber.

In the centre of the total excavated area of app. 900 ha the remains that were revealed belonged to the instalments of a ceramic workshop. A vertical, two-story rectangular kiln that measured app. 2×3 m. and had an estimated capacity of 9 m^3 was found (fig. 7).¹⁴ It comprised an intact lower combustion chamber of 82 cm height and a slightly damaged perforated clay floor, the *eschara*. The perforated clay floor was strongly supported by three pairs of parallel cross-walls bridged with arches. The vaulted stokehole (l. 140, w. 94 cm) was placed on the south side of the combustion chamber that was more protected from the winds but the kiln had also a rear smaller stokehole, which was found closed, probably for the better control of the heat distribution. In contact with the west wall of the kiln there was a 3 m wide rubble wall that reinforced the construction and protected the nearby buildings.

To the west of the kiln, remains of Roman times buildings came to light, which served the needs of the ceramic workshop. Around these facilities, there was an open-air free space terrain: at the natural bedrock that had been carefully levelled, we found clay and rock-cut water canals, rectangular and circular pits, some of them symmetrically arranged. These structures, obviously associated with the operation of the kiln, were necessary for the water supply, the clay levigation and maturation, the formation of the product and the drying prior to the firing process. The existence of installations and other evidence for ceramic products, pottery, tile and brick manufacture at rural sites is frequent. For the majority of those kiln sites, for which evidence is available, the main reported products especially of rectangular kilns are brick and tile.¹⁵

Not far away to the west, bath installations were partially revealed: a subterranean hall measuring 8.5×3 m with 9 rectangular pillars made of tiles (hypocausts) that supported a very fragmented marble floor made of large tesserae of green colour. To the north, in an area of ash and carbon layers, we found a bath furnace, the essential component of ancient baths that heated the water, the so-called *praefurnium*. Nearby, two circular tanks, coated with hydraulic plaster that provided the necessary water were found.

The bath facilities and the ceramic workshop installations revealed to reinforce the assumption that we are dealing again with the remains of a Roman villa. The numismatic evidence and the C^{14} radio chronologies of the Roman installations at Asomata give us a time span from the 1st century BC throughout the 2nd century AD. There is little doubt that we are dealing with the remains of a large organized villa including and other amenities, which extended in the area out of the road occupation limit.

Discussion

In other areas of the Roman world the archaeology of rural settlement has a history going back to the 17th and 18th century.¹⁶ In contrast, the excavation and study of such sites in Greece (as opposed to other site types) has not scored high on the archaeological

agenda. However, in the past three decades, the amount of scholarship regarding this investigation has increased dramatically as a result of intense archaeological activity in the framework of major public works.¹⁷ The results are the rewriting of the archaeological map of Greece and, following the international trend, a renewal of scholarly interest in the economic history of the countryside, fields completely new for classical archaeologists and historians, but extremely promising for the future. The research gap in rural area still exists but is constantly decreasing. A great number of villas, farmhouses and agricultural facilities either have been excavated, located or have been recognised as such by finds. The data show that the diffusion of the new model of space organisation and rural strategy, i.e. the *villa rustica*, appears in the Greek landscape from the end of the 1st century AD onwards connected with intensive cultivation and some kind of specialisation.¹⁸

As it concerns Macedonia, even if it is difficult to derive safe conclusions, the general picture is getting more and more clear and give us the opportunity to a better understanding of the rural strategies implied in the Macedonian countryside and the interrelations of the latter with its urban centres considering production, distribution and consumption of supplies.

The two partly excavated rural villas that we presented were unearthed in the proximity of Beroia, one of the most important cities of the Roman Province of Macedonia. Rural establishments of this kind were located primarily in lowland (as in Paliomana), but also in the foothills of the region (as in Asomata) in the periphery of cities and along the course of ancient roads or close to them, facilitating traffic, the transportation of goods and commerce. Unfortunately, nearly none of them has been completely excavated and published, not only in Macedonia but also in the rest of Greece, and so we lack their complete form.¹⁹

The fact that according to the evidence both our *villae rusticae* had a *pars urbana* offering urban facilities (i.e. hypocaust floors of baths, rooms with mosaics, etc.)²⁰ suggests long term occupation rather than periodic use of a site for agricultural activities or storage. In other words, they were country houses that unified the agricultural and workshop production along with the comfortable residential unit, the productivity with the elegance.²¹

This is certainly the case of the partly unearthed villas in the rural area of the nearby Naousa, at Kamara, Baltaneto and Tsifliki where rooms with mosaic floors and bath facilities came to light.²² These villas were situated in the periphery of Mieza, a very important Macedonian city in early Hellenistic times that during Roman period had most probably, maintained the status-quo of polis, according to recent epigraphic evidence.²³

It has been argued, rightly in my view, by Rizakis, that changes in land property and exploitation, as well as a reordering of agricultural strategy, were more needed when the land was situated near populous metropoleis.²⁴ This is, without doubt, the case of Beroia that shortly after the Roman conquest quickly gained one of the most prominent positions in the province. It was the headquarters of *Koinon* of the Macedonians and

had been granted the exclusive right for the title of *neokoros* – twice – and that of a *metropolis*. The prosperity and the flourish of a city of international repute during the first three centuries, certified not only by the epigraphic sources but also by the archaeological evidence,²⁵ are mainly due to the exploitation of the countryside that offers great geomorphologic advantages: the basin of Beroia area consists of a well watered by the Aliakmon River inlaid plain. The villas were the nucleus of the large estates, the “*choria*” and the relationship between the owners of these estates in the city periphery and those of the luxury city dwellings is a very close one; they both belong to the same urban elite according to the epigraphic sources.²⁶

Local elite families, possibly wealthy Greek landowners of neighbouring cities and Roman and Italian ‘immigrants’, chose to invest in land. Agriculture was considered a secure, socially respectable investment and frequently the means to improve one’s social standing.²⁷ The acquisition of land was made possible thanks to the privileges of the ἔγκτησις (*enktesis*). In the 2nd and especially in the 1st century BC Roman businessmen known as *negotiatores*, alone or in groups are settling in the fertile lands and enhance their economic strength from the exploitation and trade of agricultural production.²⁸ A few attestations of Ῥωμαῖοι ἐνκεκτημένοι as a group are to be dated to the 1st century BC, in Beroea (57–55 BC).²⁹

The bourgeois local elite and Roman settlers earned their wealth from the exploitation of large farms at a time when the land is valued as a source of prestige. Meanwhile, they had a prominent political, social and religious presence in the city mirrored in their *euergetiai*, following Hellenistic practices and internalising Roman policies.³⁰ Unfortunately, the accumulated surplus was always used by the elites either for their personal consumption or for unproductive investments such as the construction of prestigious buildings or the financing of games and festivals, which proliferated enormously during the Empire. To the latter the epigraphic sources from Beroia are quite explicit and rather early.³¹

The Romans certainly played a role in the pattern of rural settlements in Roman Greece and gave a new impetus to rural life. It would be, however, an exaggeration to suppose that they totally transformed the agricultural economy. In fact, the concentration of land into the hands of the local aristocrats has rooted in the late Classical and Hellenistic era. We have clear epigraphic evidence for this from the nearby city of Mieza, where, in a marble plaque with ten deeds of sale, we see that a certain Zopyros, son of Gorgias, made massive purchase of land.³²

As we have seen, in the Roman period the *villae rusticae* are a novel type of farm that represents the changes in the Greek landscape. These villas are the basic economic units of processing and storage of the agricultural production, the symbol of new methods of land exploitation and new agrarian practices. The hypothesis that, at least in some of the big *villae rusticae* found in the Greek countryside, the methods of exploitation were analogous to those practiced in the large estates in Italy, where slaves as well as free smallholders were used for seasonal agricultural needs, is argued on the

basis of epigraphic references to ‘managers’ of these large estates (e.g. vilici, actores, procuratores, oikonomoi, phrontistai etc.), often liberti of the absentee landowners, who managed a staff of further freedmen.³³

In fact, the principal goal of the villae of Roman type is not subsistence farming but rather the production of agricultural surplus products that are marketable and produce a profit. This fact explains why the majority of these farms are situated on easily drained sites, on main or secondary roads, along rivers or near lakes and sea, near urban centres that demanded goods (a great number of the villae of the imperial period lie within a radius of about five or six km from the town). The obvious conclusion is that these farmsteads, symbol of a new relationship between the city and its countryside, are dependent on the city.³⁴ Furthermore, it seems that the villa ‘phenomenon’ in Roman provinces is also connected to the increasing taste for and use of Roman building materials, techniques, and styles, something evident in the villas we presented. The adoption of both the architectural language and lifestyle of the villa in the provinces rendered villas as one of the explicit markers of ‘Romanisation’.³⁵

Epilogue

Unfortunately, all that we have is in fact a “snapshot” of centuries of rural activity. These archaeological snapshots are usually lifeless images of ruins, destruction and loss; they lack the sense of life that we luckily find in literature, like in the popular novels of the 2nd century, the era that our villa flourished. Work of Pseudo-Lucian, the “Lucius, or The Ass” is an unpretentious satirical text that tells a funny story in a casual and light-hearted manner, with no moralising or didacticism.³⁶

Through the adventures of the main character, Lucius, we travel in Roman Macedonia and we visit cities and countryside. The young Lucius, who is turned into an ass by magic, visits the large and populous city of Beroia. The Lucius-ass was offered for auction sale at the Beroia’s marketplace, he wandered its country and villages, and – a happy coincidence – was hosted by a wealthy landowner in his villa, where he invaded the dinner party turning the lamps upside down. The only intact lamp of our excavation that dates back to the middle of the 3rd century AD depicts a female figure in an erotic scene with an ass, a depiction inspired by the well-known love-making episode of the novel (fig. 8).³⁷ We recognise our transformed in ass Lucius, who spent a passionate night with a lady of great wealth and beauty after her request. I am sure that this erotic lamp had been useful in many ways in the dinner parties given in our villa that we were lucky to unearth.



Fig. 8: Lamp (mid 3rd cent. AD) found in the villa rustica. It depicts a female figure in an erotic scene with an ass. The depiction is inspired by the well-known love-making episode of the Pseudo-Lucian's novel 'Lucius or the Ass'.

Notes

- ¹ Koukouvou 1999; Koukouvou 2000; Koukouvou 2001; Koukouvou 2004.
- ² For parallels in Boiotia: Vlachogianni 2013; Kountouri – Petrocheilos 2013. For the villa with the mosaic Stavropoulou-Gatsi – Alexopoulou 2013, 101 fig. 16, 131. 132 note 110.
- ³ See Grigoropoulos 2013, 773. 774 notes 44. 45. The interior of the jars and the amphorae were coated with a black residue, probably pitch, see Vassiliadou 2021, in present volume.
- ⁴ Petropoulos 2013, 169 figs. 17–21. For archaeological and documentary evidence concerning wineries in Graeco-Roman Egypt, Dzierzbicka 2005.
- ⁵ Dyson 1983, 127, fig. 227.
- ⁶ Jashemski 1979, 108–110 no. 94 fig. 178. 180; Cagnat 1912, 113. 114; Nikolov 1976, 8 no. 13.
- ⁷ Varro De Re Rustica 3, 17, 2; Colum. De Re Rustica 8, 17, 6.
- ⁸ Kourempas 2011.
- ⁹ 61 bronze coins and 1 silver were found. The 3rd cent. AD coins constitute the largest group.
- ¹⁰ This is the commonest distance (2.5 miles) between a villa and a city. On the city and chora, see Bintliff 2006. On the road system of the region: Hatzopoulos – Loukopoulou 1987, 21–55. On Beroia: Papazoglou 1988, 142. 143. 146. 147; Hatzopoulos 1990. EKM I, 41.
- ¹¹ For the fish tanks, see Meirat 1964, 135; Lafaye 1969; Davaras 1974; Beelli Marchesini – Blanck 1999; Rossiter 1989, 109; Higginbotham 1997 with bibliography.
- ¹² For villae rusticae, see Rossiter 1978, 3, 29–38 and for Greece, lately Rizakis – Touratsoglou 2013.
- ¹³ See note 1.
- ¹⁴ Type IIc: Hasaki 2002, 172. 173. 175. 176. 248, pl. III.13. 16. According to Hasaki – Raptis 2016, 214, fig. 5 f, its estimated capacity was of 9 m³.
- ¹⁵ Grigoropoulos 2013, 777 note 65; Hasaki 2002, 308.
- ¹⁶ Grigoropoulos 2013, 763. 764; Dyson 2003.
- ¹⁷ Koukouvou – Stefani 2002.
- ¹⁸ See Rizakis 2013, 35–40; Alcock 1993, 64–71.
- ¹⁹ Alcock 1993, esp. 55–92. 108. 109; Rizakis 1995. For Macedonia, see Adam-Veleni et al. 2003.
- ²⁰ Rizakis 2013, 47 note 134.
- ²¹ Zarmakoupi 2013, 754. 755.
- ²² Koukouvou – Psarra 2011, 224 notes 18. 19.
- ²³ For the city's status quo see Hatzopoulos 2011 and recently EKM II, 161–201.
- ²⁴ See Rizakis 2013, 34.
- ²⁵ For the epigraphic evidence, see EKM I. See also Brocas-Defflassieux 1999.
- ²⁶ See EKM I, 40. Petsas 1983, 242; Tataki 1988, nos. 692. 722. On *choria*, see also Hatzopoulos 1990, 57–66.
- ²⁷ For Peloponnesus see Rizakis 2013, 24. 25 note 18.
- ²⁸ Alcock 1993, 75–78.
- ²⁹ Zoumbaki 2013, 56 note 14. Tataki 1988, no. 666 and p. 438. 439 with bibliography. Rizakis 1986. Hatzopoulos – Loukopoulou 1992, 48. 52. 83. 347–357; Velenis 1996; Ramgopal 2017.
- ³⁰ Zarmakoupi 2013.
- ³¹ Rizakis 2013, 49 note 147. For Beroia see EKM I, no. 68. 69. 117. 118. 119.

- ³² Rizakis 2013, 24. 25 notes 18. 19. For Mieza see Hatzopoulos 2011. EKM II, 174–183.
- ³³ Papazoglou 1982, 200. 201; Tataki 1988, 457, 479. 480; Voutiras 1997. For latifundia in Greece: Rizakis 1995; Tiologos 1995. See also lately Nigdelis 2017.
- ³⁴ Rizakis 2013; Rizakis 2014; Rizakis 2016.
- ³⁵ Generally on the phenomenon of villa culture in Greece, see Zarmakoupi 2013.
- ³⁶ Bruneau 1965; Mason 1994.
- ³⁷ Lukian. Lucius or Ass 34. For close parallels: Chrzanovski – Zhuravlev 1998 and BCH 104 (1980) 604, fig. 50.

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 Fig. 8: Photo taken by Manos Stefanidis, copyright by Hellenic Ministry of Culture and Sports, Ephorate of Antiquities of Imathia.

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**Unfinished Details in Ancient Architecture.
Consequences of Financial Shortages,
Organizational Constraints or Aesthetic Ignorance?**

Panel 3.23

Organized by

Natalia Toma – Frank Rumscheid

Introduction

Natalia Toma – Frank Rumscheid

Almost every Greek or Roman building, whose aboveground architecture is at least partially preserved, exhibits signs of incompleteness, mostly in form of undecorated mouldings or unfinished surfaces. Comprehensive studies devoted to this well-known phenomenon are still pending though. Hans Lauter's article 'Künstliche Unfertigkeit. Hellenistische Bossensäulen' (1983) and Thanassis E. Kalpaxis' monograph 'Hemiteles. Akzidentelle Unfertigkeit und "Bossenstil" in der griechischen Baukunst' (1986) were primarily focused on the definition of incompleteness and on the potential of unfinished stages for the development of accepted new architectural forms. Unfinished details are often discussed in publications concerning single buildings and in many cases the authors are proposing individual reasons, which may indeed sometimes have played a role: the imminent visit of the Emperor, changing priorities for the use of available resources or death of the builder-owner, etc. Such reasons can however hardly explain the ubiquitous phenomenon of incompleteness, and therefore one should rather look for 'system errors' in all areas of ancient construction. On this topic, which could only partially be dealt with in the panel and, for which not only archaeologists and researchers of ancient architecture are to be consulted, but also epigraphists, economic and legal historians, should be asked the following questions:

- Which originally unfinished architectural details were regarded as flaws and which were accepted as new architectural forms? When and how did the ancient definition and perception of 'unfinished' change?
- Which notions and/or models were used in the tender-invitations or building-contracts and to what extent had a construction to be completed in order to be accepted and to go into operation?
- Were unfinished surfaces or architectural details for less visible construction sections deliberately planned to reduce time and costs of construction?
- Cost savings of what extent made unfinished surfaces acceptable? Is it therefore conceivable that financial shortages led to the acceptance of certain unfinished details?
- How substantial was the time saving when carving details remained unfinished? Was the time factor so relevant that short deadlines were only to be kept by leaving details incomplete?
- Did the specific organization of the construction site and the efficient professional specialisation of the craftsmanship favor the phenomenon of unfinished details?
- Are there any written sources or material evidence for not accepted and afterwards removed incomplete parts?
- To what extent did the unfinished architectural details influence the material and aesthetic value of a building?

Even if not all questions could be answered exhaustively, the panel lectures, which we present here only in the form of extended abstracts, offered so many interesting case

studies and conclusions that we decided to publish the contributions in detail and with appropriate illustrations as a supplement of the Bonner Jahrbücher.

Heben, Stemmen, Schauen. Funktionen und Deutungen von Buckelbossen in der antiken Architektur

Matthias Grawehr

Buckelförmige Bossen sind ein häufig vorkommendes Phänomen an den Seitenflächen antiker Architekturblöcke von der Bronzezeit bis in die Spätantike. Erstaunlicherweise herrscht dennoch bis heute keine Einigkeit über ihre Funktion, und die Forschung ist bislang auch nicht zu einer chronologisch differenzierten Darstellung von Form- und Funktionsentwicklung der Buckelbossen gelangt.

Buckelbossen sind dadurch definiert,¹ dass sie nur einen kleinen Teil der Quaderseitenfläche einnehmen und in ihrem Umriss unabhängig von der Form dieser Fläche sind. Sie können einen viereckigen, dreieckigen oder auch runden Umriss besitzen, unterschiedlich weit hervorstehen, sich gleichmäßig konisch oder zu ihrer horizontal angelegten Unterseite hin verjüngen.

Als Handbuchwissen hat sich eine Deutung als Ansatzpunkt für Seilschlingen zum Anheben des Blocks eingebürgert,² und dies führt zur häufigen und falschen Ansprache aller Buckelbossen als ‚Hebebossen‘ – ein Begriff, der bereits allein deshalb problematisch ist, da er eine Deutung vorwegnimmt. Bearbeiter, die sich kritisch mit dieser Deutung auseinandergesetzt haben, erwogen alternativ Funktionen als Ansatzpunkt für Stemmeisen, als Distanzhalter zwischen den Blöcken im Werksteinlager oder beim Transport, als Apotropaia oder als ästhetische Hilfsmittel zur Belebung der ungegliederten Wandfläche.³ Im idealtypischen Bauablauf antiker Werksteinarchitektur wären Buckelbossen bei der Überarbeitung der Wandflächen nach dem Aufrichten des Baus abzarbeiten, und im Einzelfall gilt es zu erklären, warum dies unterblieb.

Es bietet sich zunächst an, Buckelbossen funktional zu differenzieren und die Geschichte ihres Vorkommens und ihrer Verwendung nach den unterschiedlichen Funktionen getrennt zu behandeln:

1. Hebebossen: Entgegen der landläufigen Meinung lässt sich vergleichsweise selten wahrscheinlich machen, dass Buckelbossen als Hebebossen gedient haben. Voraussetzung dafür ist nur bedingt, dass die Bossen weit genug hervorstehen, um eine Seilschlinge darum zu legen, denn bereits eine wenig weit vorstehende Bosse kann helfen, das Abrutschen von horizontal um den Block gelegten Schlingen zu vermeiden.⁴ Jedoch kann für Bossen, die nachweislich einst nur auf einer von zwei gegenüberliegenden Seiten vorhanden waren, eine Funktion als Hebebossen wohl ausgeschlossen werden. Ebenso wenig passen zu dieser Verwendung Bossen an Blöcken in Bodennähe, oder solche, die sich sehr nahe an der Unterkante eines Blockes, also weit unter seinem Schwerpunkt, befinden. Beispiele für tatsächliche Hebebossen lassen sich von der Spätbronzezeit auf Zypern und in der Levante über die archaische und klassische Zeit in

Griechenland finden. Mit der Verbreitung alternativer Hebewerkzeuge wie Zangen oder dem Wolf werden Belege ab dem 4. Jh. v. Chr. seltener und sind meist regional eng umgrenzt oder beschränken sich auf bestimmte Bauteile wie z. B. Säulentrommeln.

2. Stemmbossen:⁵ Eine Verwendung der Buckelbossen als Ansatzpunkt für Stemmeisen lässt sich vergleichsweise häufig wahrscheinlich machen. Hierauf weist ihre spezifische Form mit einer horizontalen oder gekerbten Unterseite hin, aber auch ihre Position nahe an der Unterkante des Blockes. Meist kommen Stemmbossen in Bodennähe vor, wo ein Widerlager einfach herzustellen war. Stemmbossen schützten die Sichtfläche des Quaders vor Beschädigung beim Ansetzen der Stemmeisen. Die Belege für diese Praxis stammen aus der gesamten Antike, von der altägyptischen über die hethitische und griechische bis hin zur römischen Architektur.

3. Abrechnungsbossen:⁶ Die Nutzung buckelförmiger Bossen als Träger von Abrechnungsmarken ist aus einschlägigen Beispielen der griechischen Antike z. B. in Rhannonous, Lebadeia, Didyma und Milet bekannt. Bisweilen handelt es sich dabei, wie in bestimmten Wandbereichen des Apollontempels in Didyma, um Werkzoll-, 'Inseln', die bei der Glättung der Wandflächen vorläufig noch ausgespart wurden.



Abb. 1: Selinunt. Strassenbegleitende Stützmauer westlich hinter Tempel D.

Die Frage nach der unterbliebenen Abarbeitung der Buckelbossen ist häufig nur im Einzelfall und durch den konkreten baulichen Zusammenhang zu klären. Häufig wiederkehrend ist die unterlassene Abarbeitung einerseits naheliegenderweise, wenn Bauvorhaben vorzeitig abgebrochen oder nur provisorisch fertiggestellt wurden oder wenn die Mauerflächen nicht einsehbar waren, wie im Fundament- oder Dach- bzw. Gebälkbereich, andererseits aber auch dort, wo Mauerflächen semantisch als Unterbauten markiert werden sollten (Abb. 1).⁷

Anmerkungen

¹ Grawehr 2018, 12; Giese – Grawehr in Vorbereitung.

² Vgl. z.B. Martin 1965, 209 f.; Ginouvès – Martin 1985, 121; Martini 2003, 126 s. v. Hebebosse; Adam 2011, 50.

³ Lugli 1957, 214–218; Coulton 1974, 4–7; Ginouvès – Martin 1985, 121; Müller-Wiener 1988, 82; Hellmann 2002, 87 f.; Hodge 2005.

⁴ Vgl. Bessac 2007, 228 Abb. 29; Rababeh 2015, 1028 Abb. 1.

⁵ Lugli 1957, 215 f.; Coulton 1974; Müller-Wiener 1988, 82 mit Abb. 38; Hodge 2005.

⁶ Lugli 1957, 218; Müller-Wiener 1988, 79; Lolos 2002.

⁷ Grawehr 2018, 85–127.

Abbildungsnachweis

Abb. 1: Foto des Verfassers.

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Polygonal Columns: Unfinished Construction or Inexpensive Fashion?

Therese Emanuelsson-Paulson

In the Pergamene architecture a 20-sided polygonal or faceted column shaft is a common feature both in finished and unfinished columns.¹ An unfinished column which was designed to be fluted was normally fluted both on the necking of the capital and the lowest part of the column before being incorporated into the building, since cutting the flutes close to the bottom of the column would be a difficult undertaking which might damage the stylobate.² From Pergamon we have also unfinished faceted columns with round shafts, and in these the facets have been finished only on the lowest part of the column and on the necking of the capital.³ The finished polygonal columns can be clearly distinguished from the unfinished ones by the surface treatment on the polished facets. It is difficult to differentiate unfinished fluted columns that are faceted but lack polishing of the facets when viewed from a distance. These combinations of finished and unfinished polygonal columns do not exist anywhere else than in Pergamon; in some cities there are finished 20-sided polygonal columns and in others unfinished ones with polygonal shape, but never both types.

20-sided polygonal columns were generally used together with Doric capitals as is confirmed by Vitruvius.⁴ In the Pergamene architecture these columns were combined with several different shapes of capitals. Pergamon is likewise the only city where we find 20-sided polygonal columns in many public and private buildings; this is probably the case in more than 20 colonnades, finished and unfinished alike.⁵ In the case of Pergamon the columns were left as polygonal probably due to lack of money, or perhaps the faceted construction had turned into a new inexpensive fashion.

It was more economical to produce polygonal columns than fluted columns, but was the presence of columns more important than their shape? This seems probable since in Pergamon the polygonal columns are almost as common as the fluted Doric columns during the 2nd century BC, and they were constructed within equally large and important building programs. The majority have the same level of finishing as fluted columns, they present the same proportions and only a few examples have a slightly fluted necking on the Doric capital. Most of the faceted columns had a polished surface on the facets and must therefore be considered as finished. Obviously, facets can be produced much more quickly than flutes and therefore they are far more economical: time was money even in antiquity. Polishing the facets was time-consuming work that would not have been done if the columns were to be altered into another shaft shape.

Fully faceted 20-sided polygonal columns with Doric capitals were used in the Aegean Islands in the 3rd century BC.⁶ In Pergamon the construction of polygonal columns starts in the 2nd century BC having possibly been inspired by earlier constructions. There is

one major difference between the Aegean Islands and Pergamon: we have no unfinished polygonal columns from the Aegean.

A locally emerged style in Pergamon explains the use of faceted columns in the Attalid kingdom. After the peace of Magnesia the kingdom was of considerable size, its economy had developed and a magnificent royal capital was to match the size of the expanding kingdom. Therefore massive construction programs took place in the city during the reign of King Eumenes II and his successors. For a short period polygonal columns were favoured in all constructions since time required to produce them is much shorter than that of fluted columns. In Pergamon, at its peak, polygonal columns were incorporated into the Pergamene architecture to supplement fluted columns. Polygonal columns turned therefore into a quicker, inexpensive fashion of construction in the 2nd century BC and spread to other towns where architecture was now directly influenced by the Pergamene model.

Notes

¹ I am most thankful for Director Prof. Felix Pirson of DAI Istanbul and the Pergamon excavations for having been granted the permit to study all these columns from Pergamon during my fieldwork in 2014 and 2015.

² Hoepfner 1997, 32.

³ For example see the unfinished stoas and propylon in the Demeter sanctuary, Bohtz 1981.

⁴ Vit. 4.3.9.

⁵ For examples from Pergamon see Bohn 1896; Pinkwart – Stammnitz 1984; Schazmann 1923.

⁶ For example see Samos, Martini 1984, 98; Kamiros, Martini 1984, 75–76; Kos, Schazmann 1932, 74.

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Das vollendet unvollendete Mausoleum von Belevi

Reinhard Heinz

Am frühhellenistischen Mausoleum von Belevi treten Unfertigkeiten an den Steinoberflächen in den unterschiedlichsten Stadien auf.¹ Eine steingerechte Neuaufnahme ermöglichte neben einer aktuellen Rekonstruktion auch Erkenntnisse zu den Bautechniken, die Hinweise auf Art und Grad der Unfertigkeit lieferten.² Die Vollendung des Monumentes scheiterte hauptsächlich daran, dass der Bauherr besiegt in einer Schlacht verstarb.³ Allerdings war die Errichtung weit fortgeschritten, v. a. im Sockelgeschoss fehlte aber noch die Sichtflächenausarbeitung.⁴

Die Krepis trug noch einen Bossenmantel, der bei der Einstellung der Arbeiten gerade abgearbeitet wurde, um die feine Kurvatur zur Geltung kommen zu lassen (Abb. 1).⁵ Die Werksteine des Fußprofils der Sockelwand waren mit ausgearbeiteten Profilierungen am Bau versetzt worden. Kantenschutzstege und Versatzbossen waren noch nicht entfernt, das lesbische Kyma gerade in Arbeit.⁶

Weniger weit fortgeschritten war die Abarbeitung der Sockelwandflächen. Alle Wandblöcke trugen einen mehr oder minder dicken Werkzoll (Abb. 1). Anathyrosen, Marken und Schrägkanten auf den Blöcken deuten aber auf die geplante Abarbeitung.⁷



Abb. 1: Mausoleum von Belevi. Unfertigkeiten an Stufenunterbau, Fußprofil und unteren Quaderschichten des Sockels

Die Grabkammer verfügte über fertige Sichtflächen. Lediglich der Sarkophag konnte nicht mehr vollendet werden. Bei einigen nicht einsehbaren Flächen wurde allerdings die Fertigstellung gar nicht angestrebt.⁸

Die Peristasis des Obergeschosses war fast vollendet. Die Werksteine des Gebälks und der Kassettendecke wurden am Boden vorgefertigt. Nur die Randfelder der Ornamentik wurden erst nach dem Versatz ausgearbeitet. Bei vielen Blöcken kam es nicht mehr dazu.⁹ Bei kleinen Details war man offensichtlich bereit, ästhetische Kompromisse einzugehen. An der Nordmauer konnten größere Partien nicht mehr fertiggestellt werden, andere, wie die Rückseiten der Blendsäulen, wurden gewollt unfertig belassen.¹⁰

Ein einziges der erhaltenen Peristasiskapitelle verblieb unfertig, es war aber mit Sicherheit schon versetzt. Da Kapitelle schon vorher am Boden ausgearbeitet wurden, handelte es sich um eine bewusste, wenn auch ursprünglich nicht gewollte Maßnahme.¹¹ Die Dachskulpturen tragen auf ihren Rückseiten Spitzeisen Spuren, eine gewollte Einsparungsmaßnahme. Ein Löwengreif allerdings ist auch auf seiner Vorderseite deutlich reduziert ausgearbeitet.¹² Dieser Greif und das unfertige Kapitell stammen beide von der schlecht einsehbaren Rückseite des Baus. Die Unfertigkeit wird zwar akzeptiert, aber der Versatz erfolgt an Stellen, die die ästhetische Wirkung möglichst wenig beeinträchtigen.

Die Ausarbeitung der Sichtflächen am Bauwerk erfolgte von oben nach unten, um tiefer liegende Partien möglichst zu schonen. Dagegen wurde bereits vor Fertigstellung der Sockelwandflächen mit der Ausarbeitung der darunterliegenden Krepis und des feinen lesbischen Kymas begonnen (Abb. 1). Im Bewusstsein, dass nicht mehr alles am Bauwerk fertiggestellt werden könne, wurde wohl entschieden, der Ausarbeitung der Stufen und des Fußprofils den Vorrang zu geben.¹³

Die Unfertigkeiten am Mausoleum sind nur zum Teil durch den Tod des Grabherrn zu erklären. Manche uneinsehbaren Bereiche waren von vornherein in Bosse geplant und sollten zu einer Zeit- und Kostenersparnis führen. Ästhetische Kompromisse an den Sichtflächen beschränkten sich zunächst auf kleine Details. Erst als klar war, dass das Gebäude nicht mehr fertiggestellt werden konnte, akzeptierte man starke gestalterische Beeinträchtigungen, wobei unfertige Wandflächen eher akzeptiert wurden als unausgearbeitete Ornamentik.

Anmerkungen

¹ Martin 1965, 298f.; Praschniker – Theuer 1979, bes. 24. 65. 175. 188–190. 199f.; Kalpaxis 1986, 19. 21; Müller-Wiener 1988, 82. 94; Hoepfner 1993, 114. 116. 122; Rumscheid 1994, 337–339; Saner 2000, 268. 271–279. 283.

² Die Bauforschung fand im Rahmen eines Projekts der Österreichischen Akademie der Wissenschaften statt, s. dazu Heinz 2017, bes. XIII f.

- ³ Das Grabmal wurde verschiedensten Persönlichkeiten aus dem 4. und 3. Jh. v. Chr. zugeordnet, Ruggendorfer wies es Antigonos I. Monophthalmos zu, Ruggendorfer 2016, 176–182. 348.
- ⁴ Heinz 2017, 204f.
- ⁵ Heinz 2017, 19f. 199f. Dass die Werkzollfelder bewusst nicht mehr zur Abarbeitung vorgesehen waren, wie es andernorts wahrscheinlich ist (vgl. Kalpaxis 1986, 21. 126. 159), wäre hier nur für die Stufenspiegel möglich, – nicht für die Felder der Stufenoberseiten, denn sie korrelieren nicht mit dem Fugennetz.
- ⁶ Rumscheid 1994, 338f.; Heinz 2017, 20–22.
- ⁷ Heinz 2017, 31–34. 196–198.
- ⁸ Heinz 2017, 68; Ruggendorfer 2016, 101; derartige Einsparungsmaßnahmen sind nicht ungewöhnlich, vgl. Kalpaxis 1986, 15f.
- ⁹ Rumscheid 1994, 338; Heinz 2017, 83. 94. 200f.
- ¹⁰ Heinz 2017, 123–125. 128f. 130f.
- ¹¹ Praschniker – Theuer 1979, 65; Rumscheid 1994, 337; Heinz 2017, 200. 204; Hoepfner 1993, 122 hält eine absichtliche Unfertigkeit, die den Prozess des Entstehens konserviert, für möglich.
- ¹² Ruggendorfer 2016, 87. 89. 130–132; Heinz 2017, 204.
- ¹³ Heinz 2017, 205. Unfertige bossierte Wandflächen waren ein gewohnter, wohl eher akzeptierter Anblick, vgl. Kalpaxis 1986, 6. 160.

Abbildungsnachweis

Abb. 1: Mausoleum von Belevi. Unfertigkeiten an Stufenunterbau, Fußprofil und unteren Quaderschichten des Sockels, © ÖAW-ÖAI (A. Sulzgruber).

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Intentionelle Unfertigkeit in der römisch-kaiserzeitlichen Architektur in Ephesos und Kleinasien

Georg A. Plattner

In der Diskussion um Unfertigkeiten antiker Architekturen können Aspekte intentionell nicht ausgeführter Arbeitsschritte definiert werden, die als Zeit-, Geld- oder Aufwandsersparnis interpretiert werden. Die Intention kann dabei oft nur vermutet oder über Plausibilitäten argumentiert werden.

Die unfertige Schmuckbasis des Apollo-Tempels in Didyma wurde als Schaustück zum Beleg handwerklicher Kunstfertigkeit interpretiert,¹ da der jeweilige Zustand der Bildfelder keinem logischen Arbeitsschritt zu entsprechen scheint. Ob diese Zwischenschritte geeignet sind, das „Könnensbewusstsein“ der Steinmetze zu zeigen, muss unklar bleiben.

Das Serapeion von Ephesos ist eine der monumentalsten Architekturen der Provinzhauptstadt und beeindruckt mit seiner präzisen und reichen Bauornamentik.² Nur an wenigen Stellen weist der Tempel, der in hadrianisch-frühantoninischer Zeit aus prokonnesischem Marmor errichtet worden ist,³ Unfertigkeiten auf. Kantenschutz und Werkzoll sind insbesondere im Bereich der Basen im Pronaos stehen geblieben. Die Ausarbeitung des reich dekorierten Frieses ist an den Schmalseiten des Pronaos in unterschiedlichen Stadien abgebrochen worden. Die Baustellenlogistik mag hier eine Rolle gespielt haben: Bei den in effizienter Arbeitsteiligkeit am Boden ausgearbeiteten Bauteilen könnte der letztmögliche Zeitpunkt des Versatzes ein zwingendes Argument zum Abbruch dargestellt haben.

Besonders markant sind die unfertigen Säulen des Serapeions. An drei der sechs erhaltenen, monolithen Säulen des oktostylen Baus sind die Kanneluren angerissen und grob angelegt, aber nicht fertig ausgeführt. Einer sehr geringen ökonomischen Ersparnis durch diesen Arbeitsabbruch steht die kompromittierte Erscheinung gerade der Front des Tempels entgegen. Offenbar stand der Bau, der später als Kirche genutzt wurde, noch jahrhundertlang aufrecht,⁴ ohne dass eine Fertigstellung zu einem späteren Zeitpunkt in Angriff genommen worden wäre. Die Frage nach der ästhetischen Rezeption ist mangels Quellen kaum zu beantworten, weder für die Bauzeit selbst noch für die Nutzung in späteren Epochen.

Musterbeispiele für geplante Arbeitersparnis sind an nur drei Seiten ausgearbeitete Kapitelle, die für eine Position direkt vor einer Wand vorgesehen waren.⁵ Da Kapitelle vor dem Versatz gefertigt wurden, bedeutete dies nicht unbedingt eine Verkürzung der Gesamtbauzeit, sondern eher eine effiziente Einsparung des Arbeitsvolumens und damit der Kosten. Beispiele dafür sind aus der Kaiserzeit bis in die Spätantike bekannt.⁶

Die Reduktion korinthischer Kapitelle zu ‚Blattkapitellen‘ ohne Binnenzeichnung der Blätter muss als intentionelle, fertige Form und nicht unbedingt als Zwischenschritt

oder Arbeitsabbruch diskutiert werden. Am Kolosseum in Rom wurde für die Reparaturen in severischer Zeit eine Reihe von Blattkapitellen verwendet.⁷ Hier erscheint die Interpretation naheliegend, dass man für einen raschen Wiederaufbau auf weitere Ausarbeitung verzichtet hat.

Die Grundform des Blattkapitells kann zugleich ein logischer Zwischenschritt bei der Herstellung eines Kapitells gewesen sein. Dafür sprechen unfertige Bauteile in Castelgandolfo⁸ oder ein Kapitell in Mylasa, für das Rumscheid überzeugend den Einsatz einer Schablone zur Positionierung der Bohrlöcher zur Definition der Blattfinger vorgeschlagen hat.⁹

Nicht zu einem Kanal ausgeschlagene Bohrlochreihen müssen zunächst als Unfertigkeit verstanden werden, mittels derer ein (geringer) Teil des Arbeitsaufwandes bei der Herstellung von Dekor eingespart worden ist. Ab severischer Zeit wurden Bohrlochreihen bei Kapitellen und Friesen häufig, in der Spätantike schließlich zur intentionellen Kunstform.¹⁰ Auch hier fehlen uns für die Bewertung der Rezeption dieses Phänomens die Quellen.

Intentionelle Unfertigkeit als Kunstform kann mit einem Fragment aus den Hanghäusern von Ephesos belegt werden. In der Wohneinheit 7 des Hanghauses 2 wurden die Säulen eines kleinen Peristyls nicht wie sonst aus Marmor gefertigt, sondern aus Bruchsteinen und Ziegeln gemauert und sorgfältig verputzt. An einem Fragment ist eine Buckelbosse aus Stuck erhalten (Abb.).¹¹ Diese sollte bestimmt als Hebebosse ver-



Abb. 1: Ephesos, Hanghaus 2, Raum 32d: gemauerte Säule mit ‚Hebebosse‘.

standen werden und die Herstellung der Säule aus kleinteiligem und leichtem Baumaterial konterkarieren. Ähnlich wurden auch in der Wandmalerei des zweiten Stils gemalte Säulen als scheinbar schwer lastende, konstruktive Elemente dargestellt.¹²

Anmerkungen

- ¹ Pirson 2008.
² Strocka 1988, 303–305.
³ Prochaska – Grillo 2013, 588 f.
⁴ Steskal et al. 2015.
⁵ Heilmeyer 1970, 140–143; Herrmann Jr. 1974.
⁶ Dazu Pensabene 1986, 324–333.
⁷ Bruno – Bianchi 2009, 105 f.
⁸ Hesberg 1978–80, 312 f. Abb. 6. 7.
⁹ Rumscheid 2012.
¹⁰ Kramer 1994, 36–38. 126–129 Taf. 2–4.
¹¹ Plattner 2016, 159 f. 169 Kat. A 61 Taf. 94 Abb. 16.
¹² Ling 1991, 24–37 Taf. 21. 27. 33 Taf. IIIB.

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Abb. 1: © Photo Georg Plattner.

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Il Complesso Severiano di Leptis Magna: il cantiere e la decorazione architettonica tra finito e non finito

Fulvia Bianchi – Matthias Bruno

Il Complesso Severiano di Leptis Magna, iniziato da Settimio Severo e completato dopo la sua morte dal figlio Caracalla nel 216 d. C., per le grandiose dimensioni, la quantità dei materiali architettonici impiegati e ancora in gran numero conservati offre l'opportunità di esaminare aspetti della cantieristica antica. La sua realizzazione lungo il Wadi Lebda ha comportato lo stravolgimento di un ampio settore della città il cui assetto urbanistico viene profondamente modificato mediante la costruzione del Grande Ninfeo, della Via Colonnata con l'attiguo complesso Tempio-Foro-Basilica-Vestibolo e del porto, espressione di un progetto unitario di dimensioni inusitate nella storia della città (fig. 1).

Il Complesso Severiano rappresenta, pertanto, l'apice della marmorizzazione di Leptis Magna non solo per la sua vastità, ma anche e soprattutto per le quantità dei materiali marmorei impiegati, quali centinaia di colonne in cipollino per il Grande Ninfeo,

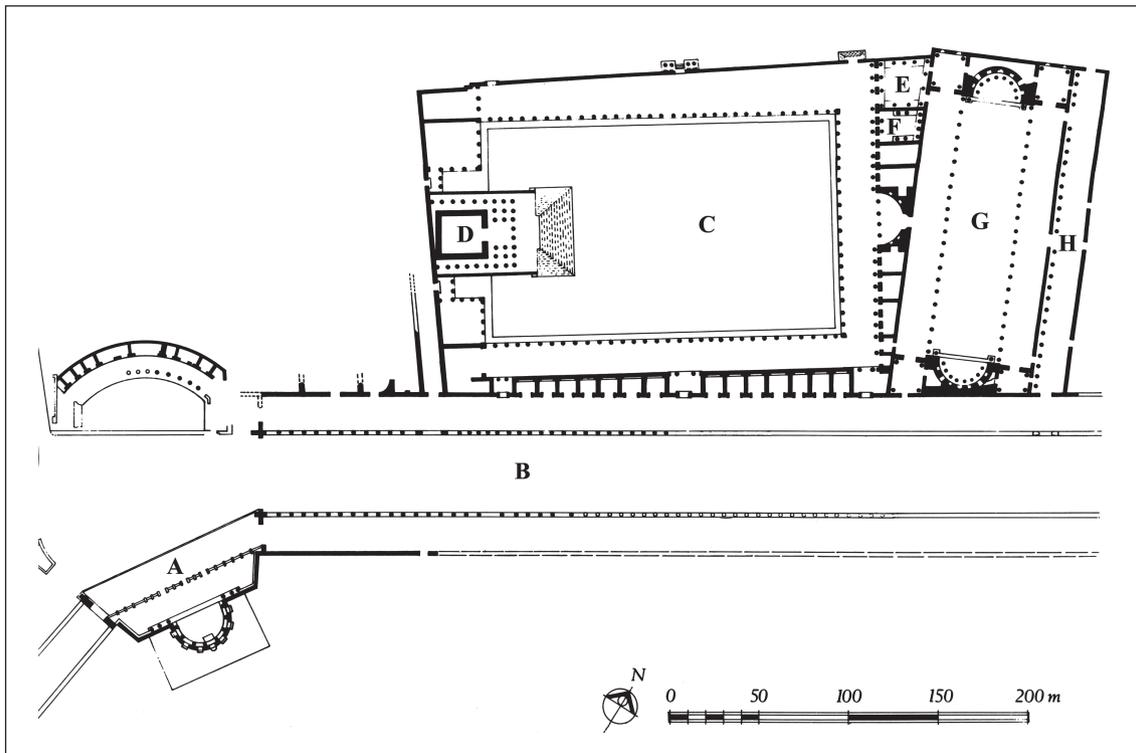


Fig. 1: Pianta del Complesso Severiano: A. Grande Ninfeo; B. Via Colonnata; C. Foro Severiano; D. Tempio della Gens Septimia; E. Sala delle Tredici Colonne; F. Sala delle Dieci Colonne; G. Basilica Severiana; H. Vestibolo (da Ward-Perkins 1993).

la Via Colonnata, il Vestibolo e i portici della piazza, circa 150 fusti di colonna in sienite per il Tempio della *Gens Septimia*, la Basilica e ancora il Grande Ninfeo. A questi si aggiungono basi e capitelli e elementi delle trabeazioni in pentelico e proconnesio il cui uso risponde a tipologie e partizioni architettoniche ben distinte.

Tutti gli elementi architettonici in pentelico, capitelli a calice e basi attiche, sono lavorati in Attica, importati del tutto rifiniti a Leptis e le sigle incise sui piani inferiore e superiore degli elementi attestano i nomi delle officine attiche coinvolte nella loro produzione. Inoltre, la lavorazione ben distinta delle superfici testimonia gli accorgimenti usati per trasportare in sicurezza i manufatti, tra l'altro metrologicamente molto uniformi, quali bugne angolari o listelli sporgenti, posti lungo il margine inferiore degli elementi, da asportare durante la messa in opera. Basi attiche e composite, capitelli corinzi e ionici, teste di Medusa, pilastri figurati e semplici, gli elementi della trabeazione in proconnesio sono lavorati, invece, *in situ*, come testimoniato soprattutto da tantissimi elementi architettonici in diversi stadi di lavorazione, dalle ingenti quantità di schegge di differenti dimensioni assorbite, ad esempio, dalla realizzazione del nucleo in cemenzizio del podio del tempio della *Gens Septimia*.

Questa evidenza chiarisce in modo inequivocabile una problematica poco percepita nella cantieristica antica che riguarda lo smaltimento degli scarti di lavorazione. A differenza degli elementi architettonici in pentelico, basi e capitelli in proconnesio mostrano una maggiore varietà metrologica. Infatti, basi e capitelli a calice in pentelico sono prodotti in Attica e arrivano a Leptis Magna già del tutto definiti in altezza, forma e decoro. Per cui i fusti in cipollino a essi abbinati devono essere necessariamente metrologicamente molto uniformi, anche se importati grezzi. Invece, basi e capitelli in marmo proconnesio sono abbinati tanto ai fusti in cipollino quanto a quelli in sienite e sono questi ultimi a presentare una notevole variazione metrologica in altezza. A queste misure non uniformi dei fusti in sienite si devono adattare le dimensioni in altezza dei capitelli corinzi e delle basi attiche e composite in proconnesio a essi abbinati.

I differenti stadi di lavorazione degli elementi in marmo proconnesio della trabeazione dei due ordini della Basilica attestano, invece, la forma di importazione e la posizione che occupavano nell'edificio. Gli elementi incompiuti della trabeazione del secondo ordine della Basilica, le basi composite lasciate lisce del pronao del tempio della *Gens Septimia*, i fusti in cipollino dagli scapi grezzi e semirifiniti in opera nel Vestibolo potrebbero essere determinati dal completamento del Complesso Severiano dopo la morte di Settimio Severo che obbliga il figlio Caracalla a terminare questo gigante. Mentre Settimio Severo è legato alla sua città natale che ha voluto dotare di un complesso monumentale per renderla quasi Urbana, Caracalla invece, ha interessi a Roma dove costruisce le grandi terme sull'Aventino e il monumentale tempio di Serapide sul Quirinale ma deve comunque completare rapidamente il cantiere lasciato incompiuto dal padre a Leptis Magna.

In questa ottica si spiegano tutti gli elementi non finiti, i quali in una visione d'insieme, pur se visibili, non devono aver nuociuto al complesso in quanto non solo non

vengono avvertite le discrepanze metrologiche ma anche la percezione del valore degli elementi resta inalterato. Tale percezione cambia solo quanto una forma, lasciata volutamente incompiuta, diventa tipologia.

Indice delle figure

Fig. 1: Pianta del Complesso Severiano: A. Grande Ninfeo; B. Via Colonnata; C. Foro Severiano; D. Tempio della *Gens Septimia*; E. Sala delle Tredici Colonne; F. Sala delle Dieci Colonne; G. Basilica Severiana; H. Vestibolo.

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Effizienzstrategien kaiserzeitlicher Marmor-Bauunternehmer. Der Fall des Stadion-Osttors in Milet

Natalia Toma

Marmor ist das Material, das in der Kaiserzeit das Bild römischer Städte maßgeblich verändert. Insbesondere die enorme Nachfrage nach marmornen Säulenarchitekturen begünstigt die Entstehung einer Marmor-Bauindustrie, deren Hauptträger Bauunternehmen waren. Diese zeichnen sich durch die Spezialisierung auf die Errichtung marmorner Säulenarchitekturen aus, die zum einen auf statische Selbstständigkeit und zum anderen auf eine Vielseitigkeit in der architektonischen Kombinierbarkeit ausgerichtet waren. Weiterhin charakteristisch ist die bevorzugte Verwendung von vorgefertigtem Baumaterial sowie von Bauteilen mit Standardmaßen eines Vielfachen des römischen Fußes. Die Bauunternehmen entspringen dem Kontext des kaiserzeitlichen Phänomens des Marmorhandels, sind indes nicht als reine Baumaterialimporteure anzusehen. Sie lieferten zusätzlich auch spezialisierte Arbeitskräfte mit, die für die Bearbeitung des marmornen Baumaterials sowie für die Herstellung und/oder Fertigstellung der Bauteile auf der Baustelle zuständig waren und anschließend die Errichtung der Säulenarchitektur zu gewährleisten hatten.¹ In diesem Kontext gehe ich der Frage nach den ubiquitären Bauunfertigkeiten im kaiserzeitlichen Marmorbau nach und untersuche, welche Bedeutung den Herstellungsprozessen innerhalb der Ökonomie des Bauens zukommt und welche Effizienzstrategien beim Bau mit importiertem Material zu finden sind.

Als Beispiel fungiert das sog. Stadion-Osttor der ionischen Stadt Milet (Abb. 1). Der fünfbogige Torbau, der wohl im 3. Jh. als monumentaler Abschluss des hellenistischen Stadions errichtet wurde, vereint eine doppelte achtstellige Säulenarchitektur korinthischer Ordnung mit einer überspannten Bogenstellung.² Das Tor zeichnet sich durch einen einfachen, rhythmisch-repetitiven Aufbau der Säulen- und Bogenarchitekturen aus und sticht durch eine stark an ein modernes Baukastensystem erinnernde Bauweise hervor, die zudem auf Bauteile mit Standardmaßen zurückgreift.³ Das Tor steht frei, auf einem Stylobat aus poliertem Material und besteht den vorläufigen archäometrischen Untersuchungen zufolge großenteils aus importiertem Marmor (möglicherweise prokonnesischer und herakleotischer Herkunft). Die Bauornamentik entspricht den spätkaiserzeitlichen standardisierten Dekorformen, also dem sog. *marble style*.⁴ Unfertigkeiten fallen vor allem im unteren Bereich auf: Die Basen der Säulenpostamente sind ausgeformt, aber nicht profiliert, genau wie die monolithischen Schäfte, deren untere Abschlüsse breite Ringbassen zeigen. Das obere Halsprofil der Schäfte ist dagegen ganz ausgearbeitet und die Kapitelle sind vollplastisch mit der typischen Akanthusdekoration versehen. In dem ebenfalls vollständig ausgeführten Gebälk sowie in der Bogenstellung stechen gleichwohl eine recht flache Ausarbeitung der Ova im ioni-



Abb. 1: Milet, Stadion-Osttor. Blick von Süden.

schen Kymation sowie der kantig belassene Perlstab hervor, alles Hinweise auf eine nicht vollendete Dekoration.

Berücksichtigt man die etablierten Kalkulationsmethoden zum Bauaufwand⁵ und wendet sie auf den beschriebenen Bau an, wird man mit einem widersprüchlichen Ergebnis konfrontiert.⁶ Es finden nämlich weder die errechnete hohe Zahl an Handwerkern für die Bearbeitung der Kapitelle noch die besonders lange Bauzeit eine archäologische Bestätigung. Andererseits wird anhand derselben Kalkulation deutlich, dass die grobe Zurichtung eines Bauteils wesentlich zeitaufwendiger als die Feinarbeit der Profilierung und der Dekorausführung ist. Die Fertigstellung der Dekoration spielt also anscheinend eine eher untergeordnete Rolle in der Ökonomie des Bauens. Die Tatsache, dass Unfertigkeiten besonders im unteren Bereich des Baus auftreten, liefert m. E. einen Hinweis darauf, dass das Voranschreiten des Bauvorgangs Priorität gegenüber der Ausführungsqualität hatte.

Eindeutig als Effizienzstrategie im Marmorbau dürfte die Verwendung von vorgefertigten Bauteilen anzusehen sein, die auf der Baustelle lediglich fertiggestellt und montiert werden mussten. Doch auch hier zeigt die archäologische Evidenz, dass lediglich Schafthalbfabrikate benutzt wurden, während die übrigen Bauteile der Säulenordnung aus rohem Baumaterial vor Ort vollständig hätten ausgearbeitet werden sollen⁷. Will man also die Hauptaufgaben der kaiserzeitlichen Marmorbauunternehmen benennen,

muss man in erster Linie den sparsamen Umgang mit Baumaterial im Anschluss an den Import anführen sowie das Beseitigen des aus dem Herstellungsprozess resultierenden Abschlags.

Anmerkungen

¹ Zu den Marmor-Bauunternehmen s. Toma 2018a, 177–188; Toma 2018b, 520 f.

² von Gerkan 1921, 32–41 Abb. 41–46 Taf. 4–7.

³ So z. B. auf monolithische Schäfte, die 16 Fuß lang sind, oder Basenpostamente, die umgerechnet $3 \times 3 \times 3$ Fuß messen.

⁴ Für die oktogonalen Basenpostamente s. Vergleiche in Leptis Magna und Ostia (Ward-Perkins 1993, Abb. 35 a; Pensabene 1995, 184 Nr. 172. 173 Abb. 208. 213) und für die Kapitelle vgl. Bianchi 2009, Abb. 16. 27; Fischer 1998, Abb. 91. 92.

⁵ DeLaine 1997.

⁶ Für kritische Anmerkungen zu den Bauaufwandkalkulationen s. Bruno 2017.

⁷ Toma 2018a, 163–167. 174 f.

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Honoring One's Pledge? Benefactors and Their Building Donations in Roman Asia Minor

Ursula Quatember

Asia Minor provides a vast amount of evidence for building donations from Hellenistic and Roman periods, both from written sources, particularly inscriptions, but also from the extant monuments themselves. This is particularly important not only for architectural history, but also for our understanding of the legal process that benefactors had to undertake in order to realize their building projects.¹

Frequently, in discussions on more or less “unfinished” buildings, the set phrase that “they ran out of money” provides a convenient and easy explanation for complex phenomena. However, a closer look at the available evidence does not permit us to draw such easy conclusions.

It is true that expectations and ambitions to erect spectacular monuments were high, especially during the Roman Imperial period. Potential donors might therefore exceed their financial or organizational limit, and the polis might have been left with unfinished and ruinous construction sites in its very center. This has led to rules for the permission of building donations and even laws concerning these official pledges, for which the benefactors were held liable. At the same time, benefactors wanted to make sure they were absolved from their legal obligations once they turned over their buildings to the city.

A good example concerning these complex matters is the Library of Celsus in Ephesos (fig. 1).² The building was conceived as a tomb for Ti. Iulius Celsus Polemaeanus, *consul suffectus* of 92 AD and in 105/106 AD, governor for his native province of Asia Minor. To justify this intra-mural burial in the very center of the city, the tomb was combined with a public library in order to satisfy Celsus' personal goals as well as the common good of the polis.

The inscriptions on the library facade do not only allow us to date the completion of the project to the late years of Trajan's reign.³ They also give us insight into the juridical and financial transactions for the construction of the library and the coverage for its running costs. In legal terms, the library represents a combination of a donation – the finished building is presented to the city – with an endowment, i.e. revenues from money handed over to the city should cover its running costs for upkeep and maintenance of the library, payment for its attendants, and purchases of new books, as the inscriptions states.

Both Ti. Iulius Celsus Polemaeanus and his son Ti. Iulius Aquila Polemaeanus passed away before the completion of the project. Therefore, 2000 sesterces were taken from the endowment and used for the completion of the library. In their inscription, Celsus'



Fig. 1: Library of Celsus in Ephesos. The inscription on the endowment is located on the back wall in the left intercolumniation above the niche

heirs particularly stressed the fact that they had fulfilled their legal obligations and that no further requests or expenditures could be asked from them.

This emphasis on the completion of the project is in accordance with the architecture. The extant remains of the library, and particularly the preserved architectural members of the facade are finished, confirming the statement of Celsus' heirs that they had honored his pledge.

Notes

¹ See e.g. Wesch-Klein 1989; Rumscheid 1999; Harter-Uibopuu 2015; all with further references.

² Still fundamental: Wilberg et al. 1953; see also Strocka 2009, with further references.

³ IvE 5101. 5113.

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Fig. 1: by the author.

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Production of Tiles and Bricks

Panel 3.25

Organized by

Luigi Cicala

The Bricks of Elea-Velia: Archaeology and Epigraphy of Production

Luigi Cicala – Luigi Vecchio

Abstract

The bricks' production represents the most significant Velia's craftwork in the Hellenistic age. The bricks' analysis, still in progress in a large research project, has been developed both on the morphological and on the epigraphic level. Production is characterized by a high degree of bricks' standardization, square and rectangular shape, and for the stamp's system with a "constant" and an "invariable" stamp. The considerable quantity of specimens available in the urban area, in situ or erratic, offers a very broad sample of analysis, destined for increase with the continuation of research. Production, strictly controlled by the local administration, it seems to be aimed at large public construction sites. Its circulation, however, it remains tied to an exclusively sub-regional context.

The production of fired bricks constitutes one of the most distinctive aspects of the crafts of Elea/Velia in the Hellenistic period. The authors are engaged in a new archaeological and epigraphic study of this production, based on a complete census of all the specimens from the urban area. This study is yielding new data on the organization of brick manufacturing and regarding the issue of where these bricks were first employed.¹ In the present paper, we give a brief outline of our ongoing work. This outline is intended as a contribution to the debate on the creations of Magna Graecia workshops in the Hellenistic period.

Typology

The bricks under study are square or rectangular in shape, have one or two rectangular grooves on the top, and a flat bottom.² Their dimensions are modular, which is evidence of the synchronous use of different types in the same walls.

Type 1 is square in plan, measuring 38 cm on average on the side, and 8/10 cm in height. Type 2, which is rectangular, measures 56/57 × 37/39 × 8/10 cm, and is thus longer than it is wide. Type 3 is also rectangular in plan and has a single groove (fig. 1). Its dimensions (37/39 × 17/18 × 8/10 cm) correspond to half the base module. Type 4 is, again, rectangular in plan, but wider than it is long (37/38 × 55/57 × 8/10 cm), which obviously reflects on the dimensions of the two grooves. So far, no specimen ascribable to Schleuning's type *d*, distinguished by three grooves, has come to light;³ however, the type is reported in R. U. Inglieri's excavation's report of the eastern neighborhood.⁴



Tipo 1



Tipo 2



Tipo 3



Tipo 4

1:5

Fig. 1: Typology of Elean Bricks.

While this basic repertoire is well-known in the literature, we have detected some variants whose typological features will need to be defined more accurately as our cataloguing work goes on. The variations regard both the module and the morphology of the bricks. Regarding the former, the presence of Type 1 specimens with a module reduced by at least 7 cm should be remarked (fig. 2, f). Since they carry the city stamp, they were evidently part of the overall brick production placed under the control of the local administration, just like their larger counterparts, of which they clearly constitute an intentional variant, whose purpose still needs to be clarified.⁵

As to the morphology of the bricks, some remarkable specimens, with a single groove (17.4 max × 18.2 × 9 cm) or a double groove (54.5 × 23 max × 9.7 cm), are characterized by an oblique short side, sloping inward either from right to left or vice versa (fig. 2, b–c).⁶ Bricks of this type – which are not easy to spot among the fragmentary specimens – may have been placed at obtuse angles in walls, with the oblique short side on the face. In other cases, instead, we observe variations in the size of one of the longitudinal sections of the brick reserved between the grooves, which is wider than the other longitudinal sections in the same specimen, and than the average width of the longitudinal section in other bricks of the same type.

Another variant encompasses specimens with the same shape and size as Type 3 bricks, but where the grooves extend across the whole length of the brick, to the two short sides (fig. 2, a).⁷ This variant was apparently meant to be laid only lengthwise. Alternatively, these bricks may have been used to build special structures, such as small canals, vents or drains built into walls, etc.

A particularly interesting specimen lacks grooves, is square in plan, and has a slightly smaller module (35.6 × 36.5 × 6 cm) than Type 1 – from which it obviously derives, given its 6 cm height (fig. 2, f).⁸ Remarkably, this brick does not carry the typical stamps of Elean-produced bricks. It could hence bear witness to a parallel production, intended for a different use.

The final type in this overview of Elean brick workshops is represented by ring or disc-shaped specimens (diam. 30 to 35 cm and 28.5 cm, respectively), both with the same average thickness of 8.5 cm (fig. 2, d–e). Some fragments of the ring type still bear their stamp, indicating that bricks of this format, too, were part of the large-scale brick production carried out for the state administration. In view of this, a further reflection on how the ring and disc-shaped bricks were employed is in order.

At this stage of the project, it may be useful to take stock of the preliminary quantitative data, which pose several problems, especially as regards the fragmentary specimens. We have recorded 3021 specimens so far, a truly remarkable number compared to other archaeological contexts in Magna Graecia. They come from different sectors in the city. Some are *in situ*, others are sporadic finds. Of course, this number is destined to increase as the project goes on. The repertoire may thus grow into one of the broadest and most significant in southern Italy.

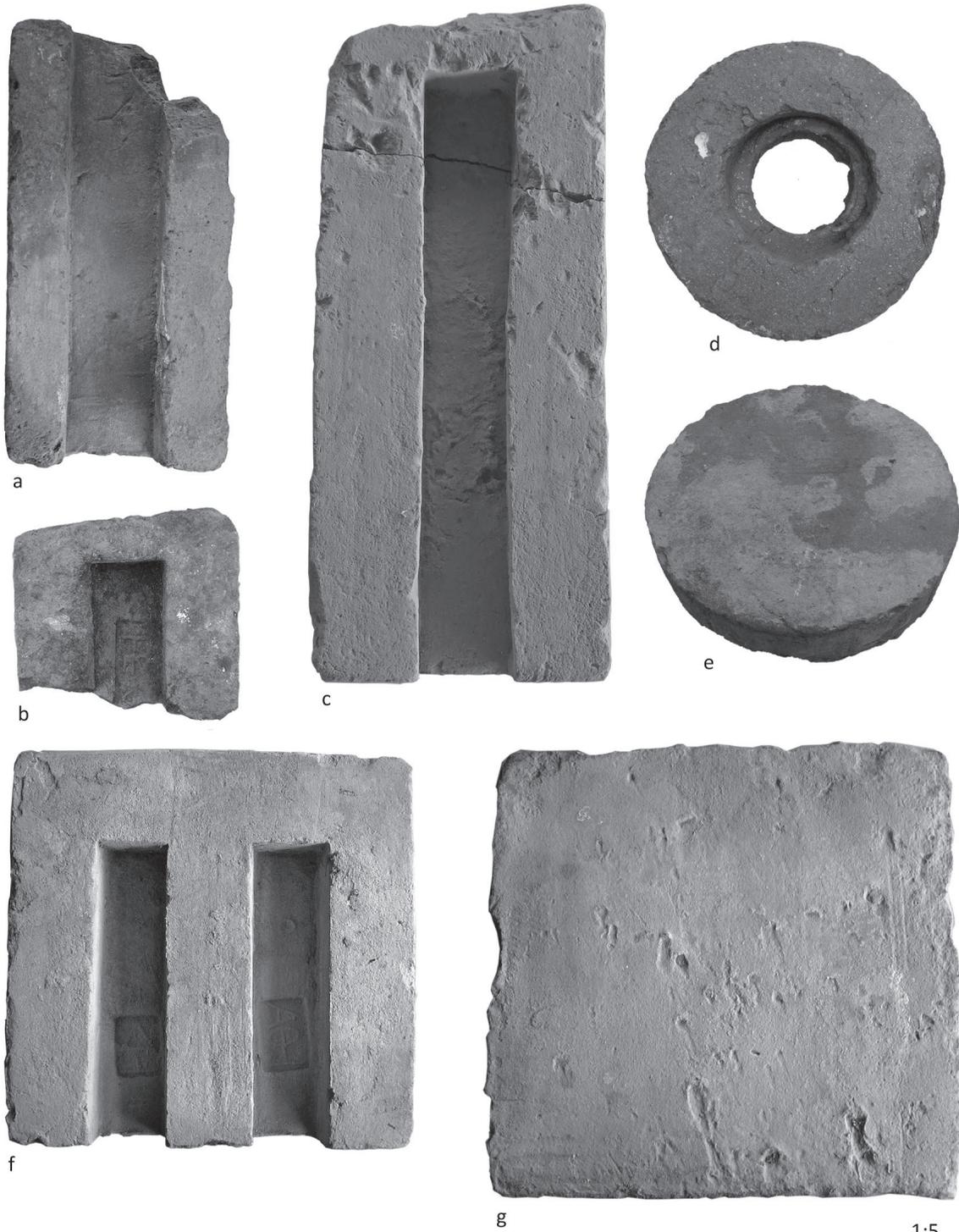


Fig. 2: Specimens of Elean Bricks.

1:5

The quantitative data about the recognized types – excluding variants, for the time being – must be regarded in the light of several aspects. For example, our classification only took account of whole specimens or stamped fragments, to minimize the risk of overestimating the number of individuals. In many cases (988 out of 3021), the presence of a stamp potentially identifies an individual, but poor preservation precludes typological attribution. Among the material recorded so far, Type 1 is the most frequently occurring, with 1186 specimens (fig. 3). It is followed by Type 2, with 554 specimens, and then by Types 4 and 3. Type 5, which lacks grooves, has been recognized in only two cases and is hence so far statistically insignificant. Round bricks also occur in low numbers (23 out of 3021); most are ring-shaped. The relative frequency of types in this sample may not fully reflect the actual original frequency of different types of bricks in buildings, since the sample includes prevalently reemployed materials from different areas of the city. However, this first sample seems large enough to be regarded as indicative at least of a rough trend, especially if we only take into consideration whole specimens and fragmentary specimens whose type can still be recognized. Another argument in favor of the representativeness of our sample is that Type 1 bricks, the most frequent, are square, and thus very versatile for use in wall-building. They are also closer than other types to the traditional formats of mud bricks. Further classification will certainly shed new light on these questions.

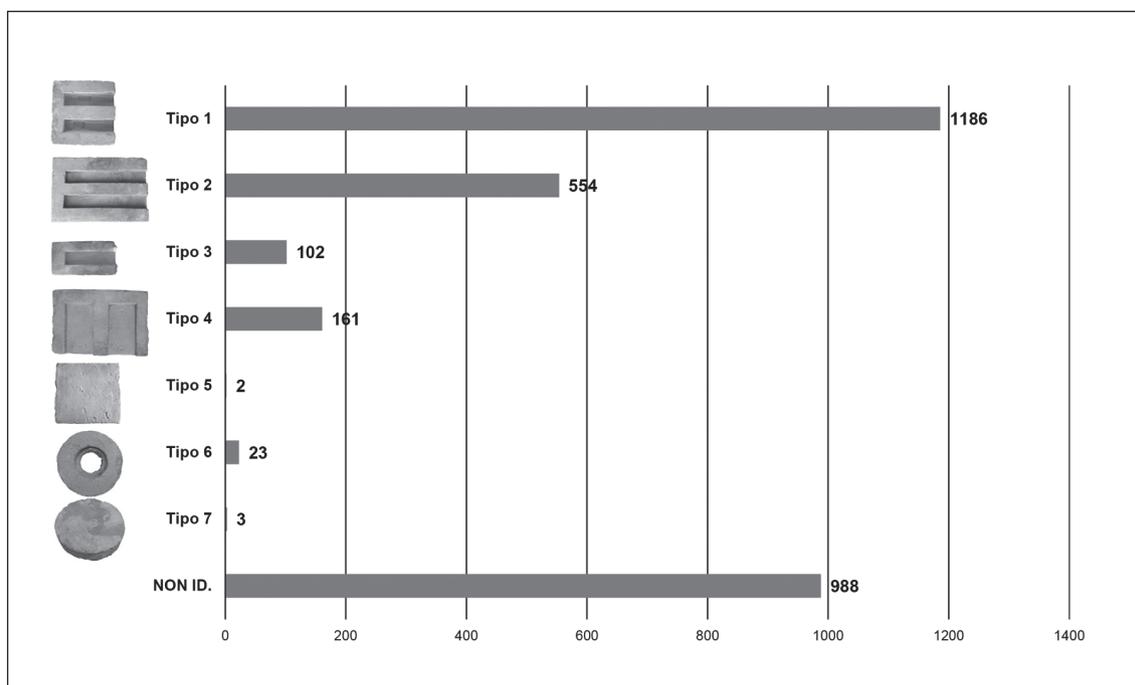


Fig. 3: Chart of Elean Bricks' Sample.

The Organization of Production

These bricks are a distinctive development of the Velia workshops, probably derived from the local mudbricks, whose 8–10 cm thickness they retain. The grooves, which extend for the whole length and breadth of the bricks, were made by means of stamps. Various interpretations have been offered for the purpose of the grooves. They certainly ensured better firing and reduced the weight of the brick. Interestingly, however, the grooves are different in Types 2 and 4, which are of the same size. Schleuning's Type *d*, also of the same size, has the same arrangement of grooves as in Type 4, but the grooves are three and smaller in size, as in Type 2.

While our sample is vast, we do not have any information about the location and organization of the brick manufacturing areas. A single kiln has been recorded so far. It dates to the Hellenistic period and lies in the southern suburb, in the valley of the Fiumarella. Furthermore, its actual use for brick production is debated.⁹

Brick production was promoted and controlled by the local administration, as the stamping system bears out. This control guaranteed a high degree of standardization in a manufacturing activity that lasted for over two centuries. According to the most accepted chronologies, the Elean bricks were produced from the late fourth or early 3rd century BC to the 1st century BC. However, we still lack reliable stratigraphic associations to confirm this timeframe, especially as regards the initial production phase.

The use of the bricks is still debated. Their first study, by P. Mingazzini, did not address this issue, limiting itself to illustrating the morphology of the bricks and possible parallels.¹⁰

Considering the scope and characteristics of brick production at Velia, and the fact that it was under strict control by the local administration, the hypothesis has been put forward that the bricks were made for a specific building program, and particularly for the erection of the town walls.¹¹ It should be noted, in this regard, that C. P. Sestieri, who discovered the first stretch of the lower city along the tower of the southern Porta Marina, hypothesized that the upper part of the walls, above the *opus quadratum* part, had been built of bricks.¹² Sestieri draw the attention to the regularity of the razing of the stone curtain, which suggested that the fired brick part had been removed for reuse elsewhere.

These bricks may thus have been mainly produced for the building of the city walls and subsequent maintenance work, in the light of the fact that they do not seem to be commonly used within the city, with the exception of some public complexes, such as the Hellenistic baths and the western building of the acropolis temple. So far, only one stretch of the walls still retains part of the brick curtain in situ. It lies in the northern quarter of the city, and belonged to the inner curtain. It is not clear whether the upper part of the walls of both curtains was built of bricks, and whether they were built separately or connected by a filling to form a wall walk.

When the defensive circuit lost its usefulness from the early imperial period onward, the second major cycle in the lives of these bricks began. Both the whole and the fragmentary specimens were systematically reemployed. The bricks stripped from the walls were used especially in private buildings, where they were adapted to Roman building techniques, as in a distinctive *opus reticulatum* observed in some funerary enclosures in the necropolis of Porta Marina Sud.

The Bricks of Velia: Production and Use

As is the case for several other sites in Magna Graecia, there was no significant circulation of the bricks produced at Elea outside of the city's territory. Their dissemination appears to be limited to a sub-regional, prevalently coastal context, where their employment shows no distinctive features. Only few specimens have been recorded immediately north of Elea, at Paestum. Surveys in the coastal strip to the south of the city have detected some fragment dispersion areas and, in some cases, reemployment of whole specimens (fig. 4).¹³ It has recently been suggested that bricks were produced in



Fig. 4: Distribution Map of Elean Bricks.

the valley of the Mingardo to be employed at the site of Palinuro, which in the Hellenistic period was part of the territory of Velia.¹⁴ Interestingly, no Elean bricks are attested at the Moio della Civitella,¹⁵ a fortified site whose attribution to Elea itself or to Lucanian peoples is still debated in the literature. Likewise, at the Lucanian site of Caselle in Pittari chessboard-style technique has been recorded, which is well documented at Elea in the Hellenistic period, but so far no specimens of Elean bricks.¹⁶ The occurrence of the chessboard-style technique here can be interpreted as evidence of the circulation of technical knowledge and/or workers.

Even further south, the only evidence comes from Blanda, a Lucanian fortified settlement which has so far yielded three brick fragments in secondary contexts. These fragments could reflect different circulation dynamics than those related to building sites.¹⁷

The presence at other sites, such as Locri, of bricks that resemble Elean types, but do not display exactly the same features, poses a more complex problem.¹⁸

The Stamping System

The stamped bricks of Velia, which have always attracted the interest of both scholars and visitors, usually bear two stamps. One is constituted by the unchanging acronym ΔH , and we have hence labeled it the “constant” or “invariable” stamp. The other, constituted by a sequence of letters, from a minimum of two to a maximum of five, varies from one specimen to the other, and we thus call it the “variable” stamp (fig. 5).¹⁹

The letters are enclosed in cartouches that are almost always rectangular or square, although oval or round cartouches occasionally also occur. They are never located on the smooth face of the bricks, but always on that with the grooves, clearly to hide them from sight when the bricks were laid, whether in floors or in walls. Their position on the brick, however, varies. They may both be impressed in the same groove or the same raised section, or freely arranged on different grooves or raised sections.

The stamps are mostly obtained from hollowed-out punches yielding letters in relief inside a cartouche. In some cases, instead, they feature hollow letters impressed with punches in relief. Sometimes the letters were traced manually in the clay, with no recourse to punches.

The letters are between 1 and 3 cm tall. They are often tied together and usually arranged horizontally, rightward or leftward, sometimes vertically. Different punches were usually employed for “invariable” and “variable” stamps, but some cases of both being impressed with a single punch are also known.

Along with these more common types, there are some stamps constituted by an unabbreviated anthroponym, in the genitive case, arranged on two lines (fig. 6). Since the bricks carrying this kind of stamp are only partly preserved, we do not know if they were associated with the “invariable” stamp or not.

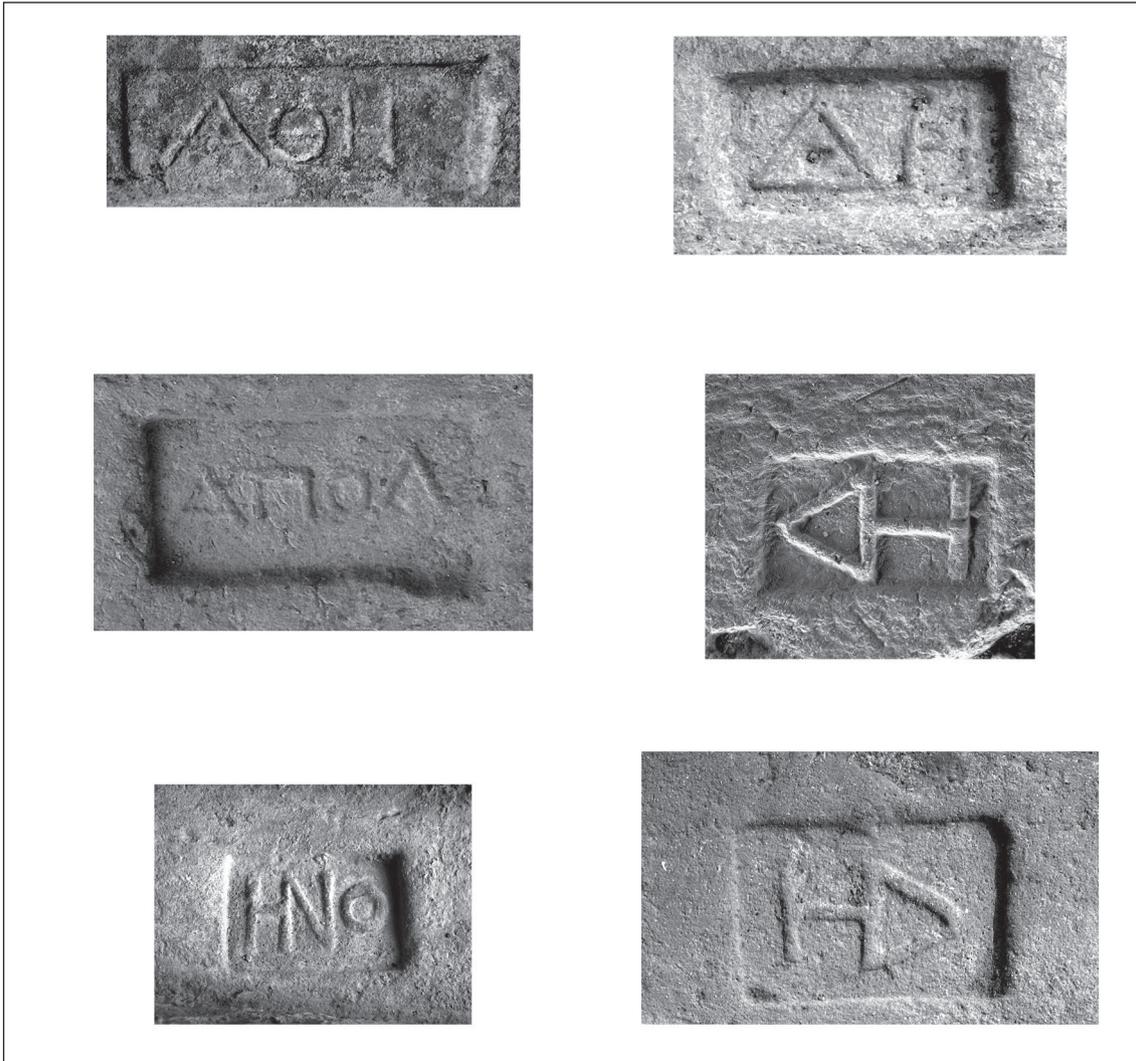


Fig. 5: Elean Bricks. A sample of Stamps.

As regards the “invariable” stamp, in some of the round stamps the acronym ΔΗ is associated with the letter Π, which could be the initial of *plinthos*; the acronym may thus stand for *demosia plinthos*, that is, “public brick” (fig. 6).

The paleographic features of the letters in the stamps point to a chronological range spanning the third and 2nd centuries BC.

The “variable” and the “invariable” stamp have been interpreted in different ways.²⁰ The “invariable” one, constituted by the acronym ΔΗ, has been explained as an abbreviation of the adjective *demosios*, referring to an implicit noun such as *keramos*, *keramis* or *plinthos*. It is thus believed to denote the public ownership of the bricks, their destination for public building projects, or a form of control or management of brick production by the state.²¹



Fig. 6: Elean Bricks. A sample of Stamps.

In the past it has often been suggested that the “variable” stamp could refer reference to the building the bricks were made for, or a production connected to a sanctuary, but this hypothesis does not seem to be tenable. All of the many acronyms recorded so far are explainable as anthroponyms, many of which are attested in local onomastics, including the apparent theonyms (e.g., AΘH, AΠO, EPM) (fig. 5–6).²² It is unlikely that a double set of references is involved, consisting partly of anthroponyms and partly of theonyms, without one being distinguishable from the other.

In general, the “variable” stamp has been thus regarded as the abbreviation of an anthroponym, identified as the name of the eponymous magistrate, that of the owner or manager of the workshop, that of the person charged with controlling the production, or that of the manufacturer of the brick.²³

As to the acronym ΔH, it is important to note that it also appears on tiles and on blocks of the city walls and other public buildings at Velia between the 4th and 2nd century BC.²⁴

It thus evidently alludes to the state through a reference to the assembly of the *demos*. This institution is documented by a decree of the city of Elea found at Cos, datable to 242 BC²⁵ and thus coeval with the use of the acronym ΔH on bricks or blocks.

It is thanks to this decree that we have some information about the political organization of Elea, such as the fact that it featured an unspecified number of *archontes* and an assembly designated as *demos*. The term is used again to designate the local political assembly in a later inscription, a dedication in honor of Caius Iulius Naso datable between the 1st century BC and the 2nd century AD. The epigraph also refers to a *synkletos*, a more restricted assembly, or possibly a council of sorts.²⁶ Scholars have debated whether this *synkletos* already existed before this period; however, this decree being bilingual, it is likely that here *synkletos* is merely the canonical Greek rendering of the term *senatus*.

The acronym ΔH, written with the same lettering as in the stamps, also occurs on a *kerykeion* discovered in the nearby Lucanian center of Roccagloriosa. In this case, it has been interpreted as an expression of the local community, which allegedly borrowed the symbol and term (*demosion*) from Italiot cities.²⁷ This interpretation, however, is unconvincing, because Roccagloriosa is also the place of origin of a well-known decree in Oscan where the local community is designated as *touta*.²⁸ It is likely, instead, that the *kerykeion* from Roccagloriosa actually came from Velia, and thus constitutes a valuable testimony of diplomatic relations between the two communities.²⁹ This obviously raises questions about the relations between Velia and the Lucanian town and, in general, the Oscan-Lucanian world. Strabo's well-known passage³⁰ mentioning Velia's defeating of the Poseidoniates and the Lucani suggests that the city escaped the Lucanian "conquest"; however, the epigraphic evidence clearly indicates that it was hardly impermeable to Oscan influence.³¹

The acronym ΔH could thus be an abbreviation, not of the adjective *demosios* but of the term *demos*, and designate the use the bricks were intended for and, hence, the fact that they were public property. Indeed, in their first employment the Eleatic bricks were only used in public buildings, and never exported. Their (quantitatively negligible) dissemination exclusively along the coast possibly depends on their use in defensive works or even as ballast on sea vessels. A local production at Palinuro may be a case unto itself, but even then the bricks would have still been intended for public use.

The invariable stamp, ΔH, is attested in a variety of graphical variants. This suggests that it is not the stamp of a state organization, but was applied by the producer himself, who thereby possibly guaranteed the standard of his product, since it was destined to be employed in public building projects.

As to the second stamp, the "variable" one, it seems unlikely that it designated the magistrate. This is often the case in the Greek world, but the name is then expressed in

a non-abbreviated form, in the nominative or genitive case, with or without ἐπί; besides, the state is already represented by the “invariable” stamp. A further argument against this hypothesis is that the acronyms are just too numerous. Only a very long duration of the building projects could justify such a variety of stamps, which would correspond to as many years.

The interpretation of the acronyms as a reference to the owners or managers of the brick factory, or the individual charged with controlling the production, is also unlikely: again, they number is too large, even for a production extending over a couple of centuries. It is much more likely that the acronyms refer to the craftsmen working in private or public workshops. This would explain both the number of the acronyms and the many variant abbreviations of the same name or of similar ones, such as Apollodoros or Apollonides.

Some bricks simultaneously carry two different variable stamps.

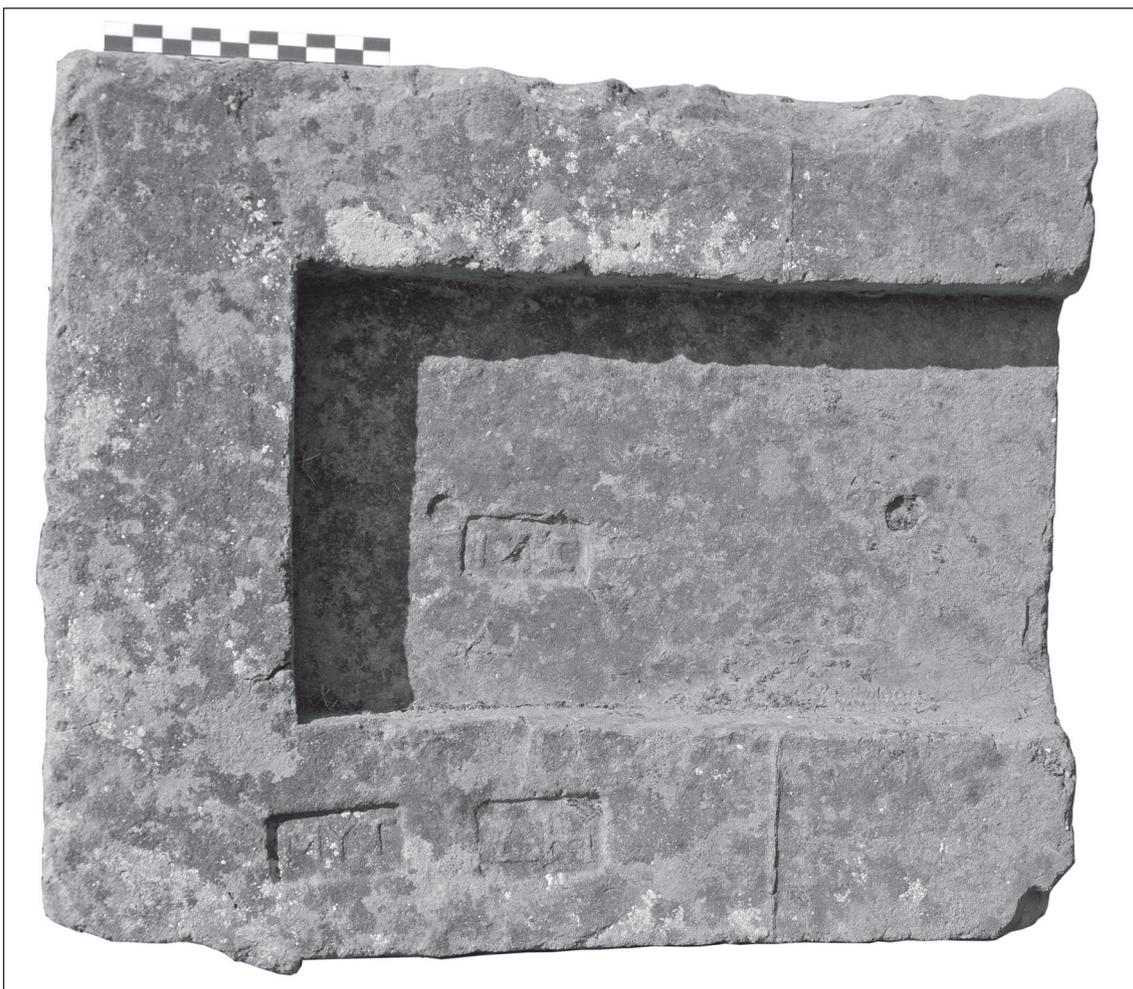


Fig. 7: Elean Brick with two Different Variable Stamps.

In all of these cases, one of the stamps reads ΖΩΙ, with an illegible omega, and is impressed inside the groove, while the other reads ΜΥΤ and is located on the raised section, next to the invariable stamp ΔΗ.

How are these cases to be explained? Was one of the two stamps – presumably that in the groove – impressed by mistake, and the brick then stamped again with the correct stamp, next to ΔΗ?

In any case, the significant datum here is that in the same workshop there would be punches for different stamps. In my opinion, this reinforces the hypothesis that the variable stamp did not identify the owner of the *figlina*, but the *officinator* who materially fashioned the bricks and evidently needed to distinguish his production from that of the others to allow the factory owner to keep the work of his individual *officinatores* under control. One could even construe these individuals as specialized craftsmen who used the stamps to “sign” their work, and may have actually owned the bricks, which were then fired in common kilns; the purpose of the stamp would thus have been to make the brick traceable to its original owner.

As regards chronological aspects, in the lack of a seriation of stamps – one of the objectives of our ongoing project – their date is mainly based on their epigraphic features, which indicate a time range spanning the third and 2nd centuries BC. So far, we lack cases of confirmed first employment of the bricks in dated buildings, with the exception of the Hellenistic baths, which have been dated to the second half of the 3rd century BC, but may actually be as late as the early 2nd century BC.

In contrast with the frequency of the stamp on bricks, we know of only very few tiles bearing the ΔΗ stamp. On these, it is punched or scratched, and differs in size and writing features from those found on bricks.³² Naked-eye examination of the clay indicates that these tiles are largely non-local products, mostly from the Phlegraean area.³³ Here a stamping system similar to Velia’s is documented at Pithecusa in the Hellenistic period, specifically on flat and barrel tiles, which carry two stamps: the usual invariable one, ΔΗ, and a variable one constituted by an abbreviation of a Greek or Oscan name enclosed, as is often the case at Velia, in a single cartouche. Two specimens from Neapolis, instead, are only stamped with the acronym ΔΗ.³⁴

The Elean stamping system has no other parallels in the Western Greece, although bricks stamped with the acronym ΔΗ occur at many sites of Magna Graecia and Sicily.³⁵ Outside of the West Mediterranean, the only other parallel is Thasos, where the bricks are stamped with the adjective *demosios*, written in full or abbreviated, combined with an anthroponym in the genitive which is believed to refer either to the factory owner or to the craftsman.³⁶

The connection of the Elean stamping system with the Pithecusa-Neapolis horizon is very interesting. In the fourth and 3rd centuries BC, Pithecusa was under the control of Neapolis.³⁷ At the time, at least as far as the production of amphorae is concerned, the two constituted a “multi-nuclear productive system”, as it has been recently defined.³⁸ The brick and amphora stamping system should thus be regarded as the expression

of a single state entity. Tiles with the ΔH stamp occur in both cities, whereas only at Pithecusa does the stamp occur on amphorae, in combination with the anthroponymic acronyms. Many of the latter also appear on Neapolitan-made amphorae, but without the ΔH stamp; the latter instead is found on some blocks of the fortifications of Neapolis. At Neapolis, as at Elea, the acronym ΔH appears to refer to the political decision-making institution, the *demōs*, which was also present at Pithecusa, as attested by a decree found at Cos.³⁹ The few specimens of tiles with the ΔH stamp known from Velia so far, some of which are indeed imported from the Bay of Naples, thus again raise the question of the relations of Velia with that area, which are well documented ever since its foundation. The possibility that these relations may also concern the city's brick stamping system is intriguing, and we hope our ongoing work will be able to shed further light on this matter.

Notes

¹ A L. Cicala is the author of the sections “Typology”, “The organization of production”, “The bricks of Velia: production and use”; L. Vecchio of sections “The stamping system”. The study of Elean bricks was resumed in the framework of the project “MaVe. Mattoni velini. Archeologia ed epigrafia della produzione”, directed by L. Cicala (Università di Napoli Federico II) and L. Vecchio (Università di Salerno), cf. Cicala – Vecchio 2014, 301–302.

² On the typology, see Cicala – Vecchio 2014, 284–285; Cicala – Vecchio 2017, 1010–1011.

³ Schleunig 1889, 185 fig. 19; Cicala – Vecchio 2019.

⁴ Cicala 2012, 153 fig. 3.37.

⁵ Cicala – Vecchio 2017, 1010; Cicala – Vecchio 2019.

⁶ Cicala – Vecchio 2017, 1010; Cicala – Vecchio 2019.

⁷ Cicala – Vecchio 2017, 1010; Cicala – Vecchio 2019.

⁸ Cicala – Vecchio 2017, 1010; Cicala – Vecchio 2019.

⁹ Cf., most recently, Gassner – D’Angiolillo 2017; Cicala – Ferrara 2018, 44.

¹⁰ Mingazzini 1954.

¹¹ Cicala – Vecchio 2014, 295–296; Cicala – Vecchio 2017, 1009; Cicala – Vecchio 2019; On “special-purpose brick” see Gerding 2006, 357.

¹² Sestieri 1960, 308.

¹³ Vecchio 2009–2012, 79. On occurrences of bricks at coastal sites and their use in cultic contexts (Palinuro, Isola dei conigli), see, most recently, De Magistris 2016.

¹⁴ De Magistris 2016, 24. 47. 81, who hypothesizes that there were one or two kilns.

¹⁵ Most recently De Magistris 2016, 52, who puts forward the hypothesis that the *opus quadratum* lower part of the wall was topped by a wooden palisade.

¹⁶ Cf. most recently Serritella – Rizzo 2019.

¹⁷ Mollo 2006, 395–396.

¹⁸ Vecchio 2009–2012, 80.

- ¹⁹ For an overview of the question of the stamping system of Elean bricks, we refer the reader to Vecchio 2009–2012, 63–114; cf. also Cicala – Vecchio 2014; Vecchio 2015; Cicala – Vecchio 2017; Cicala – Vecchio 2019.
- ²⁰ Vecchio 2009–2012, 74–77.
- ²¹ Vecchio 2009–2012, 75–77.
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- ²⁶ Vecchio 2003, 67–72; Vecchio 2015, 571–576.
- ²⁷ Gualtieri 2011, 99–112.
- ²⁸ Poccetti 2001, 197–274.
- ²⁹ Cf. Vecchio 2010, 342–343.
- ³⁰ Strabo, VI 1,1 C 252.
- ³¹ Vecchio 2003, 109–113.
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- ³³ Vecchio 2016.
- ³⁴ Pugliese 2014, 68–69, with further literature.
- ³⁵ For the literature on this subject, see Vecchio 2009–2012, 67–69.
- ³⁶ Garlan 2001.
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- ³⁸ Pugliese 2014, 138–140.
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Figs. 1–7: by Author.

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Rekonstruktion von Betriebsmodellen antiker Produktionsanlagen mit Hilfe von Prozessketten-Analysen. Methodik und Anwendung bei der Ziegelherstellung in römischer Zeit

Heinz Sperling

Grabungsergebnisse mit baulichen Befunden von Produktionsanlagen oder Halden mit Abfall oder Fehlchargen führen nach der Klärung der typologischen und zeitlichen Zuordnung häufig schnell zu den Fragen:¹

- Wie viele Menschen waren hier beschäftigt?
- Welche Produktionsleistung konnte erbracht werden?
- Welche Mengen an Ressourcen wurden verbraucht?
- Welche wirtschaftliche Bedeutung kam diesem Fundplatz zu?

Die Befunde liefern dazu meist keine Antworten, sondern lediglich Informationssegmente, wie Ofenabmessungen, am Ort verbliebene Produkte o. ä.

Werden diese Daten jedoch mit physikalischen und arbeitsorganisatorischen Zusammenhängen aus der vor Ort vorgefundenen oder anzunehmenden Technologie verknüpft, entsteht die Möglichkeit, lokale Betriebsmodelle zu rekonstruieren, mit Hilfe derer Aussagen zu diesen Fragen möglich werden.

Mit dieser Zielrichtung wurden Analysen von Produktionsabläufen – und der zugehörigen Prozessketten – eingesetzt, quantitative Betrachtungen zum Produktionsgeschehen an Fundplätzen mit römischen Ziegelbrennöfen anzustellen.

Die Elemente (Aktivitäten) der Prozesskette bei der Ziegelherstellung wurden dabei zunächst jeweils beschrieben und inhaltlich abgegrenzt; danach erfolgte das Quantifizieren des Material- und Personaleinsatzes je Aktivität (und je hergestelltes Stück bzw. je Mengeneinheit).

Die benötigten Daten stammen aus Experimenten mit rekonstruierten Brennöfen, aus Handbüchern zur manuellen Ziegelfertigung, thermodynamischen und verfahrenstechnischen Berechnungen, Schätzungen (gemeinsam mit Ziegeleimitarbeitern) etc. So konnten für verschiedene, in den römischen Nordwestprovinzen produzierte Ziegeltypen mit ihren jeweiligen Abmessungen spezifische Werte für das Ziegelherstellen abgeleitet werden.

Angaben zu Ziegelbrennöfen in dieser Region liegen in einer Vielzahl von Fundberichten zu römischen Ziegeleien vor. Diese unterscheiden sich von Brennöfen für andere keramische Produkte insbesondere durch ihre Form: sie sind in der Regel rechteckig. Die Höhe der Brennkammer – eine wesentliche Größe zur Bestimmung des für einen Brand zur Verfügung stehenden Volumens – konnte auf der Basis von Angaben aus Versuchen gewonnen werden. Daraus wurde – unter Berücksichtigung des zwischen den Rohlingen im Ofen benötigten Zwischenraumes für die Rauchgasdurchströmung – für verschiedene Ofengrößen die maximal je Brand mögliche Befüllung für die einzel-

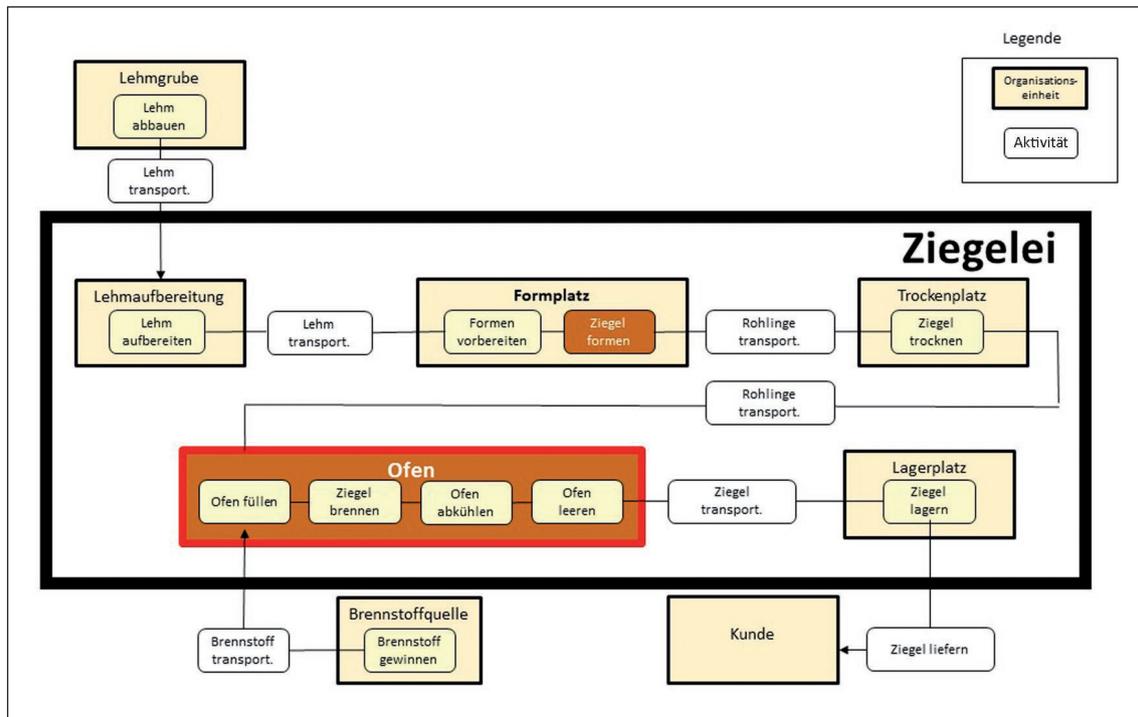


Abb. 1: Prozesskette Ziegelherstellung

nen Ziegeltypen berechnet: je Typ und Brand ergab sich so die einsetzbare Stückzahl und somit die verarbeitete Menge Lehm. Auch die Anzahl dazu benötigter Mitarbeiter-tage für dessen Verarbeitung zu gebrannten Ziegeln konnte unter Verwendung des spezifischen Personaleinsatzes auf dieser Basis berechnet werden.

Zusätzlich lagen auch Daten zu Brennmaterialverbräuchen aus Versuchen vor. Somit konnten auch die Bedarfe an Brennholz – als das hier unterstellte standardmäßig verwendete Brennmaterial – für einen Brand und für die gesamte Brennseason (von April bis September) berechnet werden.

Weitere Betrachtungen zu den in römischer Zeit für die betrachtete Region anzunehmenden Bewaldungen lieferten überdies Flächenbedarfe zur Sicherstellung des benötigten Brennmaterials für diese Brände. Dabei wurden Totalrodungen von Buchenwäldern mit unterschiedlich alten Baumbeständen betrachtet.

Auch zu den Transporten zu und von den Betriebsstätten (Lehmanlieferungen und Fertigwarenabtransport) waren aufgrund verfügbarer Kapazitäts- und Geschwindigkeitsangaben zu verschiedenen Transportmitteln Zeit- und Personalbedarfsaussagen möglich.

So konnten Betriebsmodelle für die wesentlichen Elemente des Wirtschaftssystems „Herstellen und Vertreiben von Baukeramik“ rekonstruiert werden.

Angewandt wurde dieses Vorgehen für die römische Militärziegelei in Dormagen sowie für andere, kleinere Öfen in Ziegeleien der Nordwestprovinzen. In Dormagen konn-

ten beispielsweise mit einem Ofen von 26 m³ Brennkammervolumen 169 m³ Lehm in einer Saison zu Ziegeln verarbeitet werden; ca. 15 Manntage fielen dabei je Arbeitstag in der Ziegelei an.

Überdies lieferten Recherchen zu Typen und Abmessungen italischer Ziegelbrennöfen – für Ziegel, die in Bauten im kaiserzeitlichen Rom verwendet wurden – eine enge Parallelität zu denen in den Nordwestprovinzen. Da außerdem Typen und Abmessungen der verbauten Ziegel bekannt sind, war ein Übertragen der Methodik incl. der quantitativen Betrachtungen auch für römische Großbauten möglich. So konnte u. a. die Anzahl benötigter Brennöfen für die Ziegel der Caracalla-Thermen berechnet werden.

Anmerkungen

¹ Das hier behandelte Thema ist Bestandteil der 2020 beim Propylaeum-Verlag publizierten Dissertation des Autors: <<https://books.ub.uni-heidelberg.de/propylaeum/catalog/book/625>> (23.08.2021). Für die in der Dissertation entwickelten Algorithmen siehe ferner: <<https://heidata.uni-heidelberg.de/dataset.xhtml?persistentId=doi:10.11588/data/8CB4FQ>> (23.08.2021).

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Serial Production

Panel 3.26

Serial Production in Classical Greece: Attic Figural Vases

Elisabeth Trinkl

The mass production of pottery is well known at least through the production of Megarian bowls and Terra Sigillata. Much earlier, though, the Athenian pottery workshops of the 6th and 5th centuries tried to produce series of nearly identical vases using moulds (negative forms). We can consider these vases to be early examples of mass production.

Concerning the Greek pottery of Archaic and Classical times, we usually analyse the individual hand of a potter or a painter. Concerning the figural or plastic vases, the individual craftsman and his skills do not stand out – with the only exception being the initiator(s) of the series. The vases from the workshop of Sotades, with their often exotic iconography, are probably the most famous objects of figural pottery in Attic production.¹ More often, the Attic figural vases are shaped more simply, in the shape of heads of animals and humans. The Athenians did not invent the use of moulds for plastic vases, however, they only modified it for their special purpose of creating distinctive ceramic vessels.²

Attic Production of Figural Vases

Initially, the Athenian plastic vases were small and mostly used as containers for scented oil, comparable to their predecessors from Corinthian and East Greek productions. As they became larger, the vessels were usually converted into drinking and serving vessels.³

The represented shapes of vessels are the *kantharos*, *aryballos*, mug, single or double faced, rhyton, and *oinochoe*. In this article we focus on the production of pouring vases, *oinochoai*, dating back to the late Archaic and early Classical times. The bodies of the vases are shaped as a human head, mostly female. This shape represents the biggest group. Besides the female heads, heads of male and female blacks also are documented, and there are rare examples with the heads of Heracles and Dionysos.⁴

The vast majority of the Attic pottery was thrown on the potter's wheel. For producing head vases, the potters used the same technique only for the upper part of the vessel, the vase's "neck". The body of the vessel, the head, was made using two moulds, one for the face and a second for the rear. The handle was hand-made. All components were glued together with slip.⁵ Finally, some details like eyes, eyebrows, or a wreath of leaves were painted by hand.⁶ After the final decoration the vase was fired in the kiln.

The production process relates the head vases to terracotta figurines. Theoretically, the aim was a series of almost identical objects. However, minor deformations could occur during the drying or firing process, and in the reworking process of the still-wet surface. Minor differences in the manually applied painting of the face may also lead to deviations.

Overall, the use of a mould enables mass production on a homogenous level and of similar dimensions.

Attic Figural Vases – Classification

In Athens, the production of plastic vases in the form of human heads dates back to the late 6th century. We owe their classification to the fundamental paper of Sir John Beazley, written in 1929.⁷ Since then, numerous vessels have been published, but Beazley's groups are still relevant.⁸ Based on an art historical methodology, Beazley categorized the head vases into twenty groups, so-called classes, according to the stylistic development of the face.

This paper will focus on two classes defined by Beazley (fig. 1): Class N, called the Cook Class⁹, and the Vienna Class, Class Q; two replica vases stored in the Kunsthis-



Fig. 1: A vase grouped in the Cook Class (Vienna, Kunsthistorisches Museum IV 998) and one of the name-vases of the Vienna Class (Vienna, Kunsthistorisches Museum IV 1039).

torisches Museum Wien are the name-vases for this class.¹⁰ The number of preserved vases in the diverse classes varies from only a few objects to more than 230 in the biggest group of all, the Cook Class. The small Vienna Class is represented by only 14 samples so far.

As the use of moulds aims at almost identical products, Beazley's stylistic grouping of vase painting is less suitable for moulded objects. Therefore, he himself compared the head vases to sculpture and used their chronology.¹¹

We pursue a different approach that seems more suitable for defining the coherence of a given class of moulded objects.

Quantifiable Approach Based on 3D Models

The key question is: Are the vases grouped in the same class *similar* vases, or are they more or less *identical* in terms of geometry? If their geometry is identical, they were made using the same mould or at least using the same master model.¹²

Therefore, we documented each vessel using a 3D scanner¹³ and generated 3D models from this data. So far, we possess 3D models of head vases stored in Berlin, Bologna, Budapest, Ferrara, Florence, Munich, Tübingen, and Vienna.¹⁴ All data will be stored in a repository which is being set up currently at the Austrian Academy of Sciences in Vienna.¹⁵

The digital comparison enables a quantifiable comparison of objects stored in different places based on 3D models. Generally, it is possible to compare all features of the entire vase. To examine our main question, we disregarded the texture. As we were most interested in the handling of the mould, we focussed on the heads.

Based on 3D information, OptoCat software was used to align the selected common areas of two objects. A special implementation of the iterative closest point (ICP) algorithm was employed to achieve the best fit alignment of the two 3D surfaces. During the ICP alignment, the position of the reference object was fixed in space while the second object's position was translated and rotated in space, thus minimizing the distance between the two objects. After the alignment, calculation and display of the offset between reference and search model were carried out. The distance value was displayed on the 3D model in a false colour image. If the deviation was less than 1 mm, we regarded two objects as so similar in shape that it was likely to come from the same mould.¹⁶

Analysis Based on 3D Models

Comparing vases of the Vienna Class following the approach described above, it became obvious that the vases are closely connected. The compared faces mostly have a deviation of less than 1 mm (visualised in green). Only in a few areas is the deviation

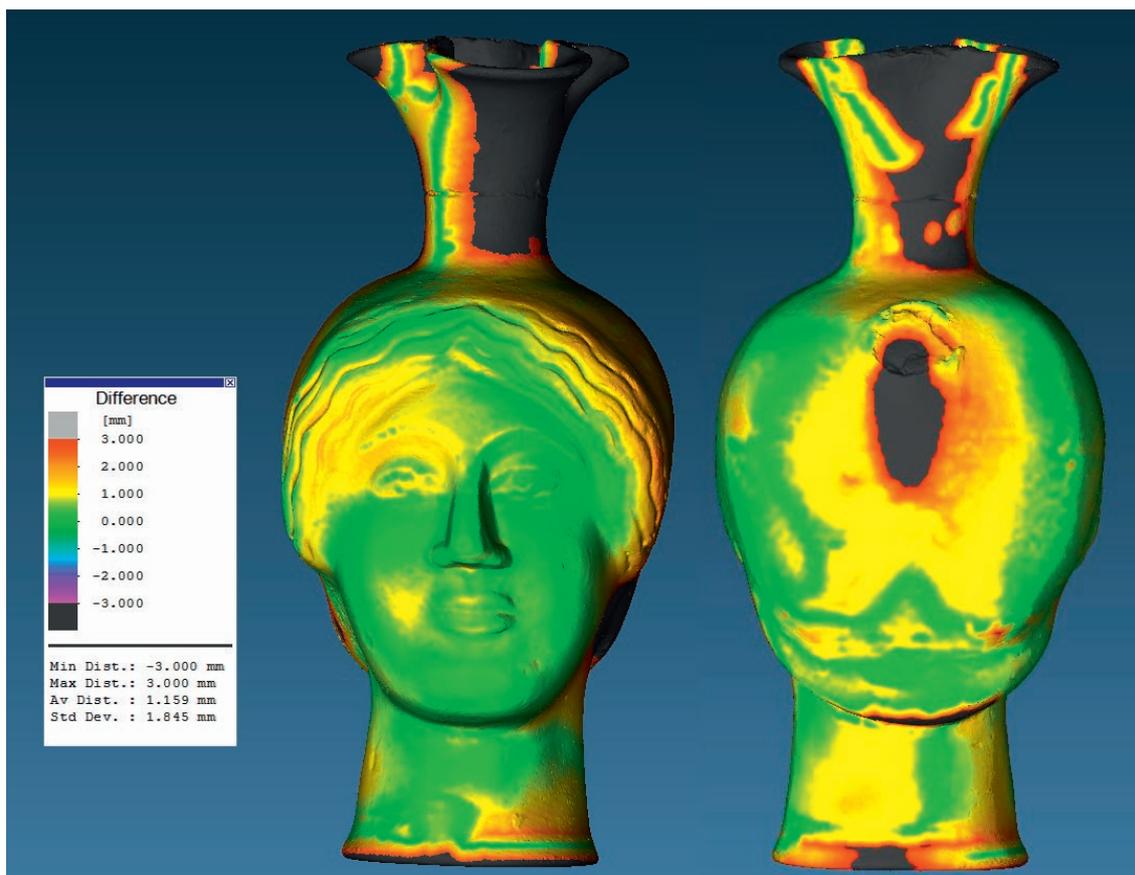


Fig. 2: The comparison of the two name-vases of the Vienna Class (Vienna, Kunsthistorisches Museum IV 998 and IV1039).

between 1 mm and 2 mm (visualised in yellow), but it never exceeds 2 mm. Comparing the back of the vases produced similar results (fig. 2).

The back side of the vases is difficult to calculate by conventional means due to the lack of reference points. Only the 3D models allow for this evaluation.¹⁷ So far, we have carried out the calculations for seven¹⁸ of the 14 known samples in the Vienna Class. No significant deviation was observed, only minor differences. Hence, it is most plausible that all vases in the Vienna Class come from the same pair of moulds. Only the final decoration made by hand shows minor differences, with the wreath having pointed or heart shaped leaves.

For the Cook Class, the situation is slightly more complex. At first glance, the only difference again is the shape of the leaves of the wreath, being pointed or heart-shaped.¹⁹ Upon closer examination, the number of existing vases is far greater, and the dimensions also differ significantly. The difference in the maximum height can be seen clearly, especially without texture (fig. 3). In line with the maximum height, the height of the faces themselves also differs. Comparing the vases by aligning the 3D models as before

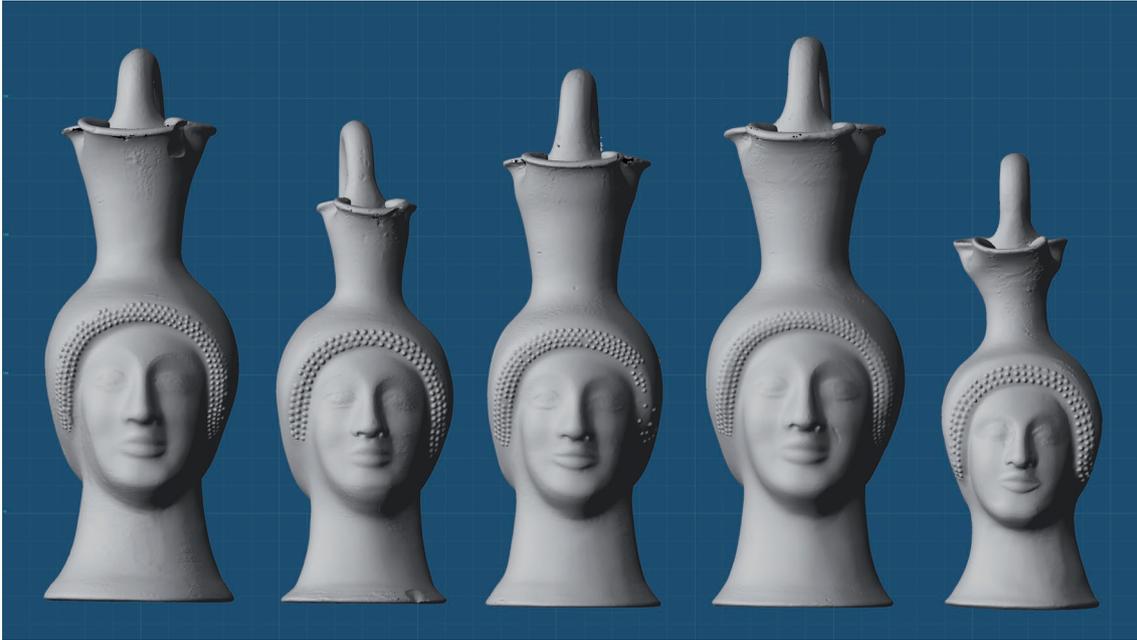


Fig. 3: 3D models without texture of five vases belonging to the Cook Class stored in Berlin; Berlin, Antikensammlung F 2191, F 2192, F 2193, F 2194, F 2195.

does not make sense. Although there is the typical similarity, the use of the same mould can be excluded for these faces.

Nevertheless, we can also find perfect matches in the Cook Class, as seen in the Vienna Class; in these cases, the deviation of the whole face is less than 1 mm (fig. 4 a; 4 b). These vessels were obviously made using an identical mould.

In a digital environment, we can change the dimensions and scale the data of the 3D models. A scaling factor was applied to one model before aligning it to the reference model for comparison, and the same factor was applied along the X, Y, and Z axes. Different factors between 0% and 20% were tested, as such differences may be explained by material shrinking and/or re-moulding from an existing model.²⁰

We started by comparing three vases of different heights stored in Vienna, all attributed to the Cook Class. The calculation shows an interdependency between the three vases (big, medium, small): the biggest is ca. 10% higher than the medium vase (fig. 5), and the smallest vase is ca. 10% smaller than the medium vase.²¹ Further vases stored in Munich and Berlin fit into the same scheme. Nevertheless, the Cook Class is less homogeneous than the 'smaller' classes; we have proven that at least three subgroups exist in the Cook Class.²² The use of digital 3D models also enabled us to evaluate fragmented objects, which is hardly possible by conventional means.²³

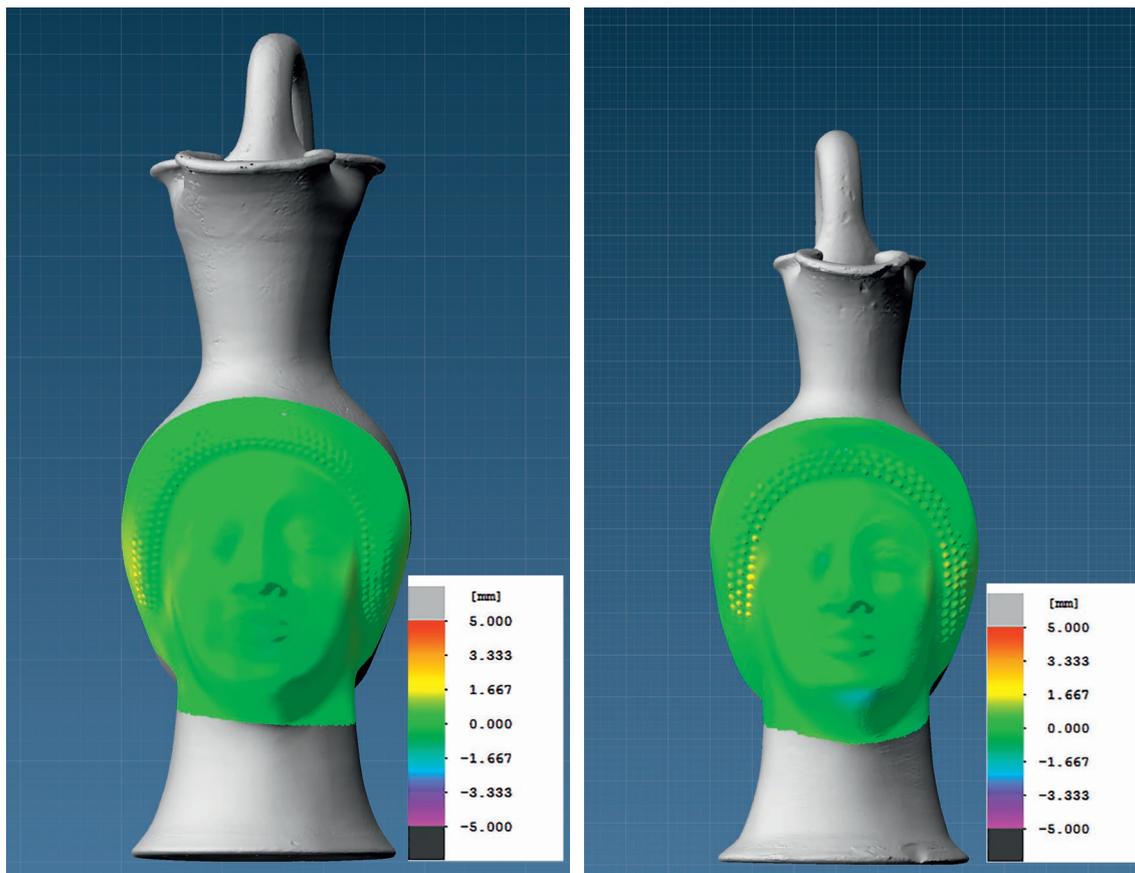


Fig. 4: Comparison of two vases in the Cook Class: Berlin, Antikensammlung F 2191 compared to F 2194; Berlin, Antikensammlung F 2192 compared to F 2193.

Conclusion

Serial analysis is well established in the research on figurines. Given the comparable production process it can also be applied on head vases.²⁴ The common element is the mould. The advantage of using a mould is that the resulting product is predictable and that limited skills are necessary to shape the figurine/vase.

Similar head vases preserved only in small quantities ('small classes'), such as the Vienna Class, are likely to be the output of one workshop which wanted to produce more or less identical vases. For this reason, they prepared a single pair of moulds, which may have been used until it broke or was worn to a high degree. The final treatment of the individual piece is less homogenous, and differs in the depiction of the wreath. Nevertheless, a series of standardized vases was produced using moulds; it aimed in some way at a 'mass production', despite the 'limited output' of the workshop.

Considering productivity, another question arises: Does the use of the moulds increase the productivity and raise the workshop's profit? We may doubt this, for reasons

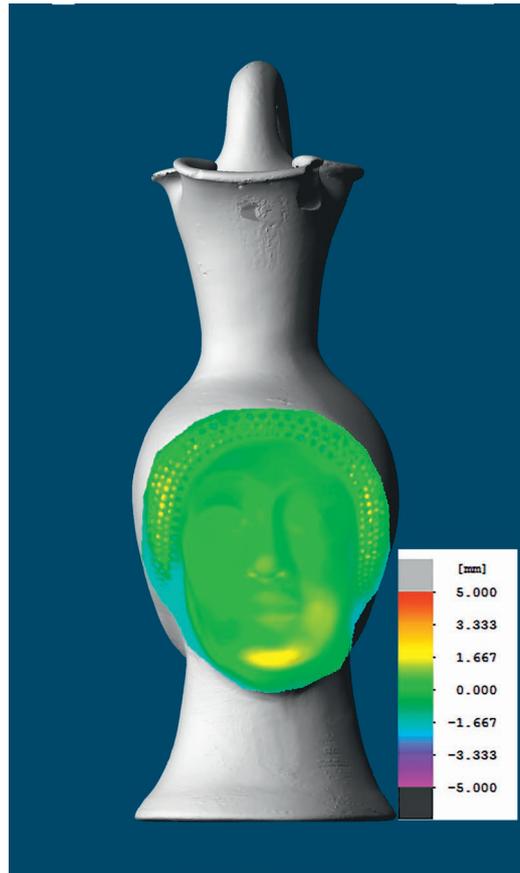


Fig. 5: Two vases in the Cook Class, one in original height (Berlin, Antikensammlung F 2191), the other calculated by 110% (Berlin, Antikensammlung F 2192).

of the “time” parameter. Only a leather-hard vase can be removed from the mould, and this may take considerable time, depending on environment, infrastructure, and weather. Afterwards, the mould itself must dry before it can be re-used. The drying period also needs to be taken into account. This leads to my assumption that especially the vases produced in small series did broaden the workshop’s product range. However, although they were produced serially, I doubt that they were more profitable than vases thrown on the potter’s wheel.

Concerning the Cook Class, the situation is slightly different: the head vases in the typical shape of this class were obviously more popular than other types of head vases. This is the conclusion drawn from the larger number of surviving items of this class.

In general, the number of copies from the same mould is always limited due to material wear and to the risks of damage or breakage. Sooner or later a new mould or a new pair of moulds becomes necessary. In the case of the Cook Class it was made from an already existing vase. The analyses proved that similar head vases from the Cook Class can be attributed to one of three interdependent groups. This fact has further

implications, especially regarding the date of the vases belonging to the Cook Class. Further 3D models and comparisons in connection with secure excavation finds²⁵ may reveal more information in this respect. Both will be the subject of future research.

Notes

¹ The exotic vessel type is often accompanied by exotic subjects, and most of them have a representative character; Guy 1981; Hoffmann 1997; Williams 2004; True 2006.

² Schlotzhauer 2006; Böhm 2014.

³ Cf. the introduction to the chapters dealing with head vases and rhyta in Schöne-Denkinger 2018, 44 f. 60 f.; Ebbinghaus 2008.

⁴ The identification of the depicted persons is subject to debate, but is not our topic here; cf. Lissarrague 1995; Reeder 1995, 212–215 No. 47 f.

⁵ Schreiber 1999, 236–241; cf. also the video “Making a Molded Attic Vase” produced by the Getty Museum. Sometimes the seams are still visible on the surface. By using imaging techniques (e.g. X-rays, CT) the joining parts are clearly identifiable; Schöne-Denkinger 2018, 51–55; Boss et al. 2010, 39 fig. 7–9.

⁶ Many heads wear a wreath of leaves, but some have a *stephane*.

⁷ Beazley 1929.

⁸ Beazley ignored vessels with full-height figures and also the productions of the 4th century. He focused on vases in the form of human heads.

⁹ The Cook Class is named after the famous religious historian Arthur B. Cook in Oxford. Cook was the former owner of the name-vase of this class, a double-sided aryballos with the faces of Heracles and a woman, today stored in New Zealand; Dunedin, Otago Museum E48.236: BAPD 218434.

¹⁰ Trinkl 2011, pl. 27.

¹¹ Very often he refers to the *korai* of the Athenian Acropolis; Beazley 1929.

¹² Schöne-Denkinger 2016 demonstrates the difficulty in making these comparisons using conventional methods of measurement. Although she produced nice results and proved relations between vases stored in Berlin, the measurements taken by hand always remain slightly tentative. The marked contrasts and especially the perfect Attic glaze also represent challenges for the measurement devices.

¹³ We used a fringe projection scanner.

¹⁴ I would like to thank all of the curators who showed interest in our method and generously granted access to their collection.

¹⁵ Spelitz et al. (2020).

¹⁶ For a more detailed explanation of the method and additional results dealing especially with the head vases stored in Berlin, cf. Trinkl – Rieke-Zapp 2018.

¹⁷ The back is often not even shown in publications.

¹⁸ Berlin F2200: BAPD 218628; Bologna G143: BAPD 218632; Ferrara 1900: BAPD 218636; Florence 73695: BAPD 218633; Munich SH2746: BAPD 218629; Vienna IV 999: BAPD 218631; Vienna IV 1039: BAPD 218630.

¹⁹ The characteristic depiction of the hair as dots of clay attached by hand is also heterogeneous, since three and four rows of dots appear. This difference can even be observed on vases which were made by the same mould.

²⁰ Nicholls 1952; Muller 1997a; Muller 1997b.

²¹ Vienna IV 998: BAPD 218491; Vienna IV 1038: BAPD 9031306; Vienna IV 997: BAPD 218490; Trinkl 2011, pl. 25f. We suggest that Vienna IV 1038 was made from a mould that was taken from Vienna IV 998, and that Vienna IV 997 had a mould that was taken from a vase similar to Vienna IV 1038; cf. Trinkl et al. 2018.

²² Subgroup of greatest height: Berlin F 2191; Berlin F 2194: BAPD 218477; Schöne-Denkinger 2018, pl. 44f.; subgroup of medium height: Munich SH 2743: BAPD 218479; Berlin F 2192: BAPD 218475; Berlin F 2193: BAPD 218476; Schöne-Denkinger 2018, pl. 46; subgroup of smallest height: Munich SH 2745: BAPD 218480; Berlin 2195: BAPD 218478; Schöne-Denkinger 2018, pl. 48. In general, cf. Trinkl – Rieke-Zapp 2018.

²³ The fragment Berlin F 2199 is attributed to the subgroup of medium-height vases belonging to the Cook Class; Schöne-Denkinger 2018, pl. 47, 5f.; Trinkl – Rieke-Zapp 2018, 71. The fragments Tübingen, University 1564: BAPD 16879, and Tübingen, University 1563: BAPD 16878 were attributed the largest and the smallest subgroup of the Cook Class respectively.

²⁴ Jastrow 1941; Hornung-Bertemes 1997; Muller 1997b; Beenhouwer 2008; Mathieux 2015.

²⁵ E.g. Guggisberg 2015.

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Blei als Material für die Serienproduktion von Votivgaben

Harald Schulze

Das Material Blei eignet sich besonders für die technisch einfache Serienproduktion von kleinformatischen Objekten. Die Herstellung von Votiven aus Blei ist von bronzezeitlichen Votivfiguren bis hin zu frühneuzeitlichen Pilgerzeichen belegt. Die serielle Herstellung solcher Bleivotive wird anhand von Funden aus dem Bestand der Archäologischen Staatssammlung vorgestellt, darunter Tonformen und zugehörige Bleivotive aus dem Vorderen Orient, Votive aus dem Menelaion in Sparta sowie römische Bleivotive aus Carnuntum.

Eigenschaften und Vorkommen

Die spezifischen Eigenschaften des Bleis – sein relativ häufiges Vorkommen in der Form von Bleierz, sein niedriger Schmelzpunkt, sein hohes spezifisches Gewicht und seine leichte Formbarkeit – haben seit dem Beginn der Metallzeit bis in unsere Gegenwart die Rolle dieses Metalls in der menschlichen Zivilisation bestimmt. Relevant war und ist vor allem der Einsatz im technischen Bereich, etwa für Rohre, Verzapfungen, Versiegelungen und Gewichte bis hin zum Bleisatzverfahren im Buchdruck, das um 1440 eine technische Revolution einleitete. In römischer Zeit wurden vor allem Wasserleitungen (der lateinische Begriff *plumbum* bezeichnet neben dem Metall auch die Bleiröhre), Schleudergeschosse im militärischen Bereich und Verplombungen aus Blei hergestellt – noch der heutige Begriff „Plombe“ leitet sich ab vom lateinischen Wort für Blei. Bereits der Antike war die Giftigkeit von Blei bewusst, die insbesondere beim Einatmen der beim Schmelzen freigesetzten Dämpfe auftritt. So beobachtete der Architekt Vitruv (*De architectura* VI 10–11) im ersten vorchristlichen Jahrhundert die Gesundheitsschäden, die durch die Dämpfe beim Schmelzen von Blei bei den damit befassten Arbeitern auftraten, und riet zur Verwendung von Tonröhren statt Bleileitungen für die Trinkwasserversorgung. Tatsächlich aber blieben die Römer aus technischen Gründen zumeist bei der Verwendung von Bleileitungen, wobei Verkalkungen der Röhren ein Ansteigen der Bleikonzentration im Trinkwasser in lebensgefährliche Konzentrationsbereiche verhinderten. Die Möglichkeiten der technisch einfachen und gegebenenfalls massenhaften Fertigung spielen auch eine Rolle im zweiten Verwendungsbereich von Blei: dem Votivwesen im weitesten Sinne.

Blei ist ein sogenanntes mildes Erz, was bedeutet, dass es am offenen Feuer zum Schmelzen gebracht werden kann. Sein Schmelzpunkt liegt bei lediglich 327,5 Grad. Man kann sich vorstellen, dass es Blei war, das am Beginn der Entwicklung des Metallschmelzens stand, indem am offenen Feuer zunächst zufällig aus bleihaltigen Erzen Blei ausgeschmolzen wurde („Lagerfeuertheorie“). Dagegen liegt der Schmelzpunkt von Kupfer erst bei 1083 Grad Celsius. Blei hätte dann in diesem Sinne den Weg für die

anderen Metalle gewiesen.¹ Die bisher frühesten Belege für Bleiobjekte sind Schmuckteile des frühen 6. Jahrtausends aus Vorderasien.² Häufig wird Blei mit Zinn zusammen zu einer Legierung verbunden, deren Schmelzpunkt bei nur 183 Grad Celsius liegt. Plinius bezeichnet in römischer Zeit Blei als *plumbum nigrum* und Zinn als *plumbum album* oder *plumbum candidum* und differenziert häufig gar nicht zwischen diesen Metallen, weil sie zumeist als Blei-Zinn-Legierung Verwendung fanden.³ Blei-Zinn-Legierungen werden wegen ihrer hellen Farbe in der Neuzeit auch als „Weißmetall“ bezeichnet.

Nur extrem selten kommt Blei in der Natur in gediegener Form vor (gesicherte Vorkommen nur in Schweden und Nordamerika), sondern zumeist als Bleierz, das seinerseits als Silberträger fungiert.⁴ Deshalb ist die Bleigewinnung häufig mit der Silbergewinnung kombiniert. Die bei dieser Art der Silbergewinnung und der Bleiproduktion freiwerdenden Bleiemissionen führten zu einem Anstieg des Bleigehalts in der Atmosphäre zwischen dem fünften Jahrhundert vor und dem dritten Jahrhundert nach Christus, wie die Analyse schwedischer Seesedimente sowie die kürzlich erfolgte Auswertung grönländischer Bohrkerne zeigen konnte.⁵ Der Erforschung des umfangreichen römischen Bleihandels gilt das Forschungsprojekt „Historisch-archäologische und naturwissenschaftliche Untersuchungen zur Bleiproduktion im römischen Reich“ – ein Gemeinschaftsprojekt der Kommission für Alte Geschichte und Epigraphik des Deutschen Archäologischen Instituts und des Fachbereichs Archäometallurgie des Deutschen Bergbau-Museums Bochum. Es entstand ein Corpus der römischen Bleibarren aus dem Zeitraum vom 1. Jahrhundert v. Chr. bis zum 5. Jahrhundert n. Chr., das bisher etwa 3000 bekannte Exemplare zusammenstellt.⁶ Gut erforscht sind aus römischer Zeit die Bleiabbaugebiete in Germanien (Eifel und Sauerland). Die charakteristischen trapezförmigen und zylinderförmigen germanischen Kleinbarren mit Durchlochungen finden sich auch auf römischen Transportschiffen. Sie wurden für den römischen Handelsraum dann üblicherweise in die längliche Kastenform der römischen Bleibarren umgegossen.⁷

Molybdomantie, Magie und Fluch

Die Billigkeit und leichte Herstellbarkeit von Bleiobjekten waren der Grund, weshalb Blei als Material für die römischen Fluchtäfelchen diente, von denen etwa 1600 Exemplare erhalten sind und die aufgrund ihrer Inschriften und Fluchformeln ein großes Interesse in der Forschung finden. Auf der weichen Oberfläche konnten die Inschriften problemlos eingeritzt werden. Es ist logisch: Man wollte keine großen Kosten aufwenden für die Verwünschungen seiner Feinde. Auch „Rachepuppen“ konnten daher aus Blei hergestellt werden.⁸ Die naheliegende Vermutung, auch die Toxizität des Bleis könnte ursächlich sein für seine Verwendung als Träger von Verwünschen, wird durch keine antiken Quellen gestützt.⁹ Gegen diese Vorstellung sprechen die Verwendung von

Blei als Material für zahlreiche Votivgattungen, in denen eine solche negative Konnotation auszuschließen ist – sondern es lediglich darum geht, diese Objekte massenhaft günstig herstellen zu können. Dass es auch bei der Verwendung von Blei als Material für die Fluchtäfelchen vornehmlich um die Kosten gegangen sein dürfte, zeigt sich darin, dass den bleiernen Fluchtäfelchen auf der anderen Seite des Spektrums die Wunschäfelchen aus Silber und Gold entgegenstehen.¹⁰ Die bizarren Formen, die das Blei beim Erkalten im Wasser ausbildet, haben spätestens seit römischer Zeit als Mittel der Wahrsagekunst gedient, der Molybdomantie. Dieser in christliche Tradition übernommene Brauch ist erst mit der EU-Chemikalienverordnung seit April 2018 für alle EU-Länder verboten worden.

Für die frühneuzeitlichen Alchemisten war Blei der erste Stoff auf dem Weg zur Goldgewinnung. Damit gewinnt das Blei als Material einen magischen Aspekt.¹¹ Für einen Star der zeitgenössischen Kunst wie Anselm Kiefer, der vielfach mit Blei arbeitet, hat Blei ein geradezu „spirituelles Element“.¹²

Die Verwendung von Blei und Bleilegierungen als Material für römische Sarkophage dürfte wiederum vor allem mit produktionstechnischen Aspekten und also auch Kostengründen zusammenhängen. Die modelverzierten Bleisarkophage der römischen Kaiserzeit mit dem Schwerpunkt in der Provinz Syrien rangierten im Kostenranking zwischen den aufwendigen Steinsarkophagen und den günstigen Sarkophagen aus Ton, Ziegeln oder Holz. In neuzeitlichen Fürstengräbern finden Blei- oder Zinksärge Verwendung für privilegierte Bestattungen, was möglicherweise mit der Beobachtung zusammenhängt, dass Blei unter bestimmten Bedingungen den natürlichen Verwesungsprozess verlangsamt.

Bleiguss

Ein Licht auf die serielle Herstellung von Bleistatuetten durch frühe Bleigusstechnik wirft ein Fundkomplex in der Archäologischen Staatssammlung.¹³ Es handelt sich um fünf Bleistatuetten gleichen Typs, von denen drei Exemplare noch ganz oder teilweise in den Tonummantelungen stecken (Abb. 1). Die Statuetten zeigen einfach gestaltete nackte Männerfiguren mit angelegten Armen. Man wird sie einer spätbronzezeitlichen Werkstatt in der Levante zuweisen können. Eine der Figuren steckt noch vollständig im Tonmantel, so dass nur die Unterseite der Standfläche sichtbar ist. Das Blei wurde demnach an dieser Stelle in den nach unten gedrehten Tonmantel gegossen, der zuvor in zwei Teilen von einer Patrizie abgenommen, verbunden und gebrannt worden war. Diese Art des Gusses in einer geschlossenen verlorenen Form stellt ein einfaches Prinzip der Vervielfältigung dar. Auch Bleifiguren der Hallstattkultur sind auf diese Weise produziert worden, so etwa in Frög, wo auch Bleibergbau nachgewiesen ist.¹⁴

Vereinfacht wird das Gussverfahren durch den Einsatz von Stein- oder Metallformen. Beim zweiseitigen Guss werden zwei Formen durch Verschnürung verbunden,



Abb. 1: Bleistatuetten im Gussmantel aus Ton.

in die dann das Blei von oben eingefüllt wird. Es entstehen Gussnähte und Speiser, die nachträglich mehr oder weniger sorgfältig entfernt werden. Figürliche Bleivotive im durchbrochenen Flachrelief, die in Serie in Steinformen gegossen wurden, treten bereits zum Beginn des 2. Jahrtausends in Mesopotamien auf.¹⁵ Aus dem letzten Viertel des 2. Jahrtausends stammen figürliche Bleivotive mit erotischen Szenen, die bei den deutschen Grabungen 1906 im sogenannten jüngeren Ischtar Tempel in Assur zutage traten.¹⁶ Sie zeigen erotische Tänze und Kopulationen im Rahmen der berühmten Tempelprostitution im Kult der Ischtar. Der Fund einer zu den Bleiausgüssen gehörigen steinernen Gussform am gleichen Ort belegt die Herstellung dieser Bleivotive im Tempelbezirk.¹⁷ Seriell gegossene figürliche Bleivotive im flachen Relief finden sich auch in der



Abb. 2: Römischer Bleispiegel.

Hallstattzeit in Mitteleuropa sowie im antiken Griechenland und im Römischen und Byzantinischen Reich und dann wieder als massenhaft verbreitete Pilgerzeichen im Spätmittelalter. Die übereinstimmende Herstellungstechnik führt dabei über Kulturen und Epochen hinweg zu typologisch sehr ähnlichen Ergebnissen.

Ein Beispiel für den Bleiguss im zweischaligen Guss sind Bleispiegel der römischen Kaiserzeit – hier ein Beispiel des quadratischen Typus mit Venusköpfen in der Archäologischen Staatssammlung (Abb. 2).¹⁸ Eine zu diesem Typus gehörige Steingussform zeigt die charakteristische Form und die Verzierungsornamente aus Venusköpfen und Delphinen als Symboltieren der Venus (Abb. 3).¹⁹ Der konische Einfüllkanal belegt, dass damit Güsse im Zweischalengussverfahren ausgeführt wurden.



Abb. 3: Gussform aus Stein zur Herstellung römischer Bleispiegel.

Bleiguss konnte auch im einteiligen Guss durchgeführt werden, wobei Blei von oben in eine offene Form gegossen wurde. Dadurch bildet nur die Unterseite eine Form, während die Gussoberfläche eine weitgehend glatte Rückseite bildet.

Bleivotive aus dem Menelaion in Sparta

In zahlreichen europäischen Sammlungen finden sich Bleivotive aus dem Menelaion in Sparta, das 1883 von Ludwig Ross identifiziert werden konnte und in den Jahren 1909/10 und schließlich 1970 von der British School at Athens ausgegraben wurde.²⁰ Die Blei-

votive stammen aus dem archaischen Heiligtum, in dem mykenische Siedlungsreste als Palast des Menelaos verehrt wurden und ein Heroenkult für Menelaos und Helena existierte. Typisch sind dünn gegossene Miniaturfiguren von Männern, Frauen und Tieren sowie kranzförmige Votive, wie sie auch die Exemplare in der Archäologischen Staatssammlung wiedergeben (Abb. 4).²¹ Die männlichen Figuren stellen bewaffnete Krieger mit Helmen und Rundschilden dar, was man mit der Verehrung des Menelaos als Kriegerkönig verbinden kann, gleichsam die Verkörperung des spartanischen Kriegerideals. Die Frauenfiguren betonen mit der Angabe langer gemusterter Gewänder mit Gürteln dieselben weiblichen Schönheitsideale wie die gleichzeitigen Korenfiguren. Nach oben und zur Seite gehobene Arme lassen an Tanzbewegungen denken.²² Tanz ist ein



Abb. 4: Archaische Bleivotive aus dem Menelaion in Sparta.

grundlegender Bestandteil griechischer Kultpraxis. Die Bleifigürchen von Tieren könnten zusammenhängen mit der Bedeutung der Helena für Fruchtbarkeitskulte; Kränze sind weitverbreitete Votivgaben. Die spartanischen Bleifigürchen weisen damit ein Repertoire von Miniaturvotiven auf, das weite Bereiche weiblicher und männlicher Kultpraxis in diesem Heroenheiligtum abzudecken vermochte. Man wird sich vorstellen, dass solche Figürchen im seriellen Bleiguss vor Ort in kleinen Betrieben hergestellt und direkt an die ins Heiligtum kommenden Besucher verkauft wurde – eine Praxis, wie sie noch bis heute an den verschiedensten religiösen Wallfahrtsorten zu beobachten ist.



Abb. 5: Figürliches Bleivotiv Venus und Amor.

Bleivotiv Venus und Amor

Aus einer Sammlung des späten 19. Jahrhunderts gelangte kürzlich als Schenkung ein interessantes Bleivotiv an die Archäologische Staatssammlung (Abb. 5).²³ Das in zwei Teile zerbrochene und partiell deformierte Votiv ist ein flacher Guss. Es zeigt in schematischer Form eine Frau und ein Kind, die ursprünglich miteinander verbunden waren. Auffallend sind die aufgesetzten Brüste und ein Halsband mit Medaillon, vor allem aber eine runde Öffnung an der Stelle des Unterkörpers der Frau. Die Art, wie diese Öffnung gefasst ist, entspricht derjenigen von Glaseinsätzen in römischen Spiegelfassungen. Der Spiegel ist als Symbol mit der Liebesgöttin Aphrodite – Venus verbunden, indem er ihre Schönheit widerspiegelt.²⁴ Die Nacktheit der Frauenfigur in Verbindung mit dem auffallenden Schmuck lassen auch hier an eine Darstellung der Venus denken – das Kind wäre dann als Eros zu interpretieren.²⁵ Die Spiegelöffnung im Unterbauch lässt zudem die Assoziation Fruchtbarkeit zu, so dass man in unserer Figurengruppe ein Votiv erkennen kann, das im Zusammenhang mit dem Wunsch nach Fruchtbarkeit an eine der Erscheinungsformen von Venus gerichtet war.

Bleivotive aus Carnuntum

Im Zuge der Niederösterreichischen Landesausstellung „Götterbilder – Menschenbilder“ 2011 wurden Teile der umfangreichen Bestände römischer Bleivotive aus Carnuntum vorgelegt, darunter auch Stücke aus den Beständen in der Archäologischen Staatssammlung München.²⁶ Charakteristisch für Carnuntum und den norisch-pannonischen Raum sind vor allem spiegelförmige Votive und dreifigurige Ädikulavotive. Die serielle Herstellung erfolgte im Guss aus Formen. Es sind einige solcher Gussformen aus dem norisch-pannonischen Raum bekannt, darunter Formen mit mehreren Motiven, aus denen sowohl spiegelförmige als auch Ädikulavotive hergestellt werden konnten.²⁷ Bei den spiegelförmigen Votiven handelt es sich um miniaturhafte Nachahmungen von Handspiegeln (Abb. 6). Sie wurden in der frühen und mittleren Kaiserzeit massenhaft in vielen Teilen des römischen Reiches produziert. Die Spiegelfläche kann dabei massiv gegossen, verziert, durchbrochen im Gitterguss oder mit Aussparungen für extra eingesetztes Spiegelglas gestaltet sein.²⁸ Durch Exemplare mit einer Inschrift für Silvanus lassen sich die Spiegelvotive in Carnuntum mit dem Kult des Wald- und Hirtengottes Silvanus verbinden, der eine wichtige Rolle in den römischen Donauprovinzen spielte.²⁹ Da zahlreiche dieser Bleivotive Lesefunde ohne sichere Fundkontexte sind, ist dabei auch eine Verbindung mit anderen Kulturen aus dem aphrodisisch-dionysischen Bereich nicht auszuschließen. Aus dem 1892 ergrabenen Heiligtum des Silvanus und der Weggöttinnen *Quadriviae* in der Zivilstadt von Carnuntum stammen neben spiegelförmigen Votiven auch Ädikulavotive, wie wir sie in großer Zahl aus Carnuntum kennen (Abb. 7). In einer Ädikula stehen drei weibliche Figuren. Die Dreierheit der Figuren, die



Abb. 6: Bleivotiv in Form eines Miniaturspiegels aus Carnuntum.



Abb. 7: Bleivotiv dreier Göttinnen in Ädikula aus Carnuntum.

Verbindung zum Silvanus-Kult und vergleichbare Darstellungen auf steinernen Votivreliefs erweisen diese als die Silvanae, die drei Begleiterinnen des Silvanus.³⁰ Bleivotive sind in den Donauprovinzen ab dem späten 2. Jahrhundert als massenhafte Weihgaben nachgewiesen. Neben den einfachen Votiven im Gittergussverfahren können auch aufwendigere Votive aus Blei hergestellt werden wie etwa die Bleivotivtafeln des Donaureiterskultes, auch bekannt als donauländische Mysterienreliefs.³¹

Spätmittelalterliche Pilgerzeichen

Im oströmisch-byzantinischen Kulturraum leben die römischen Bleivotive in Form zahlloser Bleiplaketten mit religiösen Bildern und Inschriften fort. In Europa wird ab dem 12. Jahrhundert die spätmittelalterliche Massenbewegung des Pilgerns begleitet von einer seriellen Massenproduktion von Pilgerzeichen in Blei-Zinn-Legierung. In der zweiten Hälfte des 12. Jahrhunderts setzt die Herstellung im Flachgussverfahren ein. Aufwendigere Stücke zeigen die Heiligen samt lateinischen Inschriften, so etwa das schöne Pilgerzeichen vom Wallfahrtsort St. Peter in Rom mit den Heiligen Petrus und Paulus, hier ein Fund aus Vohburg an der Donau (Abb. 8).³² Ab dem 14. Jahrhundert gibt es eine massenhafte Produktion im Gittergussverfahren.³³ Im Gitterguss hergestell-



Abb. 8: Mittelalterliches Pilgerzeichen aus Blei.

te Pilgerzeichen zeigen die Heiligen zumeist in architektonischer Rahmung, dabei teilweise in frappierender Ähnlichkeit zu den römischen Adikulavotiven. Die Fragilität der Gittergüsse und die Korrosionsprozesse der Blei-Zinn-Legierungen führen wie bei den antiken Stücken zu zahlreichen deformierten und fragmentierten Exemplaren. Die für die jeweiligen Pilgerorte charakteristischen Pilgerzeichen wurden als Ausweis der vollzogenen Pilgerreise an der Kleidung getragen und mit in die Heimat genommen. Während die antiken Votive massiert an den entsprechenden Heiligtümern auftreten, in denen sie geweiht wurden, finden sich bleierne Pilgerzeichen in der Regel breit gestreut und weit verteilt. Größere Fundgruppen kommen aus dem Schlamm von Flüssen und anderen Gewässern sowie Häfen. Ging eine ältere Interpretation davon aus, die Pilgerzeichen seien als Dankesgabe für geglückte Heimkehr in die Gewässer geworfen worden, so haben neuere Beobachtungen gezeigt, „dass die Zeichen bei der Entleerung von Latrinen und der Entsorgung von Hausmüll in die Fließgewässer gelangten und sich dort im Gegensatz zu den leichten organischen Abfällen anreicherten“.³⁴ Ich möchte annehmen, dass beides zutrifft: Wie etwa auch Münzen und andere kleine Metallgegenstände wurden Pilgerzeichen mit den Abwässern in Gewässer gespült, aber an bestimmten Punkten wie Häfen, Brücken und Gewässerübergängen konnten sie ihrem Votivcharakter entsprechend auch deponiert, d. h. hineingeworfen werden – ein Brauch, den wir von der Antike bis zur Gegenwart kennen! Gleichzeitig mit den frommen Pilgerzeichen existierten auch die frivol-erotischen Tragezeichen, die ebenfalls in Flachreliefs in Blei-Zinn-Legierung gearbeitet und an der Kleidung getragen wurden: kopulierende Paare, personalisierte Vulven und Phallustiere, dazu eindeutige Beischriften – ein Repertoire, das offensichtlich der nonverbalen sexuellen Kommunikation zwischen den Geschlechtern diente.³⁵

Anmerkungen

¹ Krysko 1979; Pernicka 1990, 45. 117.

² Pernicka 1990, 45; einige Bleiperlen aus Çatalhöyük bestehen dagegen aus Bleiglanz, also einem nicht verhütteten Bleierz, vgl. ebenda. In den Kulturen des Vorderen Orients spielte Blei auch weiterhin eine wichtige Rolle, s. die Zusammenstellungen in Andrae 1924; Rumpf 1973, 6–9.

³ Kopp 1847, 12–137 mit zahlreichen Quellenzitaten sowie Rottländer 2000, 84.

⁴ Pernicka 1990, 45.

⁵ Thüry 1995, Anm. 71; McConnell 2018.

⁶ Im Umfeld des Projektes entstanden auch eine Reihe von Publikationen, s. dazu <<https://www.bergbaumuseum.de/de/forschung/projekte/blei-silber-altertum/bleiproduktion-im-roemischen-reich>> (aufgerufen am 18. 10. 2018).

⁷ Melzer – Capelle 2007; Rothenhöfer – Bode 2015.

⁸ Barratta 2013, 284 mit der Zusammenstellung der älteren Literatur zu griechischen und römischen Ra-
chepuppen aus Blei in Anm. 15.

⁹ Giulia Barratta hat darauf hingewiesen, dass die in der modernen Literatur häufig vertretende Einschätzung von Blei als magisches Metall weder durch die antiken Schriftquellen noch durch die archäologische Überlieferung gestützt wird, sondern vielmehr auf seine Verwendung in der mittelalterlichen und neuzeitlichen Alchemie zurückgehen dürfte, so etwa Barratta 2012a, 23–27; Barratta 2013, 284.

¹⁰ Beispiele etwa aus Carnuntum s. Humer – Kremer 2011 Nr. 647–650.

¹¹ Barratta 2012a, 23 f.; Barratta 2013, 284.

¹² Dazu nur zwei Zitate: „das Blei wirkt mehr als alle anderen Metalle auf mich“ (Zitat nach Wagner 2001, 44) und „ein Freund des Bleis“, s. Ransmayr 2002, 20.

¹³ Archäologische Staatssammlung München 1985,524, Höhe der Bleifiguren: 9,1 cm; Höhe der Tonformen: 10 cm (zur Zeit als Leihgabe im Keramikmuseum Weiden): Zahlhaas 1985, 208 Nr. 102; Zahlhaas 1990, 100 f. mit Abb.

¹⁴ Gleirscher 2011, 88

¹⁵ Vgl. etwa Hrouda 2003, 388 f. mit Abbildungen von einer Gussform und Bleifiguren.

¹⁶ Andrae 1924, 2 f.; Andrae 1935, 103 f. Taf. 45.

¹⁷ Andrae 1935, 104 Taf. 45r.

¹⁸ Archäologische Staatssammlung München 1986,5619 (unpubliziert).

¹⁹ Privatbesitz, ehemals Kunsthandel Hermann Historica München Auktion 63, 26. Oktober 2011 Nr. 1597.

²⁰ Zusammenfassend und mit der älteren Literatur De Armond 2009.

²¹ Archäologische Staatssammlung München 2007,8053: Grüner 2012, 464 Abb. 31.28.

²² Grüner 2012, 464; für die dort vertretene Verbindung zum Artemis-Kult sehe ich allerdings keine Belege.

²³ Archäologische Staatssammlung München E 2017/13; zwei Fragmente: große Figur 12,2 × 4 cm, kleine Figur 5 × 2,3 cm. Fundumstände unbekannt. Das Votiv gelangte als Schenkung aus Münchner Privatbesitz an die Staatssammlung. Ursprünglich auf Stoff montiert und stark versintert, 2017 gereinigt und neu montiert.

²⁴ Zu Funktionszusammenhängen von Spiegeln und zur Rolle von Spiegeln im aphrodisischen Umfeld s. Schulze 2017, 307–309.

²⁵ Man vergleiche etwa recht schematisch gehaltene Bleivotive mit Venus und Amor aus Carnuntum: Thüry 2017, 359 f. Nr. 736. 737. Auch einige Bleifiguren nackter Frauen mit Kind im Kunsthandel, die dort als hallstattzeitliche Darstellungen von Mutter mit Kind gelten, würde ich für römische Darstellungen von Venus und Amor halten: Hermann Historica München Auktion 66, 2./3. Mai 2013 Nr. 2331; Gerhard Hirsch Nachfolger München Auktion 302, 23./24. September 2014 Nr. 1982. Dafür spricht neben der Ikonographie auch die Form der Basis dieser Figuren, die denjenigen römischer Statuetten entsprechen.

²⁶ Humer – Kremer 2011 Nr. 654–765; Holzner – Kremer 2012 Nr. 1–219.

²⁷ Holzner – Kremer 2012, 32 f. mit Anm. 6–9.

²⁸ Grundlegend zu den römischen Bleivotiven in Spiegelform Baratta 2012a; Baratta 2012b; Baratta 2016.

²⁹ Dazu zuletzt Dészpa 2012 und Perinić 2016.

³⁰ Holzner – Kremer 2012, 39.

³¹ Zusammenstellung bei Ertl 1996 und Ertl 2014; zur Zeit erarbeitet eine internationale Arbeitsgruppe eine neue aktuelle Bestandsaufnahme dieser Denkmälergruppe aus den Donauprovinzen.

³² Archäologische Staatssammlung München 1976, 2246, 0,33 × 0,4 cm: Haasis-Berner 2006, 237–252 bes. 238; <<http://www.pilgerzeichen.de/item/pz/961>> (17. 10. 2018).

³³ Zuletzt zusammenfassend Grünewald – Haasis-Berner 2018, 137–139. Siehe dazu auch die Pilgerzeichendatenbank, Staatliche Museen zu Berlin: <<http://www.pilgerzeichen.de/>> (17. 10. 2018).

³⁴ Kühne – Ansorge 2016, 14.

³⁵ Retsch 2013, 77–123.

Abbildungsnachweise

Abb. 1: Foto: ASM D 2018-1178 M. Eberlein. – Abb. 2: Foto IMG-9097 H. Schulze. – Abb. 3: Foto: St. Friedrich. – Abb. 4: Foto: ASM D 2012-729 St. Friedrich. – Abb. 5: Foto: ASM D 2017-1183 St. Friedrich. – Abb. 6: Foto: Land Niederösterreich – Archäologischer Park Carnuntum, Bad Deutsch-Altenburg, Foto N. Gail. – Abb. 7: Foto: Land Niederösterreich – Archäologischer Park Carnuntum, Bad Deutsch-Altenburg, Foto N. Gail. – Abb. 8: Foto ASM GD 1999-466 M. Eberlein.

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Serial Production or Individual Orders? Palmyrene Sculpture from the 1st to the 3rd Century AD

Dagmara Wielgosz-Rondolino

Serial production is the fabrication of significant quantities of standardized items, which impacts also the assembly process, and sometimes results in cheap goods. This facilitates their widespread distribution. Two criteria determine mass production: the availability of material, and the increasing demand for goods. In Palmyra, sculpture production or, broadly speaking, the production of all kinds of stone artefacts, fulfilled both criteria. The city was very rich in architectural and sculptural material, namely limestone of various types and qualities.

Already in 1990 Andreas Schmidt-Colinet, who published the results of a survey of hard-limestone outcrops, pointed at the prefabrication of various artefacts in the quarries.¹ Thus, the first step in the long chain of serial-production consisted in dressing the artefacts in the quarry.

As is well known, the most peculiar form of local artistic expression was figurative sculpture, which, until the end of the Palmyrene civilization, preserved its unique character. In funerary sculpture, old models were preserved since they were fixed by tradition and transmitted from generation to generation. On the other hand, sculpture was subject to the influences of oriental cultures and trends coming from the west. From the Palmyrene perspective, these could be interpreted as an imprint of the Greek and Hellenized cultures of the Roman east, and also that of the Romans. Funerary sculpture includes a variety of sculptural categories: bas-reliefs on slabs, sarcophagi, and statues.

The largest group of sculptures consists of funerary busts, or rather half-figures, which became emblematic representations of Palmyrene art. They were carved on rectangular slabs usually of standardized dimensions, approximately 55 to 50 cm. As already demonstrated over thirty years ago,² the use of funerary monuments of a specific type (busts or sarcophagi, etc.) was strictly connected to the development of multiple burials. In the case of funerary busts, serial/mass production concerns not only the huge number of these monuments, which were highly demanded by the demographically and economically developing Palmyrene society, but also by the standardization of poses, gestures, clothes, and attributes. Obvious differences between the busts concern their style (often expressed in drapery rendering), technical handling, and iconographic details; these depended on the skills of the sculptors and on the financial means of the purchasers. We may imagine a workshop providing a variety of the busts for sale, some of higher and some of lower quality, among which the customers could choose the ones they liked and could afford. This was possible because Palmyrene portraits did not reproduce the physiognomy of the deceased. In fact, the “portraits” of the Palmyrene middle and upper class represent men and women in their characteristic social con-

texts through their attributes. Garments were standardized as well: men were usually dressed in a chiton and himation, and priests sometimes wore a mantle. Women were represented in local, traditional garments: a chiton, a cloak, and a turban. Long veils supposedly covered the heads of married women. The images were accompanied by Aramaic inscriptions, sometimes bilingual (in Aramaic and Greek), but rarely in Latin. Without the engraved and/or painted text it would be impossible to identify the person represented.

Until the last decades of the second century AD, Palmyrene portraits were produced in series and not made to order. Subsequently, the situation seems to change slightly, but still it is rather difficult, if not impossible, to find any physical resemblance to the deceased. We can even suppose that some portraits might have been individually produced, especially if they were part of bigger projects connected with the most opulent tombs. Wealthy commissioners did not require accuracy in rendering the physiognomic features of the person portrayed; instead, they expected the highest quality of sculptural work. Thus, the Palmyrenes desired to differ one from another, but not necessarily by their physical features and physiognomy. The physiognomy of a person did not play a role, but attention was paid to the attributes and ornamental details added to the portrait. The diffusion of the underground tombs and funerary temples caused increasing demand for another category of funerary sculpture: the slab showing a banquet scene. Often arranged in sets of three, the slabs were intended to imitate banquet halls (triclinia). These very characteristic reliefs were mass-produced, but the familiar character of the representation stimulated a certain level of personalization. As in the case of funerary busts from the last decades of the second century AD, the banquet scenes reflected changes in the way of life of the Palmyrenes and the improvement of the economic situation. This resulted in the appearance of rich embellishments in funerary representations. A similar thing happened for sarcophagi: a specific order was made for a specific setting in the funerary temples or underground tombs.

Notes

¹ Schmidt-Colinet 1990; Schmidt-Colinet 2017.

² Makowski 1985.

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Serial Production or Individual Orders? Palmyrene Inscriptions on Artefacts from the 1st to the 3rd Centuries AD

Eleonora Cussini

The issue of serial production at Palmyra may be investigated from the viewpoint of inscriptions on artefacts produced in series. The main question I address is what the epigraphs tell us about the artefacts, be they examples of individual orders or items that were produced in series, as well as their process of production. My analysis focuses on the types of text written on different types of artefacts. The Palmyrene corpus comprises about three thousand inscriptions. The attested text-types include funerary epitaphs, honourific inscriptions, and religious dedications. They are written on architectural and cultic items: mainly on column-brackets, altars, and bas-reliefs.¹ Other significant examples of inscribed, mass-produced items are oil-lamps and *tesserae*. The last term indicates small clay (or glass) tokens with brief inscriptions and visual elements, which were distributed to guests attending banquets called *marzeah* in Aramaic. This well-known Semitic institution is amply documented at Palmyra. Tesseræ and oil-lamps are good examples of widespread cheap goods, easily reproduced by means of moulds.²

My discussion focuses on the epigraphs in their context, with special attention given to formulaic texts attested in hundreds of specimens. Other examples of Palmyrene large-scale production are inscribed column brackets where statues were placed, as well as small incense altars. About three hundred examples of this type of third-century altars are known, and I have recently discussed some of the peculiarities in the formulation of their inscriptions.³ I believe they are a good example of the process of selection and purchase of items: dedicants went to local workshops and chose the artefacts they could afford and that met their needs, in terms of decoration, shape and price. There are examples of different writing skills and variations in the structure of dedications. Likewise, funerary reliefs were ordered, or chosen among available semi-finished artefacts at local workshops. The brief epitaphs were added later, or completed, in some cases when the relief was *in situ*. Sometimes it is also possible to observe different writing styles and handwritings on a relief.⁴ Longer text-types offer the opportunity to discuss further the issue of individual orders. It is impossible, however, to deepen the analysis of the process of production: there are no extant written documents mentioning the exploitation of quarries, orders, payment, nor records of the work of craftsmen and workshops. Administrative documents were written on perishable writing materials, and have not survived. Palmyrene inscriptions do not allow us to reconstruct the process of making and inscribing the artefacts. Thus, the key-question regarding who wrote the inscriptions and how orders and production were carried out cannot be answered. The epigraphs and the artefacts they accompanied are analysed as a whole, in order to

evaluate the degree of individualisation of formulaic texts in the context of the serial production of given artefacts.

Notes

¹ For edition, Hillers – Cussini 1996; al-Asʿad et al. 2012; Yon 2013.

² Tesserae: Ingholt et al. 1955 (cf. Hillers – Cussini 1995, mainly PAT 2012–2623); Schmidt-Colinet – al-Asʿad 2005. Oil-lamps: Fellmann 1975, 13–59; Higuchi – Izumi 1994, 91–100 pl. 58–62.

³ Cussini 2019.

⁴ Cussini 2022.

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Roman and Late Antique Glass Production

Panel 3.27

New Light on Old Panes – Current Results Obtained by Experimental Archaeology: Making Roman Window Glass

Frank Wiesenberg

Introduction

Beginning in the 1st century AD, window glass was commonly used in Roman building architecture. It served as passive illumination in bathhouses as well as public and private buildings, spreading from central Rome all over the Roman Empire. Two different types of early Roman window glass can be specified: square or rectangular flat glass panes¹ on the one hand, and round and domed window glass² on the other. Both are thick-walled, and feature both a matte and a glossy side, which easily distinguishes them from the later blown Roman window glass panes.³ Both early Roman window glass varieties were reconstructed during the ‘Borg Furnace Project 2015’, as well as some of the later ones in the Archaeological Park Roman Villa Borg’s hot glass workshop.

The Hot Glass Workshop

In summer 2013, a Roman hot glass workshop featuring a wood-fired furnace with a capacity of up to three 4.5 litre ceramic melting pots for glass, and an annealing oven to cool down the glass objects in a controlled manner, was reconstructed in the Archaeological Park Roman Villa Borg in Germany.⁴ Although there were indications for glass working in the Roman *villa rustica* of Perl-Borg, the small daub furnace fragments did not allow any reconstruction. Therefore the reconstruction was based on the excavation of a small glass workshop at Trier,⁵ less than 40 km north of Perl-Borg.

After the first test-run in October 2013 was successfully finished, and proved the general functionality of the glass furnace and the annealing oven, the glass workshop was continually enhanced with several small wood-fired furnaces for making glass beads, a second small furnace for glass melting and working, and a larger annealing oven. In 2018, the building of a second hot glass workshop was completed, which houses a reconstruction of a large tank furnace, capable of melting 300 litres of glass, another small furnace for glass melting and working, and two separate annealing ovens. All of the furnace and oven structures are made from daub, using local loam and in some cases grass or straw, and fragments of Roman roof tiles. The furnaces and ovens are operated mainly with birch and beech wood. Constant temperatures between 1,000 and 1,100 °C allow the manufacture of glass vessels and other glass objects at the glass furnaces. The annealing ovens are operated during the day between 400 and 500 °C for tempering the glass vessels and cool down gradually over night.

In nine projects of one week each, and numerous research and demonstration days, these two hot glass workshops provided the opportunity to test and evaluate different glass manufacturing techniques,⁶ ranging from core-formed and slumped vessels to free blown and mould-blown vessels. The manufacturing techniques were researched by Mark Taylor and David Hill (The Glassmakers, England), assisted by François Arnaud (Atelier PiVerre, France), Torsten Röttsch (formerly LWL Industriemuseum Glashütte Gernheim, now at Glasfachschule Zwiesel, Germany), William Gudenrath (Corning Museum of Glass, USA), Jason Klein (Historical Glassworks, USA), Liliya Pangelova (Bulgaria, currently at Gozo Glass, Malta), Bettina Birkenhagen (Archaeological Park Roman Villa Borg) and the author. During the 'Borg Furnace Project 2015', a set of flat and domed Roman window glasses was reconstructed by Mark Taylor, François Arnaud and Torsten Röttsch, assisted by the author.⁷ Some flat windowpanes and one domed window were made by the author, assisted by Bettina Birkenhagen (Archaeological Park Roman Villa Borg), during the furnace projects 2017 and 2018.

Characteristics and Tool Marks as Displayed by the Glass Window Fragments of the *villa rustica* at Borg

The Archaeological Park Roman Villa Borg provides numerous fragments of Roman glass windows. Whilst most of the fragments derive from flat windows, featuring one matte and one glossy side, six of the fragments could be identified as fragments of domed windows.⁸

All of the Villa Borg's window glass fragments are so-called natural coloured, meaning a colour tint caused by natural impurities, mainly iron oxides, of the sand being used as the main ingredient for the glass. The colour tint of most of the fragments ranges from blue-green to a darker green, though green-brownish colours are exceptions. The thickness of the flat window glass fragments is between 2 and 5 mm, with one side featuring a glossy, fire-polished appearance, the other a rough, matte surface, in some cases with small crumbs of material embedded in the surface of the glass. The matte side and the tint in combination with the thickness of the glass causes this early Roman window glass to be translucent rather than transparent. Due to the small inclusions, the matte side will be referred as being the underside in terms of the manufacturing process.

The edges, featuring a smaller radius towards the underside and a larger one towards the upper side, and the rather round corners are usually not reworked, so the windowpanes were without much doubt made to fit the desired final size. In most of the corners, indentions are visible on the upper side (fig. 1), which indicate the use of tools to pull out the corners. The cross-section of some of the fragments show a layering of the glass.⁹ The following discussion of possible manufacturing methods refers only to the early matte-glossy Roman window glass and does not cover the later blown cylinder-glass.



Fig. 1: Tool mark in the corner of a window glass fragment from the *villa rustica* at Borg.

The Old Myth: Cast Window Glass

Several generations of archaeologists accepted the different suggested ideas of making this thick-walled Roman window glass by ‘casting’ glass onto an open wooden mould without questioning its feasibility, or even verifying it experimentally. The scope of ideas suggested has ranged from dry or watered wooden moulds to wooden moulds with a layer of quartz sand, or wooden moulds featuring a wooden frame to form the rectangular shape of the glass and limit its expansion.¹⁰

All of these ideas neglected the fact that glass of a Roman composition invariably needs reheating inside the furnace during the manufacturing process, usually frequently. Reheating inside the open flame of the furnace is not only essential for blowing glass, but also for making slumped vessels¹¹ – if not the glass is formed directly inside the flame, as seen for example at bead furnaces.¹² This is obvious to every glassmaker from Roman times until today. Therefore, reheating is very likely for the manufacturing process of Roman window panes, flat or domed alike. Since the heat emission of a glass furnace is quite significant, the manufacturing itself was very likely carried out outside of the furnace.

Following the idea of making the Roman flat window glass employing a wooden mould, the workpiece placed on this mould would need to be reheated at least to 1,000 °C once or several times inside the furnace. This definitely excludes wood as the mould material. Also a watered wooden mould is not suitable for this. A wet wooden mould

would cause the additional problem of hot steam escaping from the mould when glass was poured onto the flat mould, which would undoubtedly cause an uneven underside to the window pane – something not seen on the Roman fragments. In contrast to wood, a ceramic mould might be suitable for frequent reheating inside the furnace and forming of the window pane outside of the furnace. Powdered clay, chalk or a similar material could act as a releasing agent, which prevents sticking of the glass to the mould surface. The small inclusions in the underside of some Roman window glass fragments and the texture of the underside support this idea.

Apart from the use of wood as a mould material, the suggested forming process by ‘casting’ needs questioning. For a casting process the viscosity of the glass needs to be very low (lower than for blowing), which means that the glass itself has to be very hot. The glass based on a Roman composition, which was used at the Roman glass projects at Borg,¹³ had its best quality for blowing at a temperature around 1,080 °C.¹⁴ For casting, Roman glass might require a temperature around 1,200 °C. This high working temperature of the glass would cause even higher temperature peaks inside the wood-fired furnace, which tends to overstrain the ceramic melting crucibles for the glass, and the daub furnace structure as well. The ceramic cooking pots used as melting crucibles in Roman times soften at a temperature above 1,100 °C, so manipulating these with large steel tongs to pour the glass for casting seems impossible.¹⁵ The daub structure of the furnace also suffers noticeably from overheating, causing a chipping of the surface or fusing and melting of the daub, depending its composition.¹⁶

A simple re-thinking, taking into account the physical issues of the Roman glass, melting crucibles and furnaces, of the postulated use of a wooden mould or frame, and the process of ‘casting’ results in the rejection of this theory. Unfortunately, neither written sources, nor pictures from Antiquity provide any information about the manufacturing process of the matte-glossy Roman window glass. However, the most probable experimental manufacturing technique should not only display the same characteristics and tool marks on the windowpanes, it should also explain their appearance.

An Alternative Method: Making Flat Window Glass by Stretching a Glass Disc on a Ceramic Support

Mark Taylor and David Hill suggested and tested the idea of stretching a glass disc to a rectangular shape, on a ceramic support, in their modern glass studio as early as 2000, published by Denise Allen in 2002.¹⁷ This method was later re-evaluated by Taylor and Hill using both a reconstructed Roman glass recipe and a reconstructed Roman furnace during their ‘Roman Furnace Project’ in Quarley, England, in 2006. Almost a decade later, this manufacturing technique was demonstrated during the ‘Borg Furnace Project 2015’ at the Archaeological Park Roman Villa Borg in Germany, then again during the projects at Borg in 2017 and 2018.¹⁸

The idea suggested by Taylor and Hill comprises of a gather of hot glass, transferred from the glass pot onto a ceramic support, which can be frequently inserted into the working hole of the glass furnace for reheating. The upper surface of the ceramic support is prepared with a separator; powdered clay, gypsum and chalk proved suitable for keeping the glass workpiece movable on the ceramic support, without adhering to it. Gathering the glass using a solid iron bar and placing a large drop onto the support was practicable at a temperature around 1,080 °C, using the reconstructed Roman recipe glass and the reconstructed furnaces in Quarley and Borg as well. The required temperature is in the range of temperatures, which enable glassblowing, and suits both, the glass pots and the furnace. Allowing the gather of hot glass to run onto the support during pouring (fig. 2) may cause the layering, which was noticed in cross-section of some of the Roman window glass sherds.

Using a pair of trowels and pincers, the gather of glass is flattened to a glass disk (fig. 3) and then stretched to a square shape (fig. 4), starting in the middle of the glass disk. This inevitably causes tool marks as noticed in the corners of the Roman window glass fragments (fig. 1). Even frequent reheating (fig. 5) cannot eliminate all of these tool marks completely. If the window pane has already exceeded the desired size, opposite edges may be pushed back using the trowels (fig. 6). This may cause the distortion which is displayed on the undersides of some of the Roman window glass fragments, because the underside tends to be colder than the upper, and therefore stiffens faster, and also picks up heat to lesser extent during the reheating than the upper side.¹⁹

The reconstructed Roman glass stiffens rapidly outside of the furnace, so frequent reheating is essential for this manufacturing process. A pusher, a long steel bar with a grip for the ceramic plate covered with powdered release agent, serves best for reheating the glass inside the furnace's working hole. The procedure of heating – working – heating – working – heating is repeated until the flat window pane is finished to its desired square or rectangular shape. The temperature is kept at 1,080 °C during the whole manufacturing episode. After a final reheating, the window pane is transferred into the annealing oven, which is kept between 400 and 500 °C throughout the whole working day and which then gradually cools down over night to an ambient temperature. This tempering procedure virtually eliminates the internal stresses which appear inside the glass, if it cools down rapidly.

On the next day, the windowpane is removed from the annealing oven, washed to clean off any remains of the release agent on the underside – and ready to be mounted. All of the flat window panes produced by the four different teams of glassmakers, assistants for operating the pusher, and stokers for firing the furnace, featured tool marks directly comparable to the Villa Borg's Roman window glass fragments. Each reconstructed flat window glass pane had a matte and a glossy side, some with a few inclusions of the release agent in the underside. Even the less experienced team was able to make a flat window pane measuring around 23 cm in square within 12 minutes.



Fig. 2: Placing the hot gather of glass.



Fig. 3: Flattening the glass disk.



Fig. 4: Stretching the corners to form a square/rectangular shape.



Fig. 5: Reheating inside the furnace.



Fig. 6: Last corrections of the flat window glass.

Domed Window Glass – *oculi*

Whilst the flat Roman window glass discussed above is usually either square or rectangular, the domed Roman window glass may be described as a hemispherical segment of about 30 cm diameter, with a surrounding rim measuring 4 to 5 cm. Its other specifications, such as the thickness of 2 to 5 mm, the layering visible in cross-section of the sherds, the blue-greenish colour, and the either matte or glossy surfaces are identical to those of the flat window glass panes. Tool marks are visible primarily on the glossy upper side, especially in the rim area, and also where the flat rim meets the sphere.²⁰ Judging by the rim radius, thickness, and colour, the six fragments of domed window glass identified at the Villa Borg derive from at least two domed windows of an outer diameter somewhere between 36 and 42 cm.²¹

In 1997 Sylvia Fünfschilling and Beat Rütli,²² and independently in 2002 Denise Allen,²³ suggested a manufacturing method by slumping a hot glass disk over a mould. This technique shares many parallels with the technique of making flat Roman window glass discussed above. Whilst flattening the gather of hot glass on the ceramic support is the same as for making flat square window panes, the flat glass disk now is not stretched or pulled to a square shape, but transferred onto a preheated hemispherical mould (fig. 7), and slumped over it by reheating inside the furnace and the use of tools.



Fig. 7: Slumping the flat disk over the hemispherical mould.



Fig. 8: Last corrections of the domed window glass.

Once more, trowels and large pincers are suitable tools for forming the glass disk into a glass dome with surrounding rim (fig. 8).

This method was tested for the first time during the ‘Borg Furnace Project 2015’, then repeated during the ‘Borg Furnace Project 2018’ with two different teams of glassmakers, assistants for operating the pusher, and stokers. Due to the limited widths of the working hole and the annealing oven’s door alike, the two reconstructed domed window glass panes were smaller than the Roman fragments suggest, but they share all the same characteristics and tool marks. Without further practice it took both of the teams around 20 minutes to make one of these domed window panes.

Conclusion

Using a flat ceramic support, by stretching and pulling a gather of hot glass to create a square shape, four different teams of glassmakers and assistants re-created several of the matte-glossy windowpanes typical of the 1st century AD. The observable characteristics and tool marks not only matched those of the Archaeological Park Roman Villa Borg’s Roman fragments, they also explained their appearance.

Furthermore, Mark Taylor and the author reconstructed two of the Villa Borg’s domed window glasses by slumping a stretched hot glass disc over a hemispherical

mould. Again the characteristics and tool marks were not only identical to those seen on the Roman fragments, but also explained their existence. From a technical point of view, the Roman domed window glass may represent a direct link between the Hellenistic and Roman mosaic and ribbed bowls²⁴ and the matte-glossy Roman flat window glass.

Taking a making time of between 12 and 20 minutes for these first trials into account, the manufacture of window glass seems rather to be limited by both, the amount of molten glass available for working, and by the capacity of the annealing oven itself, rather than by the workforce of glassmakers, since the larger furnaces should offer at least two comfortable workplaces for teams of glassmakers and assistants.

According to current research and knowledge, the slumping method seems to be the correct technique for making domed Roman window glass panes, and the stretching and pulling method is likely to be the method of manufacturing the early Roman matte-glossy square or rectangular window panes. For theoretical and practical considerations, the often-suggested method of pouring hot glass into a wooden mould is very unlikely. Therefore the term ‘cast’ window glass, though still widely used, is not appropriate for these glass objects. It should either be replaced by ‘stretched’ or ‘pulled’ window glass or, without any interpretation of the manufacturing method, as ‘matte-glossy flat window glass’.

Notes

¹ So-called *cast window glass*. Allen 2002; Komp 2009. Due to its appearance, the term *matte-glossy window glass* would be more appropriate.

² So-called *oculi*. Allen 2002.

³ So-called *cylinder-glass* which was made by cutting open and flattening a blown glass cylinder.

⁴ Wiesenberg 2014.

⁵ Archaeological excavation ‘Trier Hopfengarten’ undertaken by the Generaldirektion Kulturelles Erbe Rheinland-Pfalz in 1999/2000. Pfahl 2000; Wiesenberg 2014, 12–17.

⁶ Wiesenberg 2016c.

⁷ Wiesenberg 2016a; Wiesenberg 2016b.

⁸ Birkenhagen – Wiesenberg 2017.

⁹ Cf. Wiesenberg 2016d, 51–56.

¹⁰ E.g. Kisa 1908, 363 f.; Komp 2009, 30 f.

¹¹ E.g. Wiesenberg 2017.

¹² E.g. Wiesenberg 2018.

¹³ Provided by Mark Taylor and David Hill. For the projects at the Archaeological Park Roman Villa Borg, the glass was melted from raw ingredients (sand, soda, lime, and metal oxide to meet the analyses of Roman glass) inside Mark Taylor’s and David Hill’s modern glass furnace, crushed down in water, and re-melted inside the wood-fired reconstructed glass furnace at Borg.

¹⁴ Re-melted genuine Roman glass fragments required a slightly higher working temperature. Taylor 2016, 21.

¹⁵ Since the glass pots are very exposed to the flame, the small glass furnace GO-Borg-2 regularly overheats the glass pots at temperatures above 1,150 °C, causing distortion and cracking of the pots.

¹⁶ The lime in the loam being used for building the furnaces and ovens at Borg causes deterioration of the daub when exposed to high temperatures. The sand added to the daub to build the furnace at the Provinciaal Archaeologisch Museum Velzeke in 2008 did flux and gradually melt at high temperatures, which resulted in a partial collapse of the furnace's inner domed roof structure in 2016.

¹⁷ Allen 2002, 103–106.

¹⁸ Wiesenberg 2016d.

¹⁹ Wiesenberg 2016d, 53 f. fig. 4. 5. These fragments disprove the use of a mould frame, because any frame would make pushing back the edges impossible.

²⁰ Wiesenberg 2016e.

²¹ Birkenhagen – Wiesenberg 2016.

²² Fünfschilling – Rütli 1997, 52.

²³ Allen 2002, 108.

²⁴ The process of slumping a hot glass disk over a hemispherical mould seems to be the probable method of making Hellenistic and Roman bowls (Isings 18) and ribbed bowls (Isings 3), mosaic and monochrome alike, as discussed in Wiesenberg 2017. Whilst the rims of the (ribbed) bowls exactly meet the ceramic support in order to create an even rim, the 4–5 cm wide rim of the domed window glass requires the use of tools to create the sharp indent.

Image Credits

Fig. 1: Frank Wiesenberg. – Fig. 2–8: Manuela Arz.

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Semiprecious Stones and Blue Glass: An Approach to the Imitation Phenomenon in *Hispania* during the Roman Period¹

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Esperanza Ortiz – Juan Á. Paz

Introduction

The oldest recorded piece of glass – translucent, pale blue-green – corresponds to a molten pre-shaped glass bar originating in *Eshnuna* (Tell Asmar, Irak) dating from *circa* 23rd century BC.² The oldest creations were used as ornaments, mostly beads with opaque blue and green inlays.³ Similarities with stones existed in terms of technical, technological and compositional factors. Originally, gemstones and glass must have been similarly prized. In fact, glass and lapis lazuli were sold as ingots or as part of finished objects meeting similar functions.⁴

Notwithstanding this, bibliography commonly records that glass beads imitate gemstones.⁵ Di Giacomo differentiates between actual forgeries (recorded in written sources) and archaeological evidence (which corroborates glass imitations of gems), suggesting that it is highly complex to draw a line between ancient forgeries and imitations, since the latter were probably sold to worse-off buyers who knew what they were purchasing and were not being deceived.⁶

In Near Eastern civilizations and in Egypt the colour blue was associated with the vault of heaven and the divine origin of authority.⁷ This colour was introduced into Roman Imperial circuits through trade with the East, and maintained its connotations of power, symbolism and magic. Nonetheless, its use was limited to high-quality or elaborate art products in a demanding and prosperous market during the Julio-Claudian period. This happened not only because resources were limited, difficult to obtain and expensive, but also perhaps because the colour purple was used to identify senators and the Imperial house, which eventually adopted it as its exclusive colour.⁸

This contribution reviews glass pieces *similes* to blue stones whose patterns may have served as models in the Roman period, mainly during the Empire, focusing on those deliberately coloured to simulate gemstones. It excludes very dark blue creations, which imitate jet and obsidian, and the most numerous instances of “natural” colour (greenish-blue).⁹

Ancient written sources provide varying yet significant data regarding several imitation practices and identification strategies. In this respect, it should be recalled that Mesopotamian texts already make references to the manufacture of colours, which were used as substitutes for lapis lazuli, turquoise, carnelian and obsidian.

This contribution is part of the aforementioned investigation project and concerns a series of items originating in *Augusta Emerita* (Mérida, Badajoz), *Celsa* (Velilla de Ebro,

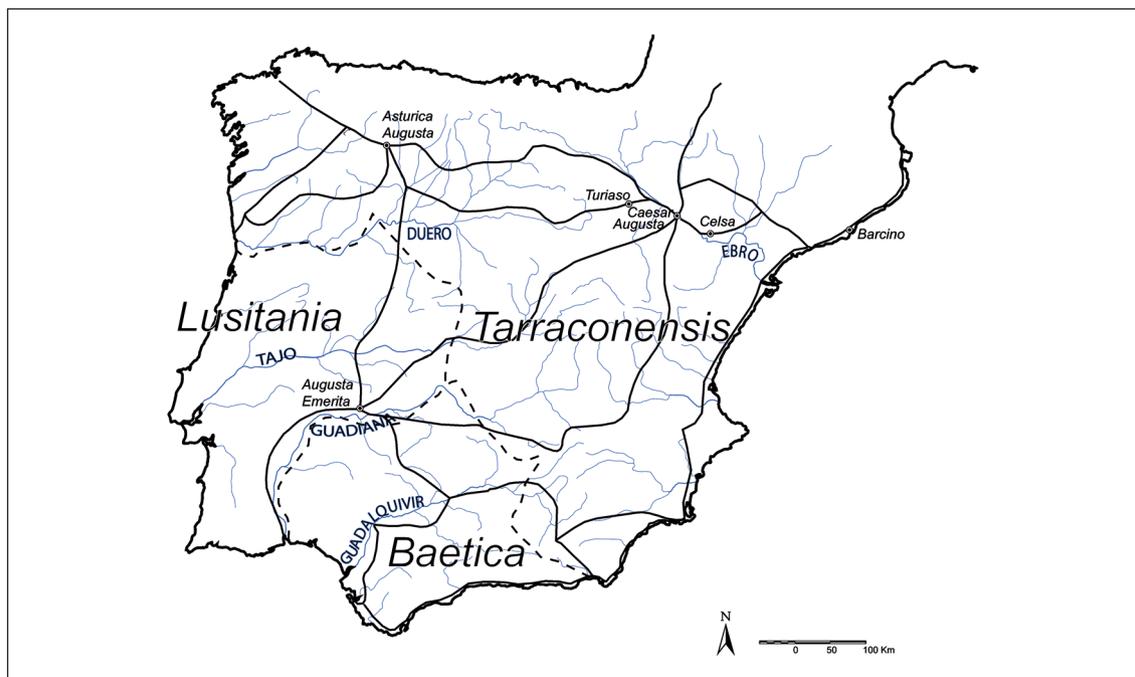


Fig. 1: Location of the studied sites in *Hispania*.

Zaragoza), *Caesar Augusta* (Zaragoza), *Turiaso* (Tarazona, Zaragoza), *Asturica Augusta* (Astorga, León) and *Barcino* (Barcelona), housed at the Museo Nacional de Arte Romano de Mérida, the Museo de Zaragoza and the Museu d'Història de Barcelona, as well as the Museo Arqueológico Nacional (Madrid) (fig. 1).

Blue Stones and Characteristics of Glass *similes*

The analysis is still in process and is vast and complex. Given the limited space we have, we will briefly focus on five gemstones and their glass counterparts.

Lapis lazuli (*sappirus*, *sapphirus*: Plin., *NH* 36.198, 37.120): This was already mined in northeastern Afghanistan 7,000 years ago.¹⁰ From that region it was taken to enclaves on the high Iranian plateaus such as Shahr-i-Sokhta. Thence it was distributed to the main Mesopotamian spots, where it was used for the manufacture of luxury items.¹¹ In the Predynastic period it was already being exported to Egypt, where it was mostly used in jewels and personal ornaments, combining prophylactic and aesthetic qualities.

It was used in Roman jewels for engraved intaglios,¹² e.g. the intaglio of Vibia Sabina housed at the National Archaeological Museum of Madrid. Personal ornaments are the most numerous and consist mostly of beads, cabochons and revetment items used in gold and silversmithing in early civilisations.¹³

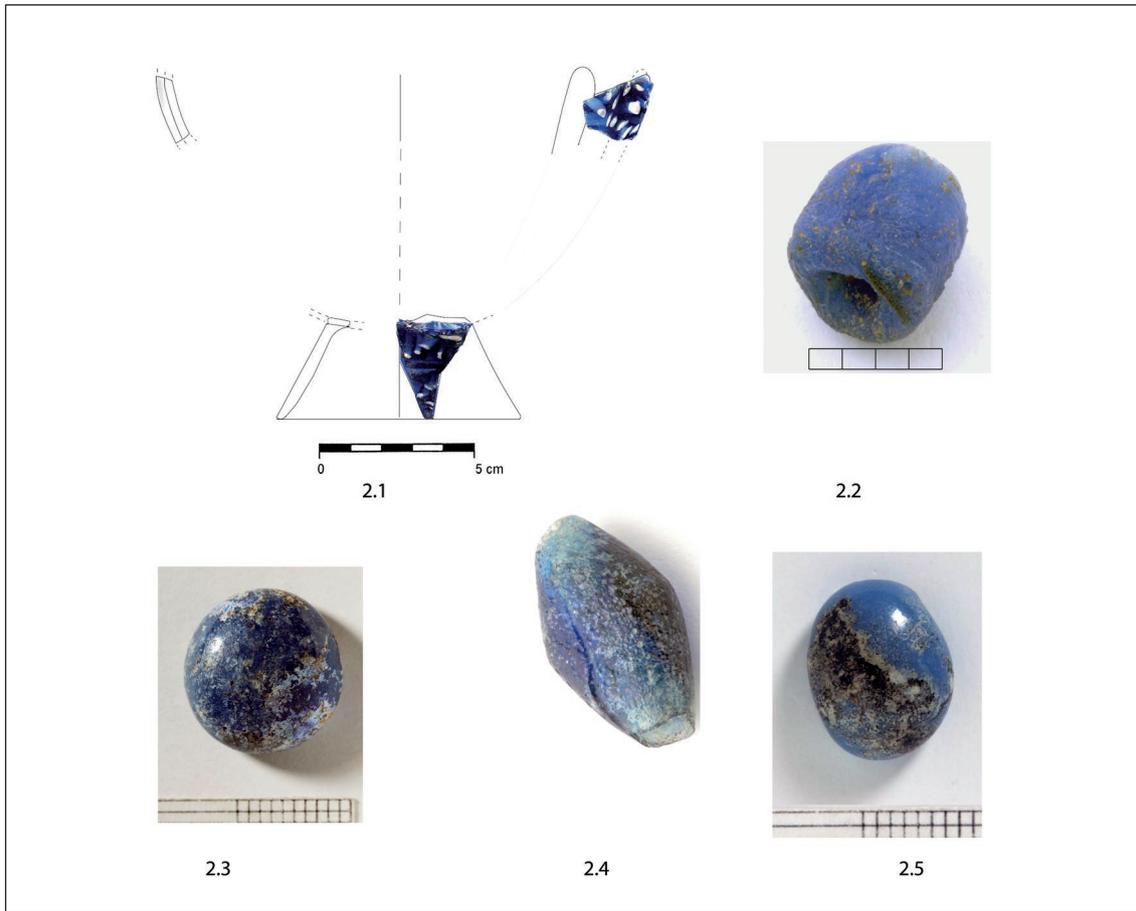


Fig. 2: 2.1. Fragments of pillar-moulded *calix*. Form: Vindonissa 22. Colonia *Celsa*. Circa 60 AD. Museo de Zaragoza, inv. 58689. 2.2. Bead. *Turiaso*. 284 AD. Museo de Zaragoza, inv. 50114. 2.3. Game-counter. Colonia *Celsa*. Circa 60 AD. Museo de Zaragoza, inv. 58689. 2.4. Bead. *Caesar Augusta*. 5th Century AD. Museo de Zaragoza, inv. 50279. 2.5. Cabochon. *Simil lapis lazuli*. Colonia *Celsa*. Circa 60 AD. Museo de Zaragoza, inv. 58259.

In the Roman period, the improvements in glass craftsmanship resulted in the production of open and closed profile vessels used for various purposes, as documented in *Augusta Emerita* and *Celsa* where a white flecked model also exists (fig. 2.1).¹⁴ Beads used for personal ornaments exist in *Caesar Augusta* and *Turiaso* (Tarazona)¹⁵ as well as two counters in *Celsa* (fig. 2.2–5).

Turquoise (*Callaina*, *Callainus*, *Callais*: Plin. *NH* 110–112, 147, 151): This was mined in Egypt from the early Dynasties until the Late Period.¹⁶ It was also mined in regions of the Caucasus and Carmania, probably in the Roman period.¹⁷

The instances found correspond to items for personal ornaments and decoration overlays. In Egypt, however, besides glass, the manufacture of faience used blue glazing

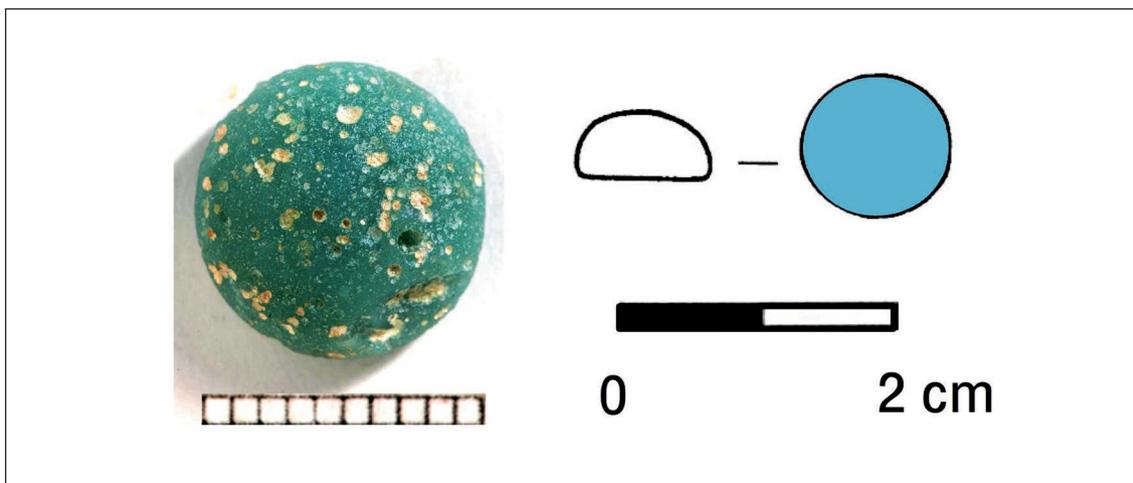


Fig. 3: Glass cabochon. Colonia *Celsa*. Circa 60 AD. \varnothing 1,1 cm. Museo de Zaragoza, inv. 58256.

and Egyptian blue or blue frit. Possibly, it was aimed at simulating turquoise or at replacing it either because it was scarce, difficult to obtain, highly coveted or impossible to get as a raw material in the appropriate size.¹⁸

Evidence of its use in jewels only exists from the Egyptian pre-Dynastic period to the Greco-Roman period.¹⁹ Most instances consist of small opaque glass turquoise blue cabochons used in rings or other ornamental items, i.e. a piece from *Celsa* (fig. 3).

Onyx (blue variant) (*Onyx*: Catull. 66.79; Prop. 2.13b.27, 3.10.19; Hor. *Carm.* 4.12.17; Collumella *Rust.* 12.10; Lucan. 10.114; Stat. *Silu.* 2.6.92; Mart. 6.42.11, 7.9.41, 11.49.3, 12.50; Gell. 19.7; SHA *Heliogab.* 32.2): We will focus on the white and blue banded combination. The type known as *nicolo* agate is conspicuous in intaglios for rings. Its use becomes more frequent in the 1st century BC and in the last centuries of the Empire, perhaps due to the magical properties attached to this material.²⁰ Some examples housed at the Museo Arqueológico Nacional (Madrid) were manufactured using this stone.

As regards glass, two types may be differentiated:

1. Double glass, highly contrasting opaque blue inside and white outside, was used in cameo carving.²¹ The predominant combination consists of opaque white on a translucent or opaque dark blue background, though other combinations also exist: white and purple, white and black, white and brown and exceptionally with three of these colours combined, also exist. This type of glass was not very common. In tableware it is usually linked to wine. Known instances include the Portland Vase and the Getty Cup. We have documented its use in a cameo originating in Astorga (fig. 4.1).

2. Opaque blue glass with two contrasting blue layers *similis* to “*nicolo* agate” and used in intaglios. No blue vessels are known whose decoration is based on this type of pattern using two colours. It was exclusively used to make seals for rings, the same as

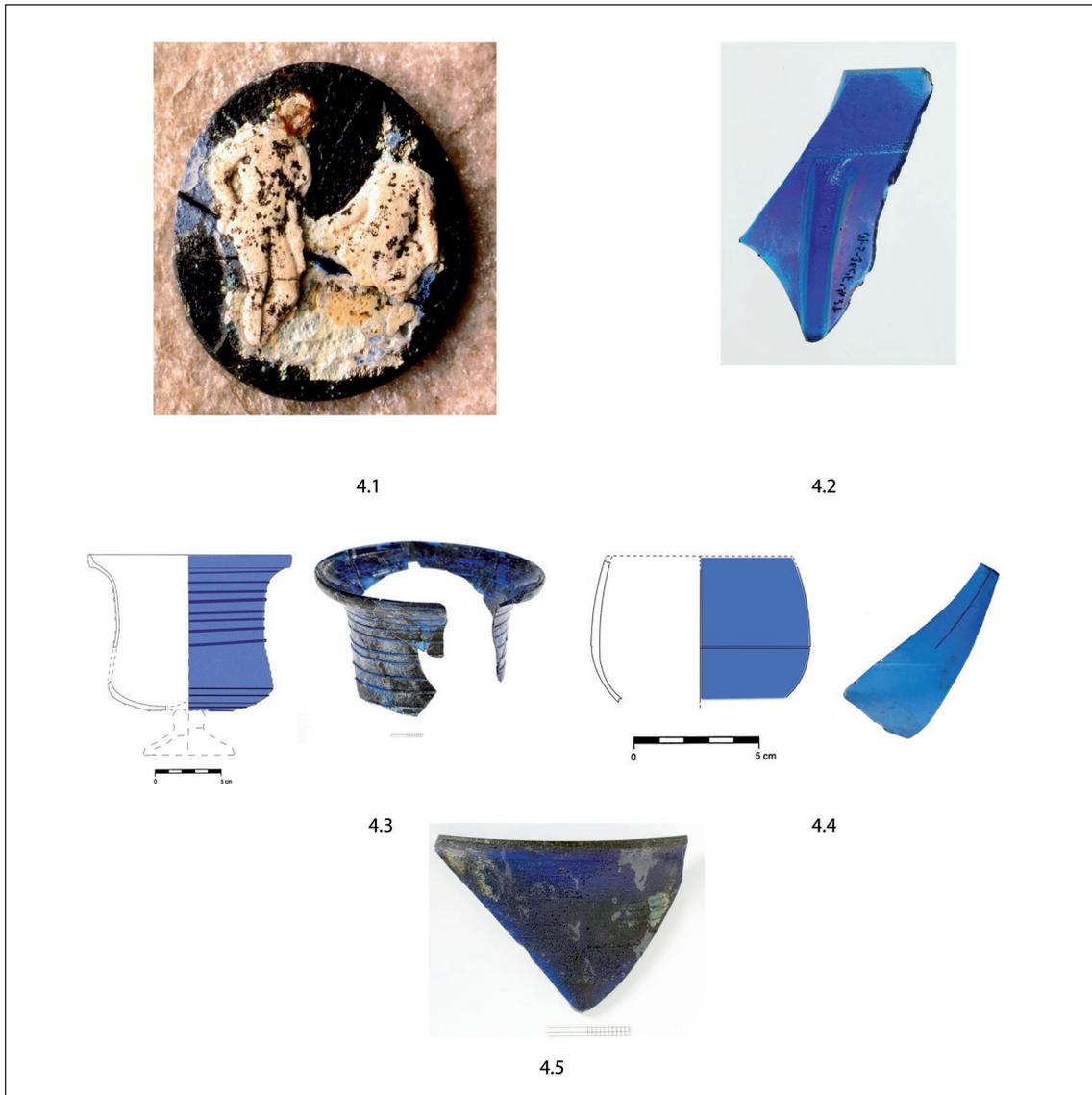


Fig. 4: 4.1. Cameo glass. *Asturica Augusta*. Museo Romano de Astorga, inv. AA.CS10.90.3058. 4.2. Isings 3b. *Caesar Augusta*. 50–60 AD. \varnothing 16 cm. Museo de Zaragoza, inv. 58337. 4.3. *Charchesium*. Isings 36a. *Colonia Celsa*. 65–68 AD. \varnothing 15 cm. Museo de Zaragoza, inv. 29924. 4.4. Isings 12. *Caesar Augusta*. 55–60 AD. \varnothing 8 cm. Museo de Zaragoza, inv. 57096. 4.5. Isings 37c. *Caesar Augusta*. 55–60 AD. \varnothing 10,5 cm. Museo de Zaragoza, inv. 58297.

the original gemstone; a workshop of glass skeuomorphs may have existed in *Bracara Augusta*.²²

Sapphire (*Cyanos*: Plin., *NH* 37.119; *App. Verg. Dirae* 37)²³: Commonly used in jewellery since the Hellenistic period, in particular from Augustus onwards, once the east Mediterranean trade routes had become established. Its use was boosted from the 2nd century AD on as jewellery evolved towards the use of polychromy and the combination of materials.

It constitutes the largest group of bright translucent or transparent blue glass. Documented vessels typically consist of Roman luxury tableware. In *Celsa*, *Caesar Augusta* and *Barcino* several instances exist. It has been documented in Isings 3b, 12, 36a and 37c. It occurs in *Celsa* and *Caesar Augusta* (fig. 4.2–5). In the former an uncut piece of glass was found probably imported from an Italian workshop and intended for the manufacture of vessels using the free glassblowing technique.²⁴

Particularly remarkable are three fragments of beakers with cabochons simulating sapphire gemstones in the style of *gemmata pоторia* made of precious metals: one originates in San Román (Castiliscar, Zaragoza)²⁵ and the other two in *Caesar Augusta* and *Augusta Emerita*, respectively. They all date from the late Roman period (fig. 5).

It was used in beads for earrings and necklaces combined with gold and occasionally with other gemstones,²⁶ as well as in jewellery and in intaglios for rings.²⁷

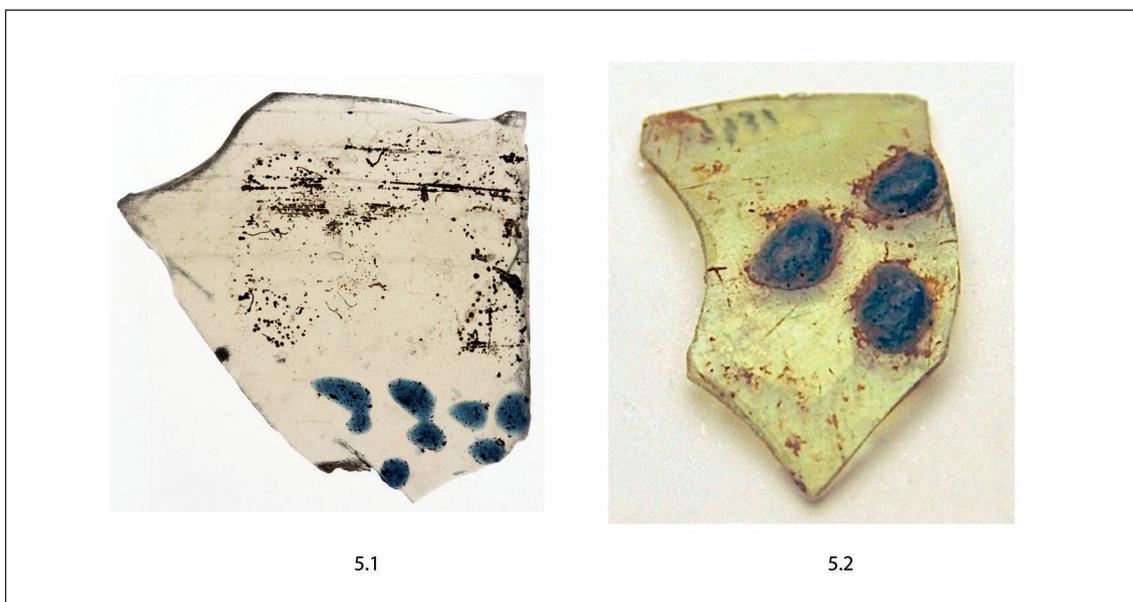


Fig. 5: 5.1. Isings 96b2a. San Román (Castiliscar, Zaragoza). 360–380 AD. Museo de Zaragoza, inv. 59115. 5.2. Alcazaba (Mérida, Badajoz). Museo Nacional de Arte Romano de Mérida, inv. DO34431.

Translucent dark blue glass beads are also very numerous. They correspond to necklaces and feature various shapes, i.e. lenticular, biconic, faceted with bevelled angles (fig. 6.1–3). Their production began in the Roman period,²⁸ clearly imitating faceted gemstones – or combining spherical beads of translucent gemstones, probably sapphire, with others similarly shaped in glass.

It appears towards the second half of the 3rd century AD, with a long-lasting presence up until the year 400 AD,²⁹ some instances even existing through to the 6th century AD.³⁰ A small circular bezel from *Caesar Augusta*, representing a sexless human face³¹ and a fragment of a stirring rod from *Barcino* are particularly remarkable (fig. 6.4–5).

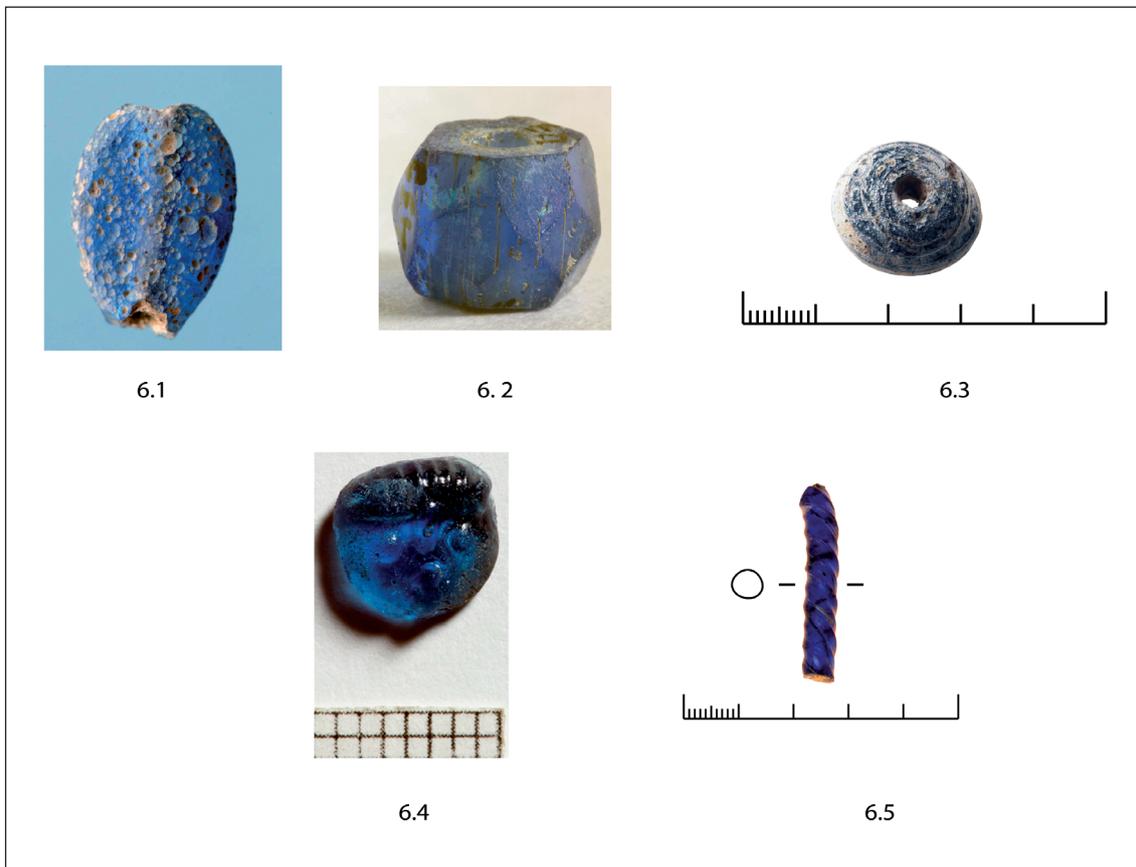


Fig. 6: 6.1–2. Glass beads. *Augusta Emerita* (Mérida). H 1,37 cm & 0,534 cm. Museo Nacional de Arte Romano de Mérida, inv. CE07338 & CE00435. 6.3. Glass bead. *Barcino* (Barcelona). 3rd Century AD. Museu d’Història de Barcelona, inv. MHCB 13375. 6.4. Round chaton glass with moulded full-face. *Caesar Augusta*. 3rd Century AD. Museo de Zaragoza, inv. 50340. 6.5. Twisted rod fragment (broken at both ends). *Barcino*. 40–68 AD. Museu d’Història de Barcelona, inv. 43330.

Aquamarine (kind of *beryllus*: Plin., *NH* 37.76–9; Prop. 4.7.7; Juv. *Sat.* 5.37; Claud. *Epitalam.* 87): This is a variety of beryl and Pliny seems to refer to it when describing oriental emeralds (*NH* 36.76).³² In the ancient period beryl was chiefly extracted in India,³³ though the best mine is located in the eastern desert of Egypt, whose working started in the late Ptolemaic period and continued until the early Byzantine period.³⁴

Two inscriptions from the province of Granada (CIL II, 2060; CIL II, 3386) could attest to its relevance and value if we accept the interesting opinion of Warmington that the word *cylindri*, used in both, could refer to beryl or aquamarine perhaps due to the shape of the beads made with this gemstone.³⁵ However, Pastor and Mendoza believe that *cylindrus* refers to an unknown or unidentified gemstone.³⁶

The “natural” colour glass used in small objects for personal ornaments may be linked to the simulation of aquamarines given the tradition documented for other gemstones. Several shapes exist: lenticular (especially used in intaglios), oval and four-sided. The last case presents bevelled edges. For that reason it was undoubtedly intended to be set in a bezel (fig. 7).



Fig. 7: 7.1. *Barcino*. 4th Century AD. Museu d’Història de Barcelona, inv. 16730. 7.2. *Barcino*. 1st Century AD. Museu d’Història de Barcelona, inv. 3497.

Conclusions

Some preliminary considerations may be put forward despite the fact that the investigation work in progress is highly complex.

Lapis lazuli and sapphire were the gemstones more often imitated in glass. They shared symbolic and physical similarities and display a common terminology in the early stages, which could explain why they featured common characteristics in glass beads.

Blue was the most significant colour for centuries in core-formed glass and one of the favourite colours of Ennion, one of the most remarkable glassmakers. In the Roman period, the colour blue in vessels mostly corresponds to the central years of the 1st century AD, as data from *Celsa* show in our analysis. Vessels constitute the most significant category in terms of quality and quantity, in particular those used for drinking – especially wine – and for personal use. The most exclusive items corresponded to Imperial gifts and *dona militaria*. The raw glass chunks from *Celsa* attest to the existence of trade to meet the demand for this colour used in special vessels and to the fact that a glass-blowing workshop existed in this colony in the mid-1st century AD.³⁷

In the late Empire, 4th and early 5th centuries, it was mostly relegated to applied decoration, the most common consisting of drops or coiled threads. Vessels made of this colour were rare and consisted of exceptionally high-quality products such as the bowl depicting Old Testament images from the necropolis of Köln-Braunsfeld.³⁸

As regards personal ornaments in the early Empire – once Egypt and the oriental Mediterranean had been annexed – the silk road supplied a market increasingly avid for luxury products including gemstones as has been documented regarding a wide variety of stones. In terms of architecture, in the 1st century blue wall plates are used exclusively in lavish pieces and included bicolour cameo glass or monochrome with moulded decoration of various motifs.³⁹ As regards *tesserae*, they emerged in the late 2nd century and continued to be used for centuries afterwards.

Discerning between genuine gemstones and glass is a recurrent topic in classical literature. Pliny refers to a series of blue stones, some of which could have been imitations, though it is not always possible to establish scientific links to catalogued rocks or minerals (fig. 8).

According to Tacitus (*Ann.* 3.55), the epitome of luxury at the table concentrated around the Julio-Claudian period, a fact confirmed by stratigraphies in *Celsa* and *Caesar Augusta*, and in other sites such as Magdalensberg. When referring to gemstones authors (see Clement of Alexandria's moral views, *Paed.* 2.118.1) usually highlight glass worthlessness. In this sense, Martial uses *gemma* to denote glass as a material (4.22.6; 8.68.5 concerning the plates in a greenhouse), though he claims it is a cheap gem (*uilis gemma*) compared to precious stones (12.74.4).

Lapis lazuli	<i>Sapp(h)irus</i>
Turquoise	<i>Callaina</i>
Chalcedony	<i>Iaspis</i> (?), <i>Aegyptilla</i> (?)
Agate	<i>Achates</i> , <i>Onyx</i> (?)
Onyx	<i>Onyx</i> , <i>Sardonyx</i>
Aquamarine	<i>Beryllus</i> , blue variety
Sapphire	<i>Cyanus</i> (?), <i>Hyacinthus</i> (?)
Anhydrite	<i>Ceraunia</i> (white stone possible with blue shine)

Fig. 8: Possible correlation between old designations of blue stones (or blue varieties thereof) and modern terminology.

Notes

¹ This paper is part of the Research Project *Ficta Vitro Lapis: Glass imitations of stones in Roman Hispania* (HAR2015-64142-P) (MINECO/FEDER, UE) funded by the Ministry of Economy, Industry and Competitiveness of the Government of Spain.

² Barag 1970, 133.

³ Caubet – Pierrat-Bonnefois 2005, 21.

⁴ Cummings 2002, 104.

⁵ Swift 2003, 337.

⁶ Di Giacomo 2016, 67 f.

⁷ Ioannidou 2006, 202–204.

⁸ Bradley 2009, 189–211.

⁹ Besides those considered here, ancient texts provide information about different blue or blue shaded gemstones. Their names, though identical to modern ones, do not necessarily refer to the same stone: Jasper (*iaspis*: Plin., *NH* 37.115-8; *Juv. Sat.* 5.42; *Verg. Aen.* 4.261; *Lucan.* 10.122; *Stat. Theb.* 4.265, 7.652; *Mart.* 5.11; *Claud. Raptu* 2.40, *Epitalam.* 87, 4 *Cons. Hon.* 589, 6 *cons. Hon.* 523, *Epigrammata Bobiensia* 18); Sardonyx (*Sardonyche*, i.e., sard, ‘carnelian’ + onyx, ‘nail’: Plin., *NH* 37.85–89, 37.197; *Pers.* 1.13; *Mart.* 2.29, 4.28.1, 4.61, 5.11, 6.59, 10.87, 11.27, 11.37); Agate (? *Achates*: *Luc.* 10.114, palace of Cleopatra; Plin. *NH* 37.5; *Claud. Epitalam.* 87); Anhydrite (*Ceraunia*?: Plin., *NH* 37.134).

¹⁰ Wyart et al. 1981, 184.

¹¹ Casanova 2013, 217 f.

¹² Marshall 1911, cat. n° 2663 and 2997; d’Ambrosio – de Carolis 1997, cat. n. 112.

¹³ Casanova 2013, 165–197.

¹⁴ Paz 1998, 525 fig. 244,4a. 4b.

- ¹⁵ Ortiz 2001, 265–267 fig. 73, nos. 2 y 4.
- ¹⁶ Harrell 2012.
- ¹⁷ Warmington 1928, 255.
- ¹⁸ Nicholson 2012, 16–21.
- ¹⁹ Aston et al. 2000, 62.
- ²⁰ Warmington 1928, 240.
- ²¹ Painter – Whitehouse 1990.
- ²² Da Cruz 2009, 10.
- ²³ Di Giacomo 2016, 36 identifies it with *Hyacinthus* (Plin. *NH* 37.125–126).
- ²⁴ Paz 1998, 530 figs. 259 and 330.
- ²⁵ Ortiz 2001, 307 fig. 78,2, Isings 96b2a.
- ²⁶ Marshall 1911, cat. nos. 2362 and 2686.
- ²⁷ Marshall 1908, cat. nos. 798 and 815; Warmington 1928, 248f.; D’Ambrosio – De Carolis 1997, cat. no. 112; Spier 2007, cat. no. 140.
- ²⁸ Spaer 2001, 64.
- ²⁹ Riha 1990, 90f.; Foy 2010, 467f.
- ³⁰ Guido 1978, 99f.
- ³¹ Ortiz 2001, 348f. fig. 110,1.
- ³² Warmington 1928, 250.
- ³³ Di Giacomo 2016, 32.
- ³⁴ Harrell 2004, 70.
- ³⁵ Warmington 1928, 251. This opinión is also defended by Di Giacomo 2016, 72f.
- ³⁶ Pastor – Mendoza 1987, 172.
- ³⁷ Paz 1998, 529–531 figs. 259 and 330.
- ³⁸ Harden et al. 1987, 16, 25–27.
- ³⁹ Boschetti et al. 2012, 142.

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Fig. 1: adapted by J. M. García Rodríguez, University of Cantabria, from various sources. – Fig. 2: 1–5. J. Garrido. Museo de Zaragoza. – Fig. 3: Desing: E. Ortiz. Photo: J. Garrido. Museo de Zaragoza. – Fig. 4: 4.1. M. Amará. 4.2–5. J. Garrido. Museo de Zaragoza. 4.3–4: Desing: E. Ortiz. – Fig. 5: 5.1. J. Garrido. Museo de Zaragoza. 5.2. CERES. S. González Gómez. – Fig. 6: 6.1–2. Archivo MNAR. L. Plana. 6.3. MUHBA. 6.4. J. Garrido. Museo de Zaragoza. 6.5. MUHBA. – Fig. 7: 7.1–2. MUHBA. – Fig. 8: A. Encuentra.

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Craftwork in Roman Cologne – A Microeconomic View on Cluster Structures Regarding Transformation of New Ideas

Ella Magdalena Hetzel

During an archeological measure in 2015 at Tel-Aviv-Street in Cologne a minimum of two mid-Empire and late Roman glass huts were excavated. The arrangement of the workshops suggests that they were part of an economic cluster. Through field research on the construction side a minimum of three workshops and a total of four ovens were documented. Several findings, like fragments of glass melting pots, threads, caps and wastes surrounding glass pipes, indicate the glass blowing activity in this area. Embedded as an empirical part in the research project on agglomeration structures of craftwork businesses in Roman Cologne, the example of Tel-Aviv-Street offers the opportunity to have a look on its dynamics on a microeconomic scale. One part of a complex process within craftwork clusters is the adaption of new ideas, which can be redrawn superficially with the very first evidence of Conchylia Cup production in a room of the eastern workshop of Tel-Aviv-Street.¹

Studies on dynamics of cluster structures are mainly investigated in an economic frame. The theory describes a field within economic science, which was first presented by Alfred Marshall at the end of the 19th century.² The first attempt to contextualize this idea was done by Alfred Weber, who defined advantages and disadvantages through agglomeration of industries and its dynamics at the beginning of the 20th century.³ During the 1990s cluster studies gained new interest by researchers through Michael Porter, who looked at clusters in a national context.⁴

Basically cluster structures provide an easy access to labor market, have a cost reducing effect and play an important role for knowledge transfer and further development.⁵ An interesting field of economic clustering is represented by craftwork businesses, which sometimes have a long historical background. Studies of modern workshop clusters show, that dynamics within these structures strengthen sales on markets.⁶ But not only economists deal with the phenomena of agglomeration within industries – this intensive development is also identified for ancient archeological contexts.⁷

The research project on Craftwork in Roman Cologne ties up with studies on ancient craftwork clusters and reflects effects of its dynamics on the basis of an archaeological database. It focuses on an ancient capital in the northwestern Provinces, which is surrounded by multiple resources and a rich natural water system. Thus Cologne was found to be situated in an economically attractive region.⁸ The archeological record for craftwork businesses within the Roman city includes over 70 excavation areas, which show evidence of localized structures. Although most of the data are in connection to pottery production, Roman glass industry also shows an impressive development in its products, which is primarily reflected in sepulcher contexts.⁹

One of these glass workshop clusters, which forms an empirical part of the research project, is the Tel-Aviv-Street in Cologne. A special product blown in one of these glass huts is the Conchylia Cup, which is an exceptional piece of artistic work and a good example for knowledge transfer within the Roman Empire. All along the Mediterranean and in the Germanic area different styled pieces of this glass type have been found. The cups follow a strict arrangement, which requires profound knowledge in marine biology.¹⁰ Nevertheless techniques of Conchylia Cup production transferred to regions, which are characterized by a fluvial environment. Surely adaption and further development of this type, successfully lasting into early Middle Ages in northwestern Europe, profited from dynamics of agglomerated businesses.

Summing up the research on cluster structures in the capital of a northwestern Province tries to redraw complex processes far away from Rome. It approaches the topic combining economic theory with archeologic datasets. Through geographic mapping and a database concerning workshops and produced goods new details on positive as well as negative effects in ancient clusters will be provided. Furthermore microeconomic studies in Roman Cologne reveal, that organization of workshops in agglomerations had a beneficial influence on adaption and transformation of new ideas within the Roman Empire.

Notes

¹ Doctoral thesis is supervised by Prof. Dr. Eckhard Deschler-Erb and Prof. Dr. Dr. h.c. Jan Bemann. Excavations took place under scientific direction by PD Dr. Alfred Schäfer and technical management by Harald Bernhard. Furthermore chemical analysis of glass is done at University of Göttingen through Dr. Andreas Kronz and analysis of glass melting pots by Dr. Małgorzata Daszkiewicz of ARCHEA at Warszawa.

² Marshall 1890, 222–224.

³ Weber 1909, 124. 128.

⁴ Porter 1990, 148 f.

⁵ Enright 2003, 105–107.

⁶ Lehmann – Müller 2010, 124–126.

⁷ Peacock 1982, 38; Goodman 2016, 323.

⁸ Grabert 1998, 237–239.

⁹ Höpken 2005, 56–58; Naumann-Steckner 2016, 116.

¹⁰ Lega – Gessani 2004, 81 f.; Whitehouse 2001, 139.

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Food Production and Consumption

Panel 3.28

Educating Farmers. Economic Strategies in Xenophon's *Oeconomicus* and Their Applications in the Agricultural Landscape

Stavros Dimakopoulos

The works of authors recounting exact agricultural practices in Classical Antiquity are rare. Ancient texts often do not mention the methods of cultivation and production as well as the elements that comprise the rural landscape. This has been seen as paradoxical, considering the numerous sources that refer to the critical importance of agriculture at a theoretical and idealistic level.¹ However, works aimed at the systematic record of agricultural knowledge are not entirely unknown. Many authors of works that vary greatly in subject and style refer to techniques and procedures related to agricultural production, namely the organization of the farm, techniques for the cultivation of various crops and tips for optimizing production. Some authors even raise questions about the moral behavior of the farmers.

From the Archaic to the late Roman period, it is a fact that the systematization of agricultural knowledge was treated in several and different ways. The first sporadic references to rural economy appear with Homer.² Apart from the Homeric works, texts of a greater agronomic interest are preserved; these more or less attempt to record and spread knowledge regarding the rural economy. In the Archaic period, important insights into rural life are provided by Hesiod in his *Works and Days*.³ In the Classical era, Xenophon is the main exponent of systematized agricultural knowledge in his work *Oeconomicus*. Unquestionably richer is the written production of the Roman period on this subject, as many texts emerge clearly for the purpose of organizing and disseminating agricultural knowledge. Consequently, they systematically describe and analyze a plethora of aspects relevant to the agricultural process.⁴ The contribution of relevant works of Classical and Roman advice-literature is multiple. These constitute documents and guidelines for the proper administration of a farmhouse, and as such they are a precious source of information on the organization of the countryside (by extension, of the rural landscape too). Considering the techniques they outline, they indubitably aim to optimize agricultural production.

The focus in this study will be the *Oeconomicus*, one of Xenophon's Socratic works.⁵ The text, which dates to the first half of the 4th century BC,⁶ is often described as a treatise on farming and household management, disguised in the form of a Socratic dialogue.⁷ Its main characters are Critobulus, Ischomachus, and Socrates, the teacher *par excellence*. The first part is more theoretical and outlines the conversation between Socrates and Critobulus and gives the definition of economy according to Xenophon: *οικονόμου ἀγαθοῦ εἶναι εὖ οἰκεῖν τὸν ἑαυτοῦ οἶκον* (1.2).⁸ In the second part, Socrates delivers an earlier conversation that he once had with Ischomachus, a *kalos kagathos*⁹ man. This part addresses several topics of a practical nature on the subject of a farm-

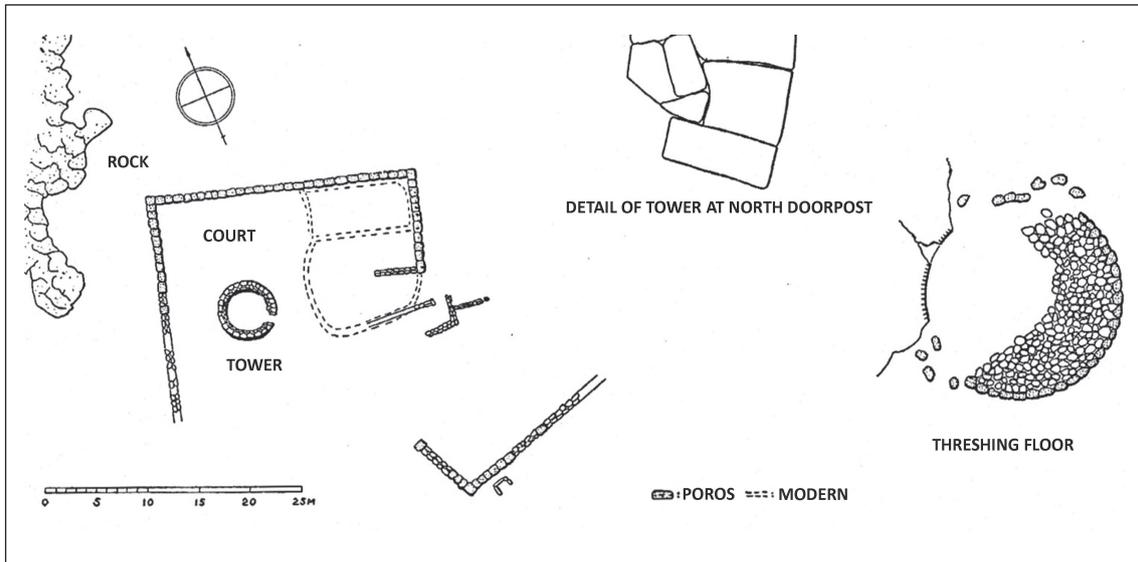


Fig. 1: The Princess Tower farm and threshing floor, Sounion.

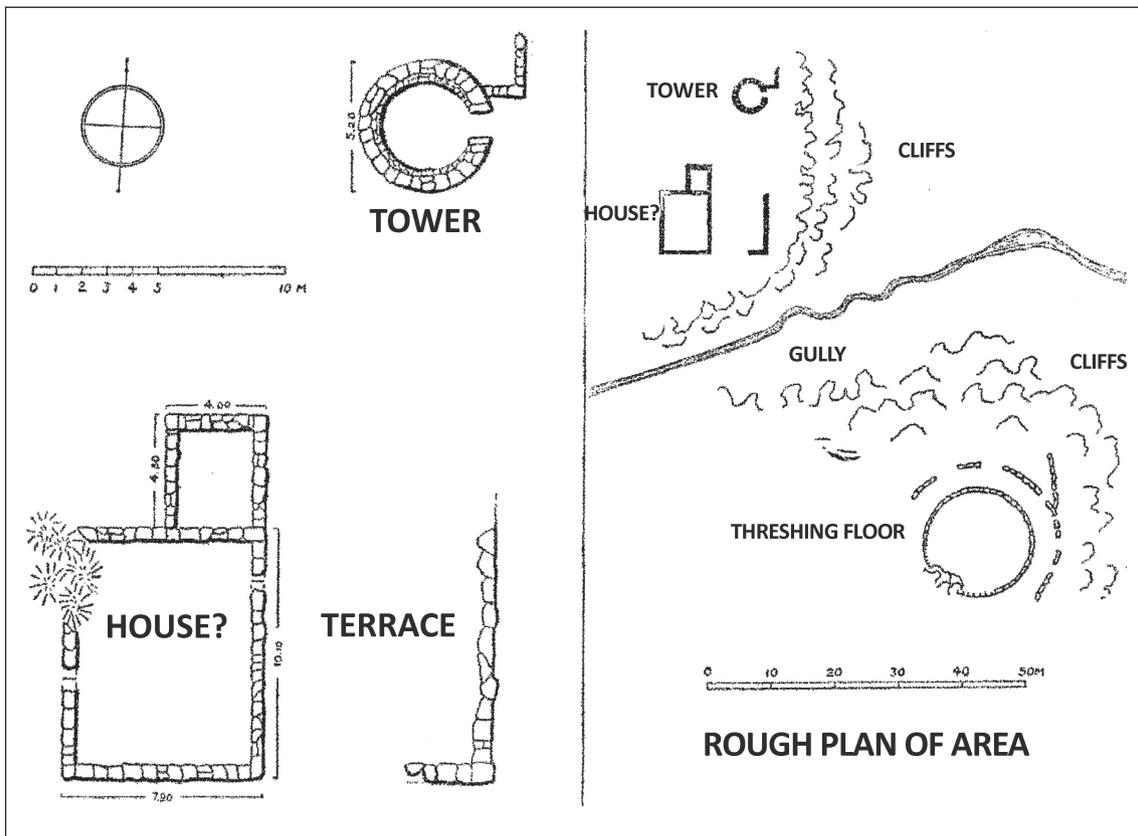


Fig. 2: The Cliff Tower farm and threshing floor, Sounion.

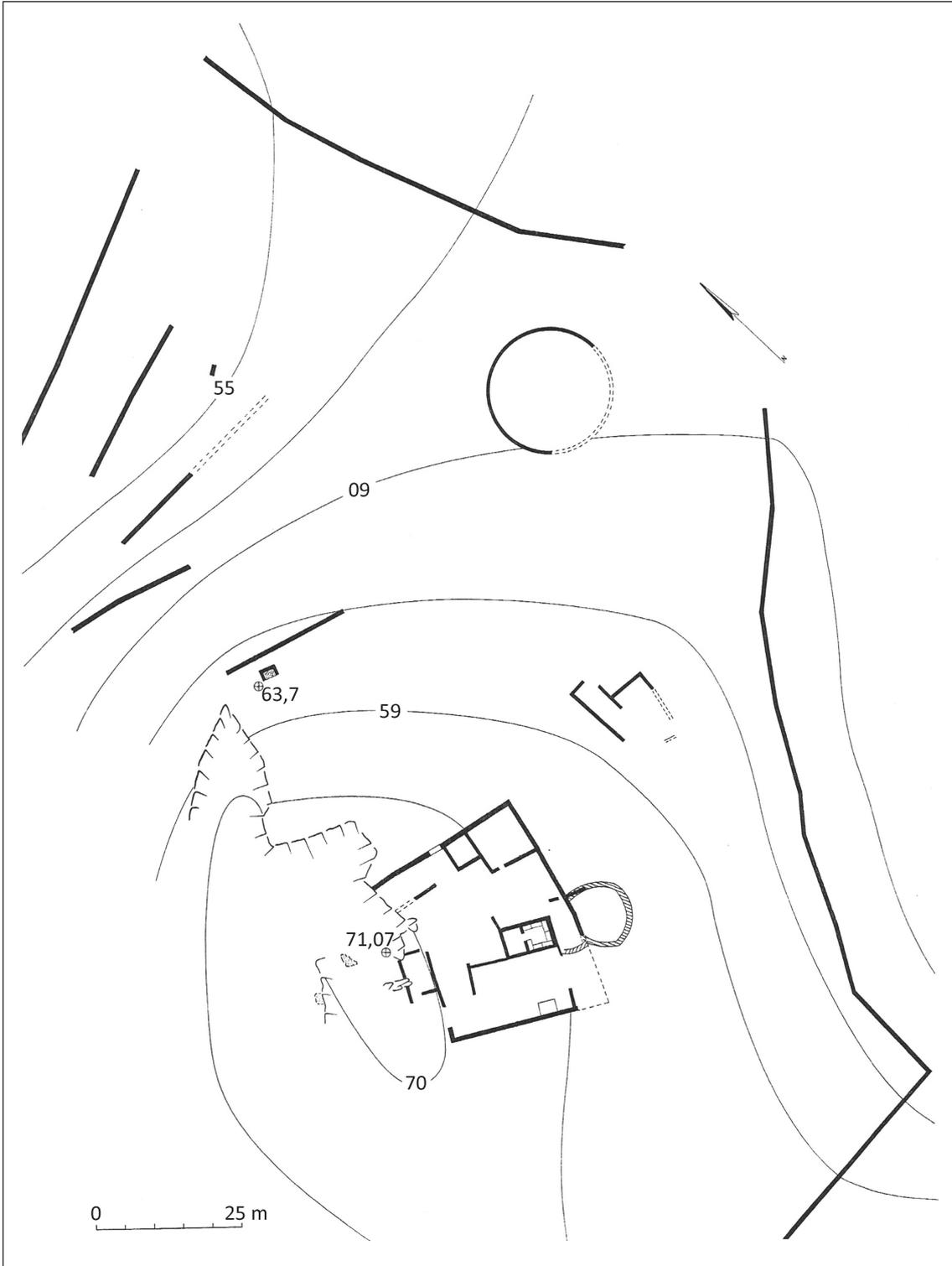


Fig. 3: The LE 16 farm, threshing floor, and agricultural terraces, Legrena.

house's administration and organization, along with the optimization of agricultural production. Socrates' praise of farming has been portrayed as "the earliest extensive eulogy of rural life in Greek prose".¹⁰ The closer examination of the issue carried out in this study includes two main key points. The first is the identification of the agricultural practices revealed throughout the dialogue and their correspondence to the actual rural landscape of Attica in the 4th century BC. In addition, it attempts to re-evaluate the pedagogical significance of the text, in order to understand the motivation for writing such a work for the farmers in that given historical period.

The Classical rural landscape of Attica was structured by three basic elements:¹¹ the farmhouses, the primary agricultural nuclei and engines of economic activity which often include a tower (circular or square in plan); numerous installations (i.e. cisterns, threshing floors, extensive systems of terraces); and the crops that were cultivated. The latter refers namely to the renowned Mediterranean triad of cereals, grape and olive trees, as well as other supplementary crops of minor importance. Accordingly, an evaluation of the *Oeconomicus* should be attempted on the basis of the three fundamental elements of the rural economy: the farmhouse, the agricultural landscape, and the optimization of production.

Regarding the farmhouses, Xenophon is quite explicit when he refers to their internal arrangement. He indicates the segregation of the spaces destined for the slaves according to sex, so as to prevent childbearing without their master's consent (9.5); he also provides information on the functional arrangement of the products and the utensils stored (9.3). However, as far as the external form of the building is concerned, he is not enlightening at all and only proposes the ideal orientation of the house (9.4). Two farmhouses, in Vari¹² and in Ano Liossia,¹³ both have their facades towards the south, and are characteristic cases of this rule which validate the author's suggestion. What is noteworthy is the absence of any mention of towers in the text. Archaeological research has identified these architectural elements in high numbers throughout the countryside of Attica (figs. 1. 2. 4).¹⁴

Only a small part of the *Oeconomicus* (16–19) discusses issues relating to the second and third axes of the agronomic theme: the installations, and the practices and techniques of cultivation. The text does not reveal any strict systematization of agricultural knowledge. Of the products belonging to the Mediterranean triad, only two are mentioned. Moreover, the reference to specific agricultural practices is rudimentary, although Socrates urges Ischomachus three times to expound on cultivation techniques (15.1–3; 15.6–9; 15.13).

Cereal farming in Classical Attica is confirmed not only by a multitude of written sources, but also by the presence of numerous threshing floors that date to that period (fig. 1–3). The text describes some general principles for this cultivation (16–18), and the author provides information on the processes of sowing, harvesting, and threshing. The cultivation is given particular attention and is dealt with in this text more extensively than in any other. However, this subject is certainly not discussed with the same

gravity that occurs later in the texts of the Roman period.¹⁵ The cultivation of vines, although considered particularly demanding, is examined quickly and without scrupulousness. Unlike Pliny the Elder, who presents and analyzes all three main cultivation techniques,¹⁶ the *Oeconomicus* only mentions the technique of trenches (19.2–3). At least two cases of ancient vineyards have been identified in Attica that were cultivated using this method and these probably date to Classical times.¹⁷ The cultivation of the olive tree was widespread in Attica during the Classical period. Extended areas were shaped by constructing agricultural terraces for the cultivation of olive trees, mainly in the southern parts of the peninsula (fig. 4). Although this is confirmed by a great variety of ancient written sources together with archaeological evidence, mentions of this crop are very minor in Xenophon's text (19.13). It is also well known that a range of secondary, complementary products were cultivated in the soil of Attica, such as vegetables and legumes. As for the olive tree, the dialogue of the *Oeconomicus* does not offer any particular information regarding these products. There is only a small part devoted to fruit trees but this does not take into account the special techniques required for each species (19).

Based on the factors mentioned above, it would not be wise to support that the text aims to systematize agricultural knowledge or that Xenophon's purpose was to exhaustively present cultivation techniques that could be useful to the farmer, at least not in the systematic way that this occurred later in Latin agronomic literature. His work lacks the scientific negotiation of agriculture that is present in Columella and the encyclopedic view of agricultural issues that characterizes Pliny the Elder. It is clear that the dearth of references to some widespread agricultural strategies, which are archaeologically encountered within the rural landscape of Attica, is problematic. The absence of any mention of agricultural terraces is a striking example. During the 5th and 4th century, the design and construction of such installations played a key role and constituted a widespread practice which aimed at serving the very high demand for olive oil. Despite the fact that they have been identified in many parts of Attica, nowhere are they mentioned in the *Oeconomicus*.

Even if Xenophon is very selective in revealing cultivation techniques, some advice underlies the text: this is an economic practice that is particularly important because it accentuates the agricultural process as a means of enrichment. The writer portrays transaction of land as the ideal means of enrichment for the Athenian citizen of the 4th century BC (20.22–29). This can be interpreted directly within the historical and social context that gave birth to the *Oeconomicus*. The indirect consequences of the Peloponnesian War, which affected agricultural life, are mainly reflected in rural land and the status it acquired as a commercial product. This practice of commercialization contributed to a general modification of the traditional rural and social model, according to which the land was inherited from one generation to the next.¹⁸ In the years of Xenophon, when the matter of self-sufficiency was of paramount importance, the land became the object of financial speculation for the wealthy citizens of Attica, who found

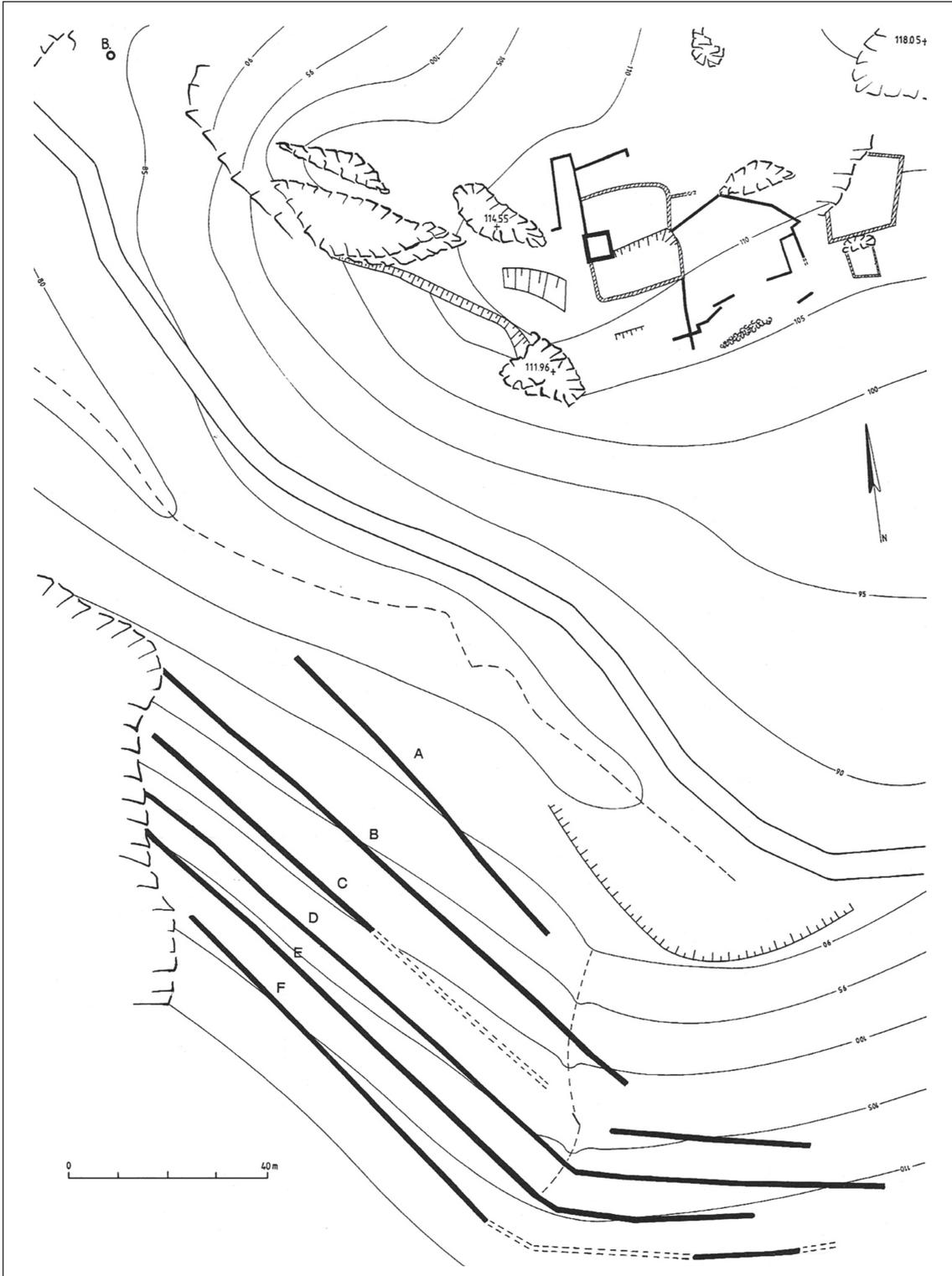


Fig. 4: The PH 33 farm and the agricultural terraces (A–F), Hagia Photini.

opportunities to purchase and exploit land plots. After they improved and made them fertile, they then sought to sell the plots at good prices in order to buy new ones. In other words, land itself had become a product, which, like many others, could result in a significant profit as a traded object. The purchase of an uncultivated field is the best possible economic practice, as the author suggests at the end of his text. Xenophon focuses more on this general principle than on any other specific technical instruction. This practice could prove to be particularly useful, considering that written works were directed primarily at the upper strata of the social structure,¹⁹ to wit those who could afford to be involved in such transactions.

Although Xenophon is constantly trying to convince the reader that his text is of pedagogical value, it becomes obvious that it is not particularly enlightening in terms of agricultural procedure. So, where does its educational significance actually lie? The concept of teaching in his work is broad and involves miscellaneous aspects. Initially, he says that economy is knowledge, just like that of the doctor, the metallurgist, and the carpenter, whose object can be defined and transmitted (1.1–2). The dialogue between Critobulus and Socrates in the first part makes clear that economy is something that can definitely be taught (2.12). Furthermore, Ischomachus teaches his wife, whom – not surprisingly – he never names,²⁰ everything she needs to know to manage the house correctly (7; 8).²¹ The given instructions pertain to the diverse tasks within the house, the supervision of the slaves (7), and the proper arrangement of all the household items (8). He does not just teach her, but also encourages her to adopt the role of teacher later (10.10).

Beyond the general tasks of household management, agriculture is also a subject of teaching and learning, albeit not in a thorough way, as was stated earlier. Convenience and its empirical character are presented as the main characteristics of agriculture.²² There are persuasive arguments developed throughout the dialogue to substantiate these features. The knowledge of agriculture can pass from mouth to mouth for one to learn all its secrets: “for if I am fit to manage the farm, I presume I can teach another man what I know myself”, states Ischomachus (12.4). He also clearly affirms that “agriculture is such a humane, gentle art that someone has but to see her and listen to her, and she at once makes him understand her” (19.17). He adds subsequently that, “agriculture herself gives many lessons in the best way” (19.18). Here it is patently suggested that agricultural knowledge is more a product of experience than something taught through a theoretical approach: a theoretical approach that Xenophon never uses systematically in the *Oeconomicus*. This is a key quote, which gives the author’s reason for not providing a detailed presentation of all cultivation practices. However, it does elucidate that, much more than any prospective instructor, engagement with the object is actually the best possible way to learn how to do something. Although experience is the primary way of teaching agriculture, some parts of the text state that engaging in agriculture is also a logical process, in which everyone can participate, as they already possess the necessary knowledge (16.8; 18.10).

But economy and agriculture are not the only things that can be taught; a careful look at the second part of the dialogue reveals abundant reasons to teach and learn one thing or another. The spirit of teaching is diffused as everything seems to be the potential object of a didactic process: from husband to wife, from parents to children, and from master to slaves.²³ This becomes evident in plentiful passages, with the widespread use of the verbs *διδάσκειν* (teach), *παιδεύειν* (educate) and their derivatives. Teaching in the *Oeconomicus* corresponds not only to practical issues related to the house or the field, but expands to abstract concepts such as ‘loyalty’ (12.6), ‘care’ (12.10), and ‘justice’ (14.3). The concept of teaching runs through the whole text as a leitmotif.

For the contemporary reader, the *Oeconomicus* is the most important testimony of rural life of the Classical period. However, its author more likely aimed to lecture Athenians on how to become successful citizens based on agriculture than how to become good farmers. Having endeavored to meticulously look behind the words of the dialogue’s three main characters and trace possible agricultural practices, it was ascertained that Xenophon did not intend to write a truly practical text for the farmers of his time. The actual cultivation techniques occupy a comparatively small percentage of the total text. If someone seeks to identify specific lucrative practices and tips for cultivating crops, he will be disappointed; the text offers only a few general guidelines and does not provide technical details on how to achieve maximum profit and increased production. At the same time, there is a notable absence of widely used techniques, such as the construction of towers and agricultural terraces, which are particularly characteristic of Attica’s rural landscape. Also, there is a striking lack of references to a series of other practices related to farming and rural life, like beekeeping and animal husbandry, to mention a few. Contrary to the writings of many of the Roman agronomists, Xenophon limits himself to general advice, without quantifying each area of agricultural production, from the construction of the farmhouse to the equipment of each installation.

As a result, the text cannot be classified as a manual of agricultural production in a strict sense. The *Oeconomicus* really teaches very little about the actual farming practices and instead discusses teaching itself to a much greater degree. Xenophon has chosen to emphasize methods of teaching and persuading for a range of issues related to the domestic and rural economy. The argument that it neither constitutes an itemized economic treatise nor that it aims to teach farmers has been proposed by a number of researchers. Among them, Kronenberg suggested that it was written with farming as an extended metaphor for various political and ethical approaches to life and for the society of Athens.²⁴ Danzig viewed it as an ethical dialogue, disguised as an economic treatise;²⁵ in the same vein, Stevens argued that Xenophon did not intend to showcase his actual knowledge of farming with this work, but to offer an ethical metaphor on human relationships.²⁶ While this had already been documented on the basis of moral philosophy and political theory, it can now also be supported by the archaeological evidence: there is little correspondence between the text of the *Oeconomicus* and the actual archaeological remains of the contemporary agricultural landscape of Attica.

Notes

¹ Isager – Skydsgaard 1992, 4; Margaritis – Jones 2008, 159.

² Describing agricultural life, Homer often underscores both the positive (*Iliad*, 18.541–572) and negative (*Odyssey*, 13.31–35) aspects of rural affairs.

³ Although agriculture is not its main theme, Hesiod’s text maintains its importance. It outlines not only aspects of the ancient Greek rural civilization but also the social background of its era, as well as the values, the celebrations, and the prevailing perceptions of the work.

⁴ Six complete agronomy works survive from the Roman period: Cato’s *De Agri Cultura*, Varro’s *Res Rusticae*, Virgil’s *Georgica*, Pliny the Elder’s *Naturalis Historia*, Columella’s *De Re Rustica*, and Palladius’ *Opus Agriculturae*.

⁵ On Xenophon’s “Socratic” works, see Ford 2008, 29–44.

⁶ It has been supported by some scholars that parts of this work were composed at different periods, see Pomeroy 1994, 5–8.

⁷ On Xenophon’s purposes and motivation, see Pomeroy 1994, 50; Marchant – Todd 2002, xxiv–xxv.

⁸ “It must be the business of the good economist at any rate to manage his own house/estate well”.

⁹ Literally a beautiful and good Athenian citizen. For the term see Bourriot 1995.

¹⁰ Pomeroy 1994, 254.

¹¹ Dimakopoulos 2016, 188–192.

¹² Jones et al. 1973, 355–452.

¹³ Jones et al. 1962, 75–114.

¹⁴ More than 50 rural towers have been found in Attica. The territory of the deme Atene is very characteristic, as there many farmhouses were constructed that include towers, see Lohmann 1993, 138–161. For agricultural towers in Sounion, see Young 1956, 122–146, with further bibliography.

¹⁵ For example, Cato (*De Agri Cultura*, 91; 129) refers in detail to the construction of the threshing floors; he even reveals techniques to prevent damage from ants and vegetation that can sprout at the point.

¹⁶ Namely the planting in trenches (shallow ditches), in holes or excavating the whole field, Pliny the Elder, *Naturalis Historia*, 17.35.

¹⁷ Vordos 2006, 380–387; Raftopoulou 2013, 142–144.

¹⁸ On the economic conditions in Athens in the 4th century BC, see French 1991, 25–27.

¹⁹ Cahill 2002, 224.

²⁰ On the utilitarian, “unerotic” character of Ischomachus’ teaching to his wife, see Eide – Whitaker 2016, 95–97.

²¹ On the wife of Ischomachus, see Stevens 1994, 217–223.

²² In order to prove how easy it was for someone to get involved with agriculture, the author provides the example of Cyrus (4.22). If the Persian king was able to do so, the simple Athenian citizens of 4th century BC could do it as well. For a comparison of *oikos* with the Persian Empire, see Kronenberg 2009, 42–46 and Nelsestuen 2017, 87f.

²³ The guidelines given by the author for the proper management of the farm and agricultural production had no place in the “official” educational system of Athens. The educational program that the male student had to follow did not include the basic knowledge of land use. Therefore, the only way to dissemi-

nate such knowledge was from father to son, from mouth to mouth, and through field experience. See also Griffith 2001, 29.

²⁴ Kronenberg 1994, 66–72.

²⁵ Danzig 2003, 61.

²⁶ Stevens 1994, 209–237. On the description of the *Oeconomicus* as a “comedy of education and an educating comedy”, see Stevens 1994, 227.

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Snow and Ice in Antiquity. Supply, Preserving, Trade, Consumption

Giulia Falco

In Antiquity, snow and ice were a consumer item with multiple uses, from the luxurious to the therapeutic, and from the preparation of food to its preservation. Due to its intrinsically volatile nature, this item is destined to escape archaeological analysis and is noted mainly in literary sources. Here we offer a synthesis of the ways in which snow and ice were stored, used and consumed in the Greek and Roman worlds. We include the prehistoric evidence and all elements of continuity throughout the Mediterranean area until the spread of mechanical cooling techniques in the twentieth century.¹

The union between snow and wine constitutes the most substantial chapter in a long-lasting history, in terms of the quantity and variety of the evidence. The beginning of this evidence dates back to the second millennium BC. The royal archive of Mari documents how, in eighteenth-century BC Mesopotamia, ice was an object used exclusively by the sovereign. It was collected by specialized workers under his direct control and used to chill the wine for royal court meals and banquets. Sometimes it was given by the king, together with the wine itself, as an élite item for visiting foreign delegations.²

In the Greek world the attestations are much later. The first certain mention is provided by the epigram 88 Page, attributed to Simonides of Ceos by Callistratus (*Miscellanies*, book VII, FGr 348 F 2, Ath., 3.125 c–d).³ This composition, extemporized during the course of a summer convivium, provides useful clues to the ways in which snow was consumed in a symposium context in the late Archaic age. In the final lines of the epigram the poet turns to the slaves in charge of the wine and exhorts them to pour snow into his cup so that he may raise toasts with well-chilled wine together with the other guests.

The custom of mixing snow and wine is confirmed over time in passages from various literary works. The play by Strattis entitled ‘Men Who Keep Cool’ was probably designed to deride decadent people who dedicated themselves to leisure and luxury.⁴ From this, we learn that in late Classical Athens “no one would be willing to drink warm wine, but quite the opposite, wine that is chilled in a well and mixed with snow”.⁵ Xenophon (*Memorabilia*, 2.1.30), in relating the story of Herakles and the contest of Vice and Virtue, tells us of a charge that Virtue brings against Vice. This is the frenetic search for snow in summer in order to chill fine wines and make her drinks tastier. In an episode recounted by Athenaeus (13. 579), the courtesan Gnathaena is offended by the paucity of the gifts offered to her by a client: poor-quality fish and snow. In order to avoid news of this spreading and diminishing her prestige, she orders her servant to mix snow and wine in the krater without being seen, thus providing a pleasant surprise for the palate of her guest, the comic poet Diphilus.

As in Greece, in Rome the union of snow and wine also continued solidly over the centuries. As early as the first Imperial Age,⁶ Seneca and Martial testify⁷ that the craze for “cold drinking” had gone to the extreme. As a result, only a prohibition from a physician was able to dissuade the most ardent drinkers from consuming chilled wine. Martial, on the other hand, puts into verse in various epigrams⁸ his own passion for *grand crus* enhanced by the addition of snow or ice; the poet shared this attitude with other personages of the Roman élite dedicated to the luxuries and the pleasures of a refined table.

Proof of the continuity of the phenomenon comes in the “Panegyric to the Emperor Theodosius” (XII [II] 14,1). In it, Pacatus Drepanius praises the sober style of the emperor, who abstained from the *luxuria* of those accustomed to inverting the order of the seasons by using ice in the summer to chill the Falernian wine. A century later, Sidonius Apollinaris, in a letter probably written in the summer of 465,⁹ invites his friend Domitius to join him in his villa at Aviticus to taste *decocta* that were so chilled as to render the chalices opaque and that gave the shivers even to those people most under the influence of the wine.

As well as being mixed with wine, snow and water from snow were drinks much appreciated throughout Antiquity for their intrinsic pleasantness, for the chilling effect on the body stressed by heat or intense thirst, and for the relief provided from the effects of excessive drinking and eating.

Dexicrates says in the play entitled *The Self-Deceivers* (fr. 1): “If I am drunk, I also drink snow”.¹⁰ “In summer snow is a sweet drink”, writes the poet Asclepiades.¹¹ Seneca, in various passages, stigmatizes the custom that arose among the decadent élite of turning to snow and ice to contrast the effects of continuous alimentary excesses.¹² And Paulinus Petricordiae recalls in the *Life of Saint Martin* (3.109–113) how, after having eaten with Magnus Maximus, the servants took golden vases that contained ice and chilled liquids in order to quench the thirst of the diners.

In Rome, snow was used in the kitchen in preparing savoury dishes to be served chilled, such as the *sala cattabia apiciana*,¹³ but also as an ingredient in preparing the refined “sorbets” of spelt and honeyed wine.¹⁴ Snow was used for tasting well-chilled and fine foods such as oysters¹⁵ and probably used to keep milk fresh.¹⁶ Layers of snow kept meat from rotting:¹⁷ mixed with hay this favored the process of desiccation.¹⁸

In order to have snow available throughout the year, techniques of preservation developed already in prehistory were perpetuated through the centuries due to their effectiveness. In the second millennium BC, in the Kingdom of Mari (and probably also at Ur), just as in Mediterranean countries up to the mid-20th century, snow was stored in semi-subterranean rooms clad with brick, or in conical holes covered with branches.¹⁹ It is supposed that the same practice was also used in Greece, based on a passage from the *Histories of Alexander* by Chares of Mytilene.²⁰

During the Roman Empire the storage function was perhaps fulfilled by ditches lined with stonework (without plaster), which have been identified in geographical areas

naturally appropriate for the gathering of snow, such as Cantabrian Spain (Juliobriga Villa), Pyrenean France (Mountmaurin).²¹ Semi-hypogaeum structures are known from urban centres such as Augusta Emérita and Augusta Raurica.²²

In storerooms, snow was wrapped in hay and enclosed in rough cloths, a technique used up to the mid-twentieth century.²³ From here, the snow was transported on mules to the centres of consumption to be sold at prices that presumably varied according to the distance from the areas of supply, the current season, but above all the purity and the consistency, from solid ice to snow water.²⁴ These were all elements that must have come together to determine the market value of an item that tended to be élite in nature. Therefore, it was a target for the gibes of moralists, such as Xenophon and, above all, Pliny and Seneca. Yet, as sources indicate, snow was easily substituted with refrigeration instruments that were much more accessible and economic, such as fountains, wells and cisterns.²⁵

Considering the means of preservation, transport, and storage, refrigeration by direct contact was probably limited to the use of snow of a particular purity. However, there was no way of assuring this, and those who prudently sought to avoid consuming snow through direct contact made use of *ad hoc* containers.

In Greece this function was fulfilled by the *psykter*,²⁶ of which today we know only the two variants that date from the Archaic age. The first is an amphora with two separate compartments: an internal one for wine, and an external one for snow. The second example is a mushroom-shaped vase, characterized by a flattened spherical body with a lid; it contained snow and maintained its properties over time and was appropriate for floating within the krater, thanks to its high cylindrical foot. Various vase representations depict this variant within a calyx-krater, while a symposiast or a servant dips a ladle into the krater or into the *psykter* itself.²⁷ Apparently this was done so as to taste, prudently, the wine refrigerated by indirect contact, or to collect the quantity of snow useful in chilling the drink to the preferred degree.

New techniques were developed in the Roman world. Martial, who in several epigrams sings the praise of snow dissolved in cups of fine wine and ice broken up in drinks, also mentions the custom of filtering snow through a colander (*colum nivarium*) for the costliest wines, and through a linen filter bag (*saccus nivarius*) for lesser-quality wines.²⁸

Besides, the *sitis ingeniosa* – to borrow Martial’s own words (14,117.2) – had come up with a truly effective indirect refrigeration technique. This consisted in thrusting a glass vessel containing water already sterilized by boiling into the snow. Pliny the Elder (*N.H.*, 31,33.40) emphasized that this gave “a pleasant coolness without the injurious qualities of snow”,²⁹ and he attributed the discovery of this method to the Emperor Nero.³⁰

Nero’s method, known as *aquae coctae* or *decoctae*,³¹ like the *psykter*, indeed possessed the evident advantage of calming the worries of many who appreciated the pleasures of cold drink, but felt that direct consumption of snow or water from snow was harmful for one’s health, even when boiled.³² In fact, snow and ice, in the classification of the

different types of water on the basis of their healthiness, occupy opposing positions in the various schools of medicine. Pliny states (*N.H.*, 31, 21.31–32) that “Some physicians grant a high position to rain-water, seeing that it has been able to rise and to be suspended in the atmosphere. Therefore, they also prefer snow and ice even more than snow, as though its texture were rarefied to the utmost, for, they say, snow and ice are lighter than water, and ice much lighter. [...] Not a few physicians however themselves maintain that hail and snow, on the contrary, make very unhealthy drink, since there has been taken from it what was its thinnest part”.³³

Among critics of the consumption of chilled drinks in general, and especially of snow and ice, the most important came from Aristotle³⁴ and the Hippocratic school.³⁵ Even as early as his treatise on *Airs, Waters, Places*, waters deriving from snow and ice were considered the most noxious of all; this consideration persisted in the opinions of Hippocrates’ followers up to and beyond the Renaissance. According to Galen, chilled drinks provoked coughs, bleeding, and inflammation. They were considered beneficial only in cases of haemorrhage, cholera, diarrhoea, or fevers with colic, and were particularly prescribed in treating persistent fevers. Two centuries later, Oribasius stigmatized drinks deriving from snow and ice and limited their use to treatments for inflammations, fevers, and haemorrhages.

In late Republican Rome, Celsus³⁶ affirms that Asclepiades of Bithynia greatly changed the way of curing, and he successfully opposed the theories and therapies of Hippocrates. Unlike the school of Kos, which allowed the use of snow, ice, and chilled drinks only for a limited number of pathologies, among the principal therapeutic instruments used by Asclepiades were baths and cold water. The latter should be kept constantly as cold as possible for some diseases.³⁷ Thanks to the effectiveness of his cures or, as Pliny malignly puts it (*N.H.*, 26, 8.14), above all due to the pleasant nature of his therapies (e.g. massages, walking, wine and cold water, hot and cold baths, hot-air-baths), “Asclepiades brought round to his view almost all the human race, just as if he had been sent as an apostle from heaven”. Already very famous in his lifetime, Pliny continues that “he preferred, according to Marcus Varro, to win for himself the surname of “cold-water giver” (*frigida danda*).³⁸

As one of the most respected physicians of late Republican Rome, Asclepiades vaunted among his patients and friends the members of the élite, such as the orator Licinius Crassus. He attracted many followers to the city from across the Mediterranean area.³⁹ Indeed, Asclepiades’s therapeutic movement produced many respected disciples over the following centuries.⁴⁰ Following his death, proof of the school’s prestige came from the fact that some of Asclepiades’s followers became affirmed physicians at the imperial court. Artorius for example, was a physician and friend of Augustus.⁴¹ But above all was Antonius Musa,⁴² who saved the emperor from a serious condition through the administration of cold drinks and cold baths, and even received the honour of a statue alongside the one dedicated to Aesculapius (*Suet. Aug.* 59.1). Becoming established as a physician to the Roman élite, Musa treated, among others, one of the main exponents of

Maecenas' literary circle, Horace, prescribing for him in midwinter baths at the Chiusi and Gabii thermae, famous for the chill of their waters (*Epist.* 1,15. 2–10).⁴³

Later, in the Neronian age, a very famous and rich physician was Charmides,⁴⁴ who condemned warm baths and persuaded people, as Musa had already done, to bathe in cold water even during the winter frosts. Pliny writes (*N.H.*, 29, 5.10) that “Charmides plunged his patients into tanks, and we used to see old men, consular, actually stiff with cold in order to show off”.⁴⁵

Various scholars⁴⁶ have linked the importance given to water in the therapeutic practices of Asclepiades' school to the striking spread of thermalism in imperial Rome. In the same way, we may suppose that the widespread use of cryotherapy initiated by Asclepiades and continued through the successes of Musa and Charmides must have been among the causes for the contemporary spread of the consumption of snow among the élite reported in the sources. In particular, the use of constantly cold drinks by avid, ill-looking consumers of snow and ice, as well as the custom of taking baths in the snow (as described by Seneca with irony and moral criticism as *luxuria* in *Naturales Quaestiones* 4b,13. 8–10) seem appropriate to Asclepiades's and Charmides's precepts. Namely: 8. “They are not satisfied even with snow but look for ice, as though it had a more reliable cold because of its solidarity; and they melt it by pouring water over it repeatedly. The ice is not taken from the surface but is dug out from a covered layer in order that it might have more strength and its cold last longer. 10. [...] You will see skinny youths wrapped in cloaks and mufflers, pale and sickly, not only sipping the snow but actually eating it and tossing bits into their glasses lest they become warm merely through the time taken in drinking! 11. [...] that snow, in which you are even swimming, has come to such a pitch, by constant use, and daily slavery of the stomach that it takes the place of water”.⁴⁷

Most commentators have seen in Seneca's words an allusion to Nero's “snow fever” and to his *aquae decoctae*.⁴⁸ Leaving a detailed examination of this topic for future research, we limit ourselves here to some brief observations that seem to indicate a therapeutic background for Nero's cryophilia.

M. Alba Calzado⁴⁹ had already suggested that the custom of taking warm baths in winter and baths in the snow in summer (Suet. *Nero* 27.2), generally attributed to the Emperor's bizarre and lustful nature, can however be traced back to the medical precepts of the period that were followed by the better-off classes. An analogous origin may be put forward for the *aquae decoctae*. Pliny (*N.H.* 31,40) calls this a “most clever discovery” by Nero, and presents it “as a pure scientific fact”.⁵⁰ This is based on Aristotle's observation⁵¹ that water previously purified by boiling could be cooled to a greater degree and that it was healthier. Thanks to the *sitis ingegnosa* of the emperor, Nero's method⁵² could be used by those who could afford large quantities of snow. This method increased not only the healthiness of the water, but also its degree of refrigeration to the utmost by embedding the glass jar in the snow. This produced ice-cold water that was more or less sterilized and could be safely mixed with wine or also drunk by itself to satisfy the

“voluptas frigoris”. Alternatively, it could be used as a therapeutic instrument, according to the medical precepts of the time.

Notes

¹ On snow in the ancient world: Turcan Déléani 1964; De Planhol 1995, 155–162; Dalby 2000, 248; Giovannetti 2013; Schneider-Schwarz 2017. References to its use in the modern age and the contemporary world in De Planhol 1995, 24–150; Giovannetti 2013, 136–138; Schneider-Schwarz 2017, 165.

² Finet 1996.

³ D. L. Page, in Dawe-Diggle 1981, 301 f. in addition to expressing some doubts on the true attribution of the epigram, also reports U. Wilamowitz’s thesis according to which the composition alludes to a snow-cellar in the foothills of Olympus; see also Olson 2006, 96 f. n. 131.

⁴ Fiorentini 2006, 265–279; Fiorentini 2017, 215–227.

⁵ Verses quoted in Ath. 3.124c: Olson 2006, 93; Fiorentini 2006, 274–275; Fiorentini 2017, 222 f.

⁶ The *terminus post quem* is suggested by the lack of testimony in authors such as Cicero, Horace and Virgil: Turcan Déléani 1964, 691 f.; De Planhol 1995, 158–160.

⁷ Seneca, *Epist.*, 9.78.23; Martial, 6.86.

⁸ Martial, 5.64; 9.2; 9.22; 9.90; 12.17.

⁹ *Epist.* 2,2. 11–12.

¹⁰ Ath. 3.124b: Olson 2006, 90 f.

¹¹ Gow-Page 1965, 44.

¹² Seneca De Ira, II. 25.3–4; De Prov., 3.13; *Epist.* 78.23, 95.20–21, 119.3; Nat. Quaest. 4b.13.

¹³ Apicius, De re coquinaria, 4.126–127.

¹⁴ Plinius the Younger, *Epist.* 1.15 (alica cum mulso et nive); see André 1961, 218.

¹⁵ Pliny, N.H., 32. 21. 64.

¹⁶ Philostratus the Elder, *Imagines*, I, 28–29 (psykters full of milk). For the use of snow in conserving milk and its derivatives, see Schneider-Schwarz 2017, 173.

¹⁷ Plut., *Symp.* 8,5 (725 a–b).

¹⁸ Geop. 19. 9, 1–2.

¹⁹ De Planhol 1995, 155 f.; Finet 1996, 83–85.

²⁰ FG^rH 125 F 16; Ath.3.124c. For snow-cellars at the foothills of Olympus, *supra*, nt. 3.

²¹ De Planhol 1995, 162; Giovannetti 2013, 135.

²² Alba Calzado 2003 (Augusta Emérita); Schneider – Schwarz 2017 (Augusta Raurica). The snow-cellar function proposed by E. Salza Prina Ricotti for the underground tunnels of the Villa Adriana was confuted in Fahlbusch 2008. On the hypothetical destination of other archaeological contexts for the storage of snow, see Giovannetti 2013, particularly 135 f.

²³ De Planhol 1995, 165; Giovannetti 2013, 135.

²⁴ The difference in the prices of snow and ice is highlighted by Seneca (Nat. Quaest., 4b. 8) and Pliny (N.H., 19.19.55).

²⁵ On refrigeration techniques in Antiquity, Forbes 1958, 108–118.

- ²⁶ Drougou 1975; Vierneisel 1990; Acovitsioti Hameau – Lesch 1996, 87–89; Trombetti 2011, with bibliography.
- ²⁷ See Vierneisel 1990, 261, figg. 41.6–41.7.
- ²⁸ Martial, 14.103 (*colum nivarium*); 14.104 (*saccus nivarius*).
- ²⁹ Jones-Andrews 1956, 400–403.
- ³⁰ Same attribution in Pliny, N.H., 19,55, and Suetonius, Nero 48. On decocta, see Juvenal 5,49–50; Ath. 3,121e; Dio Cassius 63,28.5.
- ³¹ On Nero’s method of aquae decoctae, see *infra*, 5, nt. 52.
- ³² Gell., 19,5; Macrobius, Sat., 7,12, 24–27.
- ³³ Jones-Andrews 1956, 294–297.
- ³⁴ Aristotle’s theory is reported in Gell., 19,5.6–10; Macrobius, Sat., 7,12. 26.
- ³⁵ On the matter, see De Planhol 1995, 215–222, with bibliography.
- ³⁶ Celsus, De Medicina, 1: “Asclepiades medendi rationem ex magna parte mutavit”; s. De Planhol 1995, 158, 217.
- ³⁷ Celsus, De Medicina, 4.26.
- ³⁸ Jones 1963, 274 f.
- ³⁹ Nutton 2004, 167–170. 190.
- ⁴⁰ Vallance 1990; Vallance 1993.
- ⁴¹ Marasco 1997, 280 n. 8; Marasco 1998a, 248 f.
- ⁴² Michler 1993; Marasco 1997, 280; Marasco 1998b, 247 f.; Marasco 1998b, 270–272.
- ⁴³ Marasco 1998b, 272; Marasco 2004, 21.
- ⁴⁴ Marasco 1997, 282; Marasco 1998b, 269.
- ⁴⁵ Jones 1963, 188 f.
- ⁴⁶ e.g., Stok 1992, 44; Heinz 1996, 2424–2426. 2430.
- ⁴⁷ Corcoran 1972, 68–71.
- ⁴⁸ Berno 2003, 148, nt. 16, 330 f.; Gauly 2004, 109 f. with bibliography.
- ⁴⁹ Alba Calzado 2003, 451.
- ⁵⁰ Citroni Marchetti 1991, 215 f.
- ⁵¹ *Metereologica*, 1.12.17.
- ⁵² See Dalby 2001, 76; Dalby 2003, 347.

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Fishing and the Processing of Seafood in Parion

Vedat Keleş – Michael D. Yilmaz

Abstract

Parion, a colony founded in 709 BC, is located on the Anatolian bank of the Propontis. It was a significant littoral city and accommodated two harbours. The ancient city's location and riches are now the heritage of the modern day Kemer Village of Biga Municipality, Çanakkale Province, which is a fishing village. The city was a *polis* until the period of Roman rule, and many ancient writers mentioned different aspects of the *polis*. One of these aspects is the seafood procured and processed in Parion. At Parion, a range of seafood (from fish and salted fish to crabs and oysters) is attested through ancient writers, archaeological evidence and epigraphic sources.

The intention of this paper will be to approach ancient fishing by examining the archaeological material related to the procuring, processing, and production of the aforementioned marine species. It will evaluate the marine species and fishing techniques described in modern Turkish, Greek, and Latin in order to identify the modern definition of these species. It also will aim to establish ancient production techniques. Evidence related to this topic is drawn from ancient writings, archaeological evidences and epigraphic evidences. Consequently, this paper aims to establish the place, techniques, and diversity of fishing in Parion, contributing to the disciplines of archaeology, economy, sociology and biology.

Parion

Parion is an ancient Greek colony founded in 709 BC,¹ and is known to have had two harbours.² The city was founded on the southern shore of the Propontis and is in close proximity to the point where the Hellespont joins the Propontis (fig. 1). Parion can be described as a Hellespont settlement as well as being a Troad settlement. Parion, located in Kemer Village of Çanakkale, Biga in Turkey, is still a fishing settlement today.

Marine Species of Parion

Fish and other marine species known in Parion are attested by different evidence, such as: ethno-archaeology (done in the modern village of Kemer), epigraphic sources, inscriptions and depictions, archaeological material, as well as comparisons with neighbouring ancient cities.

Parion is located on the waterway heading to the Black Sea. This important trade route is also the route taken by migrating fish, which travel from the Mediterranean or

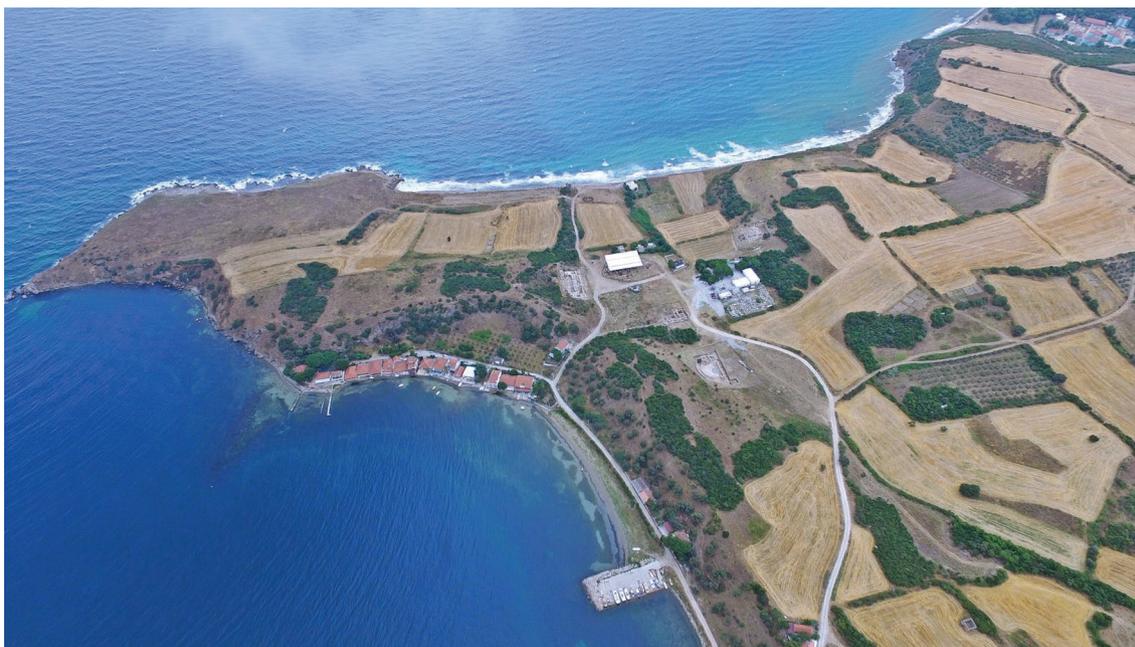


Fig. 1: Aerial photo showing the harbours of Parion and Kemer Village.

Aegean to the Black Sea and vice versa through the Hellespont-Propontis.³ Therefore, the works regarding the ancient fishing of Byzantium is an important asset for understanding ancient fishing in Parion.

Among the species⁴ listed (Table 1), the Tuna, Dolphin, Kolias, Crab and “Linusian Snail” are the most interesting species. These species and some others of significance will be mentioned briefly.

Tuna: This is known from a depiction on a published⁵ inscription. The tuna (*thynnaion*; θυνναίον) is sacrificed to Poseion in gratitude for a good harvest.⁶ The sacrifice is depicted as being made to Priapos instead of Poseidon⁷ since Priapos was the patron god of fishermen.

Dolphin: This is another species which was depicted along with the tuna and Priapos on the same inscription.⁸ From this, one could conclude that it was one of the species hunted by the fishing guild.

Kolias: Pliny⁹ names the colias as “the fish of Parion” since it was caught in great numbers in Parion.

Crab: Arkhestatus¹⁰ states that the crabs of Parion are famous, and calls them “the bears of the sea”. This can be interpreted in two ways: the term “bear” may refer to the anatomical features (i.e. long arms), in which case the species was likely a lobster, or it

is simply a large crab. Arkhestratus mentions the crab called *astakos* (ἄστακος) (lobster) to be located widely in the Hellespont, but does not mention the crab called *karabos* (καράβος).¹¹ According to Athenaeus, the *karabos* is found in rocky areas and the *astakos* in sandy areas. Although Parion has both, locals mention a giant crab called *pavurya*. Another detail is that coins of neighbouring Priapos depict lobsters.¹²

Scallop, Cockle and Oyster: The midden discovered in the Roman bath¹³ had a great quantity of scallop, cockle, and oyster, which reveals that these species were produced and consumed in Parion (fig. 2). Finds of cattle bones with butchering marks hint that the midden belonged to a nearby butchering shop.

Murex: Many unbroken *murex* shells were found in the Slope Bath, specifically in a water channel which flowed in to a small reservoir,¹⁴ hinting at cultivation. The shells could be identified as *Bolinus (Murex) brandaris*, which were the main ingredient for producing purple dye.¹⁵

Linusian Snail: Strabo mentions that the delicious “Linusian Snails” were caught in Linon, a dependency of Parion.¹⁶ The word describing the creature is *linousioi kokhliai* (Λινούσιοι κοχλῖαι), which can be translated as “Linusian screw”, and identify the



Fig. 2: Roman Bath of Parion, the midden.

Seafood Species of Parion									
Names of Species						Evidences			
Ancient Greek	Latin	Turkish	English	Binomial	Ancient Author	Epigraphic	Archaeologic	Ethnoarchaeology	
Θύννος/Θυννίς	Thynnus/ Thunnus	Ton	Tuna	<i>Thunnus thynnus</i>	-	+		+	
Ὄρκυνος/ Ὄρκυς/ ὄρκυαλος	Orcynus	Orkinos	Albacore/ Longfin Tuna	<i>Thunnus alalunga</i>	+	-		+	
Πηλαμύς/ Πελαμύς/Αμια	Amia	Palamut	Pelamyd/ Bonito	<i>Sarda sarda/ Pelamys sarda/Thynnus pelamys</i>	-			+	
Κορύλη/ Σκορύλη	Cordyla	Gobene/ Tombik	Bullet Tuna	<i>Auxis rochei</i>	-			+	
Σκομβρος (Τριχαι)	Scombros	Uskumru	Atlantic Mackerel	<i>Scomber scombrus</i>	+	-	+	+	
Κολίας	Colias	Kolyoz	Atlantic Chub Mackerel	<i>Scomber colias</i>	+	-	+	+	
Χαλκίδες/ Trichiae	Sardina	Sardalya	European Pilchard	<i>Sardina pilchardus</i>	-			+	

Table 1: Seafood Species of Parion: Evidences for Seafood Species in Parion (Legend: +: Direct evidence, -: Evidence through other cities in the region, *: No longer hunted).

Άντακαίος/ Άκκυήσιος	Attilus	Mersin	Sturgeon	<i>Acipenser gueldenstaedti</i>	-	-	-	-				
Είριας	Xiphias	Kılıç Balığı	Swordfish	<i>Xiphias gadius</i>	-	-	-	-				+
Δελφίς/Δελφίν	Delphin/ Delpinus	Yunus	Dolphin	<i>Delphinus delphis</i>	-	-	+	-				+*
Καράβος	Cancer	Yengeç (Pavurya?)	Crab	<i>Cancer pagurus (?)</i>	+	-	-	-				+
Άστακος	Locustam Marinam	Istakoz	Lobster	?	-	-	-	-				-
Κρέις	Pecten	Deniz Tarağı	Mediterranean Scallop	<i>Pecten jacobaeus</i>	-	-	-	-			+	+
Κογγύλιον	Conchylia	Kum Midyesi	Common Cockle	<i>Cerastoderma edule</i>	-	-	-	-			+	+
Όστρεον	Ostrea	İstiridye	Oyster	<i>Ostrea edulis</i>	-	-	-	-			+	+
Πορφύρα	Murex	Dikenli Salyangoz	Murex	<i>Bolinus (Murex) brandaris</i>	-	-	-	-			+	
Λινούστοι κοχλίας (Linusian Snail)	?	* Deniz Salyangozu	Giant Tun	<i>Tonna galea (?)</i>	+	-	-	-				+

Table 1 (continued)

species as a snail. Linon is located at the modern fishing village of Aksaz, or at Şahmelek Beach.¹⁷ This is supported by the fact that the word linon can mean either linen (flax) or fishing line,¹⁸ which hints that the settlement is related to fishing. Therefore, the species can be defined as a sea snail. Local fishermen mention two species of sea snails, one of which is reputedly delicious: the Giant Tun (*Tonna galea*).

Procuring the Fish

Cultivated Species

Farming fish in lagoons was begun by the Greeks, then the Romans continued producing fish by placing eggs, fingerlings, and adult fish in brackish small lakes or ponds.¹⁹ The Romans widely produced oysters, mussels, scallops and other shellfish through artificial cultivation and they were vastly consumed.²⁰

Catching of the Fish

Regarding the basic notion of fishing, it is stated that the Greco-Roman fishermen were catching fish intensively for *garum* and the salted fish industry. Although the opposite is thought, deep sea fish were exploited together with shore fish.²¹

Looking at the most frequently used techniques,²² Parion has evidence for some of these, and for the others it makes sense to assume that they also were used here.

With Hooks

Long-Line Fishing: Long-line fishing is mentioned by ancient sources as a way to catch multiple fish simultaneously. The long-line is composed of branch lines fitted with multiple fish hooks (up to a hundred) that are attached to a main line, which allows the fisherman to cast thousands of hooks at once. Although the labour of baiting these hooks limited the operation, the standardisation of Roman fish hooks made it easier.²³

Fish hooks from the midden at the Roman bath (dating to the 4th–6th century AD) preserve evidence of this method. The hooks were found grouped together (fig. 2, 3),²⁴ and were most likely discarded from the long-line system together with the fish to gain rebaiting time. They were later deposited in the midden along with the other waste material.

Regular Fishing Line (Sea & River): Catching fish with a regular fishing line in a city which had a fishing industry would not need any evidence, although singular fish hooks are present.²⁵ Polyaeus offers evidence regarding catching fish from the river, which flows to the sea by Parion.²⁶ He mentions fishermen cooking fish, drinking wine and making offerings to Poseidon, which the envoys of Parion joined while walking to Hermaeum. Hermaeum is mentioned as in the vicinity of the Çınardere or Otlukdere

Villages of Biga.²⁷ Considering the statement, the fishermen must have been positioned by the Kemer River, which would reveal fishing from the river.

Nets & Traps

Fish are known to have been caught by fishing nets, which were used by a range of small sea craft, large ships, and could be cast from the shore.²⁸ All the nets mentioned are stated to be made of linen (flax) or linon (λίνον) in Greek.²⁹

Seine: These nets are used either from the shore or from a boat or two, and are known as *σαγήνη* in Greek and *sagena* in Latin. This large net consists of two large cords, one of which had floats and the other weights, with the net or mesh held between them vertically. The net was laid in an arc that later was closed to a circle and contracted.³⁰ In

Duties of the Individuals in the <i>Neilaion</i> Fishing Guild of Parion	
Duty	Individual(s)
Arkholes/Boss – Permit Holder	Publius Avius Lysimachus
Diktuarkhontes/Partner	Publius Avius Lysimachus Publius Avius Ponticus son of Publius Marcus Apicius Quadratus Epagathus son of Artemidorus Publius Avius Bithus
Skopiazontes/Lookouts	Epagathus son of Artemidorus Publius Avius Bithus
Fellokhalaston/Float Layer	Tongilius Cosmus
Kubernontes/Pilot	Secundus son of Avius Lysimachus Tubellius Laetus
Efemereuon/Accountant – Paymaster	Cassius Damasippus
Antigrafomenos/Auditor	Secundus son of Avius Lysimachus
Lembarkhontes/Lembos Captain	Asclepides son of Asclepides Hermaiscus son of Avius Lysimachus Eutyclus son of Avius Bithus Menander son of Leucius Hilarus son of Asclepiades

Table 2: Duties of the Individuals in the *Neilaion* Fishing Guild of Parion.

Parion the use of seine is known by the inscription which mentions five vessels and the duty of a float layer (Table 2).³¹

Casting Net: Known in Greek as *amfiblestron* (ἀμφιβληστρον), these nets can be employed from the shore in shallow waters.³² According to the evidence presented by written sources these nets were not deployed from vessels. Although there is no evidence of this technique being used in Parion, the fishermen of modern Kemer Village use this basic technique. Therefore, it is likely that it also was used in Antiquity.

Stationary Net: These nets are called *peza* (πέζα) in Greek.³³ This is a very basic technique and would have been used along with other techniques.

Creels & Traps

Oppian mentions another device for catching fish called *kurtoi* (κύρτοι); according to him they “work when their masters sleep”.³⁴ These types of devices are mentioned to be constructed of wicker.³⁵

Tools of the Trade

Hooks

A total of 16 fish hooks have been identified in Parion (fig. 3). Amongst these examples one comes from the southern necropolis,³⁶ fourteen were found in the Roman bath, agora and the theatre,³⁷ and one final example is from a mixed fill from the agora. Eleven of the fish hooks were found within the midden located in the Roman bath. The midden consisted of mollusca shells and cattle bones with butchering marks dating to the 4th–6th century AD. At this time the Roman bath was no longer in use,³⁸ suggesting that there were butcher shop(s) nearby.

Netting Tools

Netting tools are known to be very similar to some medical tools.³⁹ However, the presence of these finds aboard shipwrecks of fishing vessels, one can conclude that these are netting tools.⁴⁰

At Parion, finds of netting tools are represented with three examples (fig. 3); two come from the Odeion and one from the theatre.⁴¹

Net Weights

The net weights found in Parion comprise 2 lead weights (fig. 3): one comes from the Roman bath and the other from the theatre.⁴²

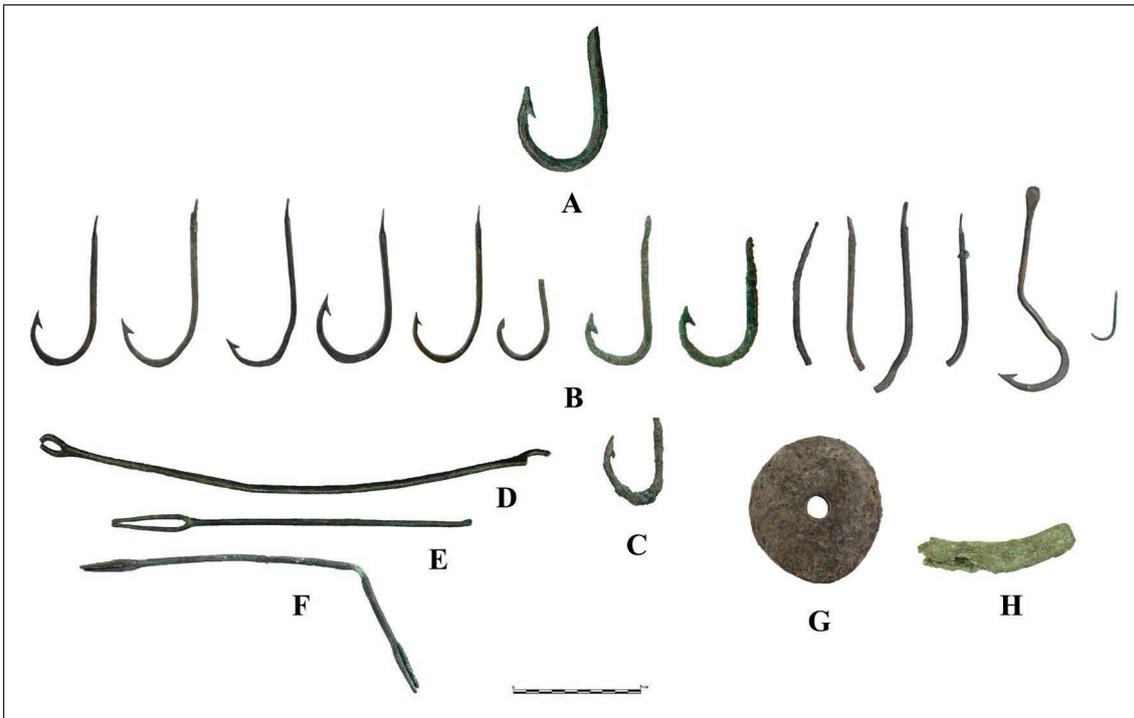


Fig. 3: Bronze fishing hooks (A. 1st–2nd century AD; B. 4th–6th century AD; C. 4th century BC–3rd century AD); Bronze netting tools (D. 3rd–5th century AD; E. 3rd–5th century AD; F. 2nd–3rd century AD); Lead net weights (G. 4th–6th century AD; H. 2nd–3rd century AD).

Products of Fish

Fresh, dried, and salted fish are not the only products of fishing industries. Along with the fish itself, the bones, oil, and internal organs were used as byproducts.⁴³

Food

Although Greeks and Romans consumed fish fresh when possible, they also often dried, smoked, or salted (*salsamentum*) fish.⁴⁴

Fresh Fish: Fresh fish is the direct product of fishing, which would be consumed locally in a short period of time and would not be an exported commodity.

Dried Fish: Most meat was preserved with salt or used in the production of other food items, which lasted longer than their fresh ingredients.⁴⁵ Fish could be stored for extended periods of time by being dried or salted. Fish was dried in the sun with the aid of salt.

Salted Fish: Salted fish, *salsamentum* or *tarikhos* (ταριχος) is another way in which fish could be stored for extended periods of time. It would naturally be an exported commodity similar to the dried fish. Salted fish was produced by placing layers of fish meat and salt in containers, which were pressed down with weights and the dry fish was preserved.⁴⁶

Ancient sources mention that all salted fish from the Hellespont and the Pontus were delicious.⁴⁷ It is stated that *salsamentum* was produced from small scombridae and tuna, which were in high demand beginning from the 5th century BC and increased drastically in the 1st century BC.⁴⁸

Garum Sauce: Another fish product are the sauces produced from the fish: the main commodity is known as *garum/garos* (γάρος) or *liquamen*. The garum sauce became a delicacy for the Roman kitchen during the Republican period. It also is known to have been used instead of salt, as a sauce, as well as for occasional medical practices.⁴⁹

There are a wide variety of recipes for the production of *garum*, though the most basic way to prepare *garum* is to let the meat, eggs, internal organs and blood of fish ferment with salt inside a container for several months. The top layer of liquid resulting from this process would be the *garum*.⁵⁰

Although a wide range of fish were used for *garum* production the finest and most expensive (*garum sociorum* and *gari scombri*) is mentioned to come from small scombridae.⁵¹ Given that *Scomber scomber* and *Scomber colias* are known to Kemer Village today, together with the ancient fishing hooks found in Parion, these *garum* commodities were likely produced in Parion and exported elsewhere.

Muria: *Muria* or *halme* is the basic and low-quality variety of *garum* and would have been used to preserve wine, meat, vegetables and cheese. Produced from fish fermented with salt and water, it should rather be called “fish juice” rather than a sauce.⁵²

Allec: *Allec* is the bottom layer from the *garum* production of undissolved fish matter. This was consumed mostly by the poor and slaves.⁵³

Gaming Pieces

Examples in Parion show that the *vertebrae* of fish were slightly worked to become gaming pieces for board games (fig. 4).⁵⁴



Fig. 4: Gaming pieces made from fish *vertebrae* from the Slope Bath of Parion (3rd–4th century AD).

Ornaments

Grave M210, dated to the late 5th century BC, contained a scallop shell with a hole made through each valve. The object is identified as a pyxis through similar examples. (fig. 5)⁵⁵

Architecture

Lime Production: During excavations in the Roman bath and Sdj 8, mollusca shells were recorded in very close proximity to or adjacent to several lime pits.⁵⁶ Especially the lime pit in Sdj 8 had mollusca shells embedded into the pit itself. This illustrates that lime production was fuelled by mollusca shells as well as limestone and marble.

Rubble Filling: Excavations conducted in the aqueduct bridge and Sdj 10 have revealed mortar (*opus caementicium*) fragments adhering to mollusca shells. This indicates that the shells were used as rubble filling.

Shipyard: Oil procured from fish is mentioned as used for the maintenance of vessels.⁵⁷ Fishing vessels therefore gathered the material for their own needs.

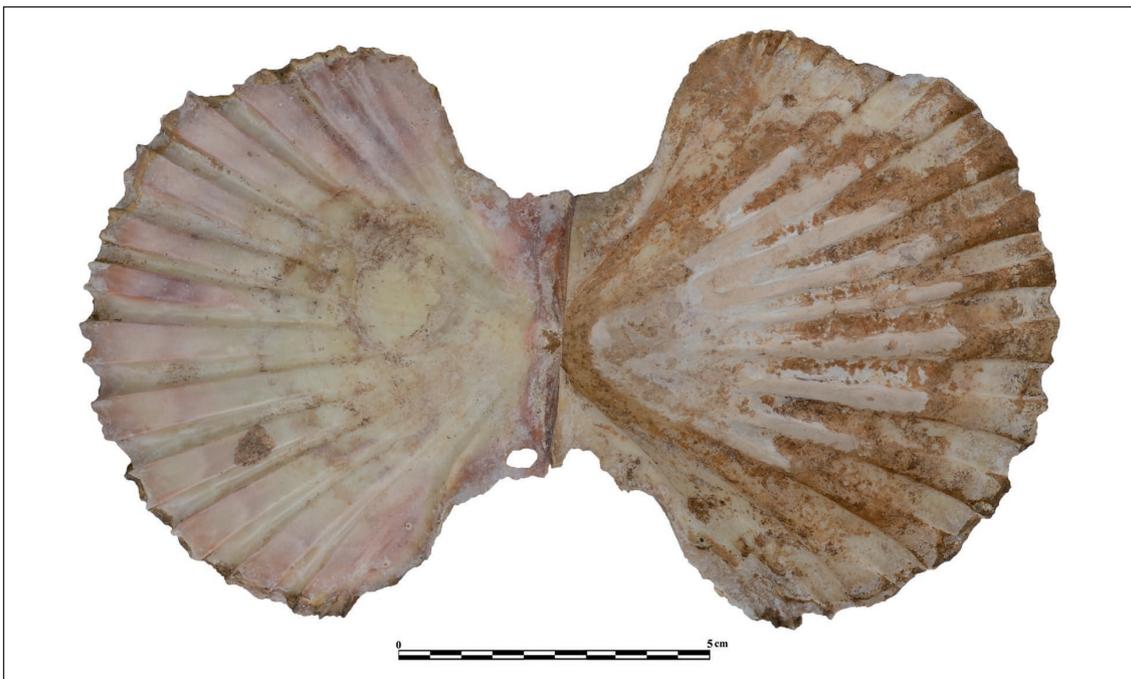


Fig. 5: Accessory made from a scallop shell from Parion.

Individuals Regarding Fishing in Parion

Archaeological and epigraphic evidence exists regarding individuals from Parion involved in fishing.

Graves

M106: The grave goods of the grave M106 (fig. 6) dated to the 1st–2nd century AD. Among these, a few scallop and other mollusca shells were left as grave goods.⁵⁸

M172: A fishing hook was deposited in the grave M172 (fig. 6), which dated to the 1st–2nd century AD.⁵⁹

M182: The individual in the giftless and therefore undated grave M182 (fig. 6) has a particular deformation on its incisor teeth. The deformation of the individual is similar to that of net menders and makers in the modern Kemer Village.⁶⁰

M210: Grave M210 (fig. 6), dated to the late 5th century BC, does have a burial gift pyxis fashioned from a scallop shell, with a hole made through each valve.⁶¹

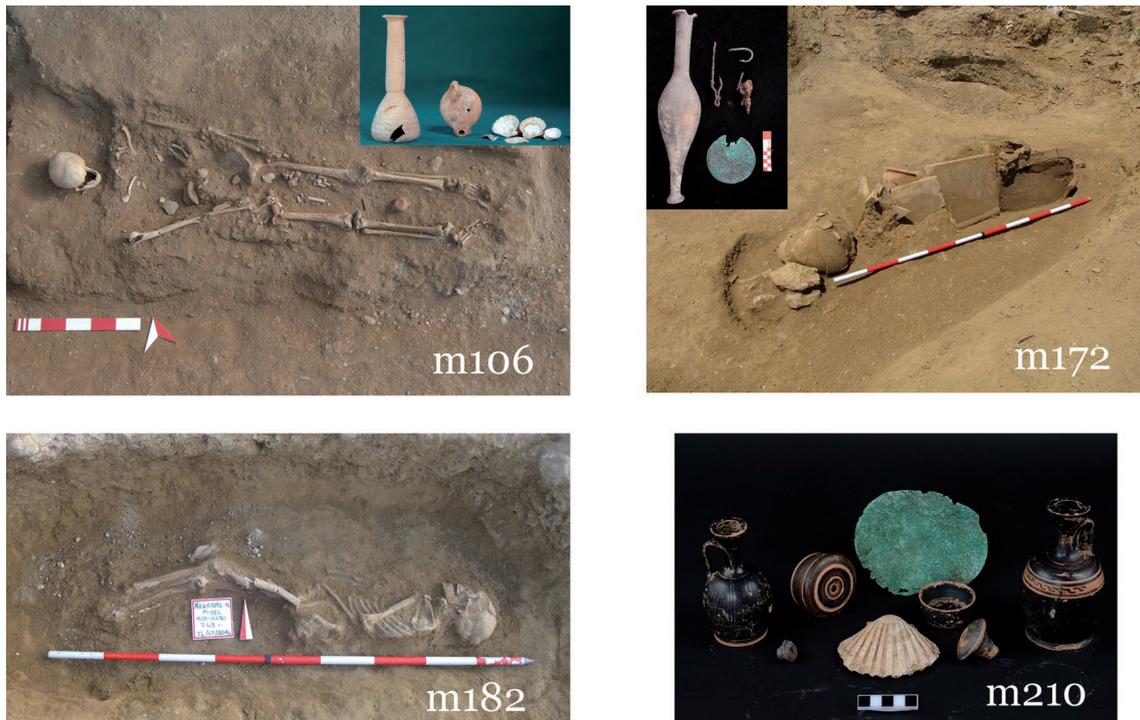


Fig. 6: Southern (Tavşandere) necropolis of Parion, with graves of individuals related to fishing finds.

Fishing Guilds

Watchtowers known as *skopeia* (σκοπιά) and *thynnoskopeia* for tuna were used for coastal fishing. The *thynnoskopeia* would be used along with determined hunting grounds for traps or nets, which were called *epokhai*. Ancient sources and legal inscriptions mention that these lookout positions along with fishing shoals were leased to private operations.⁶²

One of the hills in Parion that overlooks the Propontis is called Semer Tepe (Saddle Hill) and is used as a modern *skopeia*.

Two inscriptions from Parion, dating to the 1st–2nd century AD, give the names of the shoals or their localities.

Neilaion Fishing Guild: The inscription regarding the fishing guild operating in the *Neilaion* area is one of the most remarkable fishing guild inscriptions. It lists the names of the individuals together with their duties (Table 2), and has a depiction of Priapos and an altar with a tuna fish as a sacrifice, and a dolphin.⁶³

Phrou-Fishing Guild: Given the nature of the inscription, all that can be said regarding the second fishing guild of Parion is that it was operating in the shoals of *Phrou*.⁶⁴

Conclusion

Although fishing is thought of as a way to feed oneself, archaeological evidence points to fishing as being more complex and an important part of life for coastal cities such as Parion. This is demonstrated by seafood, which was caught and consumed in various ways and forms, its leftovers used as burial gifts, vessels, gaming pieces, and furthermore in its related architecture and even in shipyards. The commodities which were exported were also a great source of income for cities that were the proud producers of delicacies such as the prized *garum*, renowned salted fish, or even shellfish.

The existence of at least two established guilds in the 1st–2nd century AD reveals that fishing was an important part of the city's socio-economic structure. Depictions of Priapos as the patron god of fishermen hint at the significance of fishing and show that fishing was connected to religious beliefs and the social structure of society.

Fishing hooks were found in various places of the city, and most of them are from the Roman bath. Although they are from slightly different dates, they do hint at the aforementioned standardisation of fishhooks, which were crucial for long-line fishing.

The earliest archaeological evidence regarding fishing in Parion comes from the late 5th century BC and can be traced continuously until today by the fishermen of Kemer Village. This reveals a fishing tradition and heritage of at least 26 centuries.

The locals of the village are the main source for ethno-archaeological evidence in establishing the functions of finds regarding fishing and through the use of similar techniques such as the *skopeia*.

Notes

¹ Eus.Hist. 183.

² X. HG, 1.1.13–16.

³ Tekin 2009, 22; Bursa 2010, 7–9.

⁴ For evidence of species from neighbouring cities see: Bursa 2007, 82–97. 265–267; Tekin 2009, 20–45.

⁵ Robert – Robert 1950, 80–94 pl. 5; Frisch 1983, 10–14 no. 5; Lytle 2006, 68 f. fn. 75. 76 fig. 19.

⁶ Bursa 2007, 27; Tekin 2009, 42; Ath. 297e, 301f, 303b.

⁷ Robert – Robert 1950, 80–94 pl. 5

⁸ Robert – Robert 1950, 80–94 pl. 5; Frisch 1983, 10–14 no. 5; Lytle 2006, 68 f. fn. 75. 76 fig. 19.

⁹ Robert – Robert 1950, 92; Ath. 116b–c; Plin. 32.53.

¹⁰ Ath. 92d.

¹¹ Ath. 104f.

¹² Wroth 1892, 176 no. 1–5 pl. XXXV.4–6.

¹³ Yılmaz 2015, 66, Pic. 45; Yılmaz 2018, 215.

¹⁴ Keleş et al. 2018, 191, Resim 11.

¹⁵ Lytle 2007, 249.

- ¹⁶ Str. 13.1.15.
- ¹⁷ Körpe 2008, 388.
- ¹⁸ Bekker-Nielsen 2002, 218; Opp. 3.73–75.
- ¹⁹ Kron 2008, 206, 211; V. Max. 9.1.1.
- ²⁰ Kron 2008, 212 f.
- ²¹ Kron 2008, 205 f.
- ²² Bekker-Nielsen 2010, tab. 1.
- ²³ Kron 2008, 205; Bekker-Nielsen 2010, 191; Ael. NA, 15.10; Arist. HA, 621a15; Opp. 3.75,3.78,468–481.
- ²⁴ These fish hooks are said to be suitable for the catching of mackerel or pelamyd by the fishermen of Kemer. Yılmaz 2015, 64, Pic. 42.
- ²⁵ Başaran et al. 2014, 399; Çelikbaş 2016, 187–189. 404 f. Cat. no. K50, Pl. XLIII, Ill. 28.
- ²⁶ Polyæn. 6.24.
- ²⁷ Leaf 1923, 100; Frisch 1978, 105 fn. 5; Hammond 1980, fn. 23; Talbert 2000, 789 (Hermaion), Map 52.
- ²⁸ Kron 2008, 205.
- ²⁹ Bursa 2007, 22; Bekker-Nielsen 2002, 218; Opp. 3.73–75.
- ³⁰ Bursa 2007, 21; Bekker-Nielsen 2002, 217–222; Kron 2008, tab. 8.5; Bekker-Nielsen 2010, 191 f.; Ael. NA, 15.5; Opp. 3.79–84,124, 4.68,490–503.
- ³¹ Frisch 1983, 11. 13 no. 5; Lytle 2006, 69 f. fn. 77,78; Bekker-Nielsen 2010, 194.
- ³² Bursa 2007, 20; Kron 2008, table. 8.5; Bekker-Nielsen 2002, 216; Bekker-Nielsen 2010, 191; Hes. Sc. 213–215; Hdt. I.141.2; Opp. 3.80.
- ³³ Bursa 2007, 22; Bekker-Nielsen 2002, 218; Bekker-Nielsen 2010, 192 f.
- ³⁴ Bursa 2007, 22; Bekker-Nielsen 2002, 218; Opp. 3.85–86.
- ³⁵ Bursa 2007, 22; Bekker-Nielsen 2002, 218.
- ³⁶ Çelikbaş 2016, 187–189. 404 f. Cat. no. K50, Pl. XLIII, Ill. 28.
- ³⁷ Yılmaz 2015, 64, Pic. 42; Çelikbaş 2016, 187–189. 405 f. Cat. no. K51–52, Pl. XLIII, Ill. 28.
- ³⁸ Yılmaz 2015, 65; Yılmaz 2018, 215.
- ³⁹ Çelikbaş 2016, 135, fn. 859.
- ⁴⁰ Galili et al. 2013, 154 fig. 14.
- ⁴¹ Çelikbaş 2016, 135. 326 f. Cat. no. E23–25, Pl. XLI, Ill. 16; Çelikbaş 2018, 191. 215 Cat. no. 50 fig. 6.
- ⁴² Çelikbaş 2016, 226. 471 Cat. no. U1–2, Pl. LVI, Ill. 41.
- ⁴³ García Vargaz – Florido del Corral 2010, 226.
- ⁴⁴ Curtis 2008, 385.
- ⁴⁵ Curtis 2008, 385.
- ⁴⁶ Curtis 2001, 317. 397. 403. 407. 413. 416; Bursa 2007, 36 f.; Curtis 2008, 385 f.
- ⁴⁷ García Vargaz – Florido del Corral 2010, 220; Ath. 27e.
- ⁴⁸ García Vargaz – Florido del Corral 2010, 219 f.; Plb. 4.38.4–5.
- ⁴⁹ Curtis 2001, 317. 403–405. 414. 416; Bursa 2007, 36. 39–41; Lenger 2008, 69 fn. 1,2,3; García Vargaz – Florido del Corral 2010, 220.
- ⁵⁰ Curtis 2001, 414; Bursa 2007, 39–42; Curtis 2008, 385 f.; Lenger 2008, 69. 70, fn. 5,7; Plin. 31.43.
- ⁵¹ Purcell 1995, 144; Curtis 2001, 415–446; Bursa 2007, 39; Lenger 2008, 70. 73 fn 8,37; Tekin 2009, 57; Hor. S. 2.8.46.; Mart. 13.102; Plin. 9.66,31.43; Sen. E. 95.25.

- ⁵² Curtis 2001, 317. 403f. 413f.; Bursa 2007, 42; Lenger 2008, 73 fn.38; García Vargaz – Florido del Corral 2010, 220.
- ⁵³ Curtis 2001, 403. 414; Bursa 2007, 42; Lenger 2008, 73 f. fn.39,40,42; García Vargaz – Florido del Corral 2010, 220; Plin. 31.44.
- ⁵⁴ Özkan 2018, 34f. 77f. Cat. no. 28. 29.
- ⁵⁵ Karali 1999, 21 Fig.13B
- ⁵⁶ Keleş et al. 2017, 35.
- ⁵⁷ García Vargaz – Florido del Corral 2010, 225.
- ⁵⁸ Başaran 2010, 394.
- ⁵⁹ Başaran et al. 2014, 399; Çelikbaş 2016, 187–189. 404f. Cat. no. K50, Pl. XLIII, Ill. 28.
- ⁶⁰ Forthcoming anthropological (and ethno-archaeological) report.
- ⁶¹ Keleş et al. 2019, 596, Resim 2. For similar example see Karali 1999, 21 Fig. 13B.
- ⁶² Bursa 2007, 25; Tekin 2009, 49f.; Bekker-Nielsen 2010, 189; García Vargaz – Florido del Corral 2010, 213–215; Ael. NA, 15.5; Arist. Oec. 2.1346b; Pl. Lg. 7.824a.
- ⁶³ Robert – Robert 1950, 80–97 pl. 5; Frisch 1983, 10–14 no. 5; Purcell 1995, 146f. fig. 10.1; Lytle 2006, 68–70 fn. 75–78 fig. 19; Bekker-Nielsen 2010, 194; Bursa 2010, 36f.
- ⁶⁴ Robert – Robert 1950, 89–96; Frisch 1983, 14f. no. 6; Bursa 2010, 37.

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OLEASTRO: Neue Ergebnisse des französisch-spanischen Forschungsprogramms (2013–2018)

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Einleitung

Zwischen dem Ende des 1. Jh. v. Chr. und dem 5. Jh. n. Chr. erlebte die römische Provinz der Baetica mit seinem grossen Hafen Hispalis/Sevilla eine spektakuläre wirtschaftliche Entwicklung. Diese beruhte auf der gezielten Ausnutzung des lokalen Reichtums von Metallen, dem Olivenanbau, dem Weinbau und der Herstellung von Fischprodukten.

Das, in den Dressel 20 (Dr. 20) Amphoren enthaltene Olivenöl (Abb. 1), kann als emblematisches Produkt dieses Wohlstandes angesehen werden. Es wurde über drei Jahrhunderte hinweg, in grossen Mengen, Richtung Nordwesten des römischen Reiches, von der Mündung des Rheins bis zum Hadrianswall transportiert.

Innerhalb dieser Provinz, die an das Mittelmeer und den atlantischen Ozean grenzt, befindet sich die Region Turdetanien. Diese entspricht dem unteren Tal des Guadalquivir und wurde bereits von Strabon wegen seinem landwirtschaftlichen Reichtum gelobt.



Abb. 1: Dr. 20 Ölamphoren des 2. Jh. n. Chr. aus der Werkstatt Corregidora (Hornachuelos).

Die umfangreichen Arbeiten über die Verbreitung des Öls im ganzen Imperium und über die Organisation dieses Handels stützen sich insbesondere auf mehr als 2500 verschiedene Amphorenstempel, sowie auf über hundert Amphoreninschriften (*Tituli Picti*). Sie geben den Namen von mehr als 400 Händlern wider. Diese archäologischen Daten zeigen, dass wir es hier mit einem zentralen industriellen Phänomen zu tun haben.¹

Im Gegenzug sind die Forschungen bezüglich der Olivenölproduktion und den, für den Transport notwendigen Amphoren, weniger gut ausgearbeitet. Ab Ende des 19. Jahrhunderts wurden entlang des Guadalquivirs und seinem Nebenfluss, dem Genil, zwischen Sevilla und Cordoba, große Töpferateliers erkannt. Diese konnten dank beachtlichen Mengen an Oberflächenfunden, vor allem Amphorenstempel, die den Namen der *Figlina* und/oder den des Besitzers wiedergeben, identifiziert werden.²

Trotz der Wichtigkeit dieser Ölproduktion, des epigrafischen Reichtums der Dr. 20 Amphoren und der großen Anzahl von Werkstätten, wurde bis heute keine systematische Untersuchung dieser Produktionszentren durchgeführt.

Die zwischen 1950 und 2000 entstandenen Forschungsarbeiten beschäftigten sich vor allem mit der Epigrafik der Dr. 20 Amphore. Sie hatten zum Ziel, möglichst vollständige Stempelkataloge zu kreieren.³

Die Anzahl der Werkstätten (je nach Autor variiert diese zwischen 50 und 90), deren Standorte, sowie deren Charakterisierung bleiben ein zu erarbeitendes Forschungsgebiet. M. Ponsisch hat zwischen 1974 und 1991 die Grundsteine dazu gelegt.⁴

Das Fehlen von Daten bezüglich der Umwelt ist ein zu beachtendes Problem. Deshalb sind die Strategien für die Zufuhr von Brennmaterien dieser Werkstätten bis heute unbekannt.

Ist es zum Beispiel vorstellbar, dass auf dem *Singilis*, stromaufwärts von Astigi, Flösserei betrieben wurde, um die Waldflächen im oberen Tal zu nutzen? Fand die Versorgung an Brennmaterien direkt aus den Wäldern statt, die sich am Flussufer und daher in der Nähe der Töpfereien befanden? Oder sollte man davon ausgehen, dass die Wälder im Hinterland genutzt wurden, um die Werkstätten mit Holz zu versorgen?

Ein weiterer Forschungsschwerpunkt bezieht sich auf die Untersuchung der Verwendung eines der Nebenprodukte der Herstellung von Olivenöl (Trester).

Das wissenschaftliche Ziel des Programms „*OLEiculture et productions d'AmphoreS en Turdétanie Romaine (OLEASTRO)*“⁵ ist es, durch einen multidisziplinären Ansatz (Feldarchäologie, Karpologie, Anthrakologie und Archäometrie), die Produktionskette der Amphoren zu erfassen. Ferner werden die Hauptakteure dieser industriellen Herstellung sowie die Verbindung zwischen Amphoren und Ölproduktion untersucht.

Dieses Forschungsprogramm beinhaltet drei finanzierte Dissertationen.⁶ Sie beschäftigen sich mit drei Produktionszonen der Baetica, die durch M. Ponsisch als schiffbares Dreieck definiert wurden (Cordoba, Hispalis, Astigi).

Die Methodik bezüglich der Oberflächenbegehungen der Töpfereien, deren Ausgrabung sowie der Analyse des gefundenen Materials basiert auf den Forschungsgrundlagen, die im Languedoc (Südfrankreich) hinsichtlich der antiken Töpfereien von Wein-

amphoren etabliert wurde. Sie wurden an die Besonderheiten der Baetica angepasst, unter anderem an die große Menge von archäologischem Material.⁷

Gleichzeitig beschäftigt sich eine Dissertation mit der Frage des Handels und der Verteilung von Dr. 20 Amphoren Richtung Gallien und Germanien.⁸ Eine weitere Studie befasst sich mit den Töpferöfen auf der iberischen Halbinsel und im Nordwesten des Mittelmeerraumes.⁹

Bilanz und Resultate der Forschungen im Guadalquivir-Becken

O. Bourgeon koordinierte die Forschungsarbeiten im unteren Tal des Genils (Abb. 2), zwischen Écija und Palma del Río, und stellte die Resultate in ihrer Dissertation Ende 2018 vor.¹⁰

Die Bodensurveys erlaubten es, die Anzahl der bereits bekannten Töpfereien in diesem Gebiet um 30% zu erhöhen. Zudem wurde in 23 von 31 Ateliers eine spätantike Produktion von Dressel 23 (Dr. 23) festgestellt.¹¹ Diese Entdeckung relativiert weitgehend die Vorstellung, dass die Ölindustrie in der zweiten Hälfte des 3. Jh. n. Chr. eine Krise erlitt.

Insgesamt wurden 1290 Stempel gesammelt wovon 690 aus der Grabung des Ateliers Las Delicias stammen. 41 aller gesammelten Stempels sind bis heute unbekannt. Die Anzahl der verschiedenen Familien, die durch die Stempel bekannt sind, ist dank unserer neuesten Forschung von 186 auf 294 Familien angestiegen. Die genaue Untersuchung der Stempel jedes Ateliers erlaubte es, den Aufstieg und die Machtzunahme einiger lokalen Familien zu erfassen. Zu Beginn des 2. Jh. n. Chr. gelang es der *gens Fabia*, die einem Senatorenrang angehörte, zwanzig Töpferwerkstätte in Anspruch zu nehmen.¹²

Zudem ermöglichte die Ausgrabung der Töpferei von Las Delicias (Écija), die Geschichte dieser Werkstatt anhand vieler gut datierbaren Stempeln zu illustrieren. Die Ausgrabung einer ins 3. Jh. n. Chr. datierten Ölmühle lieferte ferner den Beweis, dass die Öl- und Amphorenproduktion am selben Ort stattfand (Abb. 3).¹³ Diese Entdeckung schränkt das Paradigma einer Ölwirtschaft, in der sich ölproduzierende Betriebe auf Hügeln befanden und Amphorentöpfereien an Flussufern, ein. Der Nachweis eines originellen Siphonsystems an Fässern oder *Dolia* garantierte die automatische Trennung von Olivenvegetationswasser und dem Öl und weist somit auf eine außerordentliche Modernität dieser Anlage hin.¹⁴ Ausserdem beweist das massive Vorkommen von Oliventrester in den Töpferöfen, dass diese Abfälle als Recyclingprodukt (Brennstoff) zur Energiegewinnung bei der Herstellung der Amphoren verwendet wurden.¹⁵ Dank der morphometrischen Analyse von karbonisierten Olivenkernen stellte sich heraus, dass eine große Vielfalt an Olivensorten für die Ölproduktion benutzt wurde.¹⁶

Im unteren Tal des Guadalquivir, zwischen Palma del Río und Sevilla, werden die Forschungen von Q. Desbonnets bis Ende 2018 abgeschlossen sein.¹⁷ Der methodische

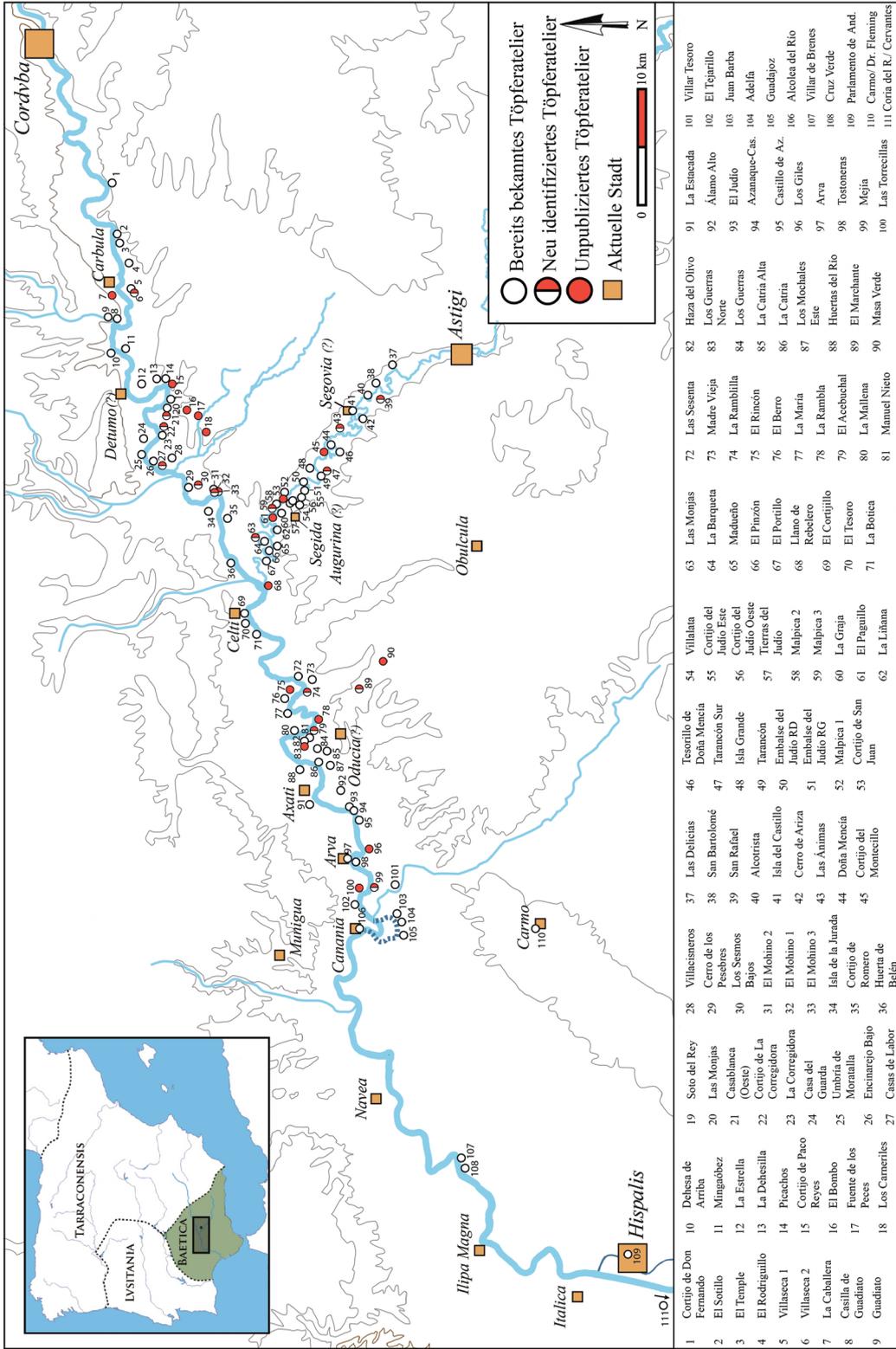


Abb. 2: Übersichtskarte der Töpferereien des Guadalquivirs und des Genils, die Ölamphoren hergestellt haben. Stand Oktober 2018.



Abb. 3: Gesamtansicht der Ölmühle des 3. Jh. n. Chr. von Las Delicias (Écija).

Hauptbeitrag dieser Arbeit betrifft die Verwendung von magnetischer Prospektion in Zusammenarbeit mit der Universität La Rochelle (F. Lévêque). Damit soll die Existenz von unbekanntem Werkstätten, durch Hervorhebung von Öfen, bestätigt werden. Dank magnetischer Prospektion zweier Ateliers konnten mehrere Öfen lokalisiert werden. Schließlich wurden 42 Ateliers inventarisiert, deren Betriebszeit größtenteils verdoppelt werden konnte (Abb. 4). Die Charakterisierung von zwei neuen Werkstätten zwischen Carmona und Écija, die sich mehrere Kilometer vom Fluss entfernt befinden, deutet darauf hin, dass nicht alle Produktionszentren entlang des Flusses liegen. Diese Ergebnisse lassen darauf schließen, dass sich sehr wahrscheinlich weitere Produktionszentren auf diesem Plateaubereich und auf den kleinen Hügeln befinden.

Darüber hinaus gaben mehr als 30% der Werkstätten Hinweise auf das Vorhandensein einer Ölmühle. Dies bestätigt, dass die Entdeckung von Las Delicias kein Einzelfall ist. Anzumerken ist, dass zwölf der Dr. 20 Werkstätten auch *Dolia* produzierten, welche für die Produktion und Lagerung von Öl unabdingbar waren.¹⁸

In der Region zwischen Córdoba und Palma del Río haben die Forschungen, unter Leitung von I. González Tobar, neue Werkstätte identifiziert und etliche unveröffentlichte Stempel zutage gebracht. In Fuente de los Peces, einem Töpferatelier, das im kleinen Tamujar-Tal liegt, wurde eine frühe Amphorenproduktion aus der Zeit Augustus entdeckt.¹⁹ Die Stempel **MR** und **TAM** wurden vor Ort gefunden, sowie dort produ-



Abb. 4: Luftaufnahme und Lokalisierung der Töpferei von Madre Vieja (Lora del Río), die sich am linken Ufer des antiken Flusslaufes des Guadalquivirs befindet.

zierte iberopunische Amphoren. Zwei weitere unveröffentlichte Töpfereien, von denen eine auch **MR** Stempel lieferte, wurden in der Nähe identifiziert. Diese archäologischen Funde zeigen, dass dieses Gebiet, das sich über wenige km erstreckt (in der 2. Hälfte des 1. Jh. v. Chr. bis in die Jahre 20/30 n. Chr.) sehr aktiv an der Produktion von Öl und Amphoren beteiligt war. Die erste Generation von Dr. 20 Werkstätten sollte daher in diesen Hanggebieten und nicht entlang des Guadalquivirs/Genils gesucht werden.

An sieben Produktionswerkstätten wurden magnetische Prospektionen durchgeführt, wobei rund fünfzehn Öfen von F. Lévêque lokalisiert wurden. In der Werkstatt von Mohino, wo während Bodensurveys drei verschiedene Produktionsbereiche identifiziert worden waren, erkennt man zwei große, rechteckige Gebäude, in denen je zwei mal vier Öfen installiert waren. Die systematische Ausgrabung dieser beiden Produktionseinheiten im Winter 2018 (Mohino 1 und 3), erlaubte es, die Evolution dieser Ateliers zwischen 20 n. Chr. und der Mitte des 2 Jh. n. Chr. zu erfassen (Abb. 5). Erst im Besitz von M. Aelius Alexander, gelangte das Atelier ab 60/70 n. Chr. in den Besitz



Abb. 5: Luftaufnahme der Töpferei von El Mohino (Palma del Rio) mit seinen zwei Produktionseinheiten (Mohino 1 und 3).

dreier *Figlinae*: *Talliane(n)sia*, *Servi(ana, -liana)* und *Scalensia*.²⁰ Die fast 10 000 dort produzierten Dr. 20 Amphoren dienten dem Transport von ca. 6900 hl. Olivenöl aus über 500 Hektaren Olivenbaumplantagen.²¹

Zusammenfassung

Die seit 2013 durchgeführten Forschungen im Guadalquivir-Becken bestätigen das große wissenschaftliche Potenzial bezüglich der Dr. 20 und Dr. 23 Produktionsstätten. Ihre Untersuchung ermöglicht es, einen wichtigen Wirtschaftszweig der Provinz der Baetica besser zu charakterisieren. Zur Zeit Augustus bis zum letzten Drittel des 1. Jh. n. Chr. sind die Töpferateliers mit den *villae* verbunden. Zuerst installierte man sie in den Hängen, wahrscheinlich in direkter Verbindung mit den Olivenhainen. Ab den Jahren 20/30 n. Chr. verbreiteten sie sich entlang der Flüsse des Guadalquivirs und Genils, welche den Transport der Amphoren nach Hispalis/Sevilla gewährleisteten. Dieses Phänomen könnte die Ausweitung des Olivenanbaus in den früher, für Getreide und Viehzucht bestimmten Ebenen, bedeuten. Ab den Jahren 70/100 n. Chr. erscheint in den Stempeln die Bezeichnung *Figlina*. Gleichzeitig erkennt man die Konzentration einiger Ateliers, die sich in den Händen wichtiger Familien befanden. Zudem lässt sich eine allmähliche Zunahme von Größe und Anzahl großer Werkstätten erkennen. Dies sind alle Faktoren, die auf soziale und wirtschaftliche Veränderungen hindeuten und kennzeichnen eine allgemeine Tendenz der Industrialisierung.

Gleichzeitig könnte die Suche nach technischen Innovationen bezüglich der Öl- und Amphorenproduktion diese Bewegung begleitet haben.

Der Machtaufstieg der afrikanischen Wirtschaft Ende des 1. Jh. n. Chr. und besonders im 2. Jh. n. Chr., stellte eine Konkurrenz für die Baetica dar. Dies könnte eventuell das Phänomen der Industrialisierung dieser Provinz näher erklären.

Anmerkungen

¹ Siehe u. a. Remesal 1986; Martin Kilcher 1987; Etienne, Mayet 2004; Blázquez, Remesal 2014.

² Bonsor 1931.

³ Chic 1985; Etienne, Mayet 2004; Berni 2008.

⁴ Zuletzt Ponsich 1991.

⁵ „Olivenanbau und Amphorenproduktion im römischen Turdetanien“. Siehe dazu <<https://www.casa-develazquez.org/recherche-scientifique/fouilles-archeologiques/oleastro/presentation/objectifs/>> (14. 12. 2020).

⁶ Bourgeon 2018; Desbonnets 2018; González Tobar, in Arbeit.

⁷ Corbeel et al. 2018, Carrato et al. 2018.

⁸ Dubler, in Arbeit.

⁹ Tiago Seoane, in Arbeit.

¹⁰ Bourgeon 2018.

¹¹ Bourgeon 2017.

¹² Bourgeon 2018, 938; Bourgeon 2021, 624–633.

¹³ Mauné et al. 2014; Bourgeon et al. 2016.

¹⁴ Mauné et al. im Druck.

¹⁵ Mauné 2015.

¹⁶ Bourgeon et al. 2018.

¹⁷ Desbonnets 2018, in Arbeit.

¹⁸ Desbonnets et al. 2017.

¹⁹ González Tobar, Mauné 2018.

²⁰ Berni 2008, 448.

²¹ González Tobar et al. 2018.

Abbildungsnachweis

Abb. 1: Foto: I. González Tobar, LabEx Archimede 2017. – Abb. 2: Karte: OLEASTRO-LabEx Archimede. – Abb. 3: Foto: S. Mauné, LabEx Archimede 2015. – Abb. 4: Foto: V. Lauras, LabEx Archimede 2017. – Abb. 5: Foto: Airdrone Vision 2018.

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Boca do Rio (Algarve, Portugal). A Centre of Export Oriented ‘garum’ Production on the Shore of Roman Lusitania

Florian Hermann – João Pedro Bernardes – Felix Teichner – Ricardo Soares

Since spring 2017, the project “Vulnerability of complex production-networks at the Atlantic Coast of Roman Lusitania” funded by the German Research Foundation (DFG TE 590/8-1) has been investigating Roman fish sauce production in Hispania and its dependency on the changing development of its direct environment. At the site of Boca do Rio the interdisciplinary cooperation between the Universities of Marburg, Cologne and Aachen (RWTH) is working locally within the PIPA-project “Boca do Rio, um sítio pesqueiro entre dois mares”, led by João Pedro Bernardes (University of Algarve).¹

Boca do Rio is located in the extreme southwest of the Iberian Peninsula. Together with the Straits of Gibraltar, this area has the highest density of fish-sauce-production sites in the whole Roman Empire.² Like many other Roman coastal settlements and small fishing sites of the region it is situated in a small bay right by the Atlantic Ocean. Two considerations led us to choose the site as one of three investigation sites³ in order to observe the dependencies mentioned above:

- The recorded vulnerability of the site of being hit by natural disasters (or extreme wave events, EWE) in recent times. In 1755 a large earthquake and tsunami hit large parts of the coast of Portugal, which led to the eventual destruction of Lisbon and also impacted Boca do Rio bay.⁴ As such events are thought of having certain repetition rates, similar events could be assumed to have taken place in prehistoric or early historic times as well.
- Long-term developments in coastal dynamics can be observed in the local deposits. This comprises the slow sedimentation of what is nowadays the (mostly) dry alluvial plain of three small rivers (port. ribeira). The conversion from an open marine body of water to the current state was a long process which started in Antiquity and could have had a drastic impact on the Roman settlement situated at the shore of the estuary.⁵

To enable the detection of environmentally forced changes within the settlement, it was crucial to identify certain ‘key features’ at the crossroads of the settlement and its environment.

Therefore, several field campaigns of geophysical prospection and excavation were conducted and the whole accessible area was investigated with geophysical and remote sensing techniques.⁶ This produced not only a new understanding of the complexity and overall composition of the fish-processing site of Boca do Rio, but also identified certain decisive indicators. The results of these studies can be summed up as follows:

The settlement lies on the eastern slope of a dune leaning against the local limestone cliffs.⁷ It was built on top of the Roman era dune and was itself covered by the growing

dune. In its southernmost region, next to the sea, was a living area, as already described by S. P. M. Estácio da Veiga in the 19th century.⁸ Due to their exposed position the majority of those structures have already been destroyed by the sea.

To the north, the continuation of the settlement consists mainly of conglomerates of various small-scale workshops. Those follow the design known from various other fish-sauce production sites, with vats arranged around central courtyards.

Parallel to the estuary, a single large structure of more than 40 m long and 10 m wide limited the settlement. Geophysical measurements and diagnostic excavations proved that this installation is a combination of a large coherent workshop with astonishingly large vats for the site and region.⁹ There were also adjoining structures that can be interpreted as harbour installations (fig. 1).¹⁰ Here, the successive steps of the 'halieutic cycle', namely of production (workshops, fish sauce) and distribution (harbour, estuary and open sea) can be studied within a single structure. Thus, this construction plays a key role in understanding the site's functionality and dependency on the stability of the environmental conditions. In accordance with the image created by Helmut Brückner's



Fig. 1: Aerial view of the recently excavated section of the harbor wall and quay at Boca do Rio. The ramp visible on the right leads directly to the large workshop, making the harbour an essential part of the production.

keynote, it is the life cycle of a port which determines the duration of a settlement. Future research on the site will focus on these port structures and their evolution.

Notes

¹ For an overview on the ongoing excavation work, see Bernardes et al. in press.

² Wilson 2006; Teichner 2016.

³ The other sites are Tróia (Setúbal) in the delta of the Sado river and *Baelo Claudia* (Bologna) near the Straits of Gibraltar; Hermann et al. 2021.

⁴ For historical sources, see Bernardes – Medeiros 2016, 266; Geological evidence: Hindson et al. 1996; Font et al. 2013. First results give Feist et al. 2019 and Hermann et al. in press.

⁵ Allen 2003; Teichner et al. 2014. First results give Hermann et al. in press.

⁶ For details see Hermann et al. 2021.

⁷ These house a necropolis, which may be connected to the settlement in the bay; Bernardes – Medeiros 2016.

⁸ Estácio da Veiga 1910; on the mosaics, see Teichner – Mañas Romero 2018.

⁹ In comparison with other sites of the region and other vats at the site, the sheer size of these stands out: Among the other vats of the site sizes of 1.4 m × 1.5 m × 1.6 m (length × width × height) are average, while in the “big workshop”, ‘whole’ vats of 3.3 m × 4.0 m × 2.0 m or ‘half’ vats of 1.6 m × 4.2 m × 2.0 m are normal. More detail in Bernardes et al. in press; Hermann et al. in press; Hermann et al. 2021.

¹⁰ For comparison see the harbour facilities of Cerro da Vila (Vilamoura): Teichner 2008; Teichner 2017a; 2017b.

Image Credits

Fig. 1: Florian Hermann; photo by Kevin Paul.

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L'économie vivrière d'*Althiburos* (au NO de la Tunisie) à l'époque protohistorique-numide

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Joan Ramon – Bouthéina Maraoui-Telmini – Francisco José Cantero –
Dani López – Marta Portillo – Silvia Valenzuela-Lamas

Introduction

L'économie vivrière d'*Althiburos* à l'époque protohistorique, est l'un des volets d'un projet de coopération de recherche archéologique entre l'INP (l'Institut National du Patrimoine) et l'UB (l'Université de Barcelone) sur le site d'*Althiburos* (gouvernorat du Kef, au NO de la Tunisie) ; il a été développé entre 2006 et 2014. L'objectif en était d'obtenir des données fiables et diverses sur la période antérieure au II^e s. av. J.-C., qui est très mal connue, à cause des limites et carences des sources anciennes et du manque de recherches archéologiques sur cette époque. Sur la base de différentes indications visibles sur le terrain, les travaux de fouilles se sont concentrés sur les côtés SE et NO du capitole, et réalisés dans deux grandes zones, avec l'intention manifeste de procéder à des fouilles en extension, mais les vestiges des constructions ultérieures, qui devaient être préservées, nous ont finalement amenés à opter pour des sondages uniquement. Pour autant, il nous a été possible de mettre en connexion les données des différents sondages et d'obtenir une vue d'ensemble relativement cohérente des structures constructives repérées.

Ces travaux de fouille nous ont permis de documenter une séquence stratigraphique presque ininterrompue, qui s'étend depuis le début du premier millénaire av. J.-C. (peut-être même un peu avant) jusqu'à l'époque byzantine, avec deux phases ultérieures de l'époque médiévale. La division de l'occupation du site a été établie en phases et sous-phases dans le premier volume monographique sur *Althiburos*.¹ Trois phases y sont distinguées : Numide Ancien (NA), Numide Moyen (NM) et Numide Récent (NR) ; avec plusieurs sous-phases : NA 1 (X^e s. av. J.-C.), NA 2 (IX^e s. av. J.-C.), NA 3 (VIII^e s. av. J.-C.), NM (fin VII^e–V^e s. av. J.-C.), NR 1 (IV^e s.–146 av. J.-C.), NR 2 (146–27 av. J.-C.). L'existence d'une occupation continue et d'une architecture en dur est attestée au moins depuis le VIII^e s. av. J.-C. Les constructions ont gardé une même orientation jusqu'à l'époque tar-do-antique ;² si le caractère de la première occupation, jusqu'au VII^e s. av. J.-C., reste encore peu clair, des éléments à partir du VI^e s. av. J.-C. (citerne, rempart défensif, tracé rectiligne des murs, des techniques de construction améliorées) permettent de penser à la formation d'ores et déjà d'un site urbain ; d'ailleurs son existence est assurément attestée dès du II^e s. av. J.-C. par les documents épigraphiques.³

La documentation révélée par les fouilles peut être considérée, en l'état actuel de la recherche, comme exceptionnelle, pas seulement pour la Tunisie antique, mais pour l'ensemble du Maghreb, au moins en ce qui concerne sa dimension diachronique. Elle

permet de comprendre le volume impressionnant des données sur la période protohistorique qui, pour de nombreux sites numido-romains, restent encore à découvrir, car elles sont enveloppées par les niveaux romains et tardo-antiques, mais elles doivent receler, à l'instar du site d'*Alhiburos*, un potentiel de connaissances considérable qui serait à exploiter à fond dans l'avenir.

Les nouveautés apportées par les fouilles à *Alhiburos* sont nombreuses et concernent de multiples aspects de la documentation archéologique, y compris des informations très solides sur l'environnement et son exploitation, objet de notre communication ; elles sont basées sur l'étude des vestiges faunistiques, carpologiques, anthracologiques et phytolithiques. Les résultats obtenus ont déjà été publiés, en bonne partie, dans les chapitres respectifs du deuxième volume de la série *Alhiburos*.⁴ Dans la présente contribution, nous en présentons, de façon succincte, une synthèse des conclusions tirée de l'analyse d'ensemble de ces données, enrichie cependant de nouveaux éléments.

Principaux résultats sur l'économie vivrière

Les fouilles à *Alhiburos* ont fourni des informations très importantes sur l'économie de subsistance, grâce à la récupération d'un matériel archéobiologique en grande quantité et en excellent état de conservation. La combinaison des conclusions obtenues à la fois par les études archéozoologiques et archéobotaniques permet de fournir un tableau aussi complet que possible sur cette question. Cependant, les recherches palynologiques menées dans différentes parties de la région proche d'*Alhiburos* n'ont malheureusement pas donné des résultats exploitables.⁵ Nous sommes tout à fait conscients que cela pourrait limiter nos conclusions, néanmoins nous pensons que les données disponibles sont suffisamment significatives pour proposer des hypothèses cohérentes.

Les données anthracologiques⁶ indiquent qu'au début du premier millénaire av. J.-C. les chênaies de la région aux alentours d'*Alhiburos* – qui y constituaient la végétation climacique – étaient déjà remplacées par la forêt de pins, avec une présence importante d'oliviers sauvages (peut-être aussi domestiques). Cela indiquerait l'existence d'une forêt méditerranéenne sèche, conséquente à une action anthropique préalable importante. Il est loisible donc de penser, que durant le deuxième millénaire av. J.-C., la région avait déjà fait l'objet d'une exploitation intensive du point de vue agricole, et que la densité de la population, au moins à la fin de cette période, était déjà relativement importante. Ceci est cohérent ailleurs avec les résultats des études polliniques dans la région d'Aïn Draham, en Tunisie nord-occidentale, qui indiquent un impact anthropique important, remontant à 4000–3670 ± 80 BP.⁷

Les résultats des études carpologiques⁸ (Fig. 1) concordent avec les données anthracologiques. D'une part, ils indiquent la prépondérance au X^e siècle av. J.-C des espèces cultivées (82,1% des restes) et, parmi celles-ci, des céréales (92,3%), principalement de l'orge (*Hordeum vulgare*) et du blé dur (*Triticum aestivum/durum*). D'autre part – et cela

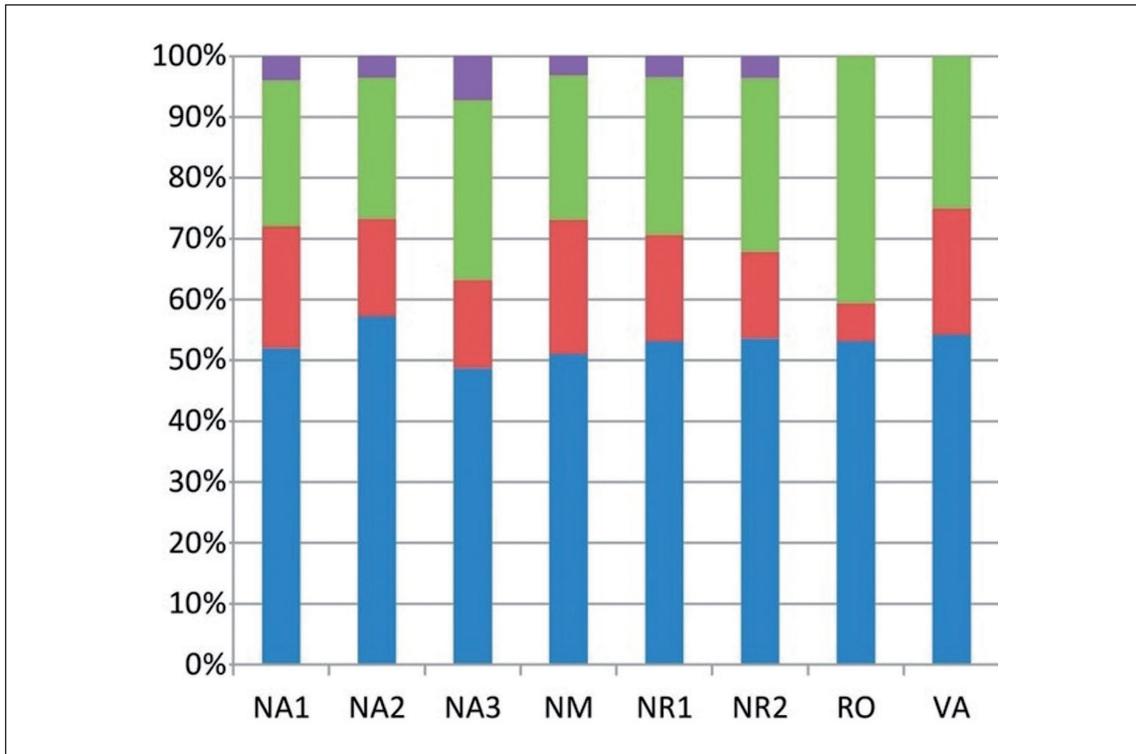


Fig. 1: Représentation des principaux groupes végétaux en fréquence relative des mentions. Les céréales sont en bleu, les légumineuses en rouge, les arbres fruitiers (dont la vigne) en vert, et les plantes oléagineuses en lilas.

est peut-être particulièrement significatif –, une présence considérable de pépins de vigne cultivée. Cela n'est pas surprenant du reste, puisque la vigne cultivée est attestée ailleurs dans le Maghreb, dans le Fazzan au début du premier millénaire av. J.-C.⁹ Il est vrai que la viticulture a un rendement différé qui exige un grand effort initial pour produire des fruits après cinq ou six ans de la plantation des pieds de vigne, mais l'exploitation des vignobles peut se prolonger pendant une longue période. La conséquence logique est que la population qui pratiquait cette culture devait être complètement sédentaire.

Du point de vue de l'évolution socio-culturelle, ces données permettent de penser qu'au début du premier millénaire av. J.-C, ou même avant, la population dépassait déjà les limites d'un mode de vie semi-sédentaire, basé sur l'agriculture d'abatis-brûlis et sur une exploitation relativement importante des ressources sauvages (animales et végétales). La sédentarité totale serait devenue alors nécessaire, à cause de l'impossibilité de poursuivre une exploitation extensive d'un territoire complètement occupé et exploité.

Des preuves supplémentaires de l'intensification de l'occupation découlent de l'étude des matières fécales d'animaux domestiques.¹⁰ Depuis le X^e siècle av. J.-C, ces restes contiennent des concentrations significatives de sphérulithes qui comprennent prin-

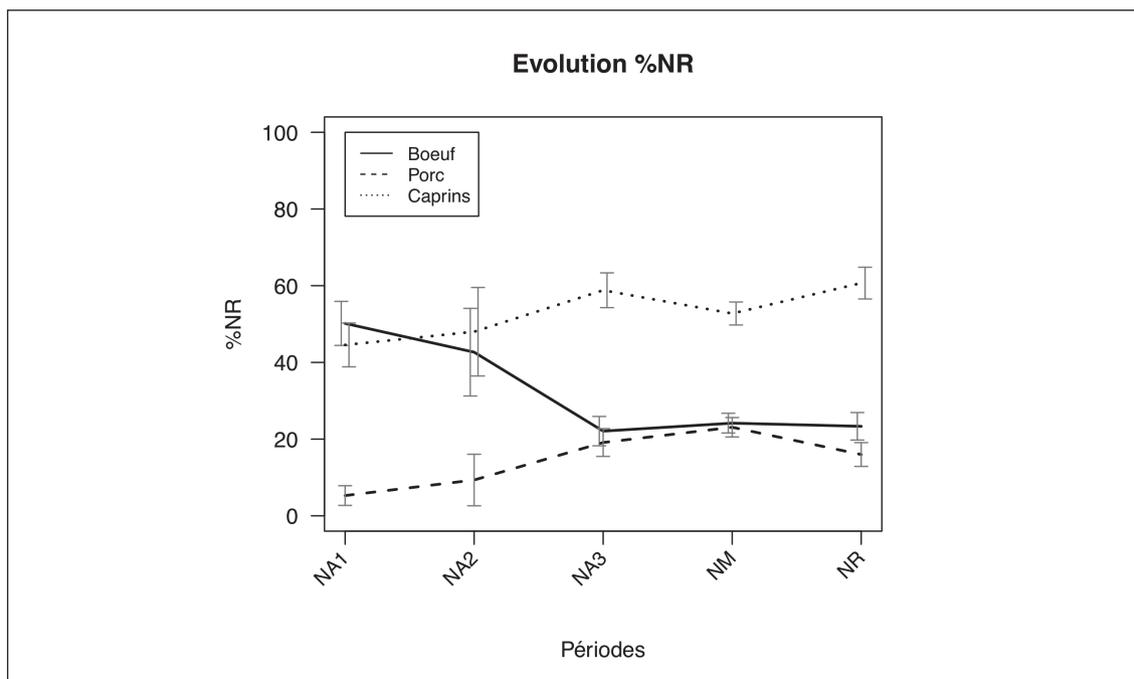


Fig. 2: Fréquence relative du nombre de restes des principales espèces animales domestiques. Les lignes verticales indiquent deux fois la déviation standard. NA1 = Numide Ancien 1 (Xe s. av. J.-C.), NA2 = Numide Ancien 2 (IXe s. av. J.-C.), NA3 = Numide Ancien 3 (VIIIe s. av. J.-C.), NM = Numide Moyen (fin VIIe–Ve s. av. J.-C.), NR = Numide Récent (IVe s. av. J.-C.–Ier s. av. J.-C.).

cipalement des phytolithes de graminées, principalement des feuilles et des tiges. Cela peut indiquer que le fourrage provient en grande partie de ce type de plantes, probablement de leurs variétés domestiques. L'utilisation généralisée des sous-produits agricoles pour nourrir les animaux domestiques peut être liée à une réduction des terres de pâturage en conséquence de l'expansion des cultures céréalières. Pourtant, l'étude des vestiges de la faune des Xe–IXe siècles av. J.-C.,¹¹ (Fig. 3) montre la présence d'un grand nombre de bovins, dont l'âge d'abattage – il s'agit d'animaux jeunes – suggère une focalisation sur la production de viande et le renouvellement rapide des troupeaux. Par conséquent, et malgré la pression humaine sur l'environnement, des prairies relativement importantes existaient encore et les ressources vivrières restaient relativement importantes.

Le VIII^e siècle av. J.-C est un tournant majeur. A cette époque, la fréquence relative des bœufs diminue de manière significative, tandis que le nombre d'animaux abattus de plus de quatre ans augmente.¹² Cela pourrait s'expliquer par la nécessité de les utiliser plus longtemps pour le travail dans les champs, peut-être à cause de l'intensification de l'agriculture. Cette tendance s'est encore accentuée aux VI^e et V^e siècles, époque où prédominent les animaux abattus à l'âge de plus de six ans, tandis que la présence de

veaux diminue considérablement. Depuis le VIII^e s. av. J.-C., et plus particulièrement à partir du VI^e s. av. J.-C., l'approvisionnement en viande est largement tributaire de l'élevage ovin et caprin – des espèces mieux adaptées aux pâturages d'environnements plus secs –, et plus particulièrement encore porcin, un animal qui peut se nourrir des restes de nourriture humaine et dont l'élevage n'implique pas nécessairement l'utilisation de terrains convenant à la production agricole.

Cette évolution qui est un indicateur significatif de l'intensification économique due à l'occupation humaine, de plus en plus importante, est confirmée, dans une certaine mesure, par les données archéobotaniques. En effet, les vestiges anthracologiques indiquent une augmentation du nombre d'espèces et l'exploitation de nouvelles niches écologiques (Fig. 3), à partir du VI^e s. av. J.-C. En particulier, la présence pour la première fois d'*Ulmus* sp. et de *Salix/Populus*, deux plantes hydrophiles, permet de penser que les bois de pins et d'oliviers – les plus utilisés à *Althiburos* aux premiers siècles du premier millénaire av. J.-C. – n'étaient plus suffisants, certainement à cause de la croissance démographique et de la réduction des forêts, provoquée par l'extension des cultures. Cela peut également expliquer la présence de *Juniperus* sp., un arbuste qui pousse dans les forêts de pins d'Alep, et l'usage, pour la première fois, du bois de vigne pour le chauffage. En bref, il existe des données suggérant une extension des zones de captage de carburant et une exploitation plus intensive de celles qui étaient déjà utilisées auparavant.

Les données carpologiques indiquent enfin la présence, au VIII^e s. av. J.-C., de nouvelles plantes pouvant servir de fourrage, notamment le trèfle, et au VI^e s. av. J.-C., une augmentation considérable des plantes fourragères (luzerne, *coronilla*, vesce, etc.), qui confirme l'existence d'un paysage avec de grandes superficies de cultures et moins de prairies.

En résumé, l'ensemble de données archéobiologiques semble confirmer l'idée d'une intensification économique importante à partir du VI^e s. av. J.-C. Cela peut être la conséquence d'une augmentation soutenue de la population, très probablement favorisée d'ailleurs par la généralisation du fer, dont la présence est attestée à *Althiburos* déjà au IX^e s. cal BC. Étant donné que la région était, selon toute probabilité, intensément peuplée à la fin du deuxième millénaire av. J.-C., il est plausible de supposer que cette nouvelle croissance avait entraîné une forte pression sur l'environnement, atteignant peut-être les limites de la capacité de charge du territoire, et provoquant, à long terme, des situations de pénurie. Cela aurait encouragé la stratification sociale et le développement institutionnel,¹³ qui seraient à la base des processus d'urbanisation et de la formation des États numides, connus bien tardivement par les sources anciennes. De toute évidence, on ne peut pas exclure que ce processus aurait été influencé par une demande de produits agropécaires des colons phéniciens installés sur la côte nord-orientale de l'Afrique antique, une demande qui n'aurait pas été satisfaite sans l'existence d'un nombre important de la population et en conséquence d'une pression croissante sur l'environnement tout au long du premier millénaire av. J.-C., qui serait à l'origine de la complexité sociale et institutionnelle.

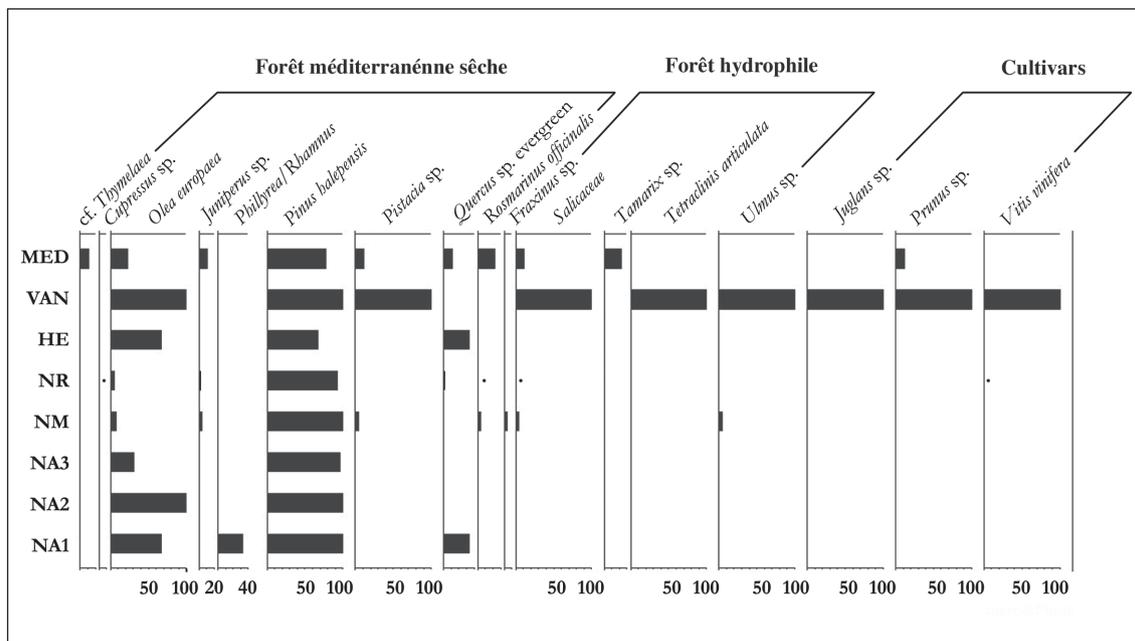


Fig. 3: Ubiquité des espèces d'arbres attestées ainsi que leur niche écologique

Conclusions

Les multiples données archéobiologiques montrent de façon cohérente qu'il y a eu une pression croissante sur les ressources naturelles dans les environs d'*Althiburos* durant le premier millénaire av. J.-C. On constate en effet, une diversification des espèces forestières exploitées¹⁴ et l'utilisation des matières fécales animales comme combustible, bien attestée depuis le VIII^e s. av. J.-C. ;¹⁵ en plus, le registre faunique indique une tendance constante de l'amointrissement de la taille des animaux, il y a en effet de moins en moins de bœufs – remplacés par les moutons et les chèvres comme premiers fournisseurs de viande –, et ils sont abattus de plus en plus vieux.¹⁶

Pour finir, les données disponibles suggèrent que la pression croissante sur l'environnement, due à l'augmentation de la population et peut-être aussi à celle des demandes faites par les Phéniciens, entraînant les situations de pénurie, ont mis en place les conditions qui ont engendré la complexification institutionnelle et sociale, aboutissant finalement à la formation des États numides.

Notes

¹ Kallala – Sanmartí 2011.

² Belarte – Ramon 2016.

³ Ennaïfer 1976, 16–20 ; Kallala et al. 2014, 135 s.

- ⁴ Kallala – Sanmartí 2016.
⁵ Miras et al. 2016.
⁶ Cantero – Piqué 2016.
⁷ Stamboul-Essassi et al. 2007.
⁸ López – Cantero 2016, fig. 1.
⁹ Mattingly et al. 2003, 342.
¹⁰ Portillo et al. 2012.
¹¹ Valenzuela-Lamas 2016.
¹² Valenzuela-Lamas 2016.
¹³ Harris 1977 ; Johnson – Earle 2000.
¹⁴ Cantero – Piqué 2016.
¹⁵ Portillo et al. 2012.
¹⁶ Valenzuela-Lamas 2016.

Vérification des images

Fig. 1 : adaptée de López et Cantero 2016. – Fig. 2 : adaptée de Valenzuela-Lamas 2016.– Fig. 3 : les auteurs.

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Production and Distribution of Roman Pottery

Panel 3.29

L'atelier de Sidi Aïch (Vicus Gemellae) : productions et commercialisation

Mongi Nasr*

Sidi Aïch (fig. 1),¹ supposé être l'antique Vicus Gemellae,² est situé à environ 36 km à vol d'oiseau au nord-ouest de la ville de Gafsa, l'antique Capsa.³ Dévoilé par un anonyme, l'atelier de ce site a été le premier du genre à avoir été signalé en Tunisie,⁴ en 1888.⁵ Actuellement, peu de vestiges sont visibles dont deux collines distinctes formées uniquement de cendres, de ratés de fours, de fragments de cassettes (fig. 2), et surtout de sigillée africaine, suivies, un peu plus loin vers l'est, par deux autres moins importantes. Tous ces éléments étayaient l'existence d'un ou de plusieurs ateliers de céramiques, réalité déjà confirmée par les vestiges de trois fours facilement reconnaissables. La première étude consacrée à ce site remonte à la fin des années soixante du siècle dernier quand H. Stern avait envisagé un travail comparatif à partir d'un matériel ramassé en automne 1966 des dépotoirs des ateliers de Henchir es-Srira et de Sidi Aïch.⁶ Puis, il faut attendre le début des années quatre-vingt-dix du siècle passé, caractérisées par la prolifération des études consacrées aux céramiques antiques et des campagnes de prospection visant à localiser les ateliers, à identifier leurs productions et à déterminer leurs aires de diffusion en Tunisie et ailleurs, pour voir l'attention portée de nouveau sur la production de ce site. Mais, pour atteindre ces fins, des définitions plus ou moins précises des caractéristiques techniques des produits de ces ateliers et des typologies propres à chaque catégorie de production sont indispensables. Or, ces conditions n'étaient pas disponibles pour les produits de Sidi Aïch. Cette situation était davantage compliquée par le fait que d'une part, les chercheurs font recours à des typologies élaborées pour les sigillées africaines dites « universelles »⁷ ou « classiques » comme moyen d'étudier les productions locales et d'un autre, dans la place de choix qu'occupe l'atelier de Sidi Aïch parmi les centres producteurs de la sigillée africaine en Tunisie en général et au Sud-Ouest en particulier. Cette situation de paradoxe fait de sorte qu'on est à la fois insatisfait d'utiliser une typologie déjà existante, mais incapable de répondre aux exigences d'une réalité régionale et par conséquent « marginale » ; et réduit le travail du chercheur à une simple opération de rapprochement avec les types « universels » ce qui serait à l'origine des confusions lors de l'identification et de la classification des produits des ateliers des régions non privilégiées. Aussi, la place de choix qu'occupe l'atelier de Sidi Aïch et qui se traduit sur le terrain par l'omniprésence et l'importance quantitative de ses fragments dans les sites des régions qui formaient autrefois la Byzacène du Sud-Ouest, rend toute tentative de classification de leurs céramiques défailante sinon stérile sans une meilleure connaissance des différentes productions de Sidi Aïch.⁸

De cet état de fait, combler ce manque était l'objectif principal de nos investigations durant les dernières années.⁹ Ainsi, nous venons d'élaborer des typologies et de dresser des catalogues propres à la vaisselle de table, aux poinçons et styles décoratifs, à la vais-

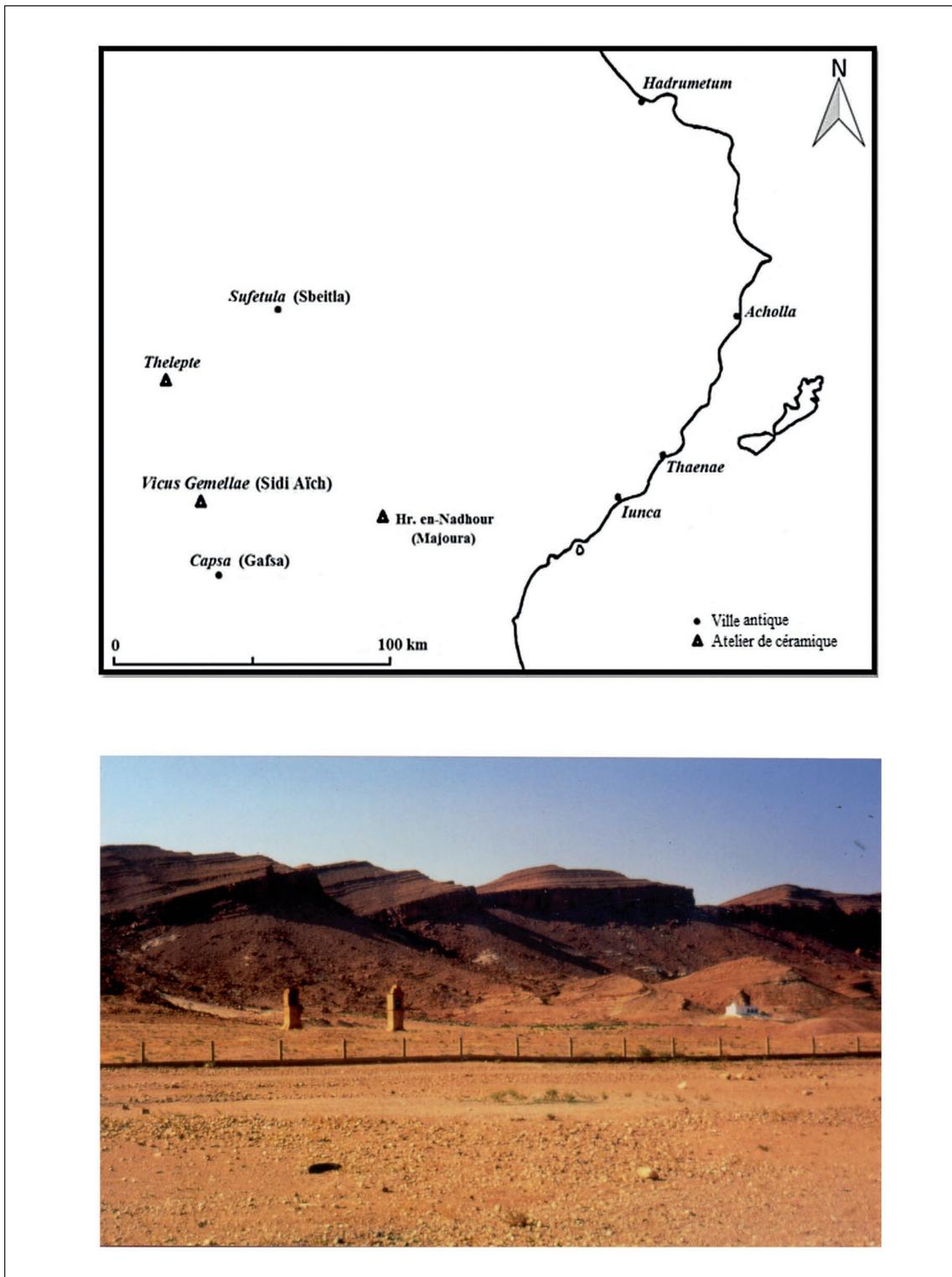


Fig. 1 : Sidi Aïch : a – carte de situation ; b – vue générale du site.

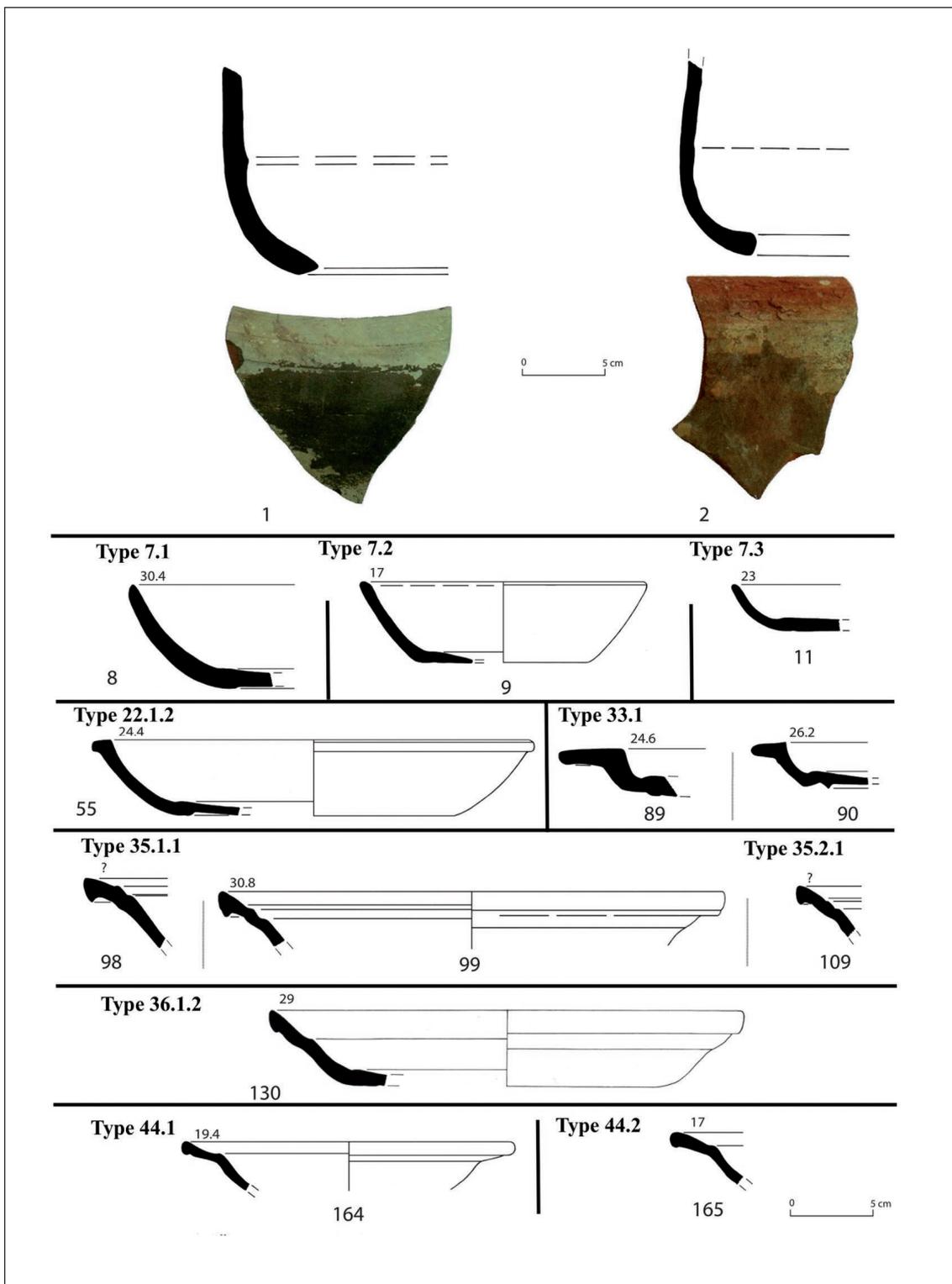


Fig. 2: Sidi Aïch. Cassettes et sigillée africaine. Vaisselle.

selle culinaire et aux lampes.¹⁰ Cet effort nous a donné l'occasion de dévoiler les grands traits distinctifs des produits de l'atelier du Vicus Gemellae et d'essayer de délimiter son espace de commercialisation.

En effet, nos investigations ont permis, entre autres, de mettre en évidence deux caractéristiques principales dans les productions de cet atelier en général et au sein de la vaisselle de table en particulier :

A – L'imitation : on constate que les potiers de cet atelier ont imité toutes les productions classiques de la sigillée africaine (A, A/D, C, C/E, D et E) dont on peut citer en guise d'exemples :

type 7 (Hayes 50B), type 22.1.2 (Hayes 32), type 33 (Hayes 33), type 35 (Hayes 68), type 36.1 (Hayes 75 et 76), type 36.2 (Hayes 73A), type 44 (Hayes 71A), type 50 (Hayes 58 et 81), type 53 (Hayes 82 et 87A), type 54 (Hayes 87A et 87B), types 64–65 (Hayes 91D), type 75 (Hayes 84 et 103B) et type 78 (Hayes 104B) (fig. 2. 3).

B – L'originalité : à côté de ces produits imités, les potiers de Sidi Aïch ont façonné des formes propres à leur atelier qui représentent les deux tiers des formes de la typologie élaborée pour la vaisselle de table c'est-à-dire 52 sur un total de 81 formes, à l'instar des types suivants : 3, 8, 10, 11, 12, 17, 18–21, 31, 32, 34, 37, 43, 47, 55, 58, 60, 63, 66, 67, 69, 73, 76. (fig. 4. 5).

Quant à la décoration de Sidi Aïch, elle retrace les différentes phases de l'évolution de celle des sigillées africaines.¹¹ Ainsi, les éléments de ce matériel, poinçons et styles décoratifs, offrent la possibilité d'un rapprochement, plus ou moins convaincant, avec les phases Hayes A(ii), A(iii), B, C, D, E(i) et E(ii), mais toujours avec un cachet d'authenticité. En effet, les poinçons (fig. 6) se démarquent de ceux des productions classiques par leurs dimensions plus réduites, leur exécution peu soignée, leurs dispositions et combinaisons à l'intérieur du récipient. En ce sens, le cas des palmettes est fort éloquent ; elles sont différentes des celles du Nord (El-Mahrine) par leur aspect mince (moins large), leur forme généralement triangulaire, leurs extrémités ornées de petits cercles à globule central, la queue se distinguant nettement du reste de la palmette, les nervures plus fines et moins longues et en fin, une tige centrale unique alors que les palmettes des productions nordiques sont, souvent, à double tige centrale.

Pour ce qui est des poinçons animaliers et des croix monogrammatiques, ils sont souvent miniaturisés et couverts de petits globules (fig. 6). Les différentes dispositions et combinaisons présentées par l'ensemble du matériel décoratif nous ont offert six grands styles décoratifs qui se distinguent de ceux adoptés par les ateliers de productions classiques soit par l'emplacement des poinçons qui tendent, le plus souvent, à s'éloigner du centre du récipient, ce qui laisse ce dernier, soit libre, soit traversé, horizontalement, par un ou deux motifs répétitifs (style IV) (fig. 6, 2) et rarement occupé par un poinçon unique (style VI.1) (fig. 6, 3).

Les productions lychnologiques « certaines » (type 1 (fig. 7, 1–3) et type 2 (fig. 7, 4. 6) corroborées par des fragments de moules et « probables » (type 3 (fig. 7, 8. 10)) (type 4 (fig. 7, 10. 11) de ce site, permettent la possibilité d'un rapprochement avec des pro-

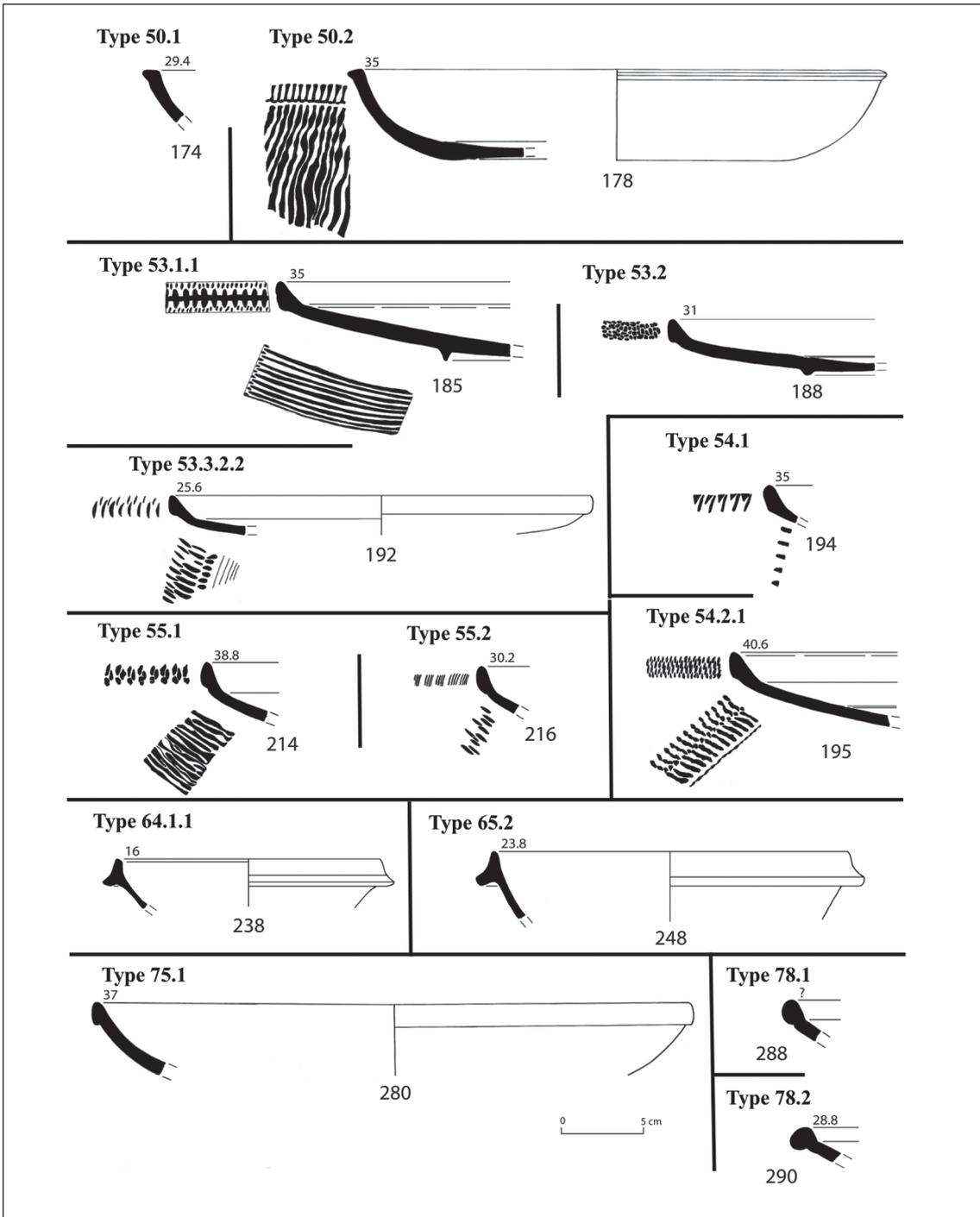


Fig. 3 : Sidi Aïch. Sigillée africaine. Vaisselle.

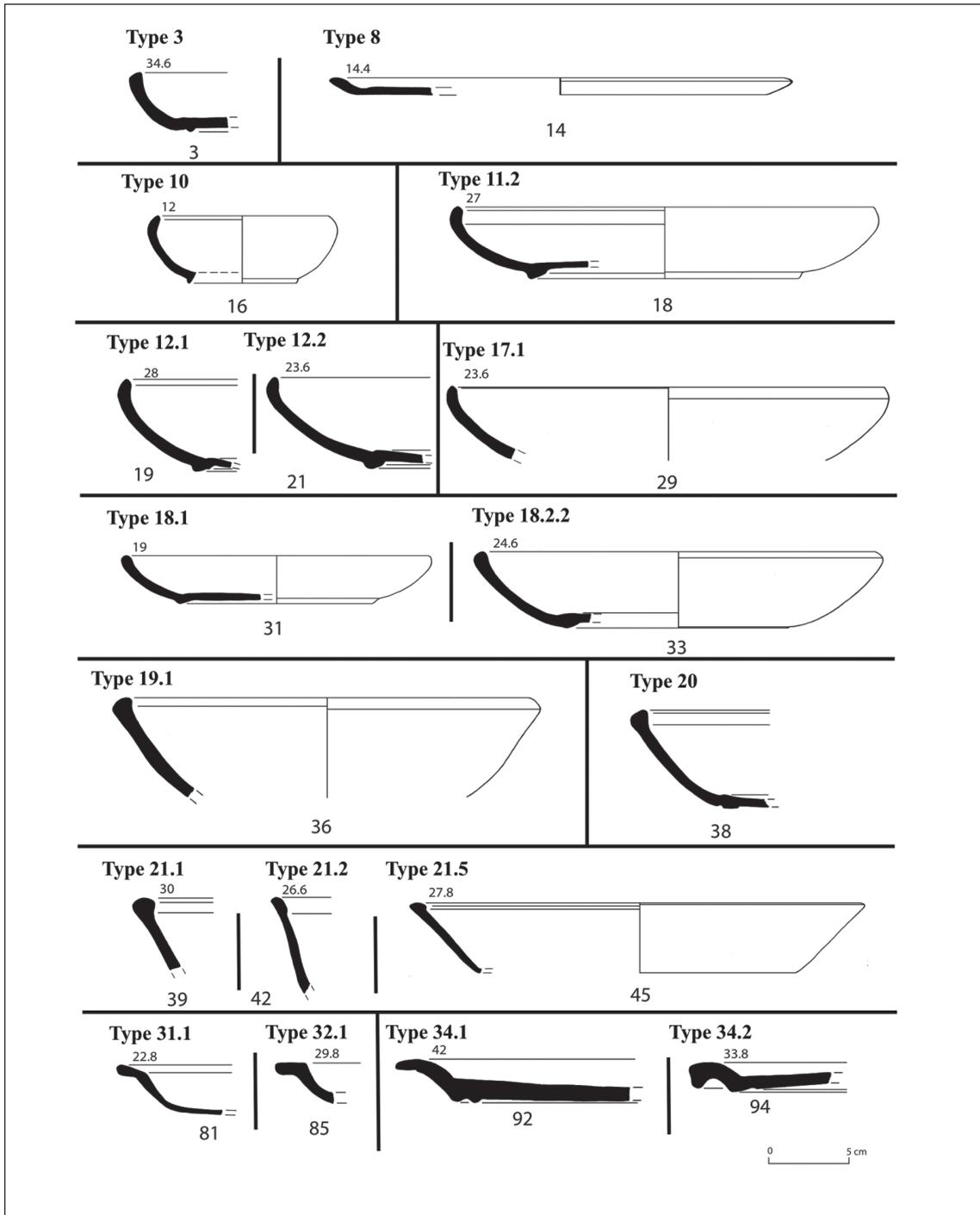


Fig. 4: Sidi Aïch. Sigillée africaine. Vaisselle.

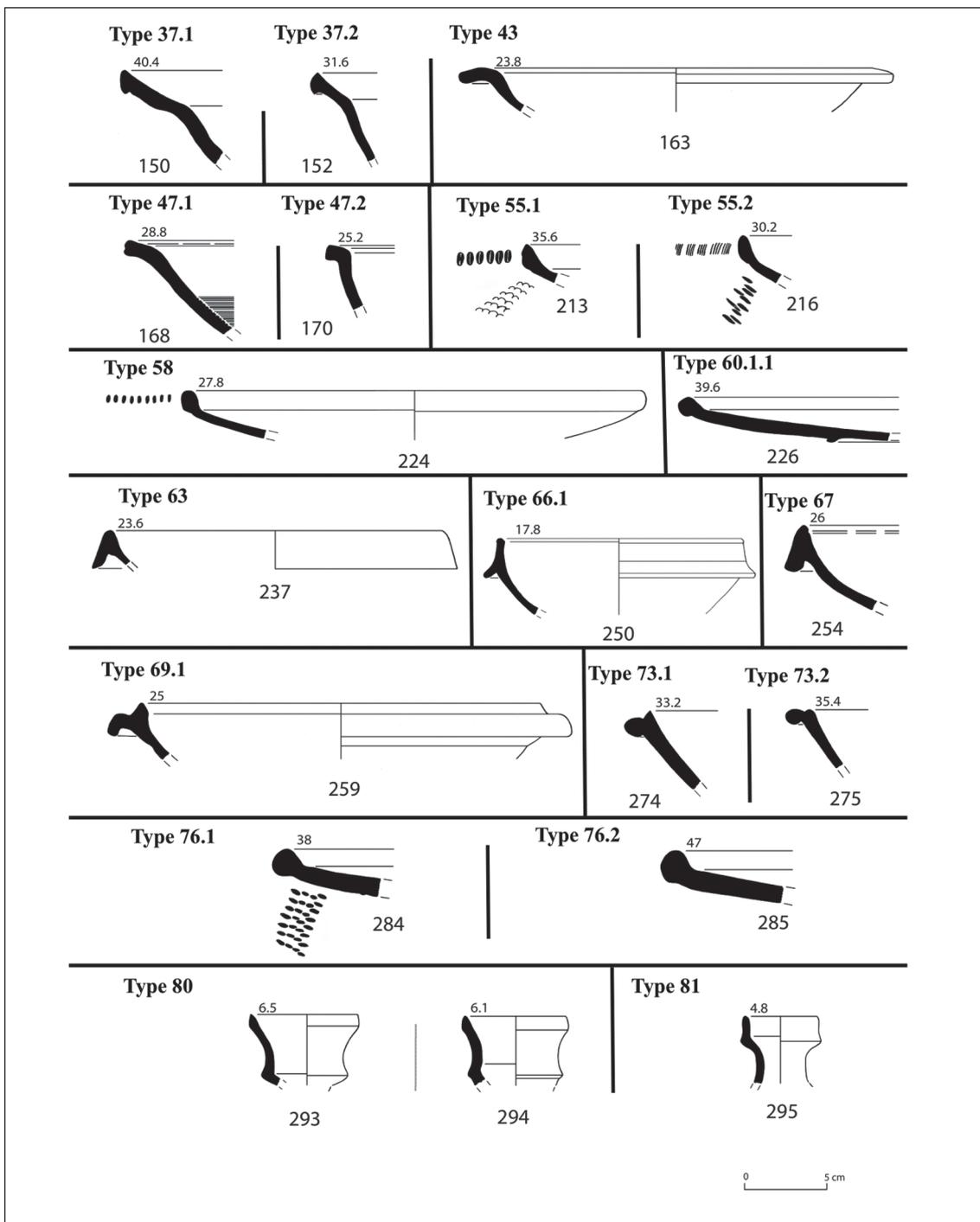


Fig. 5 : Sidi Aïch. Sigillée africaine. Vaisselle.

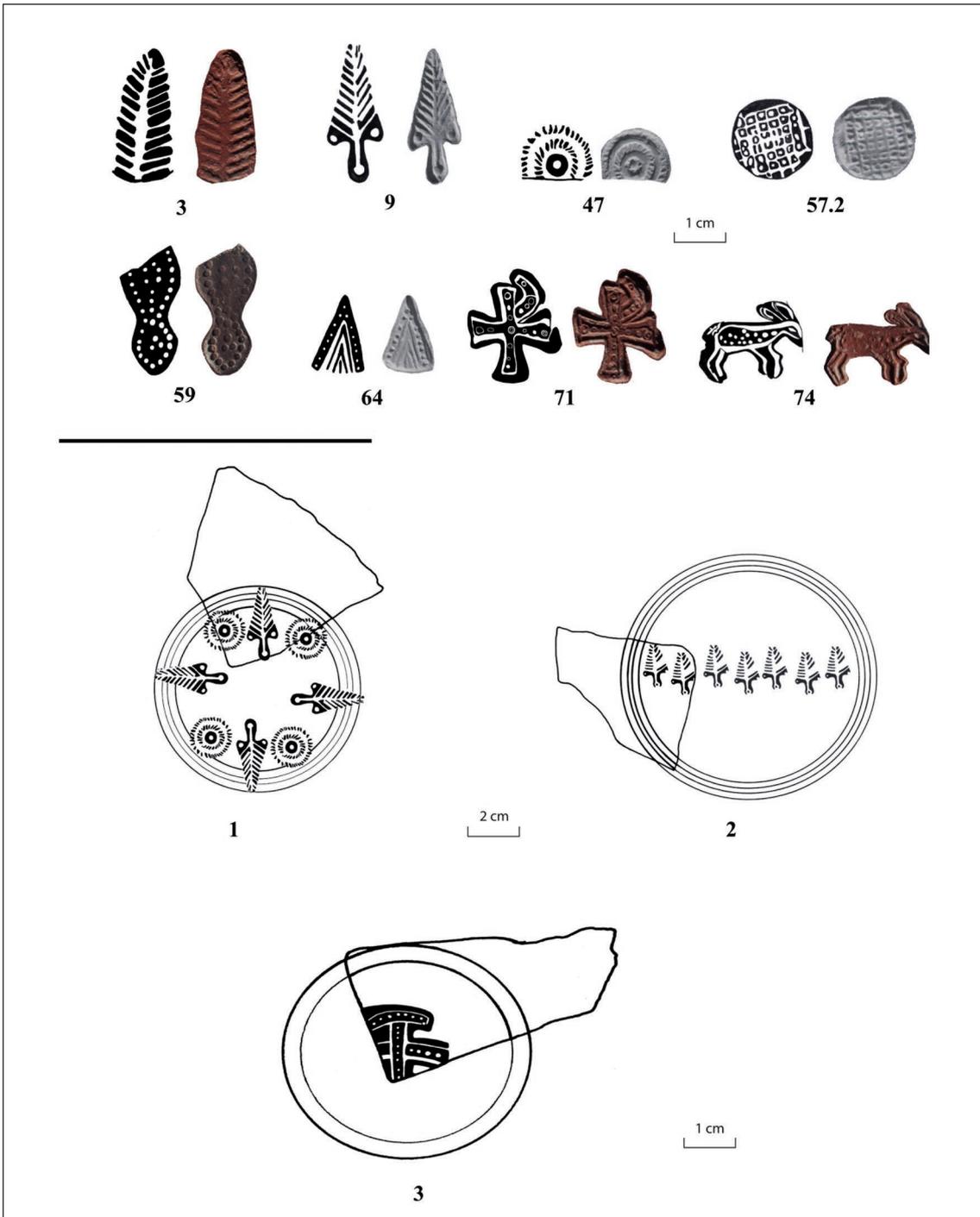


Fig. 6 : Sidi Aïch. Poinçons et styles décoratifs.

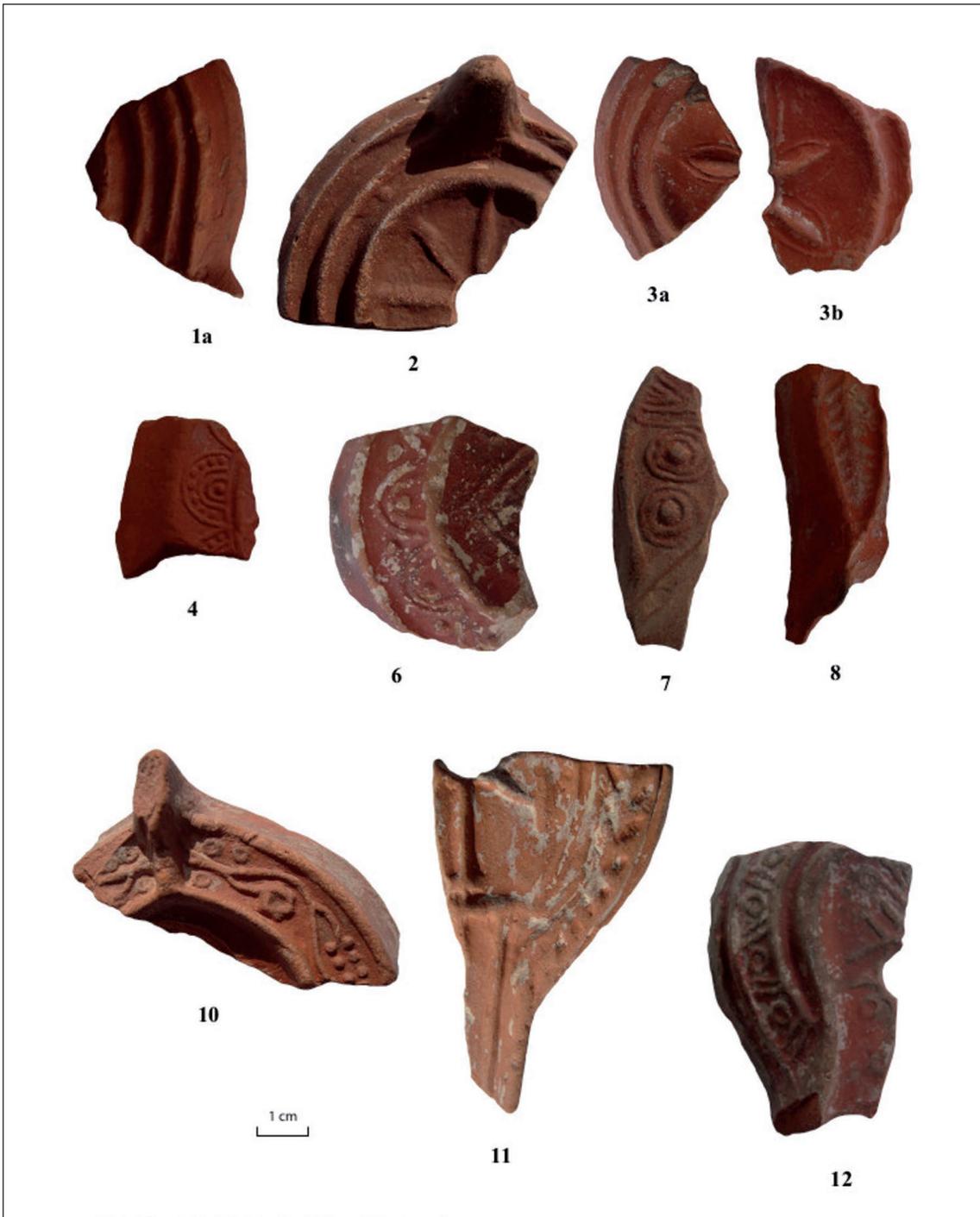


Fig. 7 : Sidi Aïch. Sigillée africaine. Lampes.

ductions classiques toutes originaires du Centre de la Tunisie (SA-L 1-4 avec Atlante VIIAI, SA-L 5-8 avec Atlante X et SA-L 9 avec Atlante XBI) dont les répertoires décoratifs appartiennent aux phases tardives de la C (C3 et C4) et de la D (D1 et D2). En effet, la typologie établie pour cette catégorie montre bien que malgré la possibilité d'insérer les types de lampes dans le cadre des grands courants techniques et stylistiques de l'époque, une marge d'authenticité reste persistante que ce soit au niveau du répertoire décoratif (types 1-3) ou tout simplement au niveau de l'aspect général (type 4) (fig. 7, 10, 11).

Chronologiquement, et en se basant sur le rapprochement et la comparaison des produits de Sidi Aïch avec les productions dites « classiques » d'une part et en se référant aux données résultantes des fouilles archéologiques effectuées à Tébessa¹² et à Sétif¹³ d'autres parts, nos investigations nous ont permis de distinguer deux notions différentes concernant l'activité de cet atelier : primo « période d'activité » qui s'étend, vraisemblablement, de la fin du IIe s. jusqu'au début du VIIe s. et secundo « apogée d'activité » située, sans aucun doute, au cours des IVe et Ve siècles.

Aussi, les différentes typologies élaborées ont facilité nos efforts pour déterminer les circuits commerciaux et délimiter l'aire de diffusion des produits du *Vicus Gemellae*. Néanmoins, il faut noter que cette délimitation s'effectue, pour le moment, essentiellement, à partir des publications.

Un coup d'œil sur la carte¹⁴ suffit pour réaliser l'importance de la position stratégique qu'occupe ce site aux limites sud de la région oléicole du Centre-Ouest. En effet, il est situé à la lisière de deux mondes économiques différents et complémentaires à la fois : au nord le monde de l'oléiculture et de l'élevage et au sud le monde des oasis et du Sahara.¹⁵ Cette particularité exceptionnelle avait eu, sûrement, beaucoup d'impact sur la capacité, la qualité, la diversité et la diffusion des productions de cet atelier.

On peut, d'ores et déjà, envisager deux niveaux de commercialisation : le premier provincial et concerne la Byzacène, le deuxième interprovincial et concerne la Numidie, la Proconsulaire et la Tripolitaine. Les investigations ont révélé l'hégémonie, incontestable,¹⁶ des productions de cet atelier dans deux sites de la Byzacène du Sud-Ouest (Thelepte et Majoura)¹⁷ (fig. 1) ce qui nous donne les jalons d'un premier espace vital ou « fief » de cet atelier. Vient, ensuite une deuxième zone, que nous pouvons dénommer « zone d'interférence », où coexistent un bon nombre de productions provenant surtout des différents centres de la Byzacène centrale et où les produits de Sidi Aïch semblent être bien représentés. Dans cette zone, les recherches sont encore embryonnaires et donc, ne permettent pas bien de discerner les différentes productions. Effectivement, cette dernière constatation est fort éloquent dans le paragraphe consacré par Hayes aux céramiques de la Byzacène du Centre-Ouest, la région de Kasserine (Cillium) et de Sbeitla (Sufetula), qui les a attribuées, à un important centre de production qui serait, selon lui, situé quelque part dans l'Ouest tunisien.¹⁸ Or, les caractéristiques techniques et formelles de ces pièces ne laissent pas de doute quant à leur appartenance aux ateliers du *Vicus Gemellae* ; c'est le cas pour la forme Hayes fig. 58c¹⁹, dont le fond interne

est décoré d'un poinçon type Sidi Aïch 59 (fig. 6). Ces propos sont confirmés aussi par l'étude de L. Neuru sur les céramiques de la région de Kasserine²⁰ qui d'une part illustre bien la forte présence des produits de nos ateliers dans le faciès étudié (au moins 27 (?) sur les 57 formes illustrées) et d'autre part, appuie, d'une certaine façon, notre position puisque ses investigations n'avaient permis ni de détecter ni de soupçonner l'existence de la moindre trace d'un atelier de ce genre de céramique²¹. Notre visite au musée de Sbeïtla nous a révélé aussi l'existence de pièces recueillies aux alentours de cette ville provenant de Sidi Aïch (formes 11 et 12 (fig. 4) et lampes types 1 et 4 (fig. 7) ;²² les produits de cet atelier sont présents également à Haïdra (Ammaedara).²³ Aussi, c'est de ces mêmes régions frontalières que provient la majorité des pièces formant la collection privée d'Aubert-Bues.²⁴ Cette dernière renferme, en plus du poinçon-matrice de Sidi Aïch,²⁵ des plats types 11, 12, 18, 20 et 21.6 (fig. 4) et des cruches types 80–81 (fig. 5).

Plus au nord, en Afrique proconsulaire, les investigations menées par John Lund dans la vallée de Segermes²⁶ ont révélé de formes propres à cet atelier : Stern XVIII SA-I, Stern XIX SA-II et Stern XL a.²⁷

À l'est, des indices très importants nous ont été offerts par les auteurs de la « reconnaissance archéologique et géomorphologique du littoral »,²⁸ qui affirment la diffusion des produits de Sidi Aïch vers les régions du Golfe de Gabès et notamment entre Skhira au nord et Bahiret-el-Bibane au sud.²⁹ Ainsi, cette prospection a permis de recueillir des fragments de type 18.2, 32–35 (fig. 4) (= Stern Id) pour le n° 65, fig. 7, type 19, 36–37 (fig. 4) (= Stern Ie/Ih) pour le n° 73, fig. 7, type 21.1, 39–41 (fig. 4) pour le n° 69 fig. 7, type 21.2, 42 (fig. 4) (= Stern Ie/Ih) pour les n° 70 et 72 fig. 7, Stern IV³⁰ pour le n° 71 fig. 7 et variante type 54.2.3, 209–211 (fig. 3) pour le n° 67 ; des poinçons décoratifs type Sidi Aïch 47 (fig. 6, 47) pour le n° 80, fig. 8 ; type 57.2 pour le n° 79 et type 59 pour le n° 74 (fig. 6, 59) et des lampes (fig. 7) S.A-L7 pour le n° 82, fig. 9, S.A-L 1a pour les n° 84–85, S.A-L10 pour le n° 86 et S.A-L11 pour le n° 90).

Les débouchés de nos ateliers s'étendaient, apparemment, encore plus loin vers le sud-est, pour atteindre Germa en Libye.³¹ A l'ouest, en Algérie du Centre-Est et du Sud notamment, la diffusion des produits des ateliers de Sidi Aïch semble être attestée au sud d'une ligne qui s'étend de Theveste (Tébessa), au Centre-Est, jusqu'au massif de l'Aurès, au nord-ouest en passant par Sétif (Sétif) au nord-est.

En effet, les travaux menés par Robert Lequément dans l'amphithéâtre de Tébessa³² ont mis au jour un bon nombre de fragments de formes (95 tessons) que nous croyons fort, sur la base de leurs caractéristiques techniques et formelles, appartenir aux ateliers de Sidi Aïch. De même, les fouilles qui ont été entreprises à Sétif entre 1959 et 1966³³ ont offert un matériel céramique divers qui renferme, entre autres, sept fragments dont nous estimons l'appartenance à notre site.³⁴ D'autre part, les prospections de Pierre Morizot³⁵ aux alentours de l'Aurès dans les régions de Bedoura, Bades, Chrak-Eddoud et Borj-Babaha, ont aussi révélé, à leur tour, des fragments qui optent, aussi bien par leurs formes que par leurs caractéristiques techniques, en particulier la qualité de la pâte, pour une appartenance à nos ateliers (surtout les formes Sidi Aïch 21.1) (fig. 4).

Enfin, d'autres témoignages de cette diffusion vers l'Ouest sont fournis par les investigations qui ont touché des régions situées plus au sud et menées par le chercheur algérien Mustapha Filah.³⁶ Le matériel céramique recueilli par ce dernier dans les régions de Henchir Aourir, Henchir el-Hassi, Henchir Merouane, Zarrie et Snab el-Abiod, a renfermé des produits provenant de Sidi Aïch, à savoir des tessons de formes ouvertes notamment celles de type 60.1.2 n° 228 (fig. 5) (= Stern XXXIII), des variantes des formes 64 n° 238, 242 et 243 (fig. 3) et 66 n° 250–253 (fig. 5) (= Stern XXXc et Stern XXXa) ; en plus, des poinçons décoratifs qui consistent en des palmes type 3, des cercles dentés type 47 (fig. 6, 47) et style I.1 (fig. 6, 1) et des triangles globuleux type 64 (fig. 6, 64). C'est, aussi, dans cette région du sud de l'Aurès que s'élevait, jadis, le camp de Gemellae (au lieu dit el-Kasbat)³⁷ d'où provenaient des pièces produites à Vicus Gemellae.³⁸

Effectivement, ces potiers semblent avoir tissé des relations beaucoup plus complexes que nous le croyons, avec une vaste clientèle dispersée à travers un territoire immense qui s'étend du Golfe de Gabès à l'Est jusqu'au massif de l'Aurès à l'Ouest et des piémonts Sud de la Dorsale en passant par Tébessa et Sétif au Nord jusqu'aux forts du Limes au Sud.³⁹

Avant de conclure, on va tenter d'esquisser, en se référant aux données actuellement disponibles, les contours de l'espace de diffusion des produits des ateliers de Sidi Aïch (fig. 8). A ce propos, nous pouvons conforter une idée, déjà courante auprès des céramologues, à savoir que l'aire de diffusion est, vraisemblablement, de caractère exclusivement continental. En effet, situés loin du littoral, les potiers du Vicus Gemellae avaient opté pour des circuits terrestres afin d'écouler leurs produits

Cette distribution⁴⁰ strictement méridionale et continentale trouve son explication, entre autres, dans une « stratégie » de commercialisation axée sur des circuits préférentiels⁴¹ qui garantit aux potiers de Sidi Aïch d'écouler leurs poteries dans des débouchés bien déterminés et ceci à maints égards. D'une part, ces marchés étaient, généralement, situés un peu à l'écart de l'hégémonie et de la concurrence des productions dites « classiques », puisqu'on constate que les produits de nos ateliers sont plus importants dans les sites de l'intérieur que dans ceux proches de la côte ou véritablement côtiers ; d'autre part, le pouvoir d'achat de la clientèle dans les sites méridionaux de l'intérieur semble être en « harmonie » avec la qualité des poteries du Vicus Gemellae.⁴²

Donc, cette distribution continentale des produits de Sidi Aïch n'était en fait que la conséquence d'une répartition plus générale des marchés et des zones d'influence entre les différents centres de production qui essayaient, chacun de son côté, de se tailler la plus grande part des marchés de consommation en fournissant des produits qui tout en satisfaisant leurs besoins fonctionnels et esthétiques prenaient en considération leur niveau socio-économique.

Au terme de ce travail au cours duquel nous avons passé en revue les principaux traits caractéristiques des productions de Sidi Aïch (typologies, degré « d'imitation » et marge d'originalité, chronologie approximative et aire de diffusion), nous tenons à rappeler que nos investigations se sont déployées pour englober d'autres centres pro-

ducteurs de céramique en Byzacène du Sud-Ouest, notamment ceux de Majoura⁴³ et de Thelepte,⁴⁴ au sein desquels on a tenté de démêler les productions locales des celles importées ce qui est une tâche peu évidente vu le grand nombre de petits ateliers locaux dans la région.

Notes

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¹ Sauf mention contraire, toutes les illustrations sont l'œuvre de l'auteur.

² Notre site couvre 26,466 hectares.

³ Sidi Aïch est situé entre 8°45'–8°55' de longitude et 34°/40'–34/45' de latitude nord.

⁴ Et non celui d'Oudna, comme cela est souvent signalé : cf. ; par exemple Atlante 1981, 12 ; Barraud et al. 1998, 139 ; Mackensen 1998, 23.

⁵ Cagnat 1888, 473 sq.

⁶ Stern 1968, 146 sq.

⁷ À propos de ce terme, voir Morel 1981, 25.

⁸ Dans ce sens voir par exemple Février 1964, 129–137.

⁹ Cf. Nasr 1992 et al. 1994.

¹⁰ Cf. Nasr 2005, 79–278 pl. I–CXIV.

¹¹ Je saisis l'occasion pour remercier mon ami et collègue, M. Bonifay de m'avoir bénéficié de ses suggestions concernant les dessins de 75 poinçons inédits de Sidi Aïch que je lui ai confié pour avis.

¹² Lequément 1968, 159–241.

¹³ Guéry 1970, 107–161.

¹⁴ Carandini 1970, pl. B.

¹⁵ Lassère 1977, 355–357.

¹⁶ Nasr 2005, 283 fig. 17 ; 361 fig. 18 ; 384 fig. 21.

¹⁷ Nasr 2005, 279–472.

¹⁸ Hayes 1972, 303.

¹⁹ Hayes 1972, fig. 59c.

²⁰ Neuru 1987, 175–188.

²¹ Neuru 1987, 186.

²² Je remercie vivement, encore une fois, M. Fathi Béjaoui qui m'a permis d'avoir accès au dépôt du musée de Sbeïtla pour consulter ces pièces encore non inventoriées.

²³ Hayes 1972, 301 fig. 58b.

²⁴ Mukai et al. 2016.

²⁵ Bonifay et al. 2015.

²⁶ Lund 1995, 614 fig. 19.

²⁷ Stern 1968, pl. V.

²⁸ Bonifay et al. 1990.

²⁹ Bonifay et al. 1990.

³⁰ Stern 1968, pl. V.

³¹ Hayes 1972, 300.

³² Lequément 1968, 159–241.

³³ Guéry 1970, 107–161.

³⁴ Cf. Nasr 2005, Tableau n° 17, 496.

³⁵ Ce sont des fragments de sigillée africaine provenant de la région de l'Aurès en Algérie et qui ont été déposés par M. Pierre Morizot au C.N.R.S d'Aix-en-Provence le 2 août 1989.

³⁶ Ce matériel, ramassé par le chercheur Filah Mohamed el Mostafa lors de la préparation de sa thèse de Doctorat intitulée « Recherches sur les agglomérations antiques, le réseau urbain et le paysage rural en Numidie occidentale (Algérie) », Aix-en-Provence, 1986 (inédit), a aussi été déposé par le chercheur au C.N.R.S d'Aix-en-Provence.

³⁷ Lassère 1977, 264.

³⁸ Hayes 1972, 300.

³⁹ Les investigations dans les régions situées au sud du Limes sont encore embryonnaires et par conséquent n'autorisent aucune conclusion. Cf. Guéry 1983, 600–604.

⁴⁰ Qui pouvait s'insérer, d'après les cas de figure du commerce antique proposés par J.-P. Morel, dans les « catégories intermédiaires entre la consommation proprement locale et la diffusion « universelle » c'est-à-dire celle « des échanges à proximité ». Cf. Morel 1982, 207 sq.

⁴¹ À propos des circuits préférentiels, voir notamment Reynolds 1995, 14–16.

⁴² Nasr 2005, 286–279 ; Nasr 2017.

⁴³ Nasr 2015 ; Nasr – Capelli, 2018.

⁴⁴ Nasr 2017 ; Nasr – Capelli, 2018.

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Keramische Verbrennungsöfen der römischen Tradition des III.–IV. Jahrhundert n. Chr. zwischen Prut und Dniester

Sergiu Matveev

Die Etablierung der Sântana de Mureș-Černjachov-Kultur im nord-westlichen pontischen Raum am Ende des 3. Jhs. n. Chr. hat eine neue Etappe in der Entwicklung der Barbarenwelt in der Region markiert. Diese Entwicklung wurde stark durch Einflüsse aus der provinzialrömischen Welt bestimmt, sowie durch Erbschaften aus dem kulturellen Schatz der verschiedenen Barbarenstämme, die eine andere Rolle bei der Bildung dieser Kultur einnahmen. Eine der großen Errungenschaften dieses Gebildes war die Herstellung von Keramikgefäßen, die in ihrer Qualität mit denen aus dem Kaiserreich konkurrierten.

Der geografische Rahmen

Das Untersuchungsgebiet besteht aus der Region zwischen zwei Flüssen: Prut (Pruth) und Nistru (Dniester), wobei die südliche Grenze vom Donaudelta und dem Schwarzen Meer gebildet wird, und die nördliche Begrenzung die Linie von den Quellen des Pruts bis zum Nistru darstellt. Historisch ist dieses Gebiet unter dem Namen Basarabia (Bessarabien) bekannt, vor allem in der ersten Hälfte des 19. Jahrhunderts, als das Territorium in die Grenzen des Russischen Reiches aufgenommen wurde. Nach einigen Grenzänderungen im 19.–20. Jh. ist der Raum zwischen Prut und Nistru heute in zwei politische Einheiten gegliedert: der Norden und der Süden liegen in der Ukraine; der zentrale Teil stellt die Republik Moldau dar. Das nördliche Gebiet umfasst auch die Prut-Nistru-Seite von Bucovina (Bukowina) (Abb. 1).

In den ersten Jahrhunderten der christlichen Ära wurde die Region, vor allem im Süden, schwach besiedelt. Sie wurde ein Raum, in den verschiedene Stämme der Sarmaten migrierten: die Jazygen, die Roxolani, die Alanen usw.; im Norden war die thrakische Kultur verbreitet – die Kultur der Karpaten. Die Demographie veränderte sich stark zugunsten der sesshaften Gemeinden mit der Bildung und Durchsetzung der archäologischen Kultur Santana de Mures – Černjachov. Sie wurde von vielen Forschern geschätzt, da sie sich in der Mitte der zweiten Hälfte des 3. Jhs. n. Chr. ausbildete. Das Bevölkerungswachstum fand einerseits dank der Migration der nordgermanischen Stämme von Goten statt und wurde andererseits im Westen von der dakischen Bevölkerung bestimmt. Ein Teil davon wurde von Kaiser Trajan erobert und in eine römische Provinz gewandelt. Das Gebiet zwischen Prut und Nistru gelangte in den süd-westlichen Sektor der Kultur der Černjachov-Santana de Mures und unterhielt eine intensive und komplexe Beziehung zur römischen Welt. Im südlichen *Castellum* wurde auf dem Gelände

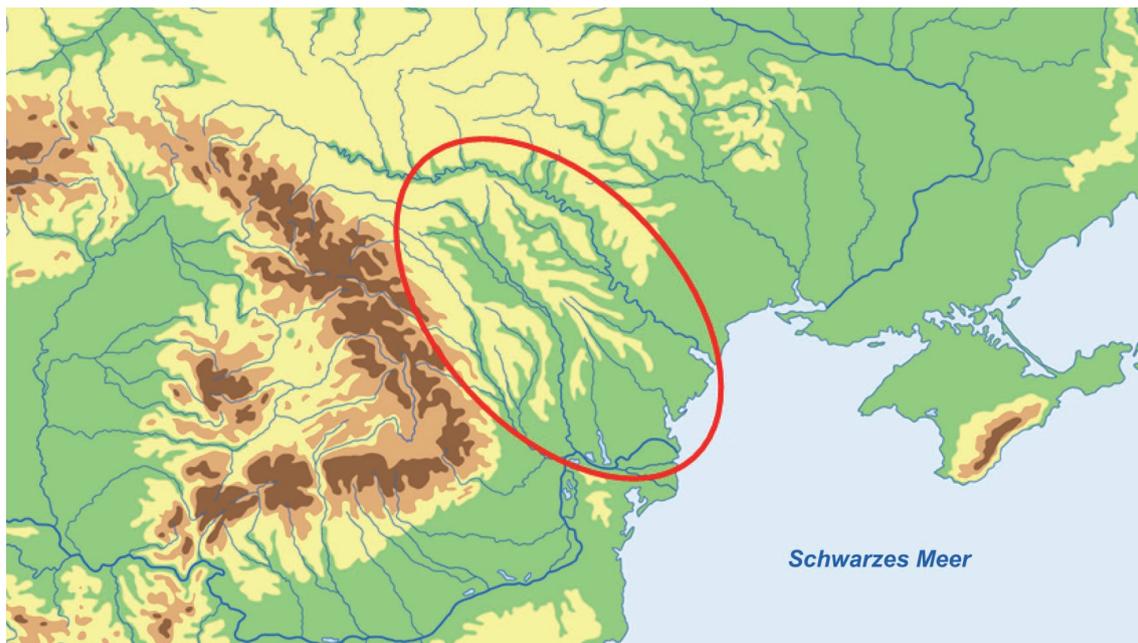


Abb. 1: Geografischer Standort.

eine alte thrakische Befestigung, Aliobrix Roman, identifiziert. Nördlicher befinden sich zwei Erdwälle mit einer Länge von 120–130 km – die Trajanswälle. Die Nützlichkeit, der kulturelle Hintergrund und die Chronologie dieser Wälle sind ein umstrittenes historiographisches Problem.¹ Am Zusammenfluss von Nistru mit dem Schwarzen Meer lag eine griechische *polis*, die zu der Zeit und bis zur zweiten Hälfte des 3. Jhs. n. Chr. von den Römern kontrolliert wurde – Tyras.

Fundrepertoire

Über 1150 archäologische Stätten von sesshaften Gemeinschaften aus den ersten Jahrhunderten nach Christus wurden in dem untersuchten Gebiet während der Zeit nach dem Zweiten Weltkrieg identifiziert. Zum Zeitpunkt der Siedlungen wurden in nur 22 Fällen Trümmer einiger Brennöfen dokumentiert (Abb. 2). Geografisch umfassen diese Entdeckungen den gesamten Raum zwischen Prut und Nistru. Die neueren Entdeckungen im nördlichen Bereich der Töpferöfen (Comarov,² Pruteni,³ Sagaidacul Nou,⁴ Călmățui⁵) werden durch die Tatsache bestimmt, dass die archäologischen Forschungen in der südlichen Region der Ukraine eine sehr begrenzte Fläche einnehmen. Die einzige Ausnahme stellen die Ausgrabungen in der Nähe des Orlivca-Aliobrix-Kastells dar.⁶

Die geringe Anzahl der bekannten Öfen verglichen mit den Siedlungen und die hohe Qualität der in solchen Installationen hergestellten Keramik, bestimmten den historio-

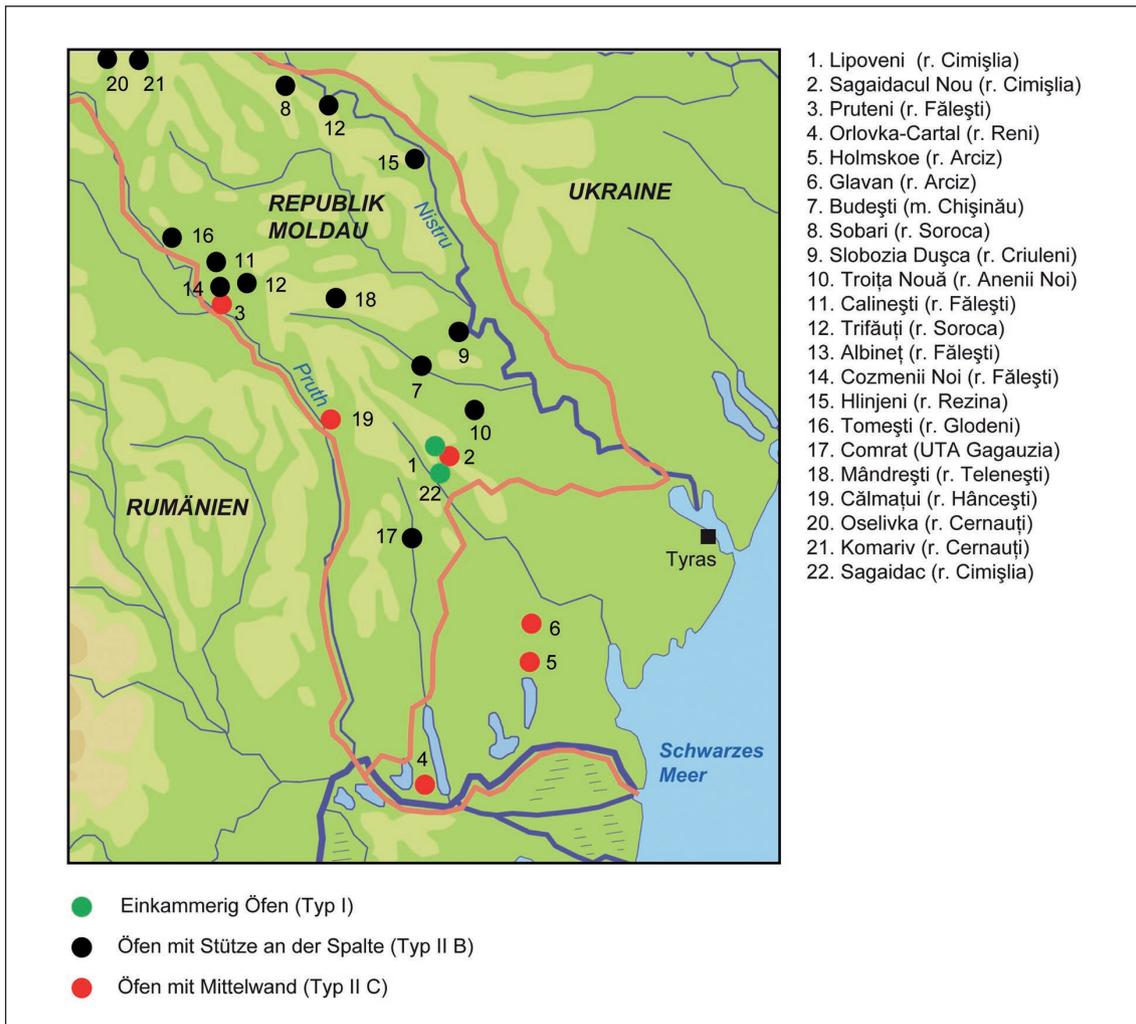


Abb. 2: Lage der Öfen.

graphischen Diskurs des 20. Jahrhunderts, aber auch der letzten zwei Jahrzehnte. Die Frage nach der Existenz einer Kaste von Handwerkern, die eine bestimmte Mikrozone abdeckten, einer Gruppe professioneller Töpfer in jeder Siedlung oder einer möglichen, weiteren Verbreitung der jeweiligen Töpferkunst bleibt fraglich. Der Platz und die Rolle des Römischen Reiches im Kontext des gegebenen Themas soll jedoch neu bewertet werden, um den Grad des Technologietransfers oder den Einfluss der barbarischen Umgebung zur Herstellung des feinen und groben Keramiksortiments zu bestimmen.

Die Hypothese, dass es einige herausragende Zentren in der Keramikproduktion mit der Töpferscheibe gab, scheint sich nach den aktuellen Ausgrabungen zu bestätigen. Dr. Robert Gindele hat in Medieșu Aurit-Șuculeu im Nord-Westen Transsilvaniens Untersuchungen durchgeführt.⁷ Mithilfe von geophysischen Daten, die durch archäologische Interventionen bestätigt wurden, konnten hunderte von Öfen und Eisen-

reduktionsgefäßen entdeckt werden. Ohne jedoch die Existenz spezialisierter Zentren zu leugnen, betrachten wir auch die Existenz von Töpferwerkstätten auf der Ebene der Standorte oder in einigen benachbarten Gebieten. Die reduzierte Anzahl der Öfen ist wahrscheinlich das Ergebnis des heutigen Kenntnisstands. Diese wurden vielmehr durch die Spezifik der Keramik bestimmt. Es bedeutet, dass die Werkstätten sich am Rande von Siedlungen befanden, aufgrund des Brandschutzes sowie der Nähe zu Wasserquellen und Ton. Maßnahmen für die südlichen und nördlichen Teile der Siedlungen zeigt die Bewegungsrichtung der Winde. Ethnographische Studien bestätigten diese Hypothese. So konzentrieren sich archäologische Untersuchungen in der Regel auf den zentralen Standort, doch häufig befinden sich die Werkstätten außerhalb des untersuchten Bereichs.

Die Typologie der Öfen

Traditionell besaßen die Keramiköfen in der barbarischen Umgebung des Raumes in der Grube eine einzige Kammer (Typ I). Üblicherweise wurden solche Öfen für handgefertigten Keramik verwendet. Die lokale Keramik, die in der barbarischen Umgebung bis in die ersten christlichen Jahrhunderte an der Töpferscheibe hergestellt wurde, war ein einzigartiges Phänomen. Sie wurde in der zweiten Art von Öfen, den Zweikammeröfen (Typ II) gebrannt. Seit den ersten Jahrhunderten der neuen Ära und am Ende des 3. bis 4. Jh. n. Chr. herrscht die Keramikbrennung auch in der Kultur Santana de Mures-Černjachov sowie am Rande der Städte vor und nimmt jetzt 90–95% der lokalen Produktion ein. Entscheidend für die Unterscheidung von zwei Varianten von Öfen ist die Abwesenheit einer Stütze (Typ II A) oder das Vorhandensein eines Ofenrostes. Im Falle des letzteren wurden zwei Konstruktionsvarianten identifiziert: Stütze in der Mitte (Typ II B) oder an der Mittelwand (Typ-II-C). Im Raum zwischen Prut und Nistru wurden derzeit keine Typ-II-A-Öfen identifiziert (Abb. 3. 4). Die zwei bzw. drei Öfen, die in Lipoveni entdeckt wurden (Abb. 5), sind eher dem häuslichen Bedarf und nicht der Keramikbrennung zuzuweisen.⁸

Die meisten der Zweikammer-Installationen produzierten reduziert gebrannte Keramik, die sich nach dem Brennen gräulich färbte. Theoretisch wäre die Farbe der inneren Wände der Brennkammer grau, ein Indikator für den Brennmodus oder zumindest für die letzte Charge: oxidierend oder reduzierend. Die Vorherrschaft der grauen Keramik gegenüber der roten ist auch durch die Koaleszenz der Stücke, die während der archäologischen Ausgrabungen gesammelt wurden, belegt. Die einzige Ausnahme eines Standortes mit einer hohen Anzahl von roter Keramik ist Sobari (Soroca), der von E. Rikman hervorgehoben wird.⁹ Dies ist mit der Sekundärverbrennung eines Teils der Keramik und der hohen Anzahl importierter Keramik aus der römischen Provinz zu erklären. So macht in Sobari die lokale Keramik in der Regel den überwiegenden Anteil der grauen Töpferware aus.

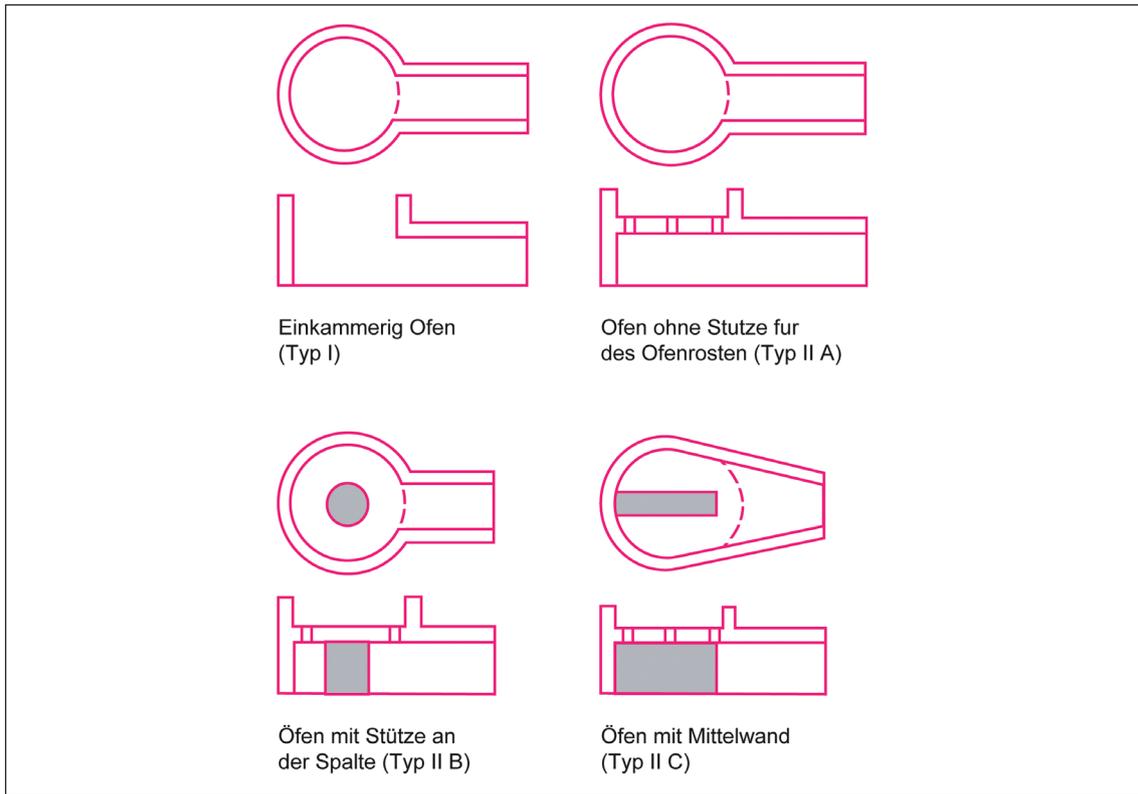


Abb. 3: Arten von Öfen.



Abb. 4: Rekonstruktion eines Ofens.

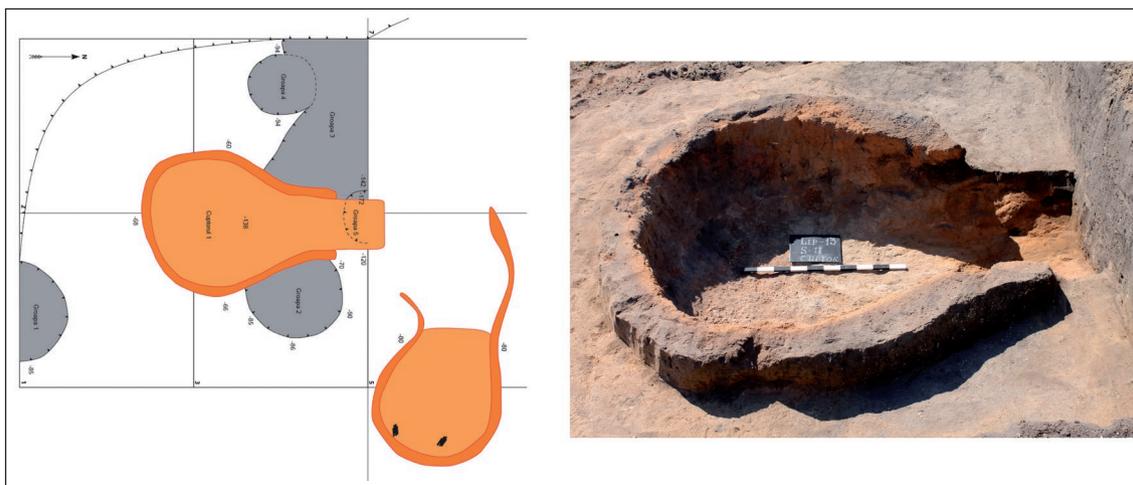


Abb. 5: Die Öfen von Lipoveni (Cimișlia).

Ein besonders interessanter Fall einer Töpferwerkstatt wurde vor kurzem in Sagaidacul Nou (Gemeinde Cimișlia) identifiziert. Hier wurden drei Zweikammer-Öfen und zwei Ofengruben freigelegt. Aus typologischer Sicht waren es drei Öfen, die bei Ausgrabungen auf dem Gebiet der spätrömischen Ära von Sagaidacul Nou entdeckt wurden. Mit vielen Ähnlichkeiten, aber in einigen Fällen zeigten sie auch einige Unterschiede. Von nahezu konischer Form, mit einem maximalen Durchmesser von etwa 1,35 m, wurden die Öfen größtenteils in den Boden gegraben. Sie bestanden aus zwei übereinander liegenden Kammern (der Brenn- und der Feuerkammer), die durch ein Gitter aus Ton getrennt waren, welches mit 25–40 Löchern für die Heißluftumwälzung perforiert war. Die Feuerräume waren mit einer Mittelwand zur Abstützung der Brennplatte versehen und in der Verlängerung der Mauer befand sich das Praefurnium, dessen Länge zwischen 0,80 m und 1,35 m betrug.

Es ist interessant zu betonen, dass der Ofen 2 die Brennkammer im östlichen Teil besaß, während die anderen beiden Installationen eine gemeinsame Zugangsgrube hatten. Es ist auch wichtig anzumerken, dass der Ofen 1 teilweise die Töpferkammer und den Feuerkanal der Anlage 2 überlappt, was zeigt, dass die Komplexe nicht gleichzeitig entstanden sind, wobei der zweite Ofen in einer früheren Siedlungsphase genutzt wurde. Dagegen wurden die Brennplatte sowie die Mittelwand des Ofens 3, nachdem dieser bereits in einem gewissen Zeitraum genutzt wurde, seit der Antike vollständig außer Betrieb gesetzt. Hinsichtlich der Mittelwände der beiden anderen Öfen wurde gezeigt, dass die Trennwand des Ofens 2 aus Ton gemacht wurde, während die von Ofen 1 im Füllboden des Eingangs des Ofens 2 angeordnet wurde. Für einen besseren Widerstand wurde ein Flusstein verwendet (Abb. 6. 7).



Abb. 6: Die Öfen von Sagaidacul Nou (Cimișlia).

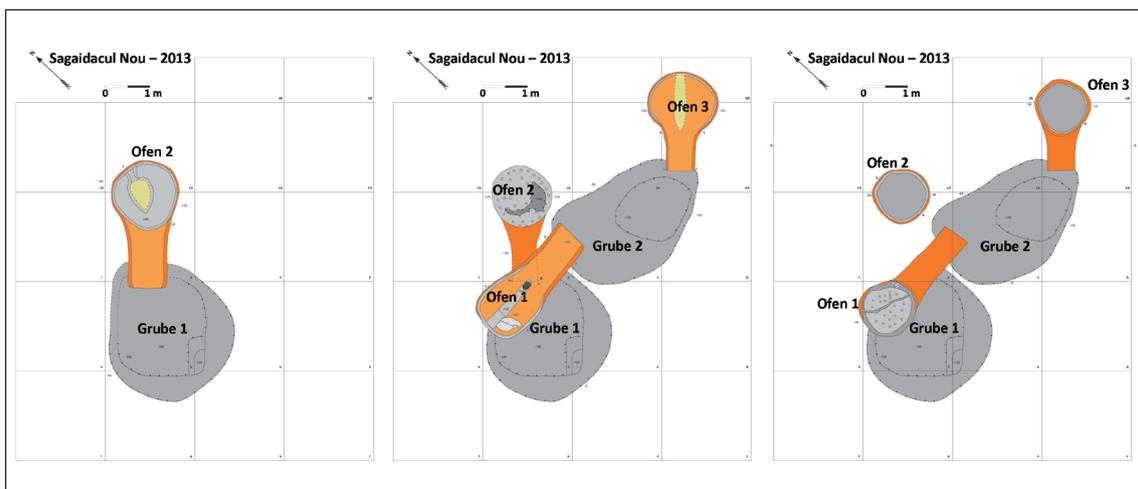


Abb. 7: Die Nutzungsphasen der Keramikwerkstatt in Sagaidacul Nou (Cimișlia).

Historiographische Probleme

Die Historiographie der Zweikammeröfen ist vielfältig. Eine der ersten Hypothesen bezüglich der kulturellen Herkunft der Zweikammeröfen wurde von M. Tichanova eingeführt, der in ihnen eine keltische Tradition der Latenezeit sah.¹⁰ In Studien, die 1960 veröffentlicht wurden, schließt auch der Archäologe G. Fedorov einen keltischen Ursprung von Zweikammeröfen im Prut-Nistru-Raum zwischen dem 3. und 4. Jh. v. Chr. nicht gänzlich aus und schlägt vor, dass die Innovation aus Dacia/Dakien kommt, wo es eine starke keltische Tradition gibt.¹¹ Die Zweikammeröfen sind ein allgemeines europäisches Merkmal der Barbarenwelt in der Nähe des römischen *Limes*. Die These einer keltischen Herkunft wurde später von A. Bobrinskij unterstützt, der auf einen Indikator für Öfen des keltischen Typs hinwies – das Vorhandensein des Ofenrostes.¹²

Für den südlichen und östlichen Karpatenraum wurde eine Forschungsarbeit von R. Alaiba durchgeführt. Er entdeckte 61 Öfen in 41 Stationen, die ihren Ursprung im 2.–4. Jh. n. Chr. haben.¹³ Dies ist eine Verbindung zur römischen Welt. Einzelne bekannte Öfen sind an Poaina-Cetate an den Grenzen der Wälder von Pădureni Jariștea-Pițigoi und Poiana-Silistea. Mehr als 10 Grabungsbefunde stammen aus dem 2.–3. Jh. n. Chr. und bis zum 4.–5. Jh. n. Chr. erreichen sie eine Anzahl von ein paar Dutzend.

Schlussfolgerungen

Der Zweikammerofen ist die am weitesten entwickelte Installationsform der Keramikverbrennung in der barbarischen Welt der nord-westlichen pontischen Region. Die Verbreitung dieser Öfen hat klare Ähnlichkeiten und ist eine direkte Folge des Einflusses des Römischen Reiches in dieser Region. Die Kartographie der offensichtlichen Befunde zeigt zwei Verbreitungsgebiete der Öfen: im Süden gekennzeichnet durch die Lochtenne, die im Norden hingegen nicht vorhanden war (Abb. 8). Diese Schlussfolgerung beruht auf einer großen Anzahl ungesicherter Befunde und unzureichender Dokumentationen zum Zeitpunkt der Forschung. Eine wichtige Anmerkung ist, dass der hier besprochene Töpferbezirk auch den chronologischen Unterschied hervorhebt. Die Entdeckungen im südlichen Teil mit Öfen mit einer zentralen Stütze stammen aus dem 3. Jh. n. Chr., mit einiger Wahrscheinlichkeit auch aus dem 2. Jh. n. Chr. Mit Ausnahme der drei Öfen, die im Sagaidacul Nou analysiert wurden. Diese stammen klar aus dem 4. Jh. n. Chr. Spezifisch sind auch andere isolierte Öfen aus der letzten zurückgewonnenen Charge in Pruteni. Innerhalb der Brennkammern wurde eine Nachahmung eines römischen Amphorentyps identifiziert, die eine interdisziplinäre Neubewertung dieses Fundes erfordern würde.¹⁴ Öfen aus der nördlichen Region mit einem auf einer zentralen Säule platzierten Gitter stammen aus dem 4. Jahrhundert n. Chr. und die Hypothese erfordert eine Erhöhung der Anzahl der Öfen um sie zu bestätigen oder abzulehnen.

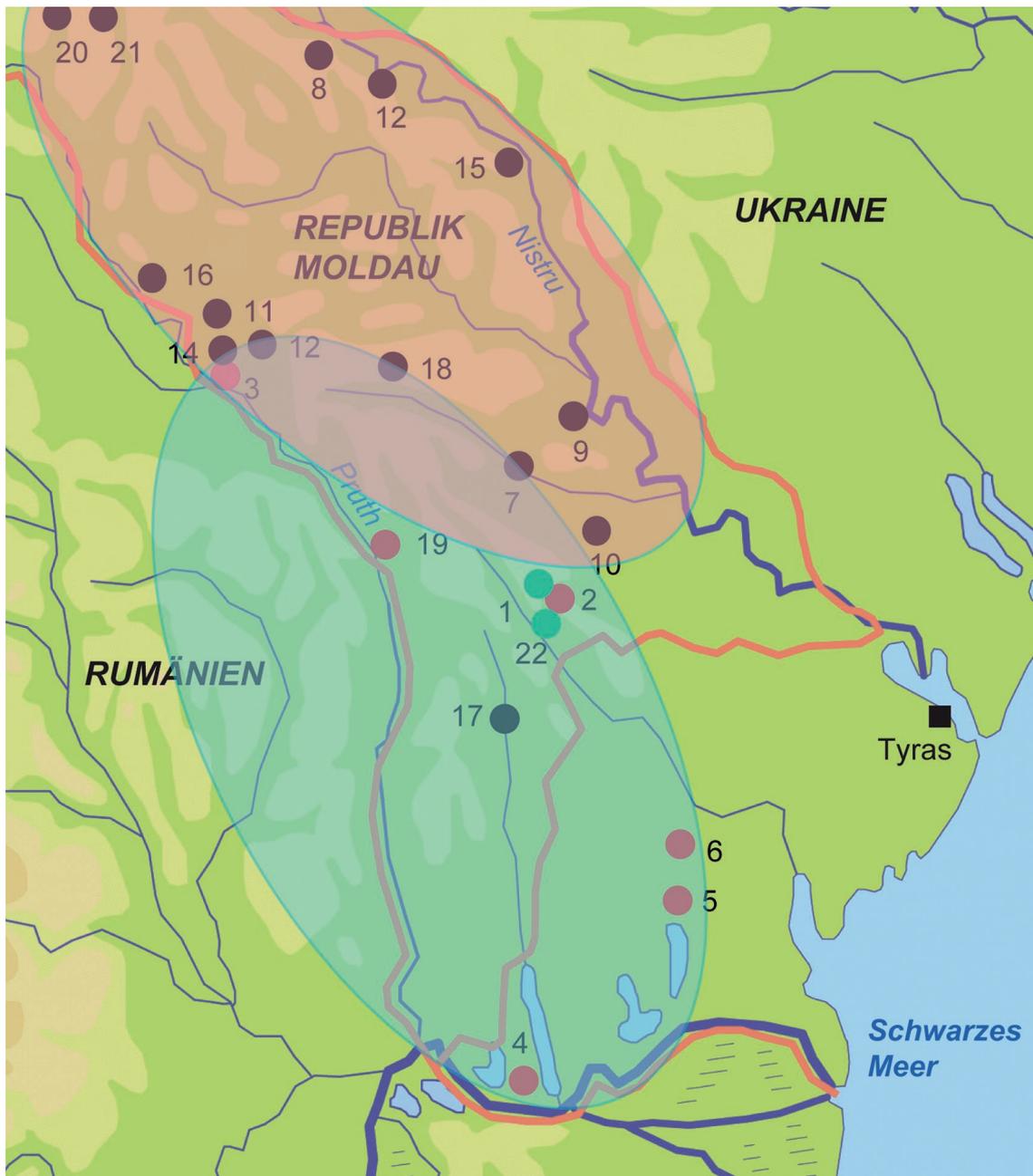


Abb. 8: Verbreitungskarte verschiedener Arten von Öfen.

Die typologische Analyse beweist eine große Verbreitung der Zweikammeröfen, einschließlich der Gebiete mit einzelnen keltischen Entdeckungen. Diese Tatsache ist unseres Erachtens ein Beweis dafür, dass die Töpfertradition unter der ansässigen Gemeinde des nord-westlichen pontischen Gebiets im 3.–4. Jahrhundert n. Chr. in der Römischen Provinz verbreitet wurde.

Anmerkungen

- ¹ Matveev – Balan 2016, 141–148.
² Petrusckas 2014, 165–183.
³ Vornic et al. 2007.
⁴ Matveev – Vornic 2014, 93–106.
⁵ Matveev – Vornic 2018, 125–136.
⁶ Brujako – Dzigovskij 2015, 243–265.
⁷ Gindele 2014, 337–343.
⁸ Matveev – Vornic 2017, 124–163.
⁹ Rikman 1970, 183–190; Rikman 1975, 168 f.
¹⁰ Tichanova 1973, 129–137.
¹¹ Fedorov 1960, 125 f.
¹² Bobrinskij 1991, 189–208.
¹³ Alaiba 2008.
¹⁴ Vornic et al. 2007, 117–119.

Abbildungsnachweis

Abb. 1–3: S. Matveev. – Abb. 4: nach Bobrinskij 1991, 80 Abb. 31. – Abb. 5–8: S. Matveev.

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Abkürzungen

AMT.IVA – Acta Musei Tutovens. Istorie veche și arheologie, Bârlad.

APRM – Arheologia Preventivă în Republica Moldova, Chișinău.

KSIA – Kratkie Soobščeniya Instituta Archeologii, Moskva.

MASP – Materialy po Archeologii Severnogo Pričernomor'ja, Odesa.

MIA – Materialy i Issledovanija po Archeologii SSSR, Moskva.

Plural – Plural, Chişinău.

SA – Sovetskaja Archeologija, Moskva.

Pottery and Exchange at the Imperial Fringe: Samian Ware at Rural Settlements in Wales and the Marches

Leah Reynolds

Introduction

This paper presents aspects of an analysis and reinterpretation of the settlement distribution and material culture of rural settlements in Wales and the Marches during the Roman period. This was a region at the very western edge of the Roman world, and consequently, has often been at the periphery of Romano-British studies. An historic lack of rural evidence and an academic focus on the military at the expense of the civilian within this region has resulted in a limited exploration of the transformative processes of incorporation into the Roman empire and of the ways in which this region responded and adapted to the new economic and social realities.

In order to redress this oversight, the distribution patterns of various forms of material culture have been mapped and analysed. This paper will provide a brief overview of the scope of this research with a particular focus on the ceramic evidence and the methodology by which these data have been compiled and analysed. Data have been incorporated from a range of excavations of varying ages and extents in order to build a methodology for inter-site comparison. The distribution of imported wares into the region will be presented, with a particular focus on Samian ware (also known as terra sigillata¹) as a means of exploring the economic and social integration of a region at the edge of the Roman world. Pottery is one of the most abundant forms of evidence available to archaeologists. It is found on almost all sites, and indeed is sometimes the only form of material culture present; this is particularly true for sites and regions which are otherwise materially poor, such as Wales and the Marches. Pottery assemblages therefore represent a rich source of material for analysis in these regions. Through the quantification and analysis of assemblages, wider economic and social research questions can be explored.

The Scope of Research

The study region comprises the modern principality of Wales and parts of the English counties which have historically been termed the Welsh Marches, from the Severn Estuary to the south to the Dee Estuary to the north.²

In the pre-Roman Iron Age, this region was a patchwork of tribal communities with diverse histories, practices, and attitudes to the Roman occupation. While some areas were integrated into the new province early in the conquest period, fierce resistance

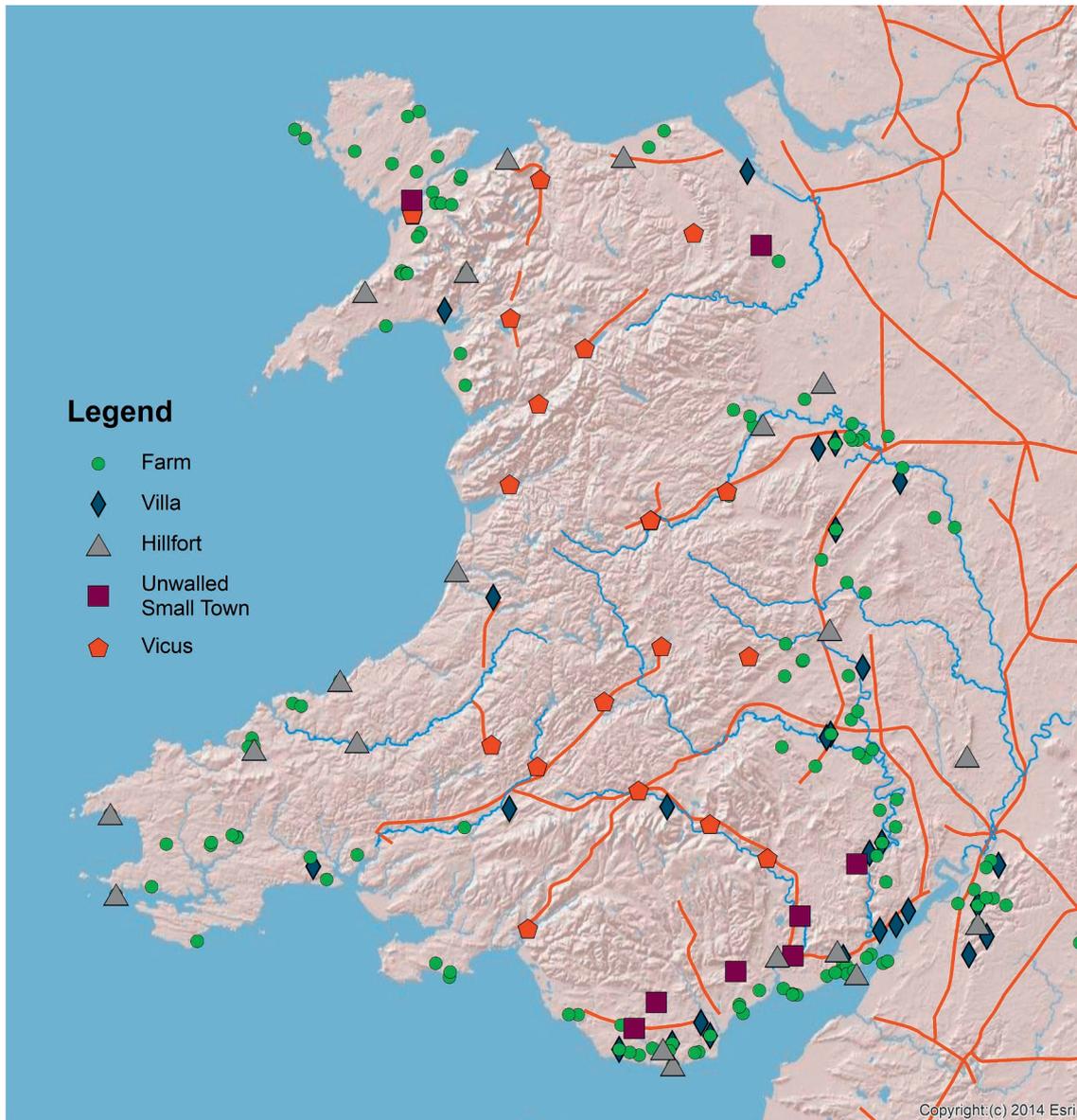


Fig. 1: The study region with all sites marked (data from Rural Settlement of Roman Britain).

was encountered in others;³ the region did not fully come under Roman control until the late AD 70s. However, despite the violence and duration of the conquest, intensive Roman military presence was reduced significantly from the late 1st and early 2nd century.⁴ While this was partly a practicality of troop movement demanded by disturbances in the north of Britain, the reduction of the military presence may also be linked to a lack of continued post-conquest resistance.⁵

This was a diverse region with a complex history, and one should expect diverse and complex reactions to the new economic and social realities brought about by incorporation into the Roman empire. One way in which these can be explored is through the examination of material culture. As noted above, pottery is one of the most abundant forms of material culture, even within areas which are otherwise materially poor. Ceramic vessels are objects which are involved both in broad networks of trade and exchange as well as in the much more intimate daily practices of eating and drinking; operating on multiple scales at the same time, they can therefore be valuable subjects of investigation for both economic and social research questions.

The sites which form the dataset of this research project have been identified using the Rural Settlement of Roman Britain Project (RSRB).⁶ The RSRB collated information from rural settlements throughout Roman Britain, with a total of ca. 3600 records of rural sites included in the database. From this dataset, 183 rural sites fall within the study region of this paper (fig. 1).

Although the RSRB database also includes details of material assemblages from its sites, due to the issues associated with the collection of ceramic data for inter-site analysis the ceramic information included as part of the RSRB database is limited. Quantification is by total sherd numbers and assemblage weight, which are not provided in all excavation reports. Of the 183 sites which were included in the research for this paper, data for sherd counts are available for 61% and assemblage weight for 22% of sites.

Where the information has been made available, the sherd count for amphorae, mortaria, and Samian wares have also been provided. Though the RSRB comprises an invaluable data source, the lack of detail with regards to form or even fabric types beyond amphorae, mortaria, or Samian ware means that the potential for analysis is limited. Therefore, the study which forms the basis of this paper has sought to supplement the RSRB data with an expanded pottery database which can capture a wider range of form and fabric data for analysis.

Quantification Type	Total Number of Sites	Data Available	%
Sherd Number	183	112	61
Assemblage Weight	183	40	22

Table 1: Number of sites for which ceramic data is available in the RSRB database.

Conducting analysis at a regional level demands a methodology that can be applied to assemblages of varying size and quality, and from a range of site types excavated under different conditions. Unsurprisingly there are significant obstacles to such work, principally the lack of consistency and standardisation across pottery reports. This affects the recording and presentation of both form and fabric, despite efforts which have been made to standardise identification and recording (such as the National Roman Fabric Reference).⁷ A further barrier is the lack of standardisation in quantification. A variety of methods are used in specialist reports, including sherd count, sherd weight, Estimated Vessel Equivalent (EVE), and Minimum Number of Vessels (MNV).⁸ The most accurate way to conduct inter-site analysis would be through the re-examination of the site archive. Unfortunately, with 183 sites and with pottery forming only one category of artefact under consideration, re-examination of all archives was not possible within the scope of this work. Therefore, a different method of quantification had to be developed which could utilise publicly available ceramic information in order to conduct a broad regional analysis of rural ceramic assemblages.

The methodology which has been used is based on a calculation for Minimum Number of Vessels (MNV), developed from a similar method used by Sian Thomas in her analysis of ceramics from Roman Devon and Cornwall (Thomas 2018), formulated along the guidelines set out by Voss and Allen (2010).⁹ The excavation reports for the sites have been examined in detail and the information has been extracted and input into a database under headings which capture data on form and fabric (Table 2). Sherds with unique attributes, such as rim forms, have been allotted a Minimum Vessel Number (MNV) of 1. Illustrated sherds denoting unique vessels have also been allocated an MNV of 1, although it should be noted that the use of illustrated sherds does privilege unusual forms. In some cases, no quantification was given within the excavation report,

SITE	BASIC FORM	COARSE/FINE	FABRIC	FABRIC – SUB	TYPOL-OGY	EARLY 75–150	MIDDLE 150–300	MNV
Whitton	Bowl	Fine	Samian	Samian – CG	Dr 31	Y	Y	1
Whitton	Bowl	Fine	Samian	Samian – CG	Dr 31	Y	Y	1
Whitton	Bowl	Fine	Samian	Samian – SG	Dr 29	Y	Y	1
Whitton	Bowl	Fine	Samian	Samian – SG	Dr 37	Y	Y	1

Table 2: Example entries from database (some columns omitted).

but where the presence of a vessel was indicated (for example, as part of a context description), the information has been recorded and the appropriate MNV assigned (e.g. 1, 2). Where multiple vessels are indicated by the excavation report, the figure has been recorded or, if none was provided, an MNV of 2 has been preferred. For example, where a simple description of 'cups' or 'bowls' is given, this has been input to the database as MNV 2.

Forms and fabrics have also been simplified into categories that allow for the inclusion of a wide variety of different classification styles used in the various site reports. For example, 'bowl' has been used as the basic form, but any recorded subform or typology is also preserved within the database. Similarly, broad fabric descriptions have been assigned for analysis, though full descriptions have also been preserved and subcategories assigned for closer analysis. In order to track chronological change, the vessels have also been broadly assigned to Early (AD 75–150), Middle (AD 150–300), and Late (AD 300+) periods following the date of production. While these categories are broad (particularly when considering the fine chronological detail available for Samian wares) they allow for the inclusion of coarse fabrics whose date ranges are less securely fixed.

There are inevitably issues with processing secondary data in this way. The primary concern is that the method tends to underestimate the number of vessels at a site. However, it is less misleading to underestimate the number of vessels than to overestimate them. MNV has a further advantage of bringing the use-life of the ceramic assemblage into clearer focus: as Voss notes, 'people don't use sherds; they use vessels'.¹⁰ This methodology was developed for regions where the ceramic record is slight and the evidence is limited, and where it is not possible either to reanalyse the site archive or the original material. As with any archaeological analysis, conclusions drawn from the analysis of assemblages in this way should be understood within the contexts of these caveats and the limitations of the method.

Samian Ware in Wales and the Marches

Having outlined the methodology, the remainder of this paper will explore the data which has been collected with a particular focus on Samian ware. This is a class of pottery which has received extensive study over more than a century,¹¹ and is therefore comparatively well-understood. The consistency of its typology and dating and its distinctive appearance mark Samian ware as distinct among Roman pottery; these characteristics have made it into something of a talisman of 'Romanness'. A further draw of Samian ware as an object of study with reference to Wales and the Marches in particular is that it is an imported fabric which arrives with the Roman military. Therefore, it is connected with large-scale networks of trade and supply in a way in which contemporaneous local fabrics are not.

Within the ceramic dataset MNV 735 Samian vessels from 88 sites have been identified. Their distribution is widespread but unequal across the region, with concentrations in the south-east and in the north-west (fig. 2). The concentration of Samian ware in the south-east is likely due to cultural links with regions to the east, which had a longer tradition of pottery use. This is also a region where villas emerge. Such sites are strongly associated with Samian presence (Table 3). Villas may therefore have been the loci of new practices incorporating Roman introductions such as Samian ware.

The relationship between Samian imports and military presence is also supported by the pattern of their distribution, particularly in the north-west. An otherwise-isolated cluster of Samian presence at rural sites may be linked to the persistent military presence in this region: the fort at Segontium (Caernarvon) was occupied continually from the Flavian campaigns to the late 4th century.¹² The presence of Samian on rural sites in an area which was practically aceramic in the pre-Roman Iron Age may therefore suggest that its distribution was linked to markets based in military rather than civilian supply and demand. The coastal distribution also reinforces the importance of maritime trade routes. These routes would have been significantly easier – and therefore more cost-effective – than difficult land routes through the mountainous upland interior.

While the term Samian ware is commonly used in Romano-British archaeology to refer to the specific products of the Gaulish kilns, a range of kiln sites were used and the dominant centres of production shifted over the period of importation to Britain.¹³ These fluctuations in supply can be identified in the archaeological record by tracking the MNV of vessels which can be identified as products of particular kiln site (fig. 3) and these can serve as a proxy for the chronology of the supply.

The distribution maps of kiln origins also indicate changes in supply over time. Though caution must be exercised (as the identification of vessel origin is highly contingent upon post-excavation analysis), some broad observations can be made. Vessels identified as South Gaulish Samian ware are located primarily in the south-east, with an isolated cluster in the north-west (fig. 4). There are no identified instances of the ware in the west or north-east, though of course this does not mean that the ware was absent in these regions. The South Gaulish production centres – including La Graufesenque – flourished in the 1st century AD but underwent a decline in the late 1st and early 2nd centuries, perhaps as a result of the expanding markets in newly-conquered territories such as Gaul, Germany, and Britannia.¹⁴ Access to the emerging markets may have been

Site Type	MNV	Number of Sites
Farm	656	72
Villa	378	18

Table 3: MNV of Samian cups by site type.

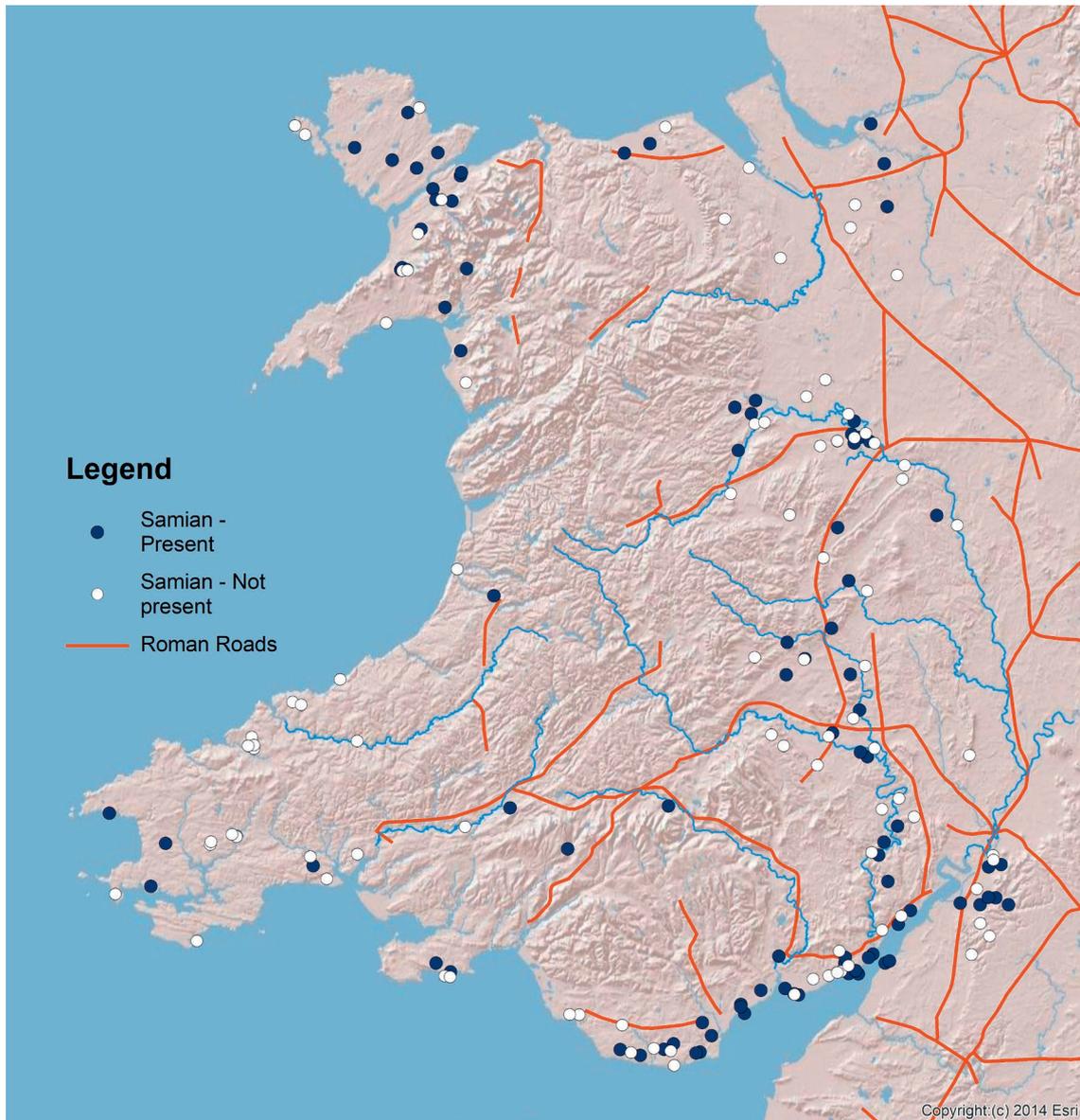


Fig. 2: Distribution of Samian presence and absence at rural settlements within the study region.

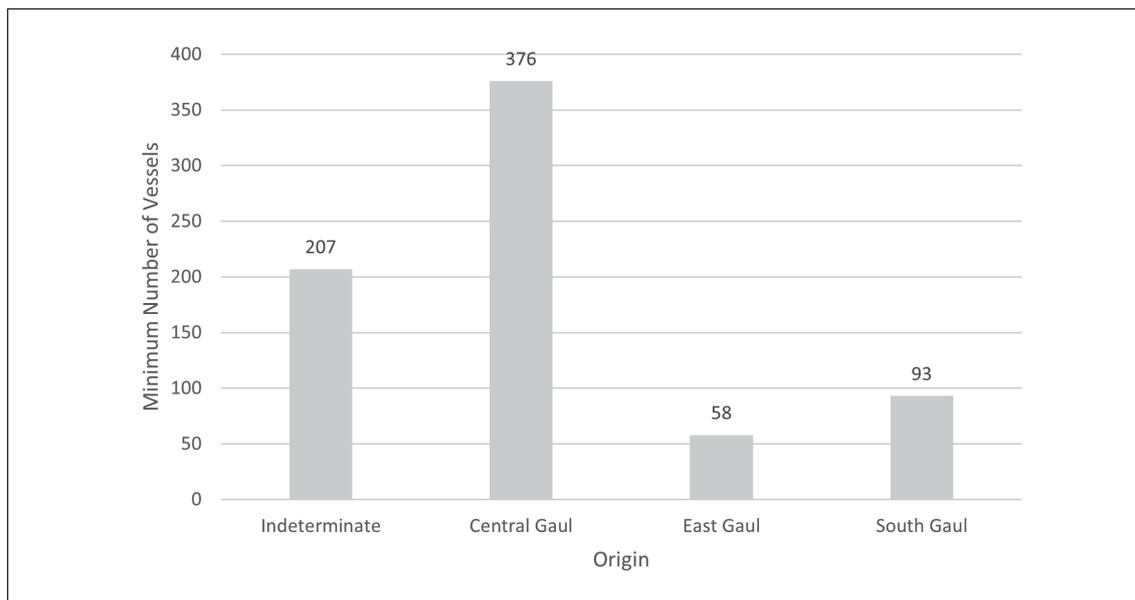


Fig. 3: MNV of Gaulish Samian by origin.

logistically easier from the more northerly centres in central Gaul (such as Les Martres-de-Veyre [AD 100–120] and Lezoux [AD 120 to the late 2nd century]). This is reflected in the dominance of Central Gaulish products in the ceramic assemblages of the study region.

Central Gaulish Samian wares are most widely distributed across the study region. They are identified at 39 sites in total and also appear in isolated instances in the south-west and north-east of the study region, unlike products of South or East Gaul (fig. 5). This suggests that the distribution of Samian ware in Wales and the Marches was at its height during the major period of Central Gaulish export, AD 100–190.¹⁵

The distribution of East Gaulish Samian suggests a contraction of Samian presence to the south-east and north-west of the study region, perhaps influenced by the continued military presence in the north-west and by the urban centre at Caerwent in the south-east. Production of East Gaulish Samian was established by the mid-1st century, but the major period of export to Britain was from AD 120 to AD 260, overlapping and subsequently outlasting Central Gaulish products.¹⁶

Form

Bowls are by far the most numerous Samian form (MNV 239). Fine Samian bowls are often viewed as high-status objects in modern academic literature.¹⁷ Where particular forms can be identified, the total MNV of Samian bowls is largely divided between the undecorated Dragendorff 31 (MNV 79) and the decorated Dragendorff 37 (MNV 76). The

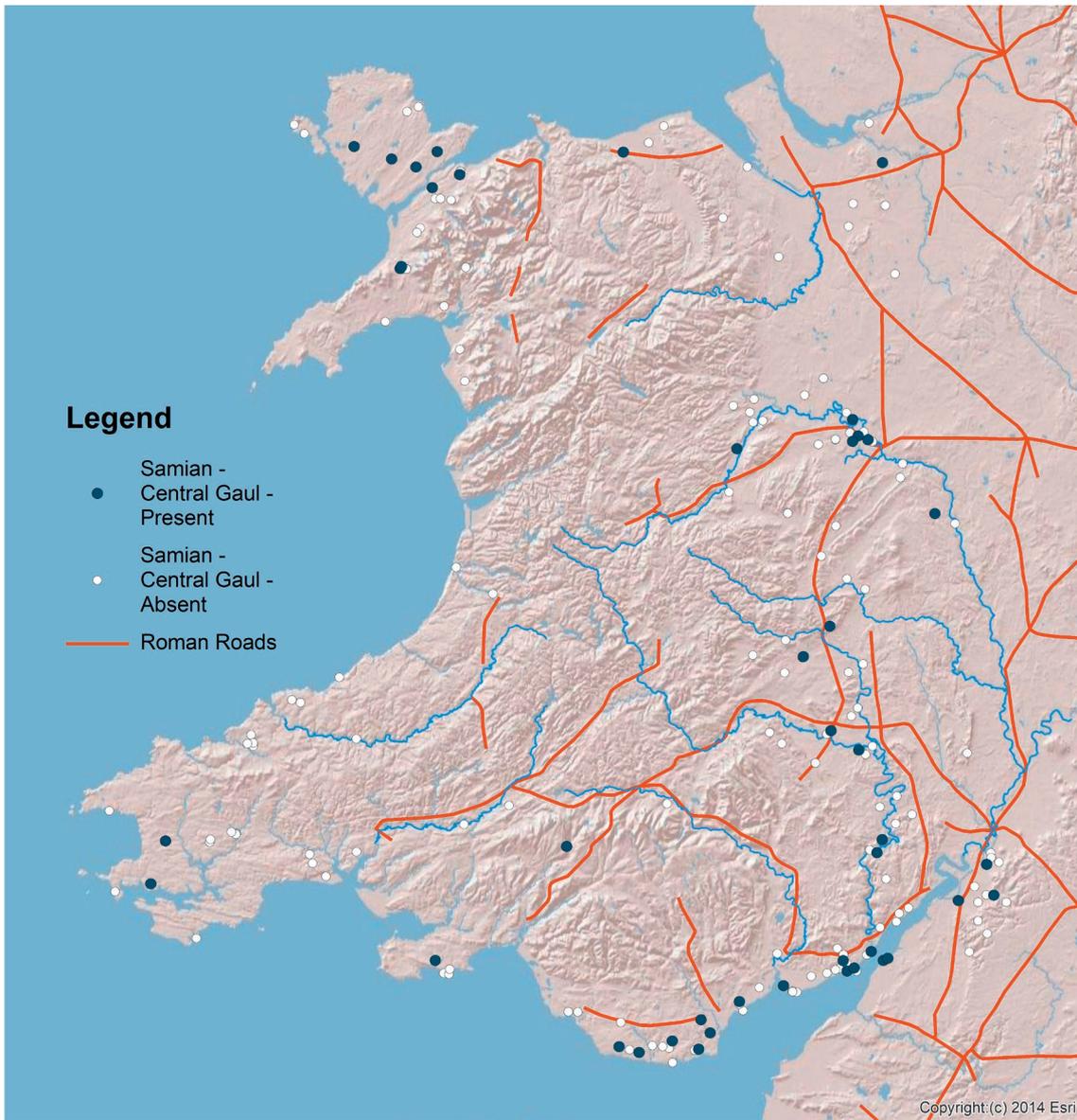


Fig. 4: Distribution of South Gaulish Samian.



Fig. 5: Distribution of Central Gaulish Samian.

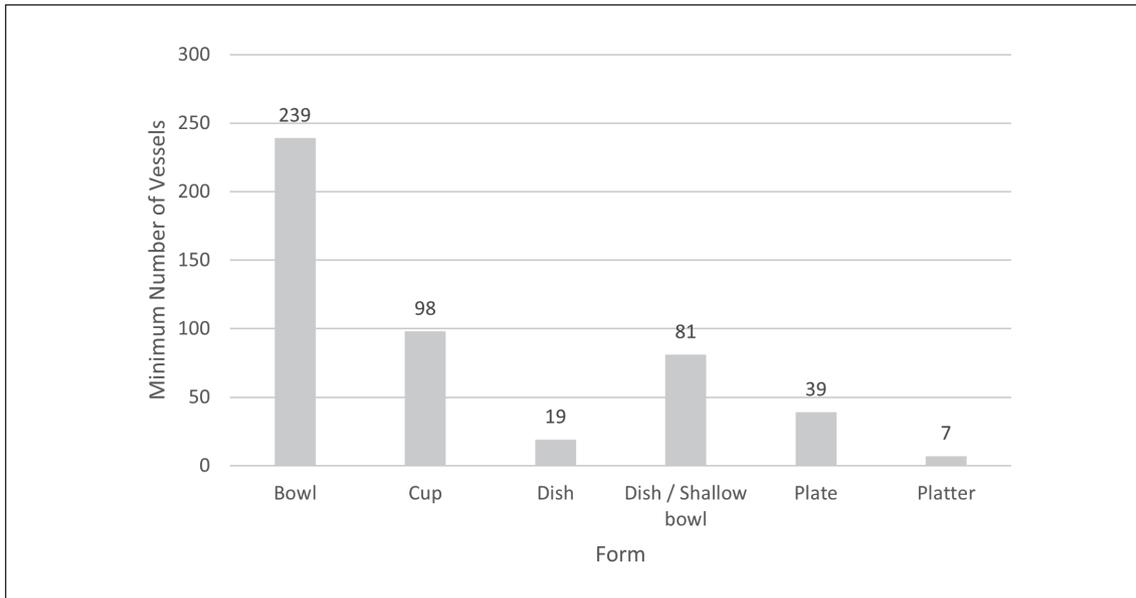


Fig. 6: MNV of Samian by major forms.

balance in the MNV of these forms is surprising given evidence which suggests that decorated Samian forms were more expensive than the plain: graffiti on a Dr 37 from Lincoln gave a vessel price of 20 *asses*, about one day's pay for a soldier.¹⁸ One might therefore expect the distribution of Samian bowls to be restricted to the materially wealthy villa sites of the south-east, yet this is not the case (fig. 7).

Samian wares were visually different from both local and imported Iron Age ceramics, and from the organic vessels which may have been used in aceramic regions. This visual distinction may have been enough to render Samian ware a desirable object. The popularity of large bowl forms may reflect a continuation of the importance of Iron Age communal vessels, such as buckets and cauldrons.

The preference for large open Samian forms has also been noted in rural settlements in other frontier provinces.¹⁹ The presence of Dr 37 at rural sites in the north-west may therefore signify the use of Roman-style cultural material within a pre-existing social context, incorporating new material culture in hybrid forms of food practice and status display.

Food is only one aspect of dining practice; the importance of drinking should not be underestimated. The importance of alcohol and drinking in combination with feasting in the Iron Age has been emphasised²⁰ and communal drinking as a ritual practice within the study area is indicated by the deposition of items such as tankards and cauldrons.²¹ Three forms comprise the majority of drinking vessels within the full ceramic assemblage (fig. 8). There are significant differences in the fabrics in which these forms occur. Beakers and tankards are overwhelmingly produced in coarse fabrics, while cups are overwhelmingly in fine fabrics. This suggests a difference in their use. Samian fine-

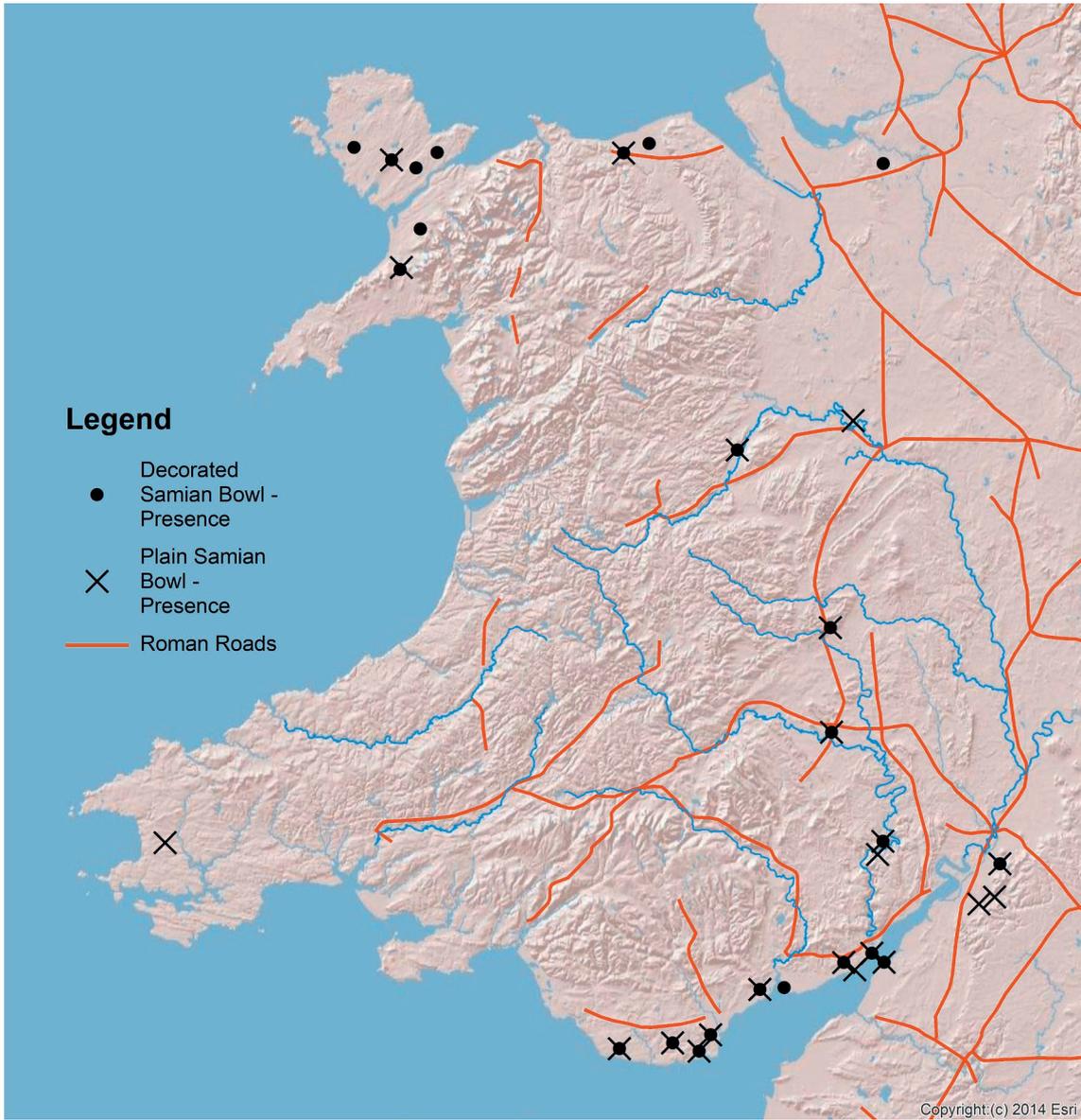


Fig. 7: Distribution of plain and decorated Samian bowls.

Site Type	MNV	No of Sites
Farm	94	137
Villa	66	29

Table 4: MNV of Samian cups by site type.

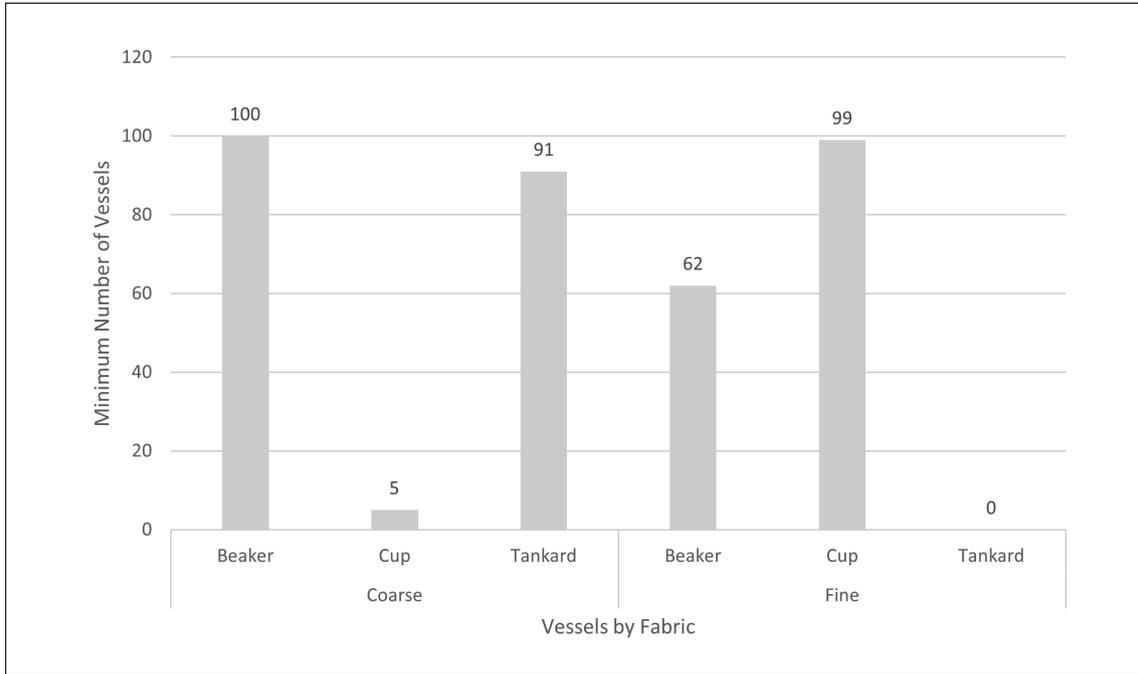


Fig. 8: MNV of all drinking vessels by broad fabric type.

wares comprise the majority of all fine cups (MNV 99). Fine cups, particularly in Samian ware, have traditionally been associated with wine-drinking, though some work has challenged this simplistic association.²²

Though communal drinking had been an important cultural practice in the Iron Age, the consumption of wine was introduced into the region during the Roman period and is therefore a particularly ‘Roman’ cultural practice.

Samian cups are also associated with other paraphernalia of wine-drinking in a culturally Roman manner (i.e. mixed with water) such as water jugs, buckets, and ladles.²³ They also appear much more frequently at villa sites than at non-villa sites (Table 4). They therefore occur in conjunction with other markers of high status and engagement with cultural forms and practices which were also introductions of the Roman period.

Further evidence of the association of Samian cups with a particular form of consumption is the absence of cups in later periods, after the end of Samian importation. Cups dominate the drinking vessel assemblage in the Early period, decline slightly in

the Middle, and drop precipitously in the Late due to the end of the import of continental finewares, as well as the lack of cup forms in the repertoire of the growing Romano-British fineware industries.

Summary

The distribution of Samian ware is unequal throughout the region. The coastal distribution and the importance of the road networks demonstrate a reliance on military networks as a mechanism of distribution, particularly outside the south-east. The high-point of the distribution was in the mid-2nd century, during the period of importation from Central Gaulish kilns. Marked preferences for certain forms indicates that Samian was valued and was linked to particular forms of social and cultural practice.

This paper has sought to show that developing flexible methodologies for inter-site comparison can be a valuable way of opening up new avenues of enquiry with existing resources. The method utilised in this paper can be used to shed new light on the economic and social integration of this previously under-studied region into Roman ways of exchange and social and cultural practice.

Notes

¹ King 1980.

² After Burnham and Davies' study of the Roman frontier in Wales and the Marches (2010).

³ Tacitus, *Annals*, 12.31.

⁴ Burnham – Davies 2010, 47.

⁵ Arnold – Davies 2000, 23.

⁶ Allen et al. 2018.

⁷ Tomber – Dore 1998.

⁸ Voss – Allen 2010.

⁹ Thomas 2018; Voss – Allen 2010.

¹⁰ Voss 2002, 661.

¹¹ E.g. Dragendorff 1895; Dechelette 1904; Knorr 1919; Oswald – Pryce 1920.

¹² Casey – Davies 1993.

¹³ Webster 1996, 15.

¹⁴ Webster 1996, 15.

¹⁵ Tyers 1996, 107.

¹⁶ Tyers 1996, 114.

¹⁷ Willis 1998, 86

¹⁸ Willis 2011, 171

¹⁹ Okun 1989, 123; Meadows 1994, 137.

²⁰ Dietler 1990.

²¹ Horn 2015.

²² Bidduph 2008, 97.

²³ Cool 2006, 136.

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Economic aspects permeate all areas of public and private life in ancient societies, whether in urban development, religion, art, housing, or in death. Research on ancient economies has long played a significant role in ancient history. Increasingly in the last decades, awareness has grown in archaeology that the material culture of ancient societies offers excellent opportunities for studying the structure, performance, and dynamics of ancient economic systems and economic processes. Therefore, the main objective of this congress was to understand economy as a central element of classical societies and to analyse its interaction with ecological, political, social, religious, and cultural backgrounds. The theme of the congress was addressed to all disciplines that deal with Greco-Roman civilization and their neighbouring cultures from the Aegean Bronze Age to the end of Late Antiquity.

In this collective volume, single contributions of sessions 2 and 3 are dealing on the one hand with the investigation of natural environmental factors – climate and landscape – as impacts on the ancient economy, and on the other hand with the exploration of production system. Thematically, the spectrum ranges from the contextualisation of ancient handicrafts, to questions about the production of, for example, decorative metal objects, glass, portrait statues and bricks, to ancient architecture and the associated construction system. The temporal and topographical framework extends from Mycenaean and Archaic Greece, through Iron Age Southern Italy and Hellenistic-Roman Sicily as well as Macedonia, to Imperial Spain and Asia Minor.

