19th International Congress of Classical Archaeology
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ABSTRACTS

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WELCOME TO COLOGNE AND BONN!
ABSTRACTS

keynotes | panels & papers | posters | workshops
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1. Keynote Abstracts

1. Sitta von Reden (University of Freiburg), Archaeology and Economic History

Archaeology and Ancient History over the past 40 years have entered a particularly happy marriage. This has not only revolutionized the subject of ancient economic history, but also transformed the nature of the questions we ask and the answers we find in economic research. We are now able to place economic processes into space, landscapes and infrastructures, use quantifiable data for social-science oriented economic models and investigate economic regions and micro-ecologies that were largely beyond the focus of literary texts in Greek and Latin. In this lecture, I will address important research agendas in which collaboration between archaeologists and ancient historians might promise particularly fruitful in the future: the use of numismatic, epigraphical and papyrological material, traditionally the preserves of ancient historians, in their archaeological contexts and temporalities; and collaborative approaches to economic questions that have turned out to be central in the 21st century. Among the latter are economic inequality, the effects of climate change on micro-economies, and economic development in global worlds.

2. Geoffrey Kron (University of Victoria), Ancient social equality, biological standards of living, and demographic development in comparative perspective

The reconstruction of the demography, biological standard of living, and class structure of the ancient world is challenging, but our fragmentary documentary and archaeological evidence does offer a coherent vision, if properly interpreted in the light of recent research into the social and economic transformation of Europe and North America between the 18th and 20th centuries, a period of the contested revival of democratic political institutions. I will focus on how we can read the effect of systems of land tenure and agricultural production, as well as differences in wealth, income and social power, through their effects upon the bodies of human beings and domestic animals, and upon the built environment. Special emphasis will be placed on how physical anthropological, archaeozoological and archaeobotanical data, long neglected by Classical archaeologists and historians, as well as a more systematic study of domestic architecture, have begun to provide significant new concrete evidence to support the long unfashionable ‘modernizing’ analysis of the great German historians of the late 19th and early 20th century, Meyer, Beloch, Pöhlmann, and Friedländer. Finally, any discussion of the explanatory power of social inequality and of the scientific power of anthropometry, particularly in these times, ought to note how class differences in height, properly attributed to the effects of under-nutrition and poverty by Villermé and Quetelet, were simultaneously exploited by Galton and many reactionaries as evidence for the biological superiority of the upper classes and a justification for eugenics.

3. Helmut Brückner (University of Cologne), Ecological and economical consequences of the human impact on the Mediterranean landscapes - examples from Western Anatolia

The natural factors of the Mediterranean ecosystems – such as rocks, soils, climate, hydrology, vegetation – are vulnerable in the sense that even minor changes may have great consequences. Therefore, the human impact, especially in Greek and Roman times, resulted in massive landscape changes, which strongly affected the economies of the ancient societies and their settlements. This can well be demonstrated when studying harbour cities. They were hubs for ancient economies, commerce and communication. From a (geo-)archaeological point of view harbours are excellent archives, rendering valuable information about shipping and trading, but also about erosion-accumulation processes, vegetation changes, pollution, and human diseases. Many marine embayments with natural harbour sites had evolved due to the postglacial sea-level rise. Their progressive siltation was caused by the progradation of the river deltas and the mostly human-induced denudation/accumulation processes. The lecture will exemplify this “life cycle” of ancient harbours for Elaia and the Kaikos (Bakırçay), Ephesos and the Kay-
stros (Küçük Menderes), Miletos and the Maiandros (Büyük Menderes), as well as Ainos and the Hebros (Meriç/Mariza). It will be demonstrated how the rise and fall of the harbour cities and their economies were connected with these landscape changes.

4. Lin Foxhall (University of Liverpool), The shapes of production in classical antiquity: space, scale, infrastructure, integration

Production is a slippery concept in the study of the classical world. It is hard to measure and difficult to characterise uniformly since it emerges from such a wide range of different activities and institutions operating at different scales, and yet it is visible through only a comparatively limited range of sources. This paper attempts to investigate the complexity of production in classical antiquity, in particular the connections between production at different scales and spatial locations, as well as the overlaps between agricultural and other kinds of production.

5. François de Callataï (Royal Library of Belgium, Université Libre de Bruxelles, Ecole Pratique des Hautes Etudes), Distribution: A coin perspective

With 25 panels and 174 announced papers, the ‘Distribution’ session can claim to be the strongest of the Congress. Indeed, this is a topic which has benefited immensely during the last decades from 1) the gigantic mass of data produced by field archaeology, coupled with 2) the scientific methods of the laboratory (even if they usually result in complicating rather than simplifying matters) and – last but not least – 3) digital humanities (including GIS). Amongst the huge amount of material data produced by classical archaeology, some categories are especially suited to distribution studies. Vases and coins come to mind first, given the impressive amount of recovered data (millions of Greek coins, dozens of millions of Roman coins) combined with their generally large circulation. Coins are particularly interesting since we usually know where and when they have been produced. Based on both numismatics and other kinds of evidence, one aims to illustrate – in a more practical than a conceptual way – the different steps of how to proceed (and how not to proceed) with the interpretation of distribution patterns. 1) A first step is to define the different biases, ancient and modern, by which what is actually measured differs from what was originally produced. 2) The second step concerns final locations considered in terms of space, time or ‘status’. 3) The third step is to wonder about what happened to objects before to be finally discovered in their ultimate locations.

6. Elizabeth Fentress (Rome), There and Back Again: Piggy-back and Return Cargoes

It has long been recognized that the presence of certain low-value imports, like querns and bricks, depends more on their role as ballast than on their intrinsic value. The ships that brought grain from Africa and Egypt could not return empty, and their naviculares would have sought merchandise of many types for resale. In other cases, a high-value, low weight cargo, like spices and silk, might attract other lower-value merchandise to fill the ships heading for Rome. This paper addresses the ways in which we might perceive these secondary cargoes, and the particular nature of ancient commercial distribution. Starting with a brief overview of the specific distributions of Attic pottery in Etruria, I will then discuss the case of African amphorae and Red Slip, with a final consideration of the traffic from the Eastern Mediterranean to Rome.

7. Simon Keay (University of Southampton), Putting Urban Economic Infrastructure into Context

This paper emphasizes the importance of the relationship between the infrastructure offered by Roman cities and the intensity of rural settlement and seaborne commerce. Roads, warehouses, market buildings, manufactories, temples, and an adequate water supply ensured that bulk agricultural commodities from rural estates were transported, stored and processed prior to consumption, sale and onward transmission. In the case of ports, harbour structures, canals and warehouses ensured transhipment, storage and re-distribution of cargoes, and the movement of commodities between land and sea. In both cases, recent work is emphasising the crucial importance of infrastructure in peripheral connected contexts. Less evident are buildings hosting invisible infrastructure, including those for dissemination of the laws needed to enforce the payment of taxes, honouring of commercial contracts and ensuring the monitoring of weight standards and prices. Much still remains to be learned about
the size, range and seasonality of the human capital that was fundamental to the mobilisation of economic resource in towns. Intensive rural surveys are continuing to provide ever sharper resolution data from the hinterlands of towns across the Empire. An important development in recent years has been the advent of data from surveys in the eastern Mediterranean, particularly the arid zones, to complement areas of more traditional enquiry in the west Mediterranean, north Africa and temperate Europe. However, differing survey methodologies and contrasting scales of analysis are still making it hard to undertake comparisons of survey results from different regions. The paper also argues that there is a case for more joined-up research into relationships between fluctuations in rural settlement, the provision of urban infrastructure, and the intensity of land and sea-based commerce.

8. Lynne Lancaster (Ohio University), Building Construction, Terracotta Production, and Knowledge Networks in the Roman Empire

With the uptake of the bathing habit that spread along with Roman conquests, terracotta building elements took on a role in the building industry that went beyond the traditional use as a roof covering. Clay is malleable and has the benefit of being much easier to shape than stone elements. The terracotta workshop therefore provided a rich experimental playground for developing new shapes and types of building elements that were both fire- and water-proof, some of which remained specific to bath buildings while others were adopted in a variety of different building types. The soft clay also allowed for stamping before firing, which in turn provides us a method for tracking distribution. Thus in this talk, I examine a number of unusual terracotta elements used for building vaults and examine what they can tell us about extents of knowledge networks in the different parts of the Roman Empire and about the different agents at work in the exchange of that knowledge. Similar studies have been made on trade networks of stone building elements, which has been possible due to the quarry marks, ship wrecks, and the identification of stone types, but in this study, I use terracotta stamping, identification of clay fabric, and unique forms of terracotta elements to identify both regional and long distance knowledge networks that do not necessarily reflect direct trade of the items themselves.

9. Jörg Rüpke (University of Erfurt), Economies of religion: symbolic, communicative and spatial dimensions of religious production and consumption

In the case of contemporary religion, attempts to use homo economicus and rational choice theory for understanding the financing of religious institutions and the “economy of religion” have repeatedly been criticised. In the case of antiquity, the issue has usually been understood in terms of the economic nexus implied in the institution of blood-sacrifice, where dozens of animals might be killed, or the consumption-expenditure required for elaborate rituals like games. This keynote will briefly review these issues, but fundamentally take a different approach, building on questions of religious agency, lived ancient religion and the urban setting of much of what can be regarded as religion in antiquity. The argument is that ancient religion involves three different ‘economies’ that cannot simply be entered into some final balance sheet, namely: the symbolic or political economy of religion, an economy of religious communication, and a spatial economy.

This in turn suggests three claims. First, that religious practices, that is cult formally addressed to divine beings, played a crucial role in establishing specifically ‘public’ roles and created ‘cultural capital’ (Bourdieu) that could be transformed into political authority. Secondly, the very logic of communication with non-human addressees stimulated massive investment in media that increased the efficiency of religious communication and produced religious goods subsequently available for consumption by others. Thirdly, given the density of the built environment of cities, space was a scarce resource that stimulated many different patterns of exploitation for religious purposes. These include the increase or reduction in visibility of different elements in permanent sacral contexts, competition over such resources, and the variation of specific religious profiles in the course of time. The lecture will mostly rely on examples taken from the city of Rome, but will suggest some more general conclusions.
Regional projects using surface pedestrian survey, coupled with remote sensing methods such as aerial photos and geophysical prospection, can contribute immense depth and breadth to our understanding of the economic life of Greek and Roman Antiquity. Firstly, whereas excavations, archival history and epigraphy necessarily focus on particular settlements, especially cities, regional survey undertakes to prospect large areas of the landscape, often including every kind of human activity: from traces of land use in the unsettled landscape, through farms and villages, thence onwards to small and giant cities, and in every period from Prehistory to the present day. This allows us to evaluate, quantitatively, the scale of rural and urban populations for each period of Antiquity, and the broad changes in the exploitation of farmland, pasture, marine resources, harbour installations and mineral resources. Changing modes de vie in the systems of land use, such as family farms or commercial villas, become apparent, as well as economic priorities. Since one third or more of ancient Mediterranean cities remain today in rural environments, and in any case excavation of entire towns has always been inconceivable, surface survey also permits us in a limited number of field seasons to recover the rise and fall of urbanism, then link this to the contemporary changes in the associated rural hinterland of towns. The data collected through surface survey, especially the abundant ceramic fragments, allow us to track local regional and interregional trade flows and the involvement of populations from the humblest peasant farm to elite domus in production and consumption. Coins recovered during landscape studies, added to those archived from stray finds and excavations, further open up insights into the degree of monetarisation of the economy and the penetration of different levels of monetary transactions at varying social levels. Remote sensing finally can recover the plans of rural and urban domestic structures, allowing us to measure the relative wealth and scale of life for different sectors of the productive population, and how these alter over time.
Session 1: The Human factor: Demography, nutrition, health, epidemics

Panel 1.1 Economy, Society and Health-related Quality of Life in the Ancient World: Bioarchaeological perspectives from the Eastern Mediterranean

Organiser: Sofia Voutsaki (University of Groningen)
Anna Lagia (Albert-Ludwigs-Universität Freiburg)

Panel abstract
In recent years scholars studying the ancient economy have often claimed that the Greco-Roman world was characterized by prosperity and increasing economic growth. To support this claim, data from diverse sources are used, including those which describe the quality of life in relation to health, assessed through the use of biological measures such as longevity, stature, mortality, morbidity and diet within clearly defined contexts.

The main aim of the panel is to explore the concept of health-related quality of life vis-à-vis the ancient economy and society. Our interest arises from two different, though related developments: On the one hand, the study of modern-day and archaeological contexts from a multitude of sites reveals a close correlation between health and socioeconomic status. On the other hand, there is a growing interest in the integration of mortuary (archaeological, epigraphic, prosopographical) and bioarchaeological data, and an increasing number of bioarchaeological studies of eastern Mediterranean necropoleis, or other burial contexts.

Our main questions are: How should we explore the correlation between socioeconomic status and health-related quality of life? Which methodological and interpretive tools should we use? How can contextual information help us consider the socioeconomic status of the deceased? Is comparability of health data feasible across time and space and what are the pitfalls? Can health-related quality of life be used to infer socioeconomic inequalities in terms of status, gender, or age, or sociocultural phenomena such as deviance? Is it possible to understand differences among cities, or between urban and rural populations? In this panel we will discuss examples from Athens, Phaleron, Chania, Sagalassos and other sites in the eastern Mediterranean dating from the Early Iron Age to the Roman period.

We hope that the panel will provide the opportunity for an interdisciplinary discussion and a more nuanced understanding of the relation between socioeconomic differentiation and health-related quality of life in the ancient world. We also hope that this discussion will contribute towards a closer dialogue between archaeology, bioarchaeology and socioeconomic history.
Paper abstracts

1. Ursula Wittwer-Backofen (Albert-Ludwigs-Universität Freiburg) - Anastasia Papathanasiou (Hellenic Ministry of Culture and Sports, Ephorate of Palaeoanthropology and Speleology), Assessing long-term change in human health: perspectives from the Global History of Health Project

The need to trace change temporally and across space has for some time now been addressed through bioarchaeology. Two global projects, one concerning the Americas and another Europe, have been launched in this effort. In this paper the basic concepts of this endeavor, along with methodological issues on the effects of sample quality as well as the quantification and comparability of data across space and time are presented and data concerning historic Europe through modern times are discussed. The unprecedented for European populations sample size that was generated in this effort was clustered according to time periods taking into account a number of contextual variables such as elevation, topography, socioeconomic status, and settlement patterns. The implementation of this approach on skeletal assemblages from the Greek mainland is discussed along with recent data concerning diet in conjunction with documented cultural changes and bioarchaeological data from fully studied contexts.

2. Sherry Fox (Eastern Michigan University), The economic implications of zoonoses in the paleopathological analyses of human skeletal remains from the eastern Mediterranean in classical antiquity

Zoonoses or diseases that are spread from animals to humans have afflicted human populations, in particular, since the domestication of animals, as people have been able to live both in greater numbers and in closer contact with animals. The economic implications of zoonotic diseases have been profound due often to the limited productivity of those burdened with zoonoses. This paper focuses upon zoonoses that have affected ancient populations in the eastern Mediterranean based upon the study of human remains from classical antiquity. Included among the zoonoses that have afflicted populations in classical antiquity in the region are malaria, brucellosis, and echinococcosis. Discussion of these zoonotic diseases involves the environmental and social factors implicated in the spread of these diseases within their archaeological contexts. In addition to paleopathological analyses, data are derived from ancient sources, early traveler accounts, premodern practices in the region, as well as from the results of modern, cutting-edge scientific analyses with aims to provide a rich portrayal of how zoonoses have affected the ancient economy of the eastern Mediterranean in classical antiquity.

3. Eleanna Prevedorou (Wiener Laboratory & Arizona State University) - Jane Buikstra (Arizona State University), Politics, power, and production in ancient Athens: the people of the Phaleron cemetery

The polis of Athens has been one of the largest, wealthiest, and most influential city-states in the ancient Greek world. During the Archaic period (ca. 700-480 BC), Athens experienced major socio-political and religious changes, including the first governmental institutions, formal laws, citizenship formalization, evidence for chattel slavery, marked socio-political stratification, and conflict among the aristocratic families, ultimately leading to the rise of democracy. To date, such complex processes are mainly known to us through texts and artistic representations. The extensive cemetery excavated at Phaleron (ca. 8th-4th centuries BC) by the Ephorate of Antiquities of Western Attica, Piraeus, and the Islands during the construction of the Stavros Niarchos Foundation Cultural Center offers us an unparalleled view of everyday life in antiquity, as it appears to represent largely non-elite and potentially diverse strata. By integrating multiple lines of evidence ranging from archaeological science to historic records, the Phaleron Bioarchaeological Project aims to reconstruct the ancient lives of the non-elites, the commoners, and the marginalized that remain largely unexplored or silenced, in order to address archaeological questions regarding the interplay between residence, community membership, citizenship, and burial in Archaic Athens.
4. Anna Lagia (Albert-Ludwigs-Universität Freiburg) - Andreas Kapetanios (Jonian University), Factors affecting health-related quality of life in classical contexts: bioarchaeological evidence from the Athenian Asty and the region of Laurion in SE Attica

Today, a multitude of studies exploring plasticity in human physiology, already before birth, argue convincingly for a correlation between socioeconomic status and human health. Is such a correlation relevant to past populations and to what extent can it be traced by bioarchaeological studies? Systematic analyses of skeletal material deriving from numerous sites across Europe, dated from Classical Antiquity to the modern period, have identified differences attributed to topography, settlement pattern, socioeconomic organization, gendered division of labor and physical activity. In this paper we explore whether such differences can be identified in skeletal material deriving from cemeteries in the Athenian Asty - i.e. the centripetally structured part of the Classical Athens Polis and its political center - and from tombs excavated in the rural region of Laurion in SE Attica that comprised a center of production and distribution of metals since prehistory. In this vein, we try to contrast bioarchaeologically identifiable parameters related to health, diet, activities, and socioeconomic status, investigate potential differentiation in time and search for correlations. Excavational, historical and bio-archaeological data are employed to stimulate a discussion on the delineation of socioeconomic differentials in classical contexts and their impact on living experiences.

5. Chelsey Schrock (University of Sheffield) - Victoria Sabetai (Academy of Athens) - Efthymia Nikita (The Cyprus Institute, Nicosia), Humanizing Antiquity: Biocultural Approaches to Identity Formation in Ancient Boeotia, central Greece

This paper presents the preliminary results of a Marie Skłodowska-Curie funded project focused on the bioarchaeological dimensions of kinship and social stratification in Archaic to Roman-era Boeotia (central Greece). In particular, our research explored genetic kinship and life quality markers in ancient Acraiphia to assess how clearly familial patterns and social divisions are visible in the skeletal record. Over 250 adult and juvenile skeletons have been analyzed. The very partially preserved nature of a large part of the assemblage necessitated the combination of diverse macroscopic and microscopic osteoarchaeological methods in order to effectively explore the aforementioned research questions. As such, palaeodemographic and palaeopathological markers have been recorded along with activity, dietary and biodistance indicators. The combination of the osteological information with funerary data pertaining to the organization of the cemetery and tomb typologies has provided interesting insights to the extent of intermarriage and differential social status in ancient central Greece. Even though our research is currently restricted to the cemetery of ancient Acraiphia, it will soon be expanded to other Boeotian necropoleis, in order to explore patterns of human mobility and life quality in a broader context.

6. Chryssa Bourbou (University of Fribourg), Living and Dying at the Periphery of the Society? First insights into a Classical-Hellenistic burial ground from Chania (Crete, Greece)

During construction works at the modern national stadium of Chania (Crete, Greece) a rescue excavation revealed an extended burial ground. A part of this burial ground, dating to the second half of the 4th-middle of the 3rd c. BC., developed alongside a road, which probably led to it or provided a gate for the city, included ca. 70 pot burials, 43 pit graves (some with multiple inhumations), and 2 tile graves, without specific spatial organization. The location, high concentration of pot burials, mingled with pit graves of multiple inhumations, the discovery of a shackled individual and the preliminary results of the associated human skeletal remains, including two cases of trepanations, suggest a possible “atypical” burial ground - compared to current funerary data for the era. Did this burial ground serve for the “special dead”, those who presumably failed to meet distinguished rites of passages (fetuses buried in pots), or lived at the periphery of the society? Could it be related to the turbulences documented in the island during this period, few of such traces depicted so far in the bioarchaeological record? Generating a synthesis of documentary, archaeological and biological evidence an attempt will be made to reconstruct the osteobiographies of the individuals buried, the sociocultural choices behind their interment and
how these regulations are possibly related to phenomena of marginality in terms of health-related issues, status or age.

7. Velissaria Vanna (UCL, London), Socioeconomic differentiation, son preference and women's status in Hellenistic mainland Greece (3rd – 1st century BC): Unlocking the evidence from the North Cemetery of Demetrias, the second capital of the Macedonian Kingdom

The present study offers an insight into socioeconomic variation in the most overlooked and controversial period in ancient Greek history focusing on bioarchaeological evidence from an area for which little information exists. Specifically, its aim is to address the issues of favourable treatment towards male children, the social position of women, and the differentiation between low- and high-status groups in Hellenistic Demetrias, through the study of oral pathology. Findings have revealed striking patterns discernable by both gender and socioeconomic status. Caries more frequently and severely affected socially privileged groups, namely high-status individuals and males. Interestingly, the exact opposite was the case for periodontal disease. In the high-status group, males had a higher proportion of hypoplastic teeth than females, whereas, in the low-status group, the opposite pattern was observed. Low-status individuals were affected by enamel defects twice as much as and three times more severely than their high-status counterparts. Demetrias appears to have been a strongly hierarchical society, in which men, particularly those that were members of the upper classes, were favoured over women. Moreover, male infants/children were given priority over female infants/children in terms of care and nutrition, although this behaviour most likely occurred only when there was a practical need for differential treatment.

8. Lynne Schepartz (University of the Witwatersrand), Health-related quality of life in the Corinthian colony of Apollonia, Albania

The sociopolitical nature of ancient Greek colonization was complex, and the interactions between colonizers and local populations are poorly understood. Did local communities prosper from colonization, or were they subject to economic and social exploitation? One way to investigate the effects of colonization is to assess the health-related quality of life in the colonies relative to the pre-colonial period using skeletal indicators of dietary and disease stress.

The Greek mother-city of Corinth founded colonies in Illyria along the present-day Albanian coast, including the large settlement of Apollonia. A sample of tumuli from the necropolis, dating from the Bronze Age through to the Hellenistic colonial periods, has been investigated. Skeletal proxies of health (dental and bone pathology levels and morphological characteristics) for the colony are compared with data from Lofkënd, a pre-colonial Bronze Age-Iron Age tumulus situated 24 kilometers inland. The health-related quality of life appears to have declined in the colonial period, but the trends in the skeletal proxies are not directly attributable to marked physical activity level or dietary changes. Considering the different microenvironments of the two localities along with their health profiles, the decline during the colonial times can be considered as reflecting the health costs of residing in an urbanized and malarial coastal setting.

9. Sam Cleymans (KU Leuven-Sagalassos Archaeological Research Project), In Sickness and in Health: Diachronic Changes of Physical Health and Quality of Life at Sagalassos, SW Anatolia

Who were better off, the Romans or the Byzantines? This very simple question has led to a discussion in economic history with at least two opposing camps. On the one hand, scholars advocated Malthusian theory, claiming that, as Roman cities were more crowded, the Romans were less healthy than the Byzantines. Another group of scholars emphasized the investments by urban Roman imperial communities in infrastructure that improve hygiene and nutrition (e.g. sewers, public baths etc.). These historians therefore regard the Romans as more healthy than the Byzantines. Yet, both perspectives are hypothetical and often lack an encompassing theoretical framework and detailed data analysis. In this respect, Quality of Life (QoL) studies can be helpful. This framework allows for placing physical health in a broader context, and looks for the factors influencing the health of populations in the past and present. As a case study for data analysis the Pisidian town of Sagalassos is
chosen. This archaeological site has yielded a large dataset of both Roman imperial to late Roman burials (1st-5th cent. AD), and Middle Byzantine graves (11th-13th cent. AD). Following a combination of paleopathology, stature, aDNA-analysis, diet reconstruction and mortality patterning, the physical health of these two populations can be contrasted. This health index allows for further comparison with QoL factors such as population density and available infrastructure. Most simple questions ask for a complex answer.

10. Maria Liston (University of Waterloo, Ontario), Inferring the presence of a leprosarium or hospital from the pathologies in the cemetery: Interpreting burials from Byzantine Thebes

The history of the modern hospital in Greece begins in the early Byzantine period with the development of hospices organized by the Church. Often associated with monasteries, these provided food, shelter, and rudimentary care for the sick and dying. As leprosy (Hansen's Disease) became widespread, debilitated patients often ended up in these facilities. Although the rigorous isolation of lepers was a later phenomenon, the frightening appearance and smell of patients with leprosy would have made them particularly unwelcome in communities. A recently excavated cemetery in Thebes, Greece appears to have been associated with one such hospital, although there is no historical documentation for its presence. The cemetery is located in the former Sanctuary of Ismenion Apollo, and the graves are clustered around the foundations of the temple of Apollo. Rectangular cuttings into the bedrock were used for multiple burials. In addition two mass graves with multiple simultaneous burials suggest a catastrophic event, probably a plague. There are multiple cases with definitive skeletal lesions that suggest advanced leprosy, and nearly every grave contains individuals with probable leprosy. In addition there are three individuals with advanced metastatic cancer, and an array of other tumors and infectious diseases. The concentration of severe pathologies is greater than would be found in an ordinary town cemetery, and we infer that an early Byzantine hospital was functioning in Thebes.

Panel 1.2 Wealthy and Healthy? Methodological Approaches to Non-élite Burials

Organiser: Ute Kelp (Deutsches Archäologisches Institut Berlin)
Wolf-Rüdiger Teegen (Universität München)
Wednesday | 23 May | 14:30-19:00 | HS I

Panel abstract

Dichotomies are often rejected as misrepresenting the complexities of past societies. This is also the case for the distinction between élite and non-élite parts of the population. In this respect, economical aspects have been considered crucial for the constitution of ancient society: from the determinant for a class-based society to being an oscillation within the stratified pyramidal model of Roman society. In social history current research emphasizes the basic legal inequality in antiquity and a social stratification along the lines of status, honors and life style as opposed to modern time functional divisions. Consequently changes in wealth distribution potentially threaten the social order. Hence income based power relations e.g. performing euergetism may support political integration in a competitive society, but economical changes such as large accumulations result in political disintegration.

This model of social stratification is consistent with ancient sources and related topics in archaeology such as the Roman domus. Yet the analysis of ancient societies beyond the political system, leading actors and élite groups relies heavily on the archaeological record. Abundantly preserved burial sites present a major part of ancient testimonies. But again research on élite grave monuments is rather extensive whilst the evaluation of numerous less conspicuous burials in the Classical world remains wanting.
In terms of methodology quantifications prevailed, which – claiming an often class-based straightforward correlation between dimension and investment to status and wealth respectively – tended to disregard all manipulations of the dead as much as personal choices. Accordingly, the qualitative analysis of graves gained ground taking the social, relational and situational agency into account, but mostly without considering the nature of the postulated urban civic society. Thus, the social interpretation of funerary contexts including grave goods or, generally speaking, of value and its material equivalent in a particular time and place remains challenging.

Applicants are invited to use approaches in various fields of research employing archaeological and anthropological data as well as epigraphical records. Starting points to identify social settings may be health and nutrition, burial practices, variation and standardization in grave monuments, etc. Special interest will be given to medium-range theories taking case-based evidence into account.

Paper abstracts

1. Christian Briesack (University of Bonn), Tomb and society in Orvieto in the 6th century BC. A study of different grave types

The necropolis of ancient Orvieto are one of the most important burial grounds in Etruria in Archaic times, mostly because of their size and urban layout, which consists of almost identical chamber tombs shaped like large cubes and build along horizontally and vertically arranged roads. Thus, these “cities of the dead” seem or rather pretend to be an image of the “cities of the living” which is why studying related tombs can have tremendous value for the analysis of social rank and society.

Fossa-tombs represent a special feature in the necropolis. This burial practice requires considerably fewer economic investment than burying the deceased in a chamber tomb in terms of space, architecture and grave goods. Therefore it was assumed in previous research that fossa-tombs belonged to the lower part of the Orvietan society. They were viewed as tombs for the household of wealthy families buried in the chamber tombs nearby.

The paper allows a closer look at these humble tombs and opens the way for different approaches to the complexity of the topic. The central question is whether or to what extent economic investment and dimension of the funeral context equal status and wealth in Orvieto. Furthermore it needs to be discussed which methods can be used considering possibilities and limits. Criteria for the research are: location, grave type, burial custom, grave goods and as far as possible age and gender of the deceased and the epigraphical record.

2. Vasiliki Brouma (University of Nottingham), The economics of death in Hellenistic Rhodes: the case of the koina

Material evidence and display for afterlife suggest a conscious psychological preparation for death. However, display in the funerary sphere can also be indicative of various socioeconomic agendas in connection to the burial ritual. This paper presents a contextual approach to funerary economics in Hellenistic Rhodes. The focus is a case study related to the koina (associations) of foreigners and their burial provisions. The Rhodian epigraphic corpus detailing these provisions is particularly rich: most date to the 2nd and 1st c. BC and consist of honorary decrees and epitaphs. These texts describe that the members of the associations were honoured as evergetai post-mortem and were commemorated annually through a number of activities (i.e. banqueting) that were organised by the living members. Also, it appears that their status in the group was consolidated in regard to their financial contribution. And although the amount of written sources is remarkable, little do we know about the actual material evidence associated with these burial provisions. In this paper, I will argue that a material-centered approach can throw light on the funerary ritual of the associations and provide a more accurate picture on the economics of these rites. A closer examination of the tombs and the funerary monuments associated with the koina, will enable us to reflect on various economic aspects of the funerary ritual such as individual and collective choice in the socioeconomic setting of Hellenistic Rhodes.
3. Konstantina Chavela (Hellenic Ministry of Culture & Sports. Ephorate of Antiquities of Achaia), "Poor" indigenous and "wealthy" Macedonians(?). The evidence of burial practices around the Thermaic Gulf (Thessaloniki)

The archaeological site of Toumba Thessaloniki spreads over a plateau to the east of the city of Thessaloniki. It includes first a conical mound (tell) with layers of the Bronze Age, the Iron Age and historic times, and also a trapezoidal (almost flat) area extending around the mound itself with settlement layers mainly from the Early Iron Age, down to the end of the 4th century BC. In addition, outside the boundaries of the ancient village an extensive cemetery has been identified dating from the 8th century down to the 4th century BC. The mortuary practices of the cemetery throughout its use are defined by a uniform approach to burials as is indicated by the constant presence of single inhumations, the almost exclusive use of pits for the interments, the standard position of extended bodies and the preference of "local" pottery and limited presence of metal objects. However, a range of variables in the funerary process can be detected which somewhat breaks up this picture of homogeneity: these differences may have been crucial to the management and definition of social and other relations. Already in the 6th century BC discrepancies are found. These are more pronounced during the 4th century and may reflect the existence of different subgroups in the community: they may be expressions of different social status or different cultural identities.

4. Angela Pancheva (Balkan Heritage Foundation), Funeral Wreaths in the Context of the Macedonian, Thracian Late Classical and Hellenistic Burial Complexes and the Necropoleis of the West Pontic Greek Poleis. Functional and Comparative Analysis

The proposed paper analyzes the chronological distribution of the different types of golden and clay funeral wreaths, and their symbolical function in the context of Late Classical and Hellenistic burial complexes from the ancient regions of Macedonia, Thrace and the necropoleis of the West Pontic Greek poleis.

In the period spanning the second half of the 4th and the first quarter of the 3rd century BCE, the number of burial complexes containing funeral wreaths increased steadily across the entire Greek world. A large number of outstanding gold specimens and their gilded clay replica were found in the necropoleis of ancient Macedonia and Thrace. Wreathed and “wreath bearing” figures are also represented in the wall painting scenes in some of the most famous Macedonian and Thracian chamber tombs, dated into this period. The functional similarities between the main categories of grave goods from these complexes e.g. metal vessels and weapons, lead to the hypothesis of the existence of a “normalized” burial model in the two adjoining ancient regions of Macedonia and Thrace. At the same time, clay wreaths are also often to be found as a part of the inventory of the burial complexes in the necropoleis of western Pontic Greek cities, such as Apollonia Pontica, Messambria, Odessos, Kalatis, as well as the island Samothrace. In general, these graves contain a small number of objects, mostly represented by locally made clay pots.

5. Hale Guney (University of Cologne), Different Grave Types in the Choria Considiana

Choria Considiana was an extensive Roman estate in central Anatolia and its different types of grave monuments belonged to non-élite inhabitants of this rural area, yet prominent within their own communities. In its northern part, today encompassing Mihaliççik County in modern Turkey, an epigraphic survey, conducted in this area since 2014, revealed a number of fifty inscriptions most of which date back to the second and third centuries AD. This county, roughly situated to the northeast of the ancient city of Dorylaion (modern Eskişehir) was part of north-east Phrygia, the ancient region neighbouring Bithynia and under Roman rule part of the province of Galatia. These inscriptions offer new information about the cultural and social status of the inhabitants of this area and provide evidence for the existence of Galatian and Thracian names, local cults as well as the local stonemasonry in northeast Phrygia.

Taking this evidence into account, the paper focuses on three necropolis areas in Dinek, Güreleyik and Otluk villages. While in one case a new group of grave stelai enriches the picture of regional styles in Roman Phrygia, the others present the variation of grave monuments – including doorstone monu-
ments – within a single necropolis. Thus, employing epigraphical data as well as archaeological records, the aim of this paper is to identify social settings in the Choria Considiana.

6. Maria Stella Busana and Cecilia Rossi (University of Padua) - Alessandro Canci, Textile workers in the Roman Venetia: from the tools to the skeletal remains

The Padua University has for years carried out many researches on textile economy in Roman Venetia (North-Eastern Italy), an area famous for the wool industry according to the ancient literary and epigraphic sources. After investigating topographic evidence and sheep breeding settlements, the PONDERA Project was focused on a systematic survey of archaeological textile tools found in the region in order to analyze technological and socio-economical aspects. After that, the TRAMA Project was aimed at identifying samples of organic and mineralized fabrics, offering for the first time a real picture of textiles produced in the area. Finally, the LANIFICA Project is now focused on tools coming from funerary contexts to enlighten the ideological meaning and the connection with the socio-economical profile of the deceased, combining both the grave goods and the human remains. The results of these researches give us a comprehensive picture of the textile manufacturing, from the tools to the human beings involved. The new goal is now identifying the ancient textile workers and their health conditions, thanks to the study of the occupational markers and the pathological affects produced by textile activities. In addition, we will try to distinguish the skeletal modifications depending on the different kinds of loom in use. This approach could give an original contribution to the knowledge of both the occupational health in Roman society and the weaving technology in the Roman Venetia.

7. Ricardo Fernandes (1) - Alessia Nava (2) - Christian Hamann and Thomas Larsen (3) - Patrick Roberts (1) - Yiming Wang (3) - Alfredo Coppa (2) - Luca Bondioli (Museum of Civilizations), A glimpse at the bioarchaeological history of the late antiquity necropolis of Centocelle (Rome): results from a multiproxy approach

(1) Max Planck Institute for the Science of Human History
(2) Sapienza University of Rome
(3) University of Kiel

Given an emphasis on historical sources the vast majority of the people that lived within the Roman world remain voiceless. In their aid, isotopic analyses of archaeological human remains provide important insights into the diet, nutrition, and mobility of single individuals. Nonetheless, available Roman isotopic data is still sparse and periods of contrasting forms of political and social organization, such as late antiquity, remain comparatively unexamined.

Burials from a Roman villa complex next to the Via Labicana (within modern day Centocelle, Rome) offer an opportunity to reconstruct the lifeways of late antiquity Romans. A pilot interdisciplinary research project was undertaken that included osteological analysis, radiocarbon dating, and multiple isotopic analyses of human remains.

Radiocarbon dates revealed a complex chronology while isotopic results demonstrated that the Centocelle individuals likely lived for several years in the region prior to death. Most individuals had comparatively poor diets with low contributions from animal protein and major caloric contributions from plant foods. Given the limited sampling different interpretations of the results are put forward. Namely, if reconstructed diets reflect a specific socio-economic condition, a cultural choice, or a more general trend towards impoverishment within late antiquity. This provides a basis for future extended research into the lifeways of late antiquity Romans.
Panel 1.3 The Economic Contribution of Migrants to Ancient Societies. Technological transfer, integration, exploitation and interaction of economic mentalities

Organiser: Raffaella Da Vela (University of Leipzig)

Thursday | 24 May | 09:00-13:30 | HS VIII

Panel abstract

The proposed panel session aims to discuss the impact of migrations on ancient economies. We aim to understand the economic role of migrants in the local communities and their position in the host societies through a wide range of contributions about ancient economic spaces in the Mediterranean and in Central Europe. In particular, we will discuss the function of migration and mobility within the fields of production, exchange and consumption.

In the field of production, we are going to analyse technological developments and economic growth in host communities following the cultural interaction and the transmission of technological knowledge due to human mobility. Furthermore, we will analyse the social position of the migrants in the work market of their new communities and in the new settled territories. A key aspect will be the contribution of migrants to the production and their networking role for the exchange. The ports of trade will be taken in consideration as a meeting-point of different economic systems. In the field of consumption, we are going to present the coexistence of different economic mentalities, as factors of innovation and conflict in local communities. Consumerism will be taken in consideration to understand dynamics of interaction, integration and segregation. The consumption behavior will be considered as proxy to understand the social identities of migrants and their expressions.

The speakers are asked to compare their case studies to build a common platform of discussion, overtaking chronological and geographical specificities, in the way to discuss more general methodological and theoretical questions: Which archaeological data are suitable to detect the relationships between economic behavior and cultural identities? How did different economic and political systems affect the position of migrants in the local communities and their participation to local and global economies? Which are the effects of different strategies of economic integration of migrants in the host societies on the economic development and on the social stability of local markets and communities? Is our interpretation biased by our modern perspectives or is it possible to contextualize an agent based perception of the economic role of ancient migrants?

Paper abstracts

1. Lukas Bohnenkämper (Universität Basel), Down to the river for pay - Migrant workforce in Middle Kingdom Egypt

The paper will discuss the archaeological and textual documentation of migrants during the Egyptian Middle Kingdom (ca. 2040–1730 B.C.) and their different economic activities and positions as far as they are traceable. The various interactions with people from Upper and Lower Nubia (Kerma Culture, C-Group Culture, Pan Grave Culture, Medjay), the Levant and the Aegean occurred in a time when Egypt took increasing interest in foreign trade and direct control over neighbouring areas to the south. Especially the Levantine settlers in Avaris/ Tell el-Dab'a were assumably crucial for the extensification of Egypt's trade with the societies of the eastern Mediterranean. Others, like the Medjay, had important roles in the Egyptian military as soldiers and border patrols.
2. Kewin Peche-Quilichini (Univ. Paul-Valéry Montpellier, CNRS) and Laura Pagliantini (Università degli Studi di Foggia), Migrations and economical interactions in the North Tyrrhenian basin (1500 BC – 100 AD): the examples of Corsican and Elban detroits

The island of Elba has been a key transit point between the Tyrrhenian route of cabotage and the itinerary linking the largest islands of the northern and central sector of the Tyrrhenian Sea. That is also reflected in the funerary practice. The bronze finds of the EIA. clearly indicate broader cultural horizons of reference, enabling the reconstruction of a network not only within the Populonia area and the most advanced centers of the nearby Tyrrhenian coast, but also with inner central Italy and, above all, with Corsica and Sardinia. The vitality of the local metalworking is favored not only by the direct availability of the raw materials but also from contacts with consolidated manufacturing knowledges coming from the neighboring areas. In the LBA–EIA, local burial customs are evidence of the cultural syncretism between Elba and the mid-western territories of Corsica and Sardinia.

In Corsica, this relay situation is also evident. In the MBA, connections with Peninsular Italy give rise to the development of a local facies of ceramic style. In the Late Bronze Age, various productions illustrate profound interactions between the south of the island and the north of Sardinia, possible echo of exogamic practices. In the EIA, relations with Villanovan Italy are materialized by the introduction of bronze artefacts. At the end of the LIA, the circulation of indigenous pottery attests migrations of the islanders towards Tuscany and the island of Elba.

3. Jeremy Hayne, Phoenician migrants? interactions and integrations at Nuraghe S’Urachi, West Sardinia

In the prehistoric world the idea of migration focuses our attention on the individual or group rather than on that of the more usual term of 'colonisation', often overlaid by preconceptions of power and inequality. In fact, migration in the sense of movement of peoples is a key concept in archaeology as the resulting change and/or continuity in host societies are often the most important study areas. This paper first focuses on the movement of people during the first millennium in Sardinia, especially the formation of settlements in the south west of the island by Phoenician settlers. Was the development of settlements a result of colonisation or migration? Secondly it examines the material culture of the Phoenician settlement at the indigenous site of S’Urachi, what economic role did the Phoenicians play in the later life of the nuraghe and how is this visible in the archaeological record?

4. Marion Bolder Boos (Technische Universität Darmstadt), Trading trinkets for silver? Some thoughts on the Phoenicians' economic impact on indigenous societies in Iberia

It has often been assumed that the Phoenician expansion in the first half of the first millennium BCE was largely due to their search for raw materials, especially metal. In order to secure their trade, the Phoenicians were thought to have established small settlements along the way to serve as ports-of-trade for their ships and as marketplaces for the exchange of goods, but without their presence having much impact on the indigenous societies. With the realization that some of those ports-of-trade were actually situated at such a short distance from one another (e.g. along the Andalusian coast) that their purpose as mere stepping stones along the way westward seems superfluous, and with a growing interest in the indigenous populations themselves, this model has come under scrutiny.

The aim of this paper is to take a closer look at the interrelations between the Phoenician migrants and the local populations along the coast of Andalusia during the 9th to 6th centuries BCE.

5. Alexander Boix (University of Bonn), Migration of Athenian Potters and Painters in the Late 5th Century BC

The paper focuses on the migration of Athenian potters and painters who left Athens in order to find new employments in various regions of Greece in the context of the socio-political crisis caused by the Peloponnesian War (431-404 BC). This paper will take in account the impact of the integration of the migrated artisans in existing or re-established workshops on the social and economic structures. The craftsmen introduce themselves into their new homelands, not only as workers, but moreover as mediators of their expertise. My case study consists in the red-figure vase painting fabrics that since the late
archaic and early classical period has been distributed into the entire Mediterranean region exclusively by Athenian traders. Therefore, the concept of exchange and the mutual influence of indigenous and ‘migrated’ art will be reviewed and, furthermore, the importance of new emission centers for the local market as well as for the Athenian trade in these regions will be analysed. Finally, the paper will dis-cuss the political and social developments and the related reasons, which led to the migration of these craftsmen.

6. Heba Abd el Gawad (Helwan University), Integration, exploitation or everything in between?: Greek immigrants and the economic negotiations in Ptolemaic Egypt

Approaches to Ptolemaic Egypt tend to frame it within the narrow biased frame of colonialism. In this respect, Egypt is perceived as being colonised by the Ptolemies and the Egyptians are traditionally perceived as the weakest link. This paper challenges current approaches to the immigration economy in Ptolemaic Egypt, highlighting the need to rethink of the impact of our modern biases on the interpretation of the multicultural past. It proposes a more balanced contextual approach to immigration placing the multi-layered socio-economic negotiations between the various social groups at central stage.

7. Simeon Tzonev (University of Basel), Neue Beobachtungen zur graeco-ägyptischen Plastikherstellung


8. Raffaella Da Vela (Universität Leipzig), Consumption Behaviors and Economic Mentalities of Migrants in Late Hellenistic Etruria

The paper aims to analyze the contribution of migrants to the economy of local communities in late Hellenistic northern Etruria. The main research question focuses on the consumption behaviors of migrants and on how their representation in funerary context could be affected, on a hand, by homeland-traditions and trade-networks and, on another hand, by the attempt to get integrated or accepted in the new country.

Some case study from different geographical regions will be taken in account, in particular the necropoleis of Castiglioncello and Populonia on the coast, these around the Trasimene Lake and these in the inland of Volterra.

Through the combination of network analysis and analysis of the identity markers within the grave-goods of the late Hellenistic necropoleis one will first individuate graves of migrants within the Etruscan communities. Following, one will compare the position of the consumption behaviors of migrants in the clusterization of grave-goods of the necropoleis. The choices related to the purchase of goods and their exhibition will be reviewed as an expression of cultural and social identities of migrants. The coexistence of different economic mentalities will be discuss as factors of innovation and conflict in local
communities. Finally, consumerism will be taken in consideration to understand dynamics of interaction, integration and segregation.

9. Hale Guney (University of Cologne), The Impact of Migrant Communities from Asia Minor in the Balkan Provinces during the Roman Period: The cases of Bithynia and Galatia

The foundation of new provinces in the Balkans under the Principate facilitated economic connections between previously established neighbour provinces in Asia Minor and the Balkan provinces. There were two main reasons for economic relationship connected one another: the first was rich natural sources in the Balkans and the second was the need for urbanization in newly conquered land which was non-urbanised and non-monetized inhabited by non-Roman population.

This paper focuses on the migrant communities from Bithynia and Galatia in the Balkan provinces (Pannonia, Dacia, Moesia and Thrace) during the second and third centuries AD and it aims to provide a detailed survey for the economic impact of migrant people in the Balkans. For this reason, first, the cults originated from Galatia and attested in the Balkans will be surveyed and examined. Secondly, the paper takes archaeological evidence into account to evaluate the economic impact which is more visible in consumption patterns.

These results show that the cities in Asia Minor made an important contribution to the development of the Balkan provinces in terms of urbanization and monetization.

10. Jan Bulas (Jagiellonian University in Kraków), Migrants from the north in the Tisa Basin, in the Roman period. Trade, conflict and politics

There are traces recorded in the archaeological material culture, dated to the late 2nd and early 3rd centuries, uncovered in the area of the Tisa river basin that suggest the migration of the barbarian tribes from the north of the Carpathians. Those migrants are usually connected with the Vandals who are also recorded in the historical sources of the time (Cassius Dio) in that area. While arrival of the new peoples into the region probably took place in the time of the turmoil of the Marcommanic Wars, it seems that not in the long period of time new political and demographical situation resulted in establishing new ties between different ethnic groups inhabiting the not only upper Tisa but wider areas.

Strong connections between different cultures are visible in grave inventories of Przeworsk culture, where among others imports Roman weapons are found. Moreover, on the barbarian territory neighbouring the Roman provinces the exact copies of Roman pottery started to be produced. Other finds like the elite graves in the region suggest strong role of the trade and political relations in shaping this new cultural phenomenon. The paper will concentrate on the question how all of those factors influenced peoples who settled the area in the Roman period as well as how influences coming from different directions shaped archaeological culture.
Session 2: The Impact of Natural Environmental Factors on Ancient Economy: Climate, landscape

Panel 2.1 The Ancient City and Nature's Economy in Magna Graecia and Sicily

Organiser: Johannes Bergemann and Mario Rempe
(Universität Göttingen)
Friday | 25 May | 09:00-13:30 | HS VI

Panel abstract
The proposed panel focuses on the interaction of ancient cities with their environmental surroundings. Reconstructions of landscapes and paleoenvironments shall be presented in order to shed light on this processes. Landscape Archaeology, especially in cooperation with Natural Sciences offers a wide repertoire of methods for the reconstruction of ancient environments and changing patterns of human-environment interaction. Sites can be contrasted with these reconstructions of their natural environment and be further investigated. A connection of environmental and socioeconomic changes visualizes cultural landscapes, which emerge within the territories of ancient cities in Magna Graecia. Environmental studies are thereby creating a more detailed vision of an area's historical development. Magna Graecia and Sicily are of high interest for this question as the coming together of different cultures may have had a changing impact even on the environment. Unfortunately, comprehensive studies, which consider environment and landscape change in South Italy and Sicily are still rather an exception. The speakers of the panel will present their approaches and results in various case studies in South Italy and Sicily, demonstrating the potential of an interdisciplinary approach to an ancient city and its territory. Thus, the survey projects in Agrigento and Kamarina of the University of Göttingen shall be presented with regard to their insights into settlement patterns and socio-economic processes, but also in connection to their paleoenvironmental reconstructions. The interdependence between landscapes and humans and potential patterns of sustainable actions by the ancient settlers shall receive special attention.

Paper abstracts
1. Anna Maria Mercuri, Palynological approach to economy and human impact reconstruction. Examples from the Greek colonial system (Metaponto area) and Roman agrarian settlements (central Sicily)

Archaeopalynology and archaeobotany are among the key disciplines in the understanding both present-day landscapes and past human-environment relationships. In archaeological contexts, plant remains help to recognize different types of land use: a) exploitation of plant resources; b) cultivation, i.e. the planting and care of useful plants; c) breeding carrying out the increase of pastures and selection of unpalatable plants by animal browsing; d) settlements with spreading of ruderal and nithrophilous plants. Pollen and Non Pollen Palynomorphs (a set of other microscopical records of biological origin, mainly including fungi and algae) are especially useful to discriminate these types of actions.

In the Metaponto area, the palynological research has been carried out on samples collected from archaeological contexts, mainly farmhouses and rural settlements of the Greek colonization. This allowed to improve the knowledge of plant species present and/or used in the sites, and environmental and land-use changes during the Greek phase of occupation. In central Sicily, pollen analyses on Roman farmhouse and rural settlements have been particularly worthwhile for palaeo-environmental/economical local reconstructions. Our data bring evidence and details about the intense land exploitation that contributed to transform the natural environment of
2. Johannes Bergemann (Universität Göttingen), Culture and nature in landscape

Three survey projects in Sicily, in Gela, Agrigento and Camarina have lead to the result, that ancient economic live must be regarded as a complex system. The impact of nature and natural factors like moving coastlines or depleted soil on human live got clear. The paper will introduce to the problem of the panel and show the settlement systems of three naturally different zones of Sicily and the natural impact on human live.

3. Mario Rempe (Georg-August-Universitaet Goettingen), The Chora of Kamarina from Archaic to Roman Times. A sustainable Cultural Landscape?

Within the scope of the Göttingen Survey of the Kamarina Chora (Southeast Sicily), manifest changes in the settlement patterns are demonstrable, especially between the Greek and Roman era. The Greek colonists did plainly use other places and pockets within the landscape and environment. Several palaeo-environmental approaches were carried out to check if the change of settlement patterns coincides with changes within the cultural landscape and/or natural disaster. The talk will focus on physical changes on the landscape, as the development of the fluvial terraces and the effects of land use and erosion are considered. In connection with these changes the results of a pollen core, which was taken in the middle of the Greek Chora, will be presented and discussed with regard to its implications for economic and ecological changes.

After contrasting geomorphological and ecological changes with settlement patterns in Kamarina, the talk will offer further considerations on some contexts in the Hinterland of Agrigento, another area surveyed by the Göttingen Institute in recent years.

4. Elena Mango (Universität Bern), Topographical and Urbanistic Considerations Regarding Himera. New Evidence from the Piano del Tamburino

This paper treats work carried out by the University of Berne in collaboration with the Archaeological Park of Himera since 2012. Our research has thrown new light and importance on the area of the colony of Himera referred to as the Piano del Tamburino, an area that has received little attention in the more than 50 years of research at Himera.

Following initial extensive study of the morphology and topography of the Piano del Tamburino with investigations employing remote sensing, surveys and various geophysical methods (geomagnetic, geoelectric, electric tomography, georadar), excavations commenced in 2012. The results to date from this multidisciplinary approach have provided new insights about the environment and development of the Piano del Tamburino, especially regarding the aspects of the interactions between the natural surroundings and the ancient polis, between different urban spaces and social activity zones, all of which contribute to a new understanding of the cultural landscape of the city. This is of special significance given Himera's unique geographic location on the northern shore of Sicily with its orientation toward the Tyrrhenian Sea and its trade with the Phoenicians and the Etruscans, as well as given its ethnic and cultural context – situated at the crossroads of various spheres of interest – in an indigenous Sican territory near the Phoenician cities of Soluntum and Palermo.

5. Oscar Belvedere - Aurelio Burgio (University of Palermo), Ancient Landscapes and Economy in the district of Northern Imera river (Sicily), from Prehistory to Early Medieval Times. A comparative analysis with the Cignana hinterland (Agrigento, South Sicily)

The aim of this paper is to present the palaeo-environmental approaches and preliminary results in the district of Northern Imera river, corresponding to the territory of the ancient cities of Himera (destroyed in 409 BC) and Thermae Himeraeae (founded in 407 BC). The area is located in the North-West of Sicily, and it is mainly characterized by hilly landscape crossed by rivers facing the Thyrrenian Sea, and by a mountainous landscape (the Madonie) on the eastern side.

Comparing the results of the archaeological excavations (in the city of Himera, and in the rock-shelter of Vallone Inferno), with topographical and palaeo-environmental analysis (both in the Northern Imera
river and in the Madonie), we have taken into consideration relevant aspects regarding the ancient habitat and human activities in the coastal area, and in the hilly and mountain contexts South and East of Himera, from Prehistory to Late Antiquity.

Strong erosion is well recognizable inside the city of Himera and in the surroundings. It is possible that it has originated in Late-Archaic and Classical Ages, maybe connected to anthropic activities. Furthermore, transformations of the territory have occurred during Late Antiquity and Early Medieval Age.

In addition, a preliminary comparative analysis can be made with the area of Cignana, in southern Sicily, East of Agrigento. Cignana is a hilly context near the coast, crossed by the road system connecting the East and West of the island.

6. Andreas Heiss, Cultivation of diversity and diversity of cultivation: Archaeobotany in Elymian and Greek regions in western Sicily

Interactions between the Greek, Elymian, and Phoenician civilisations in Early Iron Age Sicily were diverse, and fluctuating between trade, acculturation, and waging war. These aspects are already quite well-documented in their material cultures. However, bioarchaeological documents for differences and commonalties in agricultural regimes, food habits, and traded goods are still rare. We contrast archaeobotanical data from the small (Elymian?) settlements on Monte Polizzo and on Monte Iato with those from the Greek polis of Selinous, in an attempt to outline aspects of agricultural production and consumption. The results are discussed against the contrasting backgrounds of Greek vs. Elymian settlement, village vs. polis, and mountains vs. coastal plains.

7. Massimo Cultraro, Living around lava flows and volcanic mud lakes: Settlement and Landscape transformations in the western slopes of Etna from the Early Iron Age to the Classical Times

The western slopes of the Etna represent an area of interest for investigating the interaction of settlements and environmental in a long term perspective. Intensive survey activities carried out in the latest thirty years have provided a reliable source of data for examining settlement dynamics from prehistory onwards. The main interest is related to the long-term activity of Etna and its impact on the ancient landscape, either natural and human. Although a large scientific literature on the volcanic evidence of this area has been produced, comprehensive studies on the relationships between human settlement and environmental transformations are rare.

The aim of this paper is to reconstruct the different levels of interaction between human communities and their environmental surroundings. The research, which is based on selected examples, is organized in the following points.

The first one is the influence of climatic changes, which can be reconstructed focusing on the evidence of Gurrida Lake (Randazzo), located at 835 m. above sea level; based on a multiproxy investigations, a reconstruction of palaeoenvironmental dynamics indicate that the Early Iron Age (1100-800 cal. BCE) was more arid than the preceding Bronze Age.

The second research line is to reconstruct some changes in the human landscape related to the volcanic events.

The third and last focus is on the role played by specific volcanic phenomena on the religious system of the local communities.

8. Roksana Chowaniec (University of Warsaw), Late Hellenistic to Later Roman/Byzantine periods faunal and flora assemblage in the ancient Akrai (south–eastern Sicily). Paleoenvironmental and food circulation reconstruction

This presentation examine data regarding the paleoenvironmental reconstruction and food circulation during the Late Hellenistic to Later Roman/Byzantine periods in ancient Akrai (Greek colony and Roman town), SW Sicily. It presents a new bioarchaeological, archaeobotanical, geological data and archaeological artifacts. It is first considerations which apply only to the data from recent studies of the town (2010-2017). The results of archaeometric studies (lipid analysis, isotopic analysis, the osteological and botanical remains) will be present and it provides a cohesive image of changes in environment and
food sources over the mentioned periods. Materials show that Greek, and later Roman occupations caused significant environmental changes. Since the 6th c. BC various forms of human activities were present and then intensified here. The intensive human occupation and growing population damaged the natural landscape, but also allowed it to foster breeding and cultivation. The Greeks and the Romans, just as their predecessors, degraded the local natural environment by hunting, fishing, removal of forests by cutting timber, obtaining ground water, planting; and was further exacerbated by deeper and more intensive plowing, use of queries, and clay digging. The Akrai's land became drier and depleted of natural sources. The studies in ancient town are possible thanks to the cooperation between Polo Regionale di Siracusa per i siti e i muse archeologici and University of Warsaw.

9. Annapaola Mosca (Università di Roma "La Sapienza"), Natural environmental factors and human settlement in Western Sicily: the example of Lilybaeum

The paper focuses on relationship between environmental factors and human settlement in Western Sicily from the V century BC until Late Antiquity in the area around the main center of Lilybaeum. The interdependence between cultural landscape and natural environmental factors has been analyzed during archaeological surveys we undertook to understand the changes in settlement pattern. Coastal lagoons and ponds, wells of drinkable water, quarries, fertile soil and the peculiar vegetation have characterized the organization of ancient settlement in the area between Lilybaeum and Mazara del Vallo. Particular cultures, like small palms growing on rocky soil, but also wheat, olive trees and vineyards may have played an important role in the inland economy. The opportunity to practice herding due to the proximity of the mountain pastures of Erice has also contributed to the formation of ancient settlement.

But, above all, the presence of the ports of Lilybaum and the Mazaro river that was used as a haven for boats and the possibility of trade with North Africa due to the proximity to the African coasts probably influenced the wealthy owners in choosing this Sicilian area to build their houses. Through archaeological data we can understand settlement changes over the centuries, until the apparent loss of importance in the settlement after the Vandalic period.

Panel 2.2 The Impact of Rivers on Ancient Economies

Organiser: Christof Berns and Sabine Huy
(Universität Bochum)

Wednesday | 23 May | 09:00-13:30 | HS II

Panel abstract

Landscapes shaped by rivers provide characteristics and specific conditions, which have a great impact on the economic life of people living in fluvial contexts. Archaeologists so far concentrated on rivers as routes of transportation. Primarily, rivers have been considered as a frame for studies on the distribution of commodities. But especially geo-archaeological research has led to a better understanding of the complex effects of rivers on social communities. Significant geomorphic changes of river-landscapes have been proven at many sites. The different conditions of a river – i. e. seasonal (flooding, low water, icing, etc.) as well as on long-term effects (changing river courses, sedimentation etc.) but also altering possibilities of exploitation – force people to live in close relationship with the watercourse. Simultaneously the river provides specific chances for economic activities. It is the aim of the panel to investigate rivers as dynamic factors that structure ancient communities and have an impact on their economic systems. We hope to specifically look at the various functions of rivers as natural resources, the connective links and at the implications resulting from environmental changes. We seek contributions on single rivers as case studies or wider, systematic approaches addressing one or more of the following themes and questions: To what extend are rivers exploited for the supply of fresh water or
foodstuff? Are there indications of infrastructural provisions such as harbours or dams? Does the use of rivers as transportation route result in shared patterns of consumption between the communities living along a river course? What types of risks and opportunities result directly from natural and/or anthropogenic changes of river landscapes, both in short- and long-term perspective?

**Paper abstracts**

1. Sabine Huy and Barbora Weissova (Ruhr-Universität Bochum), The Economy of the Don River Communities - Driven by the River or by Land Routes?

The present paper examines economic connections along the River Don (in the western part of the Russian Federation) between the late 7th and the early 3rd century BC. The analysed time span revealed several clusters of settlements and burial fields, unevenly distributed along the entire main river course and its tributaries. An interconnection of these micro-regions is anticipated based on Greek imports encountered in each of them.

Trade between the micro-regions has been hitherto always interpreted as an outcome of the river route, the most obvious and easiest mean of transport. However, the spatial analysis of the distribution of settlements and burials shows a distinctive pattern, suggesting overland routes as substantially shorter ones. This fact alongside with characteristic topographic features (including a terrain model and the water regime of the rivers), challenged the original interpretation of the trade as being conducted exclusively via rivers. Hence, this in turn leads to the question of whether the main trade was driven by a combination of land- and waterways?

We search for an answer through two independent methodological approaches. One examines the archaeological evidence (including the distribution of sites and their spectra of findings), the other one analyses the cheapest routes between the micro-regions, applying a GIS based anisotropic least cost path analysis. The final results are interpreted with respect to the outcomes of both methodological approaches.

2. Helmut Brückner (Universität zu Köln), Life cycles of islands and harbours. The case study of the Maiandros river and the city of Miletos

During the past millennia, the formerly flourishing harbour city of Miletos and its environs have experienced major palaeo-geographical and palaeo-ecological changes, caused by the post-glacial sea-level rise, tectonic activities, the delta progradation of the Maiandros (Maeander, Büyük Menderes), and the continuous human impact since Late Chalcolithic times. Based on historical accounts, archaeological criteria, and geoarchaeological research it is possible to reconstruct the spatio-temporal evolution of the landscape. Analyses of sediment cores collected around the Temple of Athena revealed that sea level reached its highest stand there during the Early Bronze Age. A similar pattern is evident around the later Sanctuary of Apollo Delphinius, where cultural debris from the Late Chalcolithic period is covered by shallow marine sediments. The environmental changes with high erosion and accumulation rates contributed to the rapid transformation of the Milesian archipelago with five islands to the Milesian Peninsula, which started during the 2nd millennium BC by the evolution of tombolos and was later supported by intentional infill. Siltation caused by the progradation of the Maeander delta since Roman Imperial times largely silted-up the harbours of the city, subsequently integrating the Milesian peninsula into the floodplain. Today, Miletos is situated some 8 km inland.

3. Silvia Paltineri (Università degli Studi di Padova) - Mirella T. A. Robino (Università degli Studi di Pavia) - Federica Wiel-Marin (Ruhr-Universität Bochum), Flüsse als Wirtschaftsfaktor. Der Handel zwischen Etruskern, Griechen und Venetern im 6. und 5. Jh. v. Chr.

La comunicazione - che sarà tenuta in tedesco o in inglese - esamina le relazioni commerciali fra Etruschi, Greci e Veneti tra VI e V secolo a.C.: l’area settentrionale del Delta del Po e il suo entroterra erano attraversati da una fitta rete fluviale, individuata grazie a ricerche geoarcheologiche. I fiumi, prolungamento delle rotte adriatiche verso l’interno, avevano un regime costante ed erano navigabili in entrambe le direzioni: il Po di Adria passava lungo la frontiera fra Etruschi e Veneti, ma altri rami fluviali,
più a nord, univano le loro acque a quelle dell'Adige, che lambiva Este, capoluogo del Veneto preroma-
no. Gli insediamenti sorgono lungo la maglia fluviale, in posizione rilevata, su dossi o alture collinari
prospicienti i fiumi e prediligono, data la natura del suolo, un'edilizia leggera.
La distribuzione degli indicatori commerciali conferma che i traffici avvenivano lungo la rete idrografica:
nei siti del Polesine (es. Adria, San Cassiano, Balone), a forte presenza etrusca e con connotazione agra-
ria, le anfore greche da trasporto marcano l'arrivo del vino. La ceramica attica seguiva il corso del Po
(es. Forcello) e dell'Adige, una delle porte verso l'Europa centrale, spingendosi, insieme alla ceramica
etrusco-padana, nei centri veneti e oltre. Il fenomeno di ritorno di questi scambi è l'arrivo nel Delta,
lungo l'idrovia Adigé-Tartaro, di un pregiato materiale lapideo, la trachite dei Colli Euganei, impiegata a
San Cassiano nelle fondazioni degli edifici.

4. Varvara Papadopoulou - Vassilios Kapopoulos - Nektarios-Petros Yioutsos, River Arachthos:
Shaping the economic landscape of Ambracia, a Corinthian colony in the Ionian coast
Ambracia, a colony of Corinth, was founded in the late 7th century B.C. and prospered at the exact
same location, where the modern city of Arta extends today. The choice of its location was dictated by
the important strategic and trading advantages it had to offer. Built in the vicinity of the navigable river
Arachthos and at a short distance from its harbors in the Ambracian Gulf, it was situated at a nodal
point in relation to the land routes and waterways, leading both into the Epirote hinterland and Illyria
further to the north, as well as to the Adriatic sea to the west. During the 6th century B.C. Ambracia
must have played an important role in the circulation of fine Corinthian products in central Epirus and
Illyria as it is evident through recent archaeological data.
In the past few decades there have been many excavations in the wider Arta/Ambracia area, revealing
its excellent town planning, its complete drainage system, the appearance of its public and private edi-
fices, the layout of its cemeteries.
This paper will present the river Arachtos and its role as a major trade route shaping the economy and
cultural identity of the region, as well as finds that were discovered among the city's ruins that show the
Corinthian background of the colony, the trading routes to the Greek Mainland and the Western
Mediterranean and its role as an important trading hub.

5. Christoph Rummel (Freie Universität Berlin), Taming Nature. Riverine Connectivity in the
Middle Danube Region
Until the completion of major Roman infrastructure works in the late 1st century AD, the middle
Danube in what is now known as the Iron Gates or Djerdap, was not navigable from West to East (or
vice versa). This is largely reflected in cultural and material culture distributions that are frequently di-
vided into Eastern and Western Balkan groups. Various types of archaeological evidence reflect the ex-
tent to which the changes to the Danube river in the Djerdap/Iron Gates during the late 1st century AD
directly affected the economy and society of the entire middle Danube Region. This paper identifies
how the Danube as a key lifeline of Europe - as we see it today - did not come into being as such until
the Roman period, and how its role as a transport route shaped the entire northern part of the Balkan
peninsula for centuries.

6. Paul Pasieka (Freie Universität Berlin), Südetrurien und seine Flüsse. Beobachtungen zur
wirtschaftlichen und infrastrukturellen Erschließung in der römischen Kaiserzeit
Südetrurien gehört zu den wirtschaftsarchäologisch am besten untersuchten Regionen des Römischen
Reiches. Nur selten wurden jedoch die Untersuchungen einzelner Siedlungskammern oder Mikroregio-
nen vergleichend miteinander in einer Langzeitperspektive in Bezug gesetzt, um zu einem besseren
Verständnis des Wechselspiels von Wirtschaft und naturräumlichen Grundlagen in diesem Gebiet zu
gelangen. Der vorgeschlagene Beitrag will dazu beitragen, diese Lücke zu schließen.
Aus wirtschaftsgeographischer Sicht zerfällt Südetrurien in zwei Großbereiche, die v.a. durch ihre un-
terschiedlichen fluvialen Systeme charakterisiert sind: Ein Küstenabschnitt mit einer Reihe kleinerer
und mittlerer Flüsse wie Bruna, Ombrone, Marta oder Osa, die alle zum Meer entwässern und ein aus-
gedehntes, östliches Hinterland mit dem Tiber und seinem System weitverzweigter Zubringer, der vor

7. Alessandro Sebastiani (University at Buffalo, SUNY), The river Ombrone Valley: connecting economies during the Roman period

The aim of this paper is to describe the multi-scalar economical connections that happened along the river Ombrone valley (south Tuscany, Italy) during the Roman period.

As the Roman Mediterranean was a large globalized market area, ruled and connected through a series of human infrastructures that facilitated the exchange of goods and the mobility of people, this paper wants to analyze this elaborate network of economic hubs, such as cabotage ports and harbors, manufacturing district, villas, vici, farms and public facilities in the specific area of south Etruria. Drawing from the results of two different research projects (the Alberese Archaeological Project and the Impero Project), the paper will analyze the tight relationship between Roman economy and riverine connectivity, detailing the subsequent distribution of economic land-markers and infrastructures in terms of mobility of goods and people along the flow of the river, with the latter playing a crucial role in the understanding of the agency of interconnected landscapes, providing the trait d’union between the micro-scale level of economical distribution (south Etruria) and the macro-global market (the Mediterranean).

8. Anca Dan (CNRS, Ecole Normale Supérieure), Milesian Landscape Transfer: the salted fish, from Egypt to the Black Sea

The concept of “landscape transfer” answers new trends in the study of “transported landscape” (the biota accompanying human populations in their migrations, cf. Anderson 1952) and “cultural transfers” (the passage of a cultural object from a context to another, giving place to new meanings, cf. Espagne-Werner 1988). It aims at emphasizing the anthropic modification of a landscape, by the habits of a new population.

Because of “landscape transfers”, Greek – and especially Milesian – colonization had a significant impact on the Internal Sea, which still needs to be studied. From Antiquity until today, the Black Sea has the exceptional reputation of a sea very rich in fishes; however, before the 7th century BC, we have almost no traces of indigenous “eaters of fish” on its shores. The logical conclusion is that the Ionians (maybe more than the Megarians) became quickly aware of this potential and also that they brought with them the technology necessary for taking advantage of this resource as tarichos. Egypt (with Naucratis) could have been the place from where they learned and exported fish-salting and drying technology to the north.

The paper offers a brief description of the sea and river-mouth fishing before and after the Milesian colonization and stresses the environmental impact of the exploitation of salt marshes and salting basins at Black Sea river mouths.
Panel 2.3 Coastal Geoarchaeology in the Mediterranean – On the interdependence of landscape dynamics, harbour installations and economic prosperity in the littoral realm

Organiser: Max Engel and Friederike Stock
(Universität Köln)
Friday | 25 May | 09:00-13:30 | HS II

Panel abstract

Mediterranean coastlines are highly dynamic geomorphic landscapes with lateral progradation of up to tens of kilometres in alluvial delta regions during the last 5000 years. After the significant deceleration of post-glacial eustatic sea-level rise around 7000-6000 years ago, a complex interplay of regional and local factors such as vertical tectonic movements, glacial isostatic rebound, sediment supply by rivers and coastal currents, deltaic compaction, and human intervention, led to locally different histories of coastal formation. As the coastal zone provided essential access to food, maritime commerce and colonisation activities, its dynamical nature had a significant impact on the prosperity of ancient communities. In fact, Mediterranean harbours as the gateways to the maritime realm were constantly threatened by gradual sedimentation, tectonic uplift or subsidence, as well as extreme events such as earthquakes or tsunamis. Many harbours became landlocked due to coastal progradation with fundamental repercussions on the political and economic status of ancient poleis.

We invite any contributions studying the influence of the dynamic, physical coastal environment on human communities during Antiquity, may this influence be through gradual, long-term sedimentary or geomorphic processes, or episodic such as through earthquakes or tsunamis. We also invite contributions on any type of ancient human influence on the physical coastal environment including but not limited to the implementation of engineering measures or chemical or sedimentary imprints. All types of contributions are envisaged, including excavation- and field-based case studies, those comprising numerical models, synthesising reviews or advances in scientific methodology and techniques.

Paper abstracts

1. Matthieu Giaime and Christophe Morhange (Aix-Marseille Université CEREGE) - Nick Marrine (CNRS) - Michal Artzy (University of Haifa), Geoarchaeology reveals Coastline and River Changes and their Effects on Tel Akko’s Ancient Anchorages

Since the first archaeological excavations undertaken in the 1970’s/1980’s, Tel Akko is known to have been an important trade city from the early 2nd millennium BC onwards. Even if the site has been intensively excavated, no palaeoenvironmental studies looking to understand coastal changes near the tell since the Bronze Age had been undertaken until recently. Our research is based on the study of sedimentological cores drilled at the foot of the tell and in the Old City of Akko, 1500 m west of the tell. We validate the coastal changes, already proposed by previous studies, while clarifying the chronology of these changes. We propose that he southern anchorage was located in the river-dominated mouth of the Na’aman until the early Persian Period. This anchorage shifted to the “open” western coast of the tell during the Persian Period before its subsequent relocation to the rocky promontory of Akko in Hellenistic times. We attempted to locate the Hellenistic harbour of Akko by coring in the Old City, in proximity to the modern harbour. At that time, one harbour was in a semi-protected pocket beach at the foot of the promontory.
2. Andreas Vött (1) - Franziska Lang (Department of Classical Archaeology, Technische Universität Darmstadt) - Lea Obrocki (1) - Birgitta Eder (Austrian Academy of Sciences, Institute for Oriental and European Archaeology) - Hans-Joachim Gehrke (Seminar für Alte Geschichte, Albert-Ludwigs-Universität Freiburg), Major floods in the littoral realm of Elis and their potential influence on the cult site of Olympia (Peloponnese, Greece)

(1) Institute of Geography, Johannes Gutenberg-Universität Mainz

The cult site of Olympia is located 21 km inland from the Gulf of Kyparissia (Peloponnese, Greece). Since 2015, we have carried out an interdisciplinary landscape archaeological project together with the German Archaeological Institute. Geoarchaeological studies, comprising geophysical prospection and vibracoring, revealed strong stratigraphical consistencies between sedimentary records at Olympia, in the Kladeos and Alpheios River valleys and in coastal plains near Pyrgos. Also, we found evidence of crust uplift of minimum 13-20 m during the past 6000 or so years. Our data allow detecting several catastrophic floods, partly as tsunamis from the seaside, since the mid-Holocene. In contrast, thick freshwater lake deposits indicate stable ecological conditions over centuries.

Settlement activities and economic structures were studied by an archaeological survey. Considering the influence of environmental changes on economics and man-environment interactions, the research dilemma is as follows: Archaeological and historical analyses are usually based on the present landscape, but archaeological findings, associated to past landscapes, are mostly used for interpretation. In the Olympia project, results from geoarchaeological studies are regarded as integral part of archaeological analyses and allow shedding new light on the interdependencies between economic and natural factors in a diachronic perspective, i.e. based on different palaeolandslapes and their changing connectivity.

3. Łukasz Miszk (1) - Wojciech Ostrowski (Warsaw University of Technology) - Tomasz Kalicki and Sławomir Chwałek (2) - Ewdoksia Papuci-Władyka (1) - Weronika Winiarska, Engulfed past. Nea Paphos (Cyprus) north-west bay as an example of interdependence between human and environment

(1) Jagiellonian University in Kraków
(2) Uniwersytet Jana Kochanowskiego w Kielcach

The changes of Anthropogenic environmental brought on a complete disappearance of natural vegetation and led to transformation of an erosion-accumulation cycle in the river's valley which triggered to changes of shoreline near Nea Paphos (Cyprus).

In our paper, we would like to present an attempt to reconstruct the processes which influenced the formation of the coastline of the peninsula where the ancient city of Nea Paphos was located. Those processes could have had an anthropogenic origin (e.g. deforestation), but also could have depended on natural factors (e.g. accumulation of sediments). Such reconstruction is an extremely complex task in ancient history, and at the same time it is crucial to understand the economics of ancient port cities such as Nea Paphos. This research task must be carried out on the basis of interdisciplinary studies, with the primary role of geoarchaeology.

In our work the results of geoarchaeological studies (drilling, analysis and dating of thermoluminescence and optically stimulated luminescence alluvia) carried out in the north-west bay of Paphos and adjacent areas of the nearby rivers, supported by analysis of archival sources (historical maps, travel memoirs, etc.) and remote sensing data (Numerical Terrain Model, archival images, etc.) will be presented. The results of our studies allowed to verify a hypothesis on the possible existence of a second harbour in the Hellenistic and Roman capital of Cyprus.

4. Alba Mazza (The University of Sydney), The coastal landscape of a Western Greek city. The case of Selinus

Through an interdisciplinary approach this paper presents the results of the investigation of the coastal landscape of one of the most famous Western Greek cities: Selinus, Sicily-Italy. New sources, including
unpublished archaeological evidence, ancient and modern literature, historical cartography, and geological and sedimentological data from geoarchaeological investigation have been analysed. New elements of the palaeolandscape have been discovered, for example, a suspect submerged palaeoshoreline has been detected, whose shape might suggest a much more longer acropolis. Moreover, evidence of a pre-Greek coastal palaeolagoon environment and recurrent flooding dated to the Archaic and Classical period have enabled a better understanding of environmental engineering and landscape managing skills the Greeks adopted in order to cope with the challenging of living in a coastal environment. Harbour sedimentation provoked by long-term sedimentary process can be suggested. Evidence of past extreme events (earthquakes and possible tsunamis) shed light on the geo-hazards of living on Selinus.

As a result of this study, already known archaeological contexts, such as sanctuaries and fortifications, can be now framed more cogently, and harbor infrastructures are now better understood. Therefore, it is now possible to have a more solid foundation for understanding the role of the shore in the lives of the Selinuntinians and the human-coastal environment interactions.

5. Felix Teichner (Philipps-Universität Marburg) - Klaus Reicharter - Helmut Brückner (Universität zu Köln) - Florian Hermann - Kevin Paul, The Impact of Coastal Changes on the maritime economy of Roman Hispania

Besides mining and farming, the maritime economy with its distinctive fish sauce production (garum) should be acknowledged amongst the pillars of the proverbial flourishing of the Roman Hispanic provinces. The focus of this interdisciplinary research project financed by the DFG since 2017 is particularly the vulnerability of this fish-processing industry, as well as its complex production networks, when confronted with short and long-term natural phenomena occurring at the highly dynamic Atlantic coast. The multidisciplinary project analyses selectively archaeological and geological records (production facilities and sediment archives) in three areas along the Atlantic coast of Lusitania and Baetica, in order to detect the reasons for drastic changes in fish-sauce production during the Roman Empire. Within the framework of the project, roman port and production installations are prospected with geophysical methods and excavated. At the same time, the former geomorphological and environmental setting is reconstructed. Furthermore, the attested local extreme events are traced with geoarchaeological methods and cross-checked with historical accounts about natural catastrophes and their long-range impacts on the roman sea-side settlements.

6. Reinhard Stupperich (Universität Heidelberg) - Corinna Stupperich, Economy and the Persian Wars. The Case of Troizen

Before the battle at Salamis in 480/79 BC some Athenians evacuated their families and household members to Salamis and Aigina, but most of them send theirs to Troizen, where part of the hellenic navy had already assembled (Hdt. VIII 41f. Paus. II 31, 7). As six triremes and 1.000 hoplites from Troizen are said to have taken part in the battles of Artemision, of Salamis and of Plataiai respectively (Hdt. VII 180; VIII 43; IX 28), Troizen must have had about 10.000 residents. Together with the Athenian refugees a multiple of these residents must have stayed at Troizen before the battle of Salamis. The provisions needed for the survival of these persons indicate, that it was at least in part its economic prosperity, which made Troizen especially attractive as a refuge, and which lasted as numerous sanctuaries and costly tombs imply at least until the early byzantine period. On the basis of the results of an interdisciplinary survey focusing not only on the archaeological remains of Troizen but also on the climatic, geological and pedological conditions prevailing in the area the basis for Troizen's economy and its attractiveness as a refuge shall be investigated in this paper.

7. Sabine Ladstätter (Österreichisches Archäologisches Institut) - Walter Prochaska - Roman Sauer, Der Kaiser hatte doch recht! | Neue Erkenntnisse zur Verschmutzung des Hafens von Ephesos mit Marmorabrasiv

Aus Ephesos ist ein Dekret (IvE) des unter Kaiser Antoninus Pius eingesetzten Statthalters der Provinz Asia, Lucius Antonius Albus, überliefer, in dem das Ableiten von Marmormehl sowie Schmirgel in den


8. Camilla Colombi (Deutsches Archäologisches Institut), Ein Hafen am Prile-See? Neue Erkenntnisse zur Ausdehnung der Bucht bei Castiglione della Pescaia


Panel 2.4 The Riverlands of Aegean Thrace: Production, consumption and exploitation of the natural and cultural landscapes

Organiser: Eurydice Kefalidou (National and Kapodistrian University of Athens)

Wednesday | 23 May | 17:00-19:00 | HS II

Panel abstract

Rivers were (and still are) a rather defining feature of the geography of Aegean Thrace, both the large ones like the Hebros, the Lissos and the Nestos and the smaller ones like the Kosynthos, the Komp-satos and the Travos. All of them run, more or less, from North to South, i.e. from the Rhodope mountain range via the fertile coastal Thracian plain to the Aegean Sea or (the smaller ones) to lake Bistonis. Their routes, deltas, marshlands, wetlands, dunes and lagoons form a rather complex natural environment which influenced all aspects of life in antiquity, in both positive and negative ways.

For the most part these rivers were vital supports for people and economies. They provided water for people and animals, irrigated the land, facilitated trade and commerce through small vessels that navi-
gated the larger rivers, aided industrial activities, formed a rich area for fishermen and hunters, and offered raw materials such as sand and gravel. At the same time, their deltas and marshlands, especially in periods of flood, created an inhospitable environment, often unsuitable for habitation, causing illnesses like malaria that affected the local population in a variety of ways. Furthermore, these rivers connected the sea and the littoral zone with the hinterland, and thus they allowed the interaction between the Greek colonies on the Aegean coast with the local Thracian tribes, which inhabited the inland part of this region.

Recent research in Aegean Thrace includes two systematic surveys in the deltas of the Nestos and the Lissos, a rescue excavation in the city of Doriskos near Hebros, a project on the harbour city of Ainos on the Hebros delta and a project utilizing spatial technology along river courses. They all adopt a variety of approaches and methodologies: collecting and studying archaeological material, utilizing satellite images, conducting geophysical surveys, employing geoarchaeology and geoinformatics, etc. All projects aim at defining the character of various ancient riverside sites, integrating them into their broader landscape and understanding aspects of exploitation, production, consumption, communication and trade.

Some of the topics that will be addressed are: (a) The reconfiguration of ancient river routes and the settlement patterns that were formed around them; (b) The boundaries of the chora of various cities, towns, villages farmsteads, etc.; (c) The various uses of land and the means of exploitation through time; (d) The density of population in various landscape settings and the movements of (or tensions between) different groups that moved or expanded beyond their original habitation zone due to environmental and economic reasons.

**Paper abstracts**

1. Constantina Kallintzi (1) - Merkourios Georgiadis (University of Nottingham) - Eurydice Kefalidou (National and Kapodistrian University of Athens) - Kyriaki Chatziprokopiou (1), Archaic and Classical Abdera: Economy and Wealth by the Nestos Riverside

   (1) Ephorate of Antiquities of Xanthi

The Ionic colony of Abdera was founded in the mid-7th century BC by the Nestos riverside on a hill peninsula that provided a good anchorage. The landscape has been dominated by river Nestos and its courses and marshlands that divided the land and connected it with the Thracian mountainous hinterland. The river provided a fertile land for cultivations and at the same time it caused several destructive alluviation episodes, while its marshes affected the Greek colonists by inflicting them with malaria. Despite those drawbacks the colonists persisted on this location due to its strategic and landscape advantages. Another colonisation episode in the mid-6th century BC brought new economic exploitation conditions. The chora was expanded and coins were struck. Large pithoi and transport amphoras demonstrated that trade was conducted across the northern and eastern Aegean. Stone quarrying and metalworking were important economic activities; iron and bronze had been coming from the inland areas controlled by the Thracian tribes possibly through the river route. The domestic economy included the processing of grain and textile production. The appearance of farmsteads in the Classical period reveals a new economic model of exploring the landscape. The same applies for the cemeteries from the late Archaic period onwards, that expanded in space and provided a new way of promoting personal and family wealth and status within the Greek polis.

2. Nathan Arrington and Donia Terzopoulou (Archaeological Museum of Thessaloniki) - Marina Tasaklaki (Ephorate of Antiquities of Rhodope) - Thomas Tartaron (University of Pennsylvania) - Eli Weaverdyck (University of Freiburg), The Classical City on the Molyvoti Peninsula (Aegean Thrace): Landscape, Urban Development, and Economic Networks

The Molyvoti, Thrace Archaeological Project (MTAP) investigates the walled settlement situated on the Molyvoti Peninsula, which was occupied most intensively in the Classical period. The river Philiouri,
identified as the ancient river Lissos, runs between Molyvoti and Maroneia. In the past the city in Molyvoti Peninsula was identified as Ancient Stryme, a colony of Thasos, described by ancient sources as both a polis and an emporion. The first phase of MTAP established the dimensions of the city and its grid plan, identified harbors, and tracked how the coastline and the course of the river have changed. It provided a new chronology of the site, with evidence for activity down into the early 3rd cen. BC and again in the Late Roman period. The surface survey has provided data on the differential use of space within the city walls and it has also demonstrated the changing relationship between the city and its chora. It is now evident that the settlement was oriented predominantly towards trade within a regional network. But there are indications that the city was more widely interconnected. This observation should be correlated with the shifting dynamics across the region, including developments in inland Thrace. Archaeological data from the city of Molyvoti and from a settlement located in the foothills of Rhodope mountains, suggest a type of connectivity with the Thracian hinterland similar to the one testified by the Pistiros inscription.


Doriskos is reported by the ancient writer Skylax as a “defensive wall” (teichos) and by Herodotus as a “seashore” and “the great plain” of Thrace, but also as an important fortified post (royal wall) of the Persians, where a permanent garrison was installed following Darius I’s campaign against the Scythians in 514 BC. In 480 BC, it served as a place of inspection and deployment for Xerxes’ troops. It also had great strategic importance, being located on the overland corridor that connects Asia with Europe and the Aegean coast with the Thracian interior through the Hebros River, which was navigable. The Ephorate of Antiquities of Rhodope, in conjunction with the Geophysics Division of the Department of Geology at the Aristotle University of Thessaloniki, in collaboration with Prof. Gr. Tsokas, has carried out two consecutive seasons of geophysical survey (2005-2006) on the site of Doriskos. These surveys have provided clear indications for the existence of ancient residential remains. Two excavation campaigns in 2007 and 2010 revealed part of the fortification wall and urban landscape of the Hellenistic city confirming the results of the geophysical surveys. The archaeological evidence provides the image of a small fortified settlement, whose inhabitants made their living through cereal cultivation, textile production, fishing and trade.

4. Thomas Schmidts (Römisch-Germanisches Zentralmuseum), Ainos. A hub between sea and inland

Due to a siltation process Ainos, today Enez (TR), is now four kilometres distant from the sea. The banks of the river Hebros (modern Evros or Meriç) mark the area north of the city which had been a bay of the North Aegean Sea next to the mouth of the river in the past. So, Ainos became a hub between the Sea and the inland of Thrace. Byzantine sources convey that larger vessels could go up to Hadrianopolis (Edirne) and smaller ones even up to Philippopolis (Plovdiv). This is a remarkable distance for a river that ends in the Aegean Sea. If we presume similar conditions for antiquity Ainos was predestined for the role of as a hub. The city was founded as a Greek colony. Its importance in Archaic and classical times is obvious and can be proved by written sources as well as by archaeological evidence; also the Late Roman and Byzantine periods seem to be periods of wealth. In contrast, the Hellenistic and Roman Imperial eras were considered as times of decline.

The paper intends to show the development of ancient Ainos as a harbour city based on the results of a research project, financed by the German Research Foundation, which investigates the topography and environment of the ancient and Byzantine harbour city. The role of Ainos as a hub from the Archaic to Late Roman times will be discussed.

5. Despina Tsiafaki - Vasilis Evangelidis ("Athena" Research Center), Exploring rivers and ancient settlements in Aegean Thrace through spatial technology

Settlements are not developed through an empty and neutral space but, similarly to other human built features, were influenced by environmental and cultural variables. Natural geography and ecological
factors shaped the dynamics of human settlement. Especially in the Aegean Thrace the presence of rivers seems to have played a determinant role in the habitation patterns and the development of settlements in an area where different cultural contexts coexisted. Although relatively small for navigation, the valleys of these rivers were important corridors of communication, invasion and trade between the coastal Aegean zone and the interior of the Balkans. In a region where mountains are omnipresent, arable land is mostly restricted along these river valleys or in small alluvial coastal plains. Aim of the paper is to track through spatial technology the long-term shifts in settlement patterns along the course of the rivers (Nestos, Hebro) that cross the coastal Thrace. Therefore we address a number of issues
1. How and when did settlement change along the drainage?
2. How does that relate to changes in water and land management?
3. Why did these changes occur or what is the cultural context behind these changes?

GeoSpatial technology (open access GIS) in combination with geological and hydrological evidence will be used as a tool to allow us to contextualise the relationship between site and environment and detect changes in settlement patterns over an extended period of time.

Panel 2.5 Halos, A City State on the Edge?
Organiser: Vladimir Stissi (University of Amsterdam)
Saturday | 26 May | 14:30-16:30 | HS V

Panel abstract
Ancient Halos, in the south of Thessaly, Greece, was a small polis at a strategic position in a coastal landscape that looks fertile now, but may have been difficult to manage in antiquity. More than a century of archaeological research in the Halos territory and its direct surroundings by Greek, Dutch, British and Canadian teams has produced a dataset of exceptional variety and quality. Much of the area has been surveyed, many sites (including two urban centers) have been excavated, and there are detailed studies of faunal remains, geomorphology and human remains (including DNA and isotope analyses). Together these offer a unique possibility to study the subsistence of a 'city state' in exceptional depth. This is all the more interesting because Halos was not a regular polis. It only had a substantial (50 ha) urban settlement for less than forty years, and may have had no proper urban center for much of its existence – the likely site of the main central place was less than 10 ha at its largest, but that may not have lasted long; it was also uninhabited during some periods. Yet, the area hosts one of the largest known cemetery areas of Early Iron Age Greece, which contains thousands of graves over an area of several square kilometers, but dwindles in the 6th century BCE. 250 years later, the just mentioned large Hellenistic city seems to come out of the blue. The archaeological finds, moreover, suggest strong variations in wealth and food patterns over time. Clearly the demographic, social and economic foundations of this polis were unstable – which was surely not unusual, but is rarely as visible as here. At least part of this precarious situation may be related to the landscape, which was partly very marshy or subject to flash floods and episodes of heavy erosion and soil deposition, and may not have been very fit for agriculture in many areas. Archaeology and isotopes suggest periods of immigration, whereas historical sources indicate Halos was the victim of major moments of warfare, which lead to the destruction and depopulation of the city at least once. Finally the area is regularly hit by earthquakes, the devastating results of which are clearly visible in the archaeological record. In this panel we want to explore the subsistence of Halos from various angles as an exemplary case, to get a better grip on the ways a community in a difficult environment managed to survive and sometimes thrive over almost a millennium.
Paper abstracts

1. Vasso Rondiri, Dimitrios Agnousiotis and Despina Efstathiou (Ephorate of Antiquities of Magnesia) - 1. Konstantinos 1. Vouzaxakis (Ephorate of Antiquities of Karditsa), Reconsidering archaeological landscapes in the broader area of ancient Halos

Landscape always played an important role in archaeological thought and research. Through the anthropology and geography of the 19th and 20th centuries, the concept of landscape was often redefined, along with the perceptions and the philosophical currents of the time. In archaeological research, space as a variable has always participated in the formation of culture, at the same time as it was itself formed.

In recent archaeological practice landscape and material culture acquire meanings according to historical conditions, and associated with memories and senses of individuals. At the same time, acts and their actors are involved in the landscape, gaining experiences that can contribute to its interpretation. Today, the archaeological landscape is redefined historically, socially and ideologically, from something static to something fluid and dynamic, open to various interpretative perspectives.

The area of Almyros, as an archaeological landscape, has been at the forefront of archaeological research since the early 20th century. Greek and foreign scientists have always been interested in the antiquities of the area. The present paper looks forward to examining the archaeological research of the region over time, from Prehistory to the Roman Conquest, focusing on the different levels of landscape influence in the formation of the archaeological scene and vice versa. As examples, data from three major research areas are analyzed: Halos, Voulokaliva and Magoula Plataniotiki.

2. Vladimir Stissi (University of Amsterdam), Halos pottery in its landscape: a diachronic ceramic perspective

The many years of fieldwork done at Halos have produced an enormous amount of ceramics, from a wide range of contexts, covering all periods from Neolithic to the present. It would be a waste not to use this in a session focusing on the impact of landscape on the economy.

However, traditionally, mainly pottery imports are used to explore trade connections and to assess wealth, literally leaving out the local landscape. While there is nothing wrong with this in itself, overly simplistic and positivistic conclusions are all too easily drawn. Moreover, such approaches often focus on a single period, and a small selection of pottery, and they rarely take into account environmental factors. In the case of Halos, finally, the pottery assemblage hardly includes imports, even during periods when it cannot be characterized at poor. Traditional approaches would barely work.

This seems the ideal context for a different approach of pottery in connection to the economy: diachronic, focusing on local production and consumption, and set within its landscape and social context. Can we see a ‘longue durée’ in Halos pottery? And are there perhaps significant interruptions which we can relate to changes in the economic and political setup of the area? And can local pottery perhaps be set in a much wider setting after all? Previous case studies seem to indicate we can do all this. By bringing these and new explorations together, we hope to be able to offer a more comprehensive picture.

3. Sofia Voutsaki, Reinder Reinders, Arnoud Maurer, Rene Cappers, Wieke de Neef and Canan Cakirlar (University of Groningen), A landscape approach to Halos: New questions, methods and challenges

The pioneering geological, geomorphological and palynological explorations undertaken by the University of Groningen in Halos in the 1970’s offered invaluable insights into the interplay between environmental, geopolitical and social processes in the Halos area.

In the new Halos 5-year project we intend to provide more accurate data about land capacity which will enable us to raise new questions about labour mobilization and the sustainability of the Halos community.

We propose to combine novel geophysical and geomorphological methodologies (magnetometry, GPR, electromagnetic induction, electrical imaging along transects, corings) in order to reconstruct roads,
natural anchorages and harbours, to map changing hydrographical circumstances, and to understand the formation of the coastal plain. We plan to take new pollen samples in order to reconstruct diachronic developments and anthropogenic influences on the natural vegetation. We will perform macrobotanical analyses of the old corings in order to carry out radiocarbon and isotopic analyses, but also study any shells, or molluscs indicative of marine or lagoonal environments. These analyses will be complemented with the study of faunal and plant remains from the excavations in Magoula Plataniotiki.

We expect that this integrated approach will have methodological relevance beyond Halos and make an important contribution to the debates surrounding the political economy of the ancient world.

4. Margriet Haagsma (University of Alberta), The Unsustainable City: domestic economies, environment, and the maintenance of the urban landscape in Hellenistic Halos

Taking the concept of the urban-rural continuum as a point of departure, this paper will focus on the relationship between the maintenance and development of New Halos, a newly planned Hellenistic city on the Pagasitic Gulf in Greece, and the viability of the domestic economies of its inhabitants.

New Halos was founded ca. 302 BCE and abandoned around 265 BCE, likely after an earthquake. Strategically located further inland than its Classical predecessor, the habitation area of Hellenistic city covers 46 hectares and is protected by state-of-the-art defensive structures which contrast starkly with the modest houses. Analysis of domestic artefact and ecofact assemblages and environmental studies done in the area point to a surrounding countryside that was not intensively cultivated during the period of the existence of the Hellenistic city. The inhabitants of this urban centre could not support themselves by the agricultural yields of the countryside alone and the city must have been dependent on the import of grain from elsewhere. The city's marginal location, the limited capacity of the land, and the role of Hellenistic rulers who kept the city under tight economic control had a negative impact on the ability of individual households to renovate and sustain their urban environment.

The complex interaction between historical, social, environmental and economic factors thus played into the inhabitants' decision to abandon this urban centre after only 35 years of habitation.

5. Eleni Panagiotopoulou (University of Groningen) - Hillary Sparkes (University of Alberta), Diet reconstruction in Early Iron Age and Hellenistic Halos

This paper investigates dietary variation observed in populations inhabiting the area associated with the Hellenistic city of Halos in Thessaly, Greece. This is a unique opportunity to compare the diet and study dietary change from the Early Iron Age (EIA, 1100-900 BC) to the Hellenistic period (323-31 BC). Diet is reconstructed by means of stable carbon, nitrogen, and sulfur isotope analysis of human and animal bone collagen as well as enamel carbonate. The main pattern that is observed is that the diet was largely based on C3 plant and animal resources with evident absence of large marine fish despite the fact that this is a coastal location. However, there is observed variation between the two periods. In the EIA the diet was complemented by C4 resources while animal protein was higher and marine resources were totally absent. On the other hand, in the Hellenistic period, reliance on animal protein varied, some individuals depended heavily on C3 grains and olive oil, while marine resources in small amounts were present. Further interpretation of the isotopic results based on social differentiation patterns revealed dietary variation observed between age, sex, and status groups.
Panel 2.6 The Economic Structure of Eastern Anatolian Highland from Urartian Period to the End of Late Antiquity

Organiser: Mehmet Isikli (Atatürk University)

Saturday | 26 May | 14:30-16:30 | HS XI

Panel abstract
The Eastern Anatolian Highlands was one of the prominent sub-regions of the ancient Near East due to its very specific location. This region, which has rugged geographical features and harsh climatical conditions, is situated between Northern Mesopotamia, the Southern Caucasus, Northwestern Iran and Central Anatolia, each of which were important cultural regions of the Near East. The Eastern Anatolian Highlands has played an important role in the economic networks and cultural relationships developed between the southern and northern regions through the ages. Despite its negative geographical and climatical conditions, the region hosted many cultures and societies through time on account of its location and richness in natural resources and raw materials. The archaeological evidence shows that the initial periods of centralization and state formation in the region began with Urartu and continued through time. The Urartian State is the first known central political organisation in Eastern Anatolia, and during this period, the societies living in the Highlands first became acquainted with literacy. Thereafter, the economic and political structures in this mountainous zone of the Near East are more easily observed. From this point of view, the economic structures of this marginal zone of the ancient Near East will be analysed in this session from the Urartian period to the end of Late Antiquity.

Paper abstracts

1. Mehmet Işikli and Oğuz Aras (Atatürk University), Observations on the Urartian Economy in Light of the Excavations at Ayanis Castle

The Urartian State is the earliest known central political organisation in the Highlands of Eastern Anatolia and the Trans-Caucasus region. Situated around the Lake Van basin, the Urartian Kingdom attempted to control the territory between the Van, Sevan and Urmia lakes – an area that included fertile plains hidden in mountain zones and large, lush pastures. For approximately three hundred years, the Urartian Kingdom struggled against harsh geographical conditions and against several political rivals. While creating a new political system under these circumstances, a novel economic system was also being forged. Construction activities by the Urartians included not only the notable fortresses, but also dams and canals. These construction projects reflect the economy of the period, which was based on agriculture, stock breeding and booty (the latter of which might include captives, sheep and other commodities). Fortresses were important components in this economic system, as they hosted public buildings such as temples, palaces and storage facilities. They also acted as political and economic centres for the inspection, storage and distribution of surplus production. Ayanis Fortress, having been excavated since 1989, is one of best-known and striking examples of these fortified centres, presenting a paramount picture of the 7th century BC Urartian Highlands. This paper focuses on the new evidence from Ayanis and tries to analyse the Urartian economical system through its architecture, archaeological findings and written evidence.

2. Leila Afshari (Atatürk University), The Economic Conditions of the Eastern Anatolian Highland (Armenia Satrapy) during the Achaemenid Period

The Achaemenid (Persian) Empire was the largest of all ancient Near Eastern “world empires”, spanning from Egypt to central Asia and the Indus region. Its formation began after 550 B.C.E., when the petty king Cyrus of Anshan/Fars (in southwestern Iran) and his son Cambyses conquered the mighty Medes and the empires of Lydia, Babylonia and Egypt. For 200 years, from the second-half of the sixth century
to the decades before 330 BC, the Persian dynasty of the Achaemenids ruled Anatolia and Armenia as part of an enormous empire stretching from the Mediterranean Sea to Afghanistan and India. The satrapy of Armenia was one of the more remote satrapies of the empire, stretching west from eastern Anatolia to the southern Caucasus Mountains and south to Lake Urmia. It is located quite some distance from the center of the empire and creates the northernmost border of the empire in the southern Caucasus Mountains. Armenia has several natural borders, such as the Black Sea to its northwest and the great Caucasus Mountain range to the north, and the satrapy had a varied geography containing mountains, plains, grasslands, semi-deserts, large lakes and several rivers and streams. The landscape was harsh, and as a result, the population was resilient. While the landscape was severe, it could also be plentiful: the numerous rivers and streams in the region left the landscape fertile, large lakes such as Lake Van provided fish, and the landscape was rich with raw materials, especially metals such as copper, silver and iron.

3. Nusret Burak Özsoy (Erzurum Technical University) and Elif Yavuz (Atatürk University), The Economic and Political State of Eastern Anatolian during the Classical Period

Eastern Anatolia, with its challenging climatic conditions and ruggedly mountainous terrain, was a territory that proved difficult to control for many civilizations throughout history. Due to the nature of its terrain, which exhibits a natural defense system, it offered advantages and disadvantages to civilizations that wanted to dominate it. During the Hellenistic and Roman periods, the territory acquired a particularly strategic significance. This was especially the case, when Rome began to engage with the Caucasus region, at which time Eastern Anatolia thereby began to find itself in an important military and economic position. In this study, the developments experienced in these periods will be evaluated in terms of regional geography and economic conditions.

4. Ahmet Cüneydi Has and Aşegül Akın Aras (Atatürk University), Economic Mobility in Eastern Anatolia during the Byzantine Period

The region of Eastern Anatolia, where terrestrial climate conditions prevail, was a frequent conduit guiding east-west trade. While regional climate and vegetation cover present challenges, it has been able to survive economically through many periods by keeping production at a constant level. The most important factor in this regard is the fact that the region effectively functioned as a transit point on account of its strategic geographic position. This economic dynamism in the Byzantine period brought the region forward not only economically but also in many other respects. From this perspective, the trade of Eastern Anatolia will be analyzed from archaeological and geographical data. We will also try to provide detailed information about how effectively the region succeeded in using Roman trade routes in the Byzantine period.

Panel 2.7 River Valleys and Regional Economies

Wednesday | 23 May | 14:30-16:30 | HS II

Paper abstracts

1. Romel Ghrib (Department of Antiquities), Study of Ancient Economy around Zarqa River in Jordan

This study investigate the economy for the ancient world's in Zarqa river in middle of Jordan. An archeological excavations and surveys determined that, people were hunters and food gatherers. However, an upgrading of human settle pattern happened to be as agricultural villages as (Ein Ghazal site). A revolution of tools and usage by copper discovery took place as in (Tulailat AlGhasoul site), while water harvesting and defense fortification appeared clearly at (Al-Batrawi site). Through bronze age, Jordan was divided into three kingdoms: Edoms, Moabs and Ammonites, settlement continued through the Classi-
2. Desirè Di Giuliomaria (University of Bonn), Walking along the Ilissos River

The Ilissos valley has always been one of the most fascinating places in Athens, because of the several cults and myths that the ancient literature refers and archaeological data, most of the time, confirm. The present study started from two main questions: How did the areas around the Ilissos river change during the time and how much the abundance or scarcity of water influenced those changing processes. Considering a range of historical time (6th c. BC-8th c. AD), the Ilissos valley has been inhabited at least from Classical to Byzantine period. Therefore, it went through many changes of purposes: from one of most ancient cult place (Thuc. II 15, 3-6), to a residential area (ls. VIII 35) until when it became an operating centre of ceramic and metal production, supplying the entire city. Actually, an inscription reused in Plaka -and probably coming not so far from the Ilissos’ banks- testifies a leather workshop nearby the river around the second half of 5th c. BC (IG I3 257). Workshops along watercourses should exist since Classical period, as some evidences along the Eridanos river and into the Classical Agora prove. Thanks to the Eforia of Athens, I had the possibility to study the notebooks of the campaigns led by I. Threpsiadis and J. Travlos around 1960s: thus, I could explore every phase that they came across and how changed the topography of the entire area. My study is still at the beginning and I hope that the new data will stimulate a fervid debate.

3. Annapaola Mosca (Università di Roma "La Sapienza"), An ancient landscape shaped by the river: the impact of the Adige at the base of the Alps. A new research perspective

The goal of this study is to analyze the impact of the upper section of the Adige North of Verona on the ancient landscape and the economy with a focus on the Roman age. The river, despite the fact that it could not be navigable at different times of the year, has been used since protohistorical era for the transport of goods from the port of Adria. Many data suggest that in Roman age the Adige could be more easily connected via a network of channels to other Adriatic ports. But so far it had never been proven how the Adige influenced the organization of the settlement and the productive landscape of the district. If we examine the distribution of Roman sites placed in the Adige Valley, it is clear that the presence of marshes and the danger of damage caused by floods forced the choice of conoids as settlement sites. Some settlement is necessarily rebuilt, due to its position closely connected with the river, in the same place as pre-Roman settlement, so we can assume there were berths along the river. Other Roman settlements were organized on the hillsides, where agriculture could be practiced. The production sites were placed near the streams entering the Adige. The water of these streams was used in productive activities and the Adige itself could contribute to the diffusion of the products. We know the circulation of tiles but also of other manufactured goods and of stones. Definitely the river forced people to have a close relationship with water.

4. Ilaria Serchia - Giulia Rebonato - Anna Rita Marchi (Soprintendenza Archeologia Belle Arti e Paesaggio per le province di Parma e Piacenza), The impact of the Parma creek floods on urban and economic development of Roman Parma in light of recent findings from "via del Conservatorio" archaeological excavations

The archaeological excavation of a large urban area of the Roman city of Parma (“via del Conservatorio” construction site), just a few meters from the omonymous creek, allowed the stratigraphic investigation of several alluvial events. The proximity to the Parma creek influenced growth, development and involution of this area since the Iron Age. During Republican age, through the construction of the town walls and the putting in place of containment mixed systems, the creek was regimented and exploited for different craft activities. With the re-establishment of the colony, during the Augustan age, the area was completely rebuilt through the construction of at least two domus. At the same times, a complex hydraulic system was realized...
and connected to the creek through a series of exhaust ducts serving the domus. Throughout the imperial era, at least until the 3rd century AD, a series of alluvial events occurred that caused the partial flooding of the town, and considerable damage to structures and infrastructures that were nevertheless restored. Until the Late Antiquity, when the excavations document the evidence of a strong flood that led the creek to move toward the town and caused the consequent need of constructing new walls to bar the creek itself and which, de facto, came to shrink the urban perimeter. During the second half of the 12th century another strong flood caused a further displacement of the watercourse into the bed within which it still flows nowadays.

Panel 2.8 Environmental Factors on Regional Economies

Friday | 25 May | 14:30-16:30 | HS II

Paper abstracts

1. Charalambos Dokos - Katerina Dokou - Paraskevi Liasidou - Despoina Manolopoulou - Nikolas Solomou - Kyriakoula Manaridou, Preliminary topographical and paleobiological data of the area Skales of the village Kato Pyrgos, Tyllirias district, Cyprus: implications about Cyprus coastline cartography

Geographical and geomorphological characteristics of Cyprus changed the route of history of the island. One of the most important questions that “nettle” the interest of geologists, geographers, biologists, historians and archaeologists is the characteristic shape of the coastline. It believed that the current shape of the island was much different than the one in antiquity. Therefore we conducted a large scale survey starting from the area of Tylliria district, in order to estimate the primary coastlines of Cyprus by using topographical and paleobiological data. The area Skales was surveyed thoroughly for identifying marine bivalves preserved in their calcareous shells. Each station was topographically identified. The fossil as intact or fragments was carried carefully and cleaned gently for identification purposes. Each fossil was identified and characterized. Afterwards each specimen was catalogued in order to have the species for each station. Each station was double checked for the exact position of the station, the distance between them and the sea side. In this study twenty five pieces of marine bivalves fossils collected, twenty of them were fragments and five as whole pieces. The clarification of the primary coastline is essential for archaeological excavation purposes. Bivalves are an important paleobiological indicator of sea level changes. Therefore the location of these is essential in order to have a spectrum of the sea level and coastline in antiquity.

2. Manolis Stefanakis (University of the Aegean), Some Remarks on the Economy of the Ancient Deme of Kymissaleis on Rhodes

The ancient Deme of the Kymissaleis, located on the south west coast of the island of Rhodes, has been explored since 2006, in the context of the Kymissala Archaeological Research Project (KARP). Up to date it remains the only case study of the demes of the Rhodian countryside. The aim of this paper is to understand and better explain the way in which the Hellenistic inhabitants of the ancient Deme adapted to their natural environment and exploited it. The approach is based on the theory of watersheds, according to which an ancient community should have a specific productive space in order to emerge into a political organization with some status of autonomy and independence, and the political geographic boundaries of such a unit should therefore coincide with the natural boundaries of a specific geographical area. As decisive criteria for the delimitation of such a periphery one should consider farmland and pasturage, as well as precipitation (rain, snow etc), on which cultivation (and pasture) depends. There is plenty of evidence to support that Kymissaleis were indeed adapting natural landscape features to fit the needs of residential communities. Moreover it becomes clear how the inhabitants at
each site would have accessed resources through proximity to roads, sources of water, and arable land, as well as the flow of natural and cultural resources among sites and both in and out of the region.

3. Michele Matteazzi (Catalan Institute of Classical Archaeology), The Upper Adriatic littoral landscape between Atria and Altinum during Roman times: natural environment, road network and land use

Following a landscape archaeological approach and through an integrated reading of all the available archaeological, historical and paleoenvironmental data, the paper aims to investigate the complex relationship man-landscape, which was established over the Upper Adriatic littoral area between the centers of Altinum and Atria during Roman times (3rd cent. BC-6th cent. AD).

If today the relationship between landscape and water looks very tight (the area is in fact characterized by the presence of a complex hydrographic system and the Venice Lagoon basin), we know the quite same condition existed also during Roman times, when classical sources tell us that here there were the northernmost part of the great delta of the river Padus and, above all, a wide marshland called Septem Maria (i.e. “the seven seas”), the area where the river itself flowed to the sea with more branches. Furthermore, the delta area was exploited by a fluvial route going from Ravenna to Aquileia and at least by two important roadways: the via Popillia, and the route remembered by Tabula Peutingeriana that reached Altinum starting from Ravenna.

Therefore, the final goal we want to reach with this study is double: on the one hand, to identify the environmental factors that both favoured and conditioned the Roman occupation of the territory; on the other hand, to come to a better understanding of the forms this occupation took, and of its actual effects on the natural environment.
Session 3: Systems of Production: Land use, industry, technology, artistic production

Panel 3.1 Production Beyond the Palaces: Technological and organizational aspects of LBA ceramic manufacture

Organiser: Natalie Abell and Jill Hilditch
(University of Michigan)
Wednesday | 23 May | 14:30-19:00 | HS III

Panel abstract
Shifts in the organization and technologies associated with craft production have long been recognized as inextricably linked to economic change and development. In Late Bronze Age (LBA) contexts, craft production has, until very recently, been seen as an activity closely tied to the Minoan and Mycenaean palaces, and undertaken by specialists or workshops "attached" in one way or another to those institutions. Yet, several recent reassessments of LBA economy have clarified how some production and economic activity took place at the fringes of—or wholly outside of—palatial oversight. Examination of variation in the organization and techniques of ceramic production holds promise for further elucidating the complexity of LBA economies, providing insight into interaction and transfer of technological knowledge between ceramic and other craft specialists, and highlighting variability in how producers did (or did not) respond to the changing exchange patterns and consumer expectations. In addition, despite decades of attention focused primarily on the production of fine and painted wares, recent work has turned to examining coarse, cooking, and even architectural ceramics with a view to explicating where these kinds of wares were produced and what kinds of technologies were employed in their manufacture. Thus, this panel brings together papers focused on these aspects of LBA ceramic production as a means of encouraging comparisons within and between regions, between coarse, cooking, and fine ware production, and at different degrees of separation from palatial interest and oversight.

Paper abstracts
1. Julie Hruby (Dartmouth College), Using Mycenaean Palaces and Potters as a Mechanism for Understanding How Context and Intensity (Don't) Work as Models with which to Describe Craft Production

The tablets from the prehistoric Palace of Nestor at Pylos in Greece record four potters; one named Piritawo is “wanakters” (“royal”). Given his ties to the palace, we would expect to consider him an attached specialist, yet he fails to meet other criteria traditionally associated with the term. This suggests that the term “attached” conflates patronage with quality of output. Despite being a primary supplier for the palace, Piritawo makes vessels that are metrically variable, reflecting a range of factors including carelessness, seasonality, and level of task specialization; these factors indicate that at best, the definition of intensity also requires additional nuance.

Whether our goal is to understand a potter’s lived experience, examine the apportioning of ancient labor, or create a statistical argument for craft specialization, it is critical that we understand the full process of ceramic production. A craftsman who works “part time” (either seasonally or day-by-day) may create more standardized vessels than does a “full time” specialist if the former only shapes pots while the latter digs and prepares clay, forms it, and fires the resulting vessels. Production can be undertaken by a single individual, divided among several (each of whom is responsible for a different task), or shared; it may prove more useful, though methodologically challenging, to discuss ancient artisans in terms of how much time they dedicated to each specific production task.
2. Lynne Kvapil (Butler University) - Kim Shelton (University of California) - Debra Trusty (University of Iowa), Decisions, decisions, decisions. Examining the role of choice in pottery production at Petsas House, Mycenae

Petsas House, located in the immediate vicinity of the palace of Mycenae, provides an opportunity to study and understand variations in fine and cooking ware vessels from the perspective of both production and consumption. Petsas House, destroyed late in the LHIIIA2 period, was used for habitation and storage in addition to ceramic production and is one of the few examples of multi-use space in a settlement during this period of palatial expansion and centralization. Choices made by potters during production demonstrate an understanding of the need for standardization balanced with a desire for experimentation and innovation.

Within the Petsas House workshop, surviving traces of vessel construction and technical gestures in undecorated fine ware and cooking pots speak not only to workshop organization but elucidate the potters themselves. Fine details, such as methods of handle and tripod leg attachments, reveal preferences and skill levels of individual craftspeople. Beyond the workshop, the syntax between surface decoration and vessel shape in painted fine ware vessels suggests pots were crafted as much for official use as for individual consumers.

The result of this investigation reveals a sensitivity on the part of artisans to the needs of a consumer base that included, but was not limited to, palatial society. In order to meet the needs of their clientele, multiple potters found ways to standardize production while also reserving the ability to experiment in their craft.

3. William Gilstrap (Massachusetts Institute of Technology), The protean potter. Economic strategy and social organization in prehistoric complex society

At the height of Mycenaean culture, from storage to shipment to service, pottery was relied upon as a choice material for vessel production. The raw materials were widely available and the process of production had already become a craft honed by specialized artisans. The sheer quantity of pottery found in excavation records conjures images of a ubiquitous presence and juxtaposes the question of what role both product and producer had in the lives of everyday people atop the citadels and in the fields.

The research presented here approaches this topic through an assay of broad typological assemblages from twelve contemporary, yet contextually very different archaeological sites in and around the Saronic Gulf.

An integrated program of analysis reveals a resounding complexity in the structure of Mycenaean social and economic interaction at a variety of scales. For example, observations of both pottery production and consumption make it plain that craftsmen had the ability to act as agents of the palatial elite and the day to day consumer all while participating in trade on the interregional scale. Rarely has it been considered that craftsmen had a multidimensional role in complex societies. Rather these roles are too often considered as completely separate entities. In treating craft production as a composite system, the organizational structure of Mycenaean economic strategy – local, regional, interregional and beyond, becomes much easier to envision.

4. Kyle Jazwa (Duke University), Non-Palatial Architectural Ceramics in LBA Mainland Greece: Design, Production, and Use

In this paper, I consider the invention, production, and use of architectural ceramics (roofing tiles, built drains, etc.) for non-palatial architecture in Late Bronze Age (LBA) mainland Greece. Categorically, architectural ceramics are at an archaeological middle ground between pottery and architecture. Although they share a material medium with pottery, architectural ceramics have distinct uses and, due to their function, are highly visible. As architectural elements, however, they are also unique, because they require greater labor investment for production relative to their vernacular counterparts. Thus, the extensive use of architectural ceramics in LBA buildings certainly provided a monumental quality to the buildings they adorned. Despite this, such buildings are often not primary palatial structures, but are more often found on subsidiary buildings or at non-palatial sites. This paper explores the implications for the production and use of these architectural ceramics in these non-palatial contexts. First, I show
that the use of architectural ceramics had variable meaning in Greece, according to local manufacturing capabilities and labor organization. I then explore the contribution of architectural ceramics to non-palatial ceramic economies and detail cross-craft interaction for each industry. Trained potters are shown to have produced some architectural elements, such as cover tiles, but other elements drew on established architectural traditions.

5. Natalie Abell (University of Michigan) - Evi Gorogianni (University of Akron), Pottery Production on Late Bronze Age Kea: Organizational Perspectives

Patterns of ceramic production and distribution changed significantly during the Aegean Late Bronze Age (LBA). In the Cyclades, exchange networks reoriented from a focus in the Minoan and Minoanized southern Aegean toward the Mycenaean mainland; local manufacturing choices also shifted, with a nearly complete cessation of production of decorated tableware by LBA III. It has been argued that such changes are a result of the development of mainland workshops and the emergence of the palaces as major production and consumption hubs. Yet, the precise mechanisms by which these changes occurred remain unclear, in part because of a rarity of analyses that highlight the ways in which local producers and consumers—especially outside the “palatial cores”—made choices over time that contributed to changing patterns in material culture.

This paper examines local ceramic production at the Bronze Age town of Ayia Irini on the Cycladic island of Kea, at the fringes of palatial territories. We examine the manufacture of local ceramic objects, including both decorated and plain wares, from tableware to storage jars, in order to examine shifts in the organizational configurations of production to meet demand in various ceramic categories over time. We argue for a more complicated picture of local production than has been implied by previous narratives and suggest that shifting production mechanisms impacted the changes in Keian ceramic assemblages in the LBA.

6. Emilia Oddo (Tulane University), Palatial and nonpalatial pottery production from domestic neopalatial contexts: an inter-regional case study

This paper presents the comparative analysis of two contemporary domestic pottery assemblages from two different sites: Knossos (House of the Frescoes), in north-central Crete, and Myrtos-Pyrgos (House B), on the southeastern coast. Although both domestic contexts, the assemblages pertain to different social contexts and are representative of different regional ceramic styles. In terms of social contexts, a comparison between the two assemblages offers the opportunity to reflect upon the way pottery can provide information concerning the character of its broader architectural contexts (elite architecture, House of the Frescoes, and non-elite, House B), the variety of human activity related to the area, as well as the nature of the sites (palatial, Knossos, and non-palatial, Myrtos-Pyrgos). In the comparison, I will take into consideration shape typologies and functions, as well as decorations, to draw attention to inter-regional patterns of production and consumption. As we will see, despite the perceived unity of Neopalatial pottery production, once a part of the cultural koine, regional variability dominates the field.

7. Charlotte Langohr and Iro Mathioudaki (Université catholique de Louvain), Ceramic traditions in Palatial Crete in the longue durée. Examining shifts in pottery consumption and production at Malia and Sissi, north-east Crete

Malia and Sissi are centuries-old Minoan settlements located at 4 km of distance on the northeastern coast of Crete, 40 km east of Knossos. This paper aims at examining main shifts in table, coarse and cooking wares consumption and production at two neighboring sites in adopting a broad chronological perspective. Malia was one of the major palatial centres of the island; it knew its moment of glory during the First Palaces period before its violent destruction and following rebuilding during the Second Palaces period. The secondary site of Sissi was densely occupied throughout these periods of the Middle and Late Bronze Age; it knew a totally new layout and extension by the beginning of the Second Palaces period. Our current research focuses on refining and comparing the respective local ceramic sequences in order to shed some light on the developments and changes in pottery traditions at both
sites. In the framework of this panel, by highlighting and contextualizing the main shifts in the con-
sumption and production of different categories of pottery from both Malia and Sissi, it will be shown
how these traditions meet or differ within this region. In doing so, we aim at opening a new window on
processes of continuity and rupture at two regional palatial and non-palatial sites of North-central
Crete, before, during and after the transition of the First and Second Palaces which sees the formation
of a new political and socioeconomic geography for the island.

8. Jill Hilditch and Caroline Jeffra (University of Amsterdam), As the world turns: technological
approaches to assessing ceramic production within and beyond the palaces in the LB Aegean

The focus on unpacking material changes at the transition between the Mid and Late Bronze periods,
known widely as Minoanisation, has reassessed the interactions that facilitated the movement of peo-
ple, objects and technological knowledge off Crete. These new methods open further questions on
whether a technological focus can offer new insights into the Mycenaean world.

It is clear that traditional narratives for the initial adoption and use of the pottery wheel within the
Mycenaean period are not satisfactory. The emergence of wheel-throwing remains a poorly understood
innovation within the Aegean, chronologically and spatially. It now seems clear that wheel-coiling per-
seisted across this landscape throughout the later phases of the Bronze Age, with many regions reveal-
ing co-existing ceramic traditions. So, how can we use this information to shed light on the organisation
of Mycenaean potting communities? The LB III period across the Aegean is marked by enormous social,
political and economic differences, perhaps best represented by palatial vs. non-palatial settlement
contexts. This paper explores choices in ceramic forming techniques to assess potting communities
during this complex period, for example:

Is there a clear relationship between organisation of production and the potter's wheel within Myce-
naean palatial centres and non-palatial settlements?

Can the adoption and extent of wheel-throwing shed new light on the relationship between Cretan and
mainland communities?

Panel 3.2 Organization of Space and Work: Potter's workshops in the Greek world

Organiser: Jon Albers (University of Bonn)
Saturday | 26 May | 14:30-16:30 | HS III

Panel abstract

We know hundreds of Greek workshop sites, but only very few are well preserved or investigated en-
tirely – usually we find kilns or waste deposits as indicators for ceramic production. In the past Archae-
ologists used different approaches to reconstruct the organization of space and work: chaîne opéra-
toire, space syntax, combination of signatures or Roman and ethnographic parallels etc.

This panel plans to present and investigate known or new evidence concerning the organization of the
production process by analyzing the sites, products and tools. Examples from the whole Greek World
between Iron Age and the Hellenistic period should be considered.

Possible questions are:

• What is the relation between kilns, working and storage space?
• What can we say about the position of typical installations like basins, potter’s wheels etc.?
• Which different kinds of tools or installations were used in which area of workshops?
• Can we interpret different stamps or marks as part of production or trade?
• Can we identify workshops, which are specialized only in single steps of the whole production
chain?
• What can we say about the relation between workshops and raw materials (e.g. water supply or clay pits)?

Paper abstracts

1. Jon Albers (University of Bonn), Spatial organization of a potter's workshop in Selinous

Throughout seven excavation campaigns (2010-2016), the department of Classical Archeology of the University of Bonn (Dir. Prof. M. Bentz) excavated the southern part of Insula S16/17 in the Cotone Valley of Selinous in total. Structures of a large potter's workshop were identified which includes nine kilns from different periods as well as roofed and open working spaces differing in size and function. Structures from the mid-6th century BC covered most sections of the insula and formed a group of older workshops. The subdivision of the later complex was already defined in this period. However, the expansion of the area altered between the mid-6th and the late 5th century BC several times: older buildings were unified to a larger workshop with a minimum size of 1000m², which incorporated also the northern section of the insula and produced ceramic products of different kind. During these building processes, the deposition of vases as building sacrifices and numerous architectural changes took place. In the course of the Carthaginian conquest of Selinous in 409 BC the workshop was destroyed. This presentation focuses on the change between archaic and classical patterns through the ages. It examines how the modification of the architectural structures, some specific installations like basins etc. and the used spaces go along with a change of the organization of production from small objects like terracotta figurines to an almost industrial production chain.

2. Jan Marius Müller (University of Bonn), Tools, products and objects of everyday live: The inventory of a Selinuntine workshop-building destroyed in 409 B.C.

During the excavations conducted by the University of Bonn in the industrial quarter on the eastern slope of Selinus, next to a big kiln, a tiled workshop-building featuring a roof-tile pavement was uncovered. The inventory of the building was mostly preserved under a destruction layer which can be dated to the year 409 B.C., when the city was conquered and destroyed by the Carthaginians. In its last phase the structure was subdivided in three rooms which, according to the findings, had different functions. They contained typical workshop equipment, storage and cooking vessels as well as evidence of a small domestic sanctuary. The workshop equipment consists, among other things, of a smoothing tool, a bearing of a potter’s wheel and vessels for working with clay and water, but nearly no spacers, which were found in large quantities in other parts of the insula. The evidence points to the conclusion that the building served as working place and shelter for a small crew of potters, who were also responsible for the maintenance of the big kiln and the monitoring of the firing process.

3. Giovanna Greco (Università degli Studi di Napoli FEDERICO II) - Antonella Tomeo (Soprintendenza Archeologia Belle Arti e Paesaggio per le province di Caserta e Benevento), Cuma: importazioni e produzioni nella città arcaica e classica

Gli ultimi anni di ricerche a Cuma hanno profondamente modificato il quadro delle conoscenze della città antica ed il dato più eclatante è restituito dalla documentazione relativa all'impianto arcaico, negli anni centrali dell'VIII secolo a.C. L'intervento focalizza l'attenzione sugli aspetti economici della città, analizzati attraverso il materiale importato e la nascita di botteghe artigianali, tra VIII e VI secolo a.C. La notevole quantità, la qualità e la varietà dei materiali rinvenuti parlano a favore di una economia fiorente, partecipe dei traffici che attraversano il Mediterraneo occidentale. Il contributo essenziale delle analisi archeometriche ha consentito di individuare e definire le produzioni locali che elaborano repertori formali e decorativi selezionati dagli artigiani locali di cui si riconoscono alcune personalità. Emblematica è la produzione del proto corinzio come del c.d italo geometrico o della ceramica a fasce. La presenza dei grandi contenitori da trasporto è un altro parametro significativo dell'economia della città arcaica e classica, così come la notevole presenza di ceramica attica - a figure nere e rosse- rin-
venuta nei contesti di abitato, conferma il trend commerciale già noto dai rinvenimenti nelle necropoli; il legame con l'ambiente attico, attestato già con le prime anfore SOS, rimane un fattore stabile nell'economia della città, ancora in piena età classica con l'importazione di vasellame a vernice nera.

4. Anne Segbers (University of Bonn), Greek pottery workshops in South Italy: reconstructing a production system

When the Greeks started to colonize Southern Italy, they also imported their way of pottery production. Specialized workshops existed beside household production from colonization times until the roman occupation. Excavations show that in the first generations, potters only worked in temporary workshops. From the 6th century BC on, permanent, specialized workshops existed in the cities and settlements. They produced a great variety of products and sold them locally. Only a small amount was exported to other Greek sites or to the indigenous population.

At the same time, the Greeks settled the countryside with farms, small settlements and sanctuaries. Almost all of these sites had their own pottery production, very often at an (almost) specialized level. Only the analysis of workshops in the cities and in the countryside allow a full view of the production, distribution and consumption of pottery products in a wider region.

The lecture presents an overview of Greek pottery production sites in southern Italy and shows how the reconstruction of a craft can contribute to the overall picture of life in antiquity.

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

Organiser: Marlis Arnhold (University of Bonn)
Saturday | 26 May | 14:30-16:30 | HS II

Panel abstract

Economic aspects concerning Roman religion cannot only be studied using the extant sanctuaries and under aspects such as consumption, but are essential to all forms of material articulations of cultic practices, such as objects and images. Moreover, they were embedded into the material culture of their respective period of time, even though they may have been reserved for very specific functional contexts. Seeing and perceiving religious imagery therefore cannot be discussed without the analysis of material forms and the production processes which contributed to their creation. Thus the rationalization and economization which affected the production of stone sculpture resulted among others in astonishingly consistent iconographies, motives, and modes of composition which enabled the creation of easily recognizable images of deities. As Marlis Arnhold underlines in her contribution on representations of the Mithras and other deities, these images could nevertheless articulate individual notions of the divine. Katharina Rieger’s contribution reviews the prevailing explanations of low costs for standardized and repetitive dedicational objects, and looks for the significance of this economic process for the religious imaginary in Late Republican and Imperial times. Kristine Iara's contribution deals with the city of Rome in Late Antiquity and discusses evidence for the impact of 'budget cuts' on the creation, production and dissemination of these images, previously virtually ubiquitous in the city of Rome.

Paper abstracts

1. Anna-Katharina Rieger (University of Graz), Multiplied gods: the significance of repetition and modular production of image-objects of Graeco-Roman deities

The idea of the paper is to look for the significance of the repetitive and little individualized types of imagery of gods dedicated in sanctuaries – mainly statuettes (terracotta or marble). The explanations
oscillate between the cheap and easy way of production, but the levels of significance can be differentiated. The phase of their production is where the economic argument ties in. However, when applying a demand-driven approach, the (re-)production of always the same types is also regulated by the clients buying or commissioning the pieces. The clients again act against the background of their cultural and social environment, where individual decision, economic possibilities and religious purpose interact and/or compete. On the next level, the repetition and resemblances effect the communication with people and with the gods, and the appearance of the sacred places, where they are dedicated. The cultural imaginaire – in this case the idea of supranatural gods and the contact to them – could turn out in this perspective to be as much a driver for the repetitive production as are economic reasons. Examples will be drawn from the Late-Republic and Imperial sanctuaries at Ostia, Nemi and Corinth.

2. Antonino Crisà (University of Warwick), Religion, micro-economies and divinities reproduction on small tesserae in Roman Sicily

Tokens are very common objects nowadays and can be used, for instance, to get a free drink at festivals or pubs. In the Roman world, these objects were produced on a vast scale and are still discovered by archaeologists, although they are often difficult to understand. ‘Token Communities in the Ancient Mediterranean’ is a new research project, founded by the ERC and carried out by the University of Warwick. It aims to understand the role and function of tesserae in ancient communities, focusing on the analysis of finds from European museums.

I am currently studying tokens from Hellenistic and Roman Sicily within this project. The paper aims to present two vital aspects of my research: the role of tokens as a means to activate and boost micro-economies on a local scale, and the reproduction of images to represent community or individual identities. First, I assess a set of unpublished finds from Marineo (Palermo), which testifies how terracotta tokens showing images of local deities could be linked to religious festivals. Moreover, standardization of divine images is crucially linked to the economization of local cults and sanctuaries economies. Second, I analyze some tesserae from Syracuse, which may be connected to tax payments and pastoralism. Such objects, including their iconographies and archaeological contexts, are therefore crucial to understanding how microeconomies and standardized dedicational objects worked in small Sicilian communities.

3. Regina Hanslmayr, Herms: the Commercial Success of an Economic and Multifunctional Format of Antique Sculpture

This paper focuses on the widespread use of herms in the Roman world. Depending on context and iconography a herm could serve as an emblem for a lot of different levels of meanings. A copy of the famous Hermes Propylaios by Alkamens recalled the great Athenian past under the rule of Perikles in general. Depending on its specific location, a roman patron could either emphasize the religious connotation of Hermes as the god of boundaries in its typical pillar shaped idol, or rather refer to it as a piece of art by a well known sculptor. Countless small scale hermbusts depicting Dionysus, his entourage, Hermes and other mythological figures offered an even greater range of usability. Based on the evidence in the Vesuvian area those hermbusts embellished private gardens and were often used as a decorative element in marble tables (monopodia). But even when reduced to a small scale and produced in bulk, the original religious purpose of the archaic idol of Hermes still lives on in the Roman Imperial period. A hermbust of Dionysus found in a Lararium in Pompeii is only one of several find contexts that indicate, that despite the decorative function of many of those small scale herms, they still carried a religious message. This talk will also consider the question of specialized workshops and the rationalization that clearly occurred in the production of herms in general and more so in the category of the small scale herms.

4. Marlis Arnhold (University of Bonn), Economizing images of the divine

From the Hellenistic period onwards the growing interest of Rome and other urban centers in Greek art led to the development of a great variety of methods and techniques to produce and emulate images including also representations of deities. This also involved involved motives, iconographies, and
modes of composition which reveal striking consistencies, as is particularly evident when motives were
employed in very different functional contexts, as was the case in representations of the winds or sea-
sons which appear in domestic, funerary, and cultic (i.e. images of the Mithras-tauroctony) contexts
alike. This bricolage of image elements which can be found throughout the Roman Empire presupposes
their general accessibility and availability for craftsmen and commissioners. Particularly in case of relief
sculpture, as can be found in context of mithraea, for instance, motives of specific meaning were deliber-
ately combined to underline the desired characteristics of the represented god. Starting from these
consistent image elements of representations of divine agents, the contribution analyses the produc-
tion modes of these images including the aspects of the availability and accessibility, as well as ways of
distribution of motives, iconographies, and modes of composition. Thus asking for the conditions, the
economization and rationalization processes affecting the production processes of art from late Repub-
lican/Hellenistic times onwards are being discussed.

5. Kristine Iara (American Academy in Rome), Reproducing and disseminating signs: late antique
Rome

The paper’s chronological and geographical focus is on the city of Rome in Late Antiquity, a period of
profound transformations affecting both the physical appearance of the city and the civic and religious
life of its inhabitants. The material under discussion are the images of gods as well as other objects that
refer materially to divine presence (architecture, depictions, inscriptions, etc.). These objects were, in
Imperial Rome, virtually ubiquitous. Their production and dissemination on the one hand, their percep-
tion on an everyday basis by Rome’s inhabitants on the other, were a matter of course. For an examina-
tion of the reciprocity of economic conditions and the material manifestation of religion the time span
of inquiry is particularly appealing, as 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
sheds light on the interdependence of ‘budget cuts’ and the material expression of religion by address-
ing the following three questions: who were the (groups of) persons who had an ongoing interest in
investing into religious imagery and other objects (as above), even with melting economic resources?
How did this decrease of economic resources become manifest: In lesser quantities of objects, in a re-
duction in terms of varieties, or in a reduction of the narratives to the bare essential? How did this af-
fect topography in terms of visibility?

Panel 3.4 Reconstructing Scales of Production in the Ancient Greek World:
Producers, processes, products, people

Organiser: Martin Bentz (University of Bonn) and
Eleni Hasaki (University of Arizona)
Wednesday | 23 May | 09:00-13:30 | HS V

Panel abstract

Scholars have many ways, both traditional and experimental, to approximate the scale of craft produc-
tion, which has always been central to the story of ancient economies. This panel examines these new
methods, some borrowed from other disciplines, for estimating the workshop crew size, the workshop
physical space, the time requirements for the chaîne opératoire for each product, the needs of the
population for different goods, or the percentage of ancient products surviving to this day. Even Cook’s
(1959) seminal 1% of ancient ceramics modern survival percentage based on the survival rate of Pana-
thenaic amphorae is now considered an overestimation. These new methods and approaches should
help us overcome the paucity of archaeological evidence. By employing social network analysis, individ-
ual worker’s output, architectural energetics, and production-consumption ratios, we aim to improve
our understanding of the scale of craft production. in the ancient Greek world, both in Greek mainland
and in Greek colonies in Sicily. Archaeologists and ancient economists are using new approaches to study the ancient economy at a micro-level, taking into consideration several variables, such as raw material procurement, labor investment, cross-craft dependencies, apprenticeship periods, and product demand, to name a few. Our test cases range chronologically from Prehistoric to Classical times, and geographically from Athens, to the Argolid, and Selinunte in Italy. The industries covered are pottery-making, vase-painting, tile works, and monumental construction. This panel will show how the labor investment for tiling a roof or for building a monumental tomb in Bronze Age Greece reveals the economic complexity of ancient societies in craft specialization and workforce mobilization. Moreover, estimating the sizes of ancient ceramic workshops can lead to better reconstruction of the economic cycles of production and consumption, which helps us understand the range of scales of imports and exports. Our discussant, Peter Acton, a distinguished economist, has studied several industries in Classical Athens. With his micro-level focus he has demonstrated how some industries have a competitive advantage over others, either by specialization, or increased personnel, or a branded name.

Paper abstracts

1. Kyle Jazwa (Duke University), Comparing the Labor Investment and Production of Early and Late Bronze Age Ceramic Roofing Tiles in Mainland Greece

In this paper, I evaluate the economics of ceramic roofing tiles in Early and Late Bronze Ages (EBA; LBA) Greece. On two separate occasions, ceramic roofing tiles were “invented,” used for centuries, and subsequently forgotten. The tiles were not adopted from foreign sources and, in both instances, roofed several central structures. Despite this, tiles were not labor saving or functionally superior relative to their vernacular counterparts, but required a significant increase in labor investment. Roofing tiles, therefore, offered an important visual impact to the structures they covered. Despite these similarities between periods, a close examination of the physical remnants of productions demonstrates that there were unique technologies and labor requirements for each period’s tiles. With an evaluation of the assemblages from Zygouries, Mitrou, Eleon, and Lerna and the published accounts of the tiles from Gla, Kolonna, Tiryns, and Midea, I reconstruct the labor requirements for tile production in each period. I then consider these results relative to the local/regional ceramics industries and assess the broader economic impact of tile-roofed structures in each period. I show that roofing tile production in each period was distinct. Whereas LBA tiles required substantially more resources, specialized labor, and integration into the broader economics of ceramics at the time, the demands for EBA tiles could have been met by the household with ad hoc and unskilled production.

2. Rodney Fitzsimons (Trent University), Laying the Foundations for the Mycenaean State: Labour Investment, Tomb Construction, and Early State Formation in the Bronze Age Argolid

Prior to the appearance of the first palaces at Mycenae in the 15th century B.C., the most impressive architectural manifestation of elite authority in the Argolid was not the palace or the house, but rather the tomb, specifically the shaft grave and the tholos tomb. While the funerary data supplied by these burials have long served as the primary means by which the study of Early Mycenaean state formation has been approached, such studies focus almost exclusively on the grave goods themselves, rather than the tombs that housed them. This paper seeks to address this lacuna by applying an energetics approach to the funerary landscape, an approach that posits that the quantity of labour expended upon any particular architectural project correlates with the socio-political complexity of the society that produced it. Since one aspect of socio-political power is defined by differential access to labour resources, the values thus generated serve as quantifiable and easily comparable measures of the power of those groups responsible for their undertaking. This approach injects a new, yet rarely considered dimension to current discussions of “wealth” and “status” and offers new insight into the nature of the socio-political transformations that transpired during the Early Mycenaean Period.
3. Giulia Rocco (Università di Roma Tor Vergata), Relations among workshops and craftsmen in protoattic vase-painting: limits and perspectives in quantifying the production

The pottery production of Athenian workshops in the VII cent. B.C., raises many questions, sometimes similar to those risen by their later activity in VI cent. B.C., when the amount of painters/potters and vases produced was considerably higher also for export purposes. In this paper will be examined the limits and perspectives in quantifying the production of a ware made mainly for ritual purposes, the individual worker’s output and the organization of the workshops, that seems more instable than before and later. The major problem in protoattic vase-painting is in fact represented by the difficulty to recognize the transfer of skills and knowledge from an artisan to another and, as result, the reconstruction of the activities of the single craftsmen within a workshop. There are also examples of painters moving from a workshop to another, but also going abroad, in a period in which migration played an important role in the staff turnover and in transferring the style of some protoattic workshops within the territory of Greece and in the West. The workshops of the Vulture and Passas Painters, of the Analatos and Mesogheia Painters and of the Painter of the Cinosarges Amphora offer starting points to examine some of these issues and a comparison term to focus on some transformations in the 2nd and 3rd quarter of the VII century B.C., that may be the consequence of a different historical and social context in which craftsmen worked.

4. Eleni Hasaki (University of Arizona) - Diane Cline (George Washington University) - Tyler Jo Smith, Najee Olya and Ethan Gruber (University of Virginia) - Peter Stewart and Thomas Mannack (Oxford University), Beazley’s Connoisseurship-based Athenian Kerameikoi: A Social-Network Analysis

Our paper focuses on the Social Network Analysis (SNA) of the collaborations between Athenian potters and painters of 600-400 BCE as established by Sir John D. Beazley in the first half of the twentieth century. Beazley identified more than 1,000 potters and painters for over 20,000 black-figured and red-figured vases. His attributions have remained largely unchallenged and central to the study of stylistic analysis of these pots.

The visual rendering of these associations will highlight who were the true innovators of the Athenian Kerameikos, and how the entire quarter was interrelated. It will also help us identify some weak associations where the workshops simply satisfied the local demand without amounting to great catalysts of technology and style.

Beazley’s connoisseurship-based attributions have received a lot of criticism because Beazley did not state clearly his methodology and used several terms (also without defining them) to associate painters and potters with each other. The complexity and ingenuity of Beazley’s work will be visually displayed, showing that he, despite the criticisms of his work, was in some sense a forerunner of Social Network Analysis. Our project will be the first one to actually visualize, calculate, and evaluate the total amount of all these associations and interconnections, moving beyond simple lists of painters and potters and encouraging scholars to discern previously-unnoticed patterns.

5. Philip Sapirstein (University of Nebraska–Lincoln), Productivity and staffing of Athenian pottery workshops from a quantitative perspective

This paper builds upon my recent work on the Athenian pottery industry (AJA 117.4: 493-510 [2013]), which demonstrated that the number of vases attributed to a painter corresponds to career length, and whether the painter was a full-time specialist or also potted. The research reveals a significant shift toward specialization after the development of the red-figure technique. My new paper will consider the broader question of workshop staff. An ethnographic model approximates the numbers of individuals that would have been required in the full production sequence. Because it is likely that the painting of the vases occupied a significant fraction of the whole time needed to complete a pot, we can model the personnel of an Athenian workshop according to its total number of associated vases.

I focus on workshops whose corpus is reasonably well defined. Those of Exekias and Nikosthenes are representative of the latter sixth century, when one master potter and painted most vases with only
minimal staff support. By the fifth century BC, red-figure workshops like those of Brygos and the Penthesilea Painter must have been substantially larger than their predecessors. However, in the big picture the Athenian workshops remained relatively small, and the evidence for expansion by vertical integration within shops is limited. The early Classical Athenian industry did not develop large manufactorys like those attested in regions producing Roman sigillata.

6. Vladimir Stissi (University of Amsterdam), Millions of vases can’t be wrong. But how about making them? Assessing the scale of Archaic-Classical Athenian pottery production and its impact on workshop staff

In several recent papers, I have argued that the scale of production of Athenian Black and Red Figure pottery was much larger than is usually assumed. The amount of extant material, the excavated production remains and their spread over the Athenian periphery, the evidence derived from Beazleyan attribution, and estimates of likely consumption rates, even in Athens alone, all seem to point in a similar direction – a seven-figure yearly output for the Late Archaic and much of the Classical periods. While – roughly – calculating such high estimates, and offering supporting evidence for them, is, in my opinion, not very hard, the part that still largely eludes us regards the way production at such a scale was organized, and what its implications were on a human level. Detailed studies of both excavated workshop remains and attributed vases have offered us indications of labour division and hierarchies within workshops, and there has also been some discussion about numbers of craftspeople involved in various tasks and hierarchical roles. In this paper I want to explore a bit further what large scale production may have meant for the work and lives of the artisans doing the work, to see whether it is possible to offer a general impression of the ways the output was made possible. This will not only help us to understand the achievements of those involved, but is also, I think, a necessary condition to make any estimate of the scale of production realistic and credible.

7. Martin Bentz (University of Bonn), Production and Consumption of Ceramics at Selinous. A quantitative approach

For the first time a real “potter’s quarter” with at least 84 kilns of classical time has been identified in Selinous. On this base it seems possible to determine plausible production numbers comparing them to consumption numbers in order to find out if ceramics were produced for subsistence or if a surplus was created. Moreover the number of people living on ceramic production is compared to the number of all inhabitants to understand the role of ceramic production for the city’s economy.

8. Niccolò Ceconi (Scuola Archeologica Italiana di Atene), The economy of the ancient pavements. Prices, Contracts and Economy of the Mosaics and Marble Floors in the Ancient Greek World

The proposed paper aims to discuss some archaeological and epigraphical documents related to the prices, contracts and economy of the mosaics and marble floors of the ancient greek world. The analysis will focus in particular on financial operations relating of marble floors and mosaics registered: in the building accounts of the greek temples and sanctuaries of the classical and hellenistic age (Rationes aedificationum); in the papiri of Zenon Archive; in others significant epigraphic documents. The research will analyze three main aspects of the documentation:
1) The prices of materials for the production of marble floors and mosaics.
2) The payments of craftsmen involved in the construction of marble floors and mosaics.
3) The relationships between craftsmen and buyers involved in the construction of marble floors and mosaics. The informations inferred from research, likened with the archaeological data, could provide a first frame of the economic, financial and productive processes of the floors of the ancient greek world.
Panel 3.5 A. Making Wine in Western-Mediterranean B. Production and the Trade of Amphorae: Some new data from Italy

Organiser: Jean-Pierre Brun (Collège de France)
Nicolas Garnier (SAS Laboratoire N. Garnier / Ecole Normale Supérieure de Paris AOROC)
Gloria Olcese (Sapienza, Università di Roma)

Saturday | 26 May | 09:00-13:30 | HS XIII

Panel abstract

"Wine Production and Trade in the Western Mediterranean during Antiquity: New archaeological, archaeometric, archaeobotanical and biomolecular research on an economic indicator”

The goal of this session is to present both new data and current projects on viticulture in antiquity, on the production and circulation of wine, and on the containers that held the wine. These containers have been recently recovered in the western Mediterranean, thanks to interlinking, multidisciplinary research, involving archaeological, archaeometric, archaeobotanical and molecular-archaeological methods.

The focus of our investigation is Italy, in relation to areas of comparison (Spain, North Africa), with the intent to deepen our knowledge of the transformations to the agricultural landscape in certain sample areas. We also aim to focus attention on wine production facilities, which have until now remained under-studied (such as rock cuts); and moreover we intend to focus on the Mediterranean distribution of amphorae which, as the primary containers of the drink, played an important role in religious, funerary, economic and social life in Antiquity.

The advancement of technical knowledge is gradually solving the old question of differentiating between wine and olive oil production facilities. We knew that the same presses were used for both products and henceforth the identification would be based on other markers such as the presence or absence of oil mills or tanks connected by overflows. But now, systematic water sieving can turn up olive stones or grape seeds, and biochemical analyses in gas chromatography or liquid chromatography coupled with mass spectrometry now provide very reliable results.

A new synthesis on amphorae and production centers is needed, because the rapid evolution of the methods of analysis and their expansion allow both some certainty about contents (sometimes multiple) and even details concerning the type of wine (red or white).

The second part of the session will present some new data related to the production and distribution of wine amphorae - coming from the Tyrrhenian coast of Italy, Spain and Africa - in Italy and the western Mediterranean, the study of which was also carried out using laboratory methods.”

Paper abstracts

1. Jean-Pierre Brun (Collège de France), From oil to wine? A balanced view on the production of the most emblematic agricultural products of Antiquity

Olive oil and wine, considered as two emblematic agricultural products during Antiquity, have been overvalued in archaeological studies because their production and trade leave perennial archaeological remains such as presses, vats, jars and amphorae. For a long time, presses were chiefly attributed to olive oil. Progress in research has now established a more balanced view: in the northern part of the western Mediterranean, presses are mainly concerned with wine production as assured by biochemical analyses and carpology. For trade, advances in amphorae typology the multiplication of mineralogical and biochemical analyses restore a more accurate picture of the regional evolution of wine production and trade. Further progress can be made: much of the wine production of wine still escapes archaeolo-
gy. Domestic production is difficult to retrace because installations are often made of organic materials; a large proportion of the local commercial production, which was often made with palmenti or any uncharacteristic devices and was marketed in skin containers. In some regions, such as Cisalpina, Lusitania, Aquitania, etc., wine was produced and marketed in wooden vats and barrels. Thanks to recent progress, we are in a position not only to clarify our knowledge, but also to detect our shortcomings.

We also know that it will not be possible to fill some gaps, even by multiplying the angles of analysis, but delimiting them is also an enormous advance in historical knowledge.

2. Gabriella De Lorenzis (Università degli studi di Milano) - Francesco Mercati (CNR - Italian National Research Council) - Carlo Bergamini and Maria Francesca Cardone (Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria - CREA) - Maria Gabriella Barbagallo (University of Palermo) - Francesco Sunseri (Università degli studi Mediterranea di Reggio Calabria) - Osvaldo Failla (University of Milan), Genomic tools to reconstruct the grapevine domestication and evolution in the western Mediterranean basin

The Western Mediterranean Sea Basin is a main centre for viniculture diffusion and grapevines domestication, due to its historical importance during the Centuries, strongly influenced by Greek colonization. Sicilia and Southern Italian regions played a key role in the introduction of the wine culture and viniculture techniques in Italy from Greece. A large germplasm collection of grapevine accessions (195) coming from the South of Italy, Greece and neighboring countries have been genotyped by Vitis18kSNP chip array to investigate genetic diversity, population structure and parentage. The SNP profiles differentiated 169 unique genotypes with the higher number of synonymies detected among Italian regions. Cluster analyses identified high genetic similarity values (100-83%) and there was not detected a grouping based on the geographic origin, even though the Greek samples appeared closer related to neighboring country accessions than the Italian ones. Multivariate analysis highlighted an overlapping among the genotypes coming from the different geographical regions, as well as, structure analysis showed a high number of admixed samples. Parentage analysis identified that two Italian cultivars performed a role in the evolution of the grapevine genetic pool in the South of Italy. Genetic results highlighted the common genetic origin of these genetic resources and appeared to reflect the historical and geographical background of this area.

3. Laurent Bouby (1) - Jazmín Ramos-Madrigal and Anne Kathrine Wiborg Runge (2) - Thierry Lacombe (3) - Vincent Bonhomme and Sarah Ivorra (1) - José Alfredo Samaniego Castruita (2) - Roberto Bacilieri (3) - M. Thomas P. Gilbert (2) - Jean-Frédéric Terral (1) - Nathan Wales (2&4), 3. Cultivated grapes in Roman Gaul. Archaeobotanical data

(1) ISEM UMR 5554, CNRS, Montpellier University
(2) Centre for GeoGenetics, Natural History Museum of Denmark, University of Copenhagen
(3) UMR AGAP, Univ Montpellier, CIRAD, INRA, Montpellier SupAgro, Montpellier
(4) UMR AMIS, CNRS, Université Toulouse III – Paul Sabatier

Grape cultivation was a highly important activity in the southern areas of Roman Gaul. Many aspects of wine production are nowadays well documented by archaeology. However, little is known about the cultivated grape itself. Latin writers, such as Columella and Pliny the Elder, provided extensive information about the different types of grapes known during their time. Confronting this information with that concerning the modern diversity of grape vines can help us draw new information from ancient texts. But it is still impossible neither to identify specific varieties nor to know which were cultivated in southern Gaul.

Archaeological excavations provide significant numbers of well-preserved grape pips, due to waterlogged conditions in some structures. Morphometric and palaeogenomic analyses were carried out on samples of pips from several Roman sites. Morphometrics characterized the shape of ancient pips and helped compare them to reference collections of modern pips of wild and domesticated grapes (Terral et al. 2010). A new palaeogenomic approach, based on targeted-high-throughput sequencing of ten thousand Single Nucleotide Polymorphisms, explored identities and genetic relationships of grape cul-
tivars across times, by assembling a dataset of ancient and modern samples (Ramos-Madrigal et al. submitted).

The combined results from these independent approaches bring evidence of the cultivation of an important varietal diversity in southern Gaul. This diversity seems to occur even at the scale of the individual farming site. In each site, some pips display characters typical of the wild morphotype. The significance of this result in the framework of the Roman viticulture will be discussed. Ancient DNA brings evidence of the use of clonal propagation of varieties and that several Roman samples held parent-offspring relationships with varieties grown today in Alpine regions.

4. Gloria Olcese (Sapienza Università di Roma) - Nicolas Garnier (Laboratoire Nicolas Garnier) - Andrea Razza and Domenico Michele Surace (Sapienza Università di Roma), Multidisciplinary Research on Wine Production in Southern Italy: Rock-Cut Units ("palmenti") and Organic Residues in Economic-Historical Context

Up to now, studies on wine production have covered archaeological evidence, such as presses, vats and storage rooms in farms, or containers such as amphorae and dolia, but only a few studies have also considered rock-cut units ("palmenti"). The project “Fare il vino nell'Italia antica: i palmenti rupestri” aims to produce more detailed studies on these important structures through the use of a multidisciplinary methodology. These studies will focus on the Tyrrhenian coast of Italy.

The project intends to generate, through a morphological comparison of the structures, a first hypothesis about the development of these units over time, and to categorize the units based on the substances produced in them (wine or oil). Another purpose is to determine whether any relationship existed between local ceramics workshops and the wineries, with the aim of reconstructing the dynamics of the wine industry.

Innovative laboratory methods will allow us to identify any markers of substances absorbed into the sides of the vats. Biochemical analysis clearly shows the presence of markers of grapes (tartaric and malic acids) and of alcoholic fermentation (malonic, maleic, succinic, fumaric, and pyruvic acids). The analysis of eight palmenti has shown the application of pitch (in Etruria) or resin (in Campania) for waterproofing the vats, and that the basins have been used not only for the transformation of grape into must, but also into wine.

5. Anna Depalmas (Università di Sassari) - Cinzia Loi (Ispettore Onorario SABAP-CA) - Alessandra Pecci (Universitat de Barcelona) - Nicolas Garnier (Laboratoire Nicolas Garnier) - Alessandro Usai (SABAP per la città metropolitana di Cagliari e le province di Oristano e del Sud Sardegna), Wine in Sardinia. New archaeological data and research methodology

Wine is an important drink in the history of Sardinia. Recent research has allowed to date back of the introduction of wine production and consumption in the region. The combination of botanical finds and chemical residues allows to suggest the production and consumption of wine already from the Middle Bronze Age. The Bronze Age settlement of Sa Osa, is one of the few Sardinian archaeological sites, which allows us to reconstruct a complete picture on the development of the exploitation of natural resources, agricultural technologies, as wine's production.

The grape seeds found at Duos Nuraghes at the Final Bronze Age level are the squat type with short stalks which are characteristic of Vitis vinifera L. var. sylvestris. Discoveries at Genna Maria indicate that in the Early Iron Age there were cultivated as well as wild species. The stone presses constitute a fundamental element of the agricultural production process and they are of significant interest due to their historical and archaeological value. Those that have survived often have missing parts and are deprived of their original context in the landscape; therefore, it is difficult to interpret their typology and age. However, they represent an interesting feature that could be related to ancient wine production. A total of 150 fixed rural wine-presses have been found and 50 movable containers, suggesting the widespread of wine production for a long period of time, that needs further investigation.
6. Yolanda Peña Cervantes (National University of Distance Education, UNED), Wine production in the Iberian Peninsula in the Roman period: Archaeology, Archæobotany and Biochemical Analysis

In this session, we will analyse the production of wine in Hispania up from the data that have been supplied by recent archaeological excavations, where archæobotanical and biochemical analyzing methods have been applied. The increasing implementation in the use of this kind of analysis in Spain and Portugal has allowed us to determine the functional orientation of the great number of press facilities, and to provide new and interesting information about the techniques that were used in the process of wine production and fermentation in this Roman province. With these new analyzing techniques, we can detect new areas of wine production in central Peninsula and Northern Lusitania and to recognize a better study of models of production in the regions where wine has been traditionally manufactured, such as coastal Tarraconensis or the Baetica province. In this presentation, the introduction of similar data obtained from the areas or Italy, Northern Africa and Gallia will enable us to create a comparative frame between the economic trends of the Western provinces of the Empire, where wine was a key product in ancient economy.

7. Maxine Anastasi and Nicholas Vella (University of Malta), From Vine to vat and beyond: The case of ancient Malta

It has been widely accepted that small islands were suitably placed to adapt to niche markets in their efforts to produce and export desired goods. The Maltese islands were probably no exception to this if we go by what the late Antonia Ciasca suggested in a 1985 article, where she proposed that a small number of locally produced pottery containers carrying foodstuffs were distributed to Maltese individuals residing away from the islands. Since then, new discoveries both in Malta and abroad have brought to light new archæological evidence to substantiate further this distribution, as well as support a production and export of Maltese wine during the Late Punic/Early Roman period. This short presentation brings together new and old data to highlight what we can surmise so far, as well as our intention to embark on a programme of scientific analyses to corroborate and expand this suggested hypothesis.

8. Gloria Olcese (Sapienza, Università di Roma), Wine and Sea: Production and Trade of Wine and Amphorae from Latium and Campania. New Data Based on Archaeological and Archæometric Research

Archaeological and archæometric studies carried out in the last few years as part of the “Immensa Aequora” Project (www.immensaaequora.org) focused on centres for producing wine amphorae and ceramics in the area of the Tyrrhenian Sea, particularly Latium and Campania. Parallel studies are in the process of reviewing the cargoes of some western-Mediterranean shipwrecks, dating to between the 3rd century B.C. and the 1st century A.D, which were transporting wine in amphorae from Tyrrhenian production centres. The present contribution promises to present a summary of these studies, with particular attention to production in Campania and some in Latium from the 3rd century B.C. to the 1st century A.D. The use of laboratory analyses (chemical and mineralogical) lets us establish some reference groups for the main production sites. Meanwhile, residue analysis, carried out for now on the Greco-Italic amphorae of some shipwrecks (3rd century B.C.) produced in the Gulf of Naples, has made it possible to confirm the presence of red wine on the interior of some types of amphorae.

9. Luana Toniolo (Parco archeologico di Pompei, Grande Progetto Pompei) - Alessandra Pecc (Universitat de Barcelona), Wine production and distribution in the Vesuvian region: New evidence for old questions

Despite the huge quantity of data apparently available about wine production and distribution in the Vesuvian area, much still needs to be done to answer many questions about the scale of production, technonological features and on a wider scale the connections with the other regional production centers.

The paper aims to analyze the state-of-the art considering all the available evidence, focusing on the most critical issues with an approach based not only on a traditional archaeological study but also on
archaeometrical analysis of ceramic fabrics and provenance, analysis of residues (gas-chromatography coupled to mass spectrometry) and archaeobotanical studies. All these datasets suggest the idea of a more complex than expected landscape of production.

10. Giorgio Rizzo - Andrea Razza and Domenico Michele Surace (Sapienza Università di Roma) - Violeta Moreno Megías (Universidad de Sevilla), Hispanic imports to Ostia in the Early Imperial Age: New data from amphorae

Rome was an extraordinary centre of consumption, and attracted an incredible amount of goods arriving through its ports (Ostia and Portus). One of the first peripheral regions to undertake the distribution of its agricultural surplus to the capital was Hispania, especially the Baetica province, which underwent a radical transformation in the organization of the exploitation and commercial trade of their resources from the Second Punic War to the Augustean age. After drawing up a comprehensive balance of Hispanic imports to Ostia transported by amphorae (wine, oil, salsamenta and fish sauces), the focus will be on a case study. An important sample area in the region of Ostia is the context of Binario Morto (about 50 BC-50 AD) where remains of a wooden waterwheel and a structure with amphorae used to drain the groundwater have been found. The study of the 335 amphorae shows a significant majority of Hispanic productions. Petrological and chemical analyses have permitted to determine the origin of the amphorae from specific workshops located in the areas of the Guadalquivir Valley and around Cádiz, and on the northern coast of Catalonia.

Panel 3.6 Building BIG – Constructing Economies: From design to long-Term Impact of Large-Scale Building Projects

Organiser: Ann Brysbaert (Leiden University) and Jari Pakkanen (Royal Hollow, University of London)

Friday | 25 May | 09:00-13:30 | HS III

Panel abstract
The economic growth of modern societies has been closely linked with construction industries: investments, transport infrastructures for materials, and labour-intensive building programmes all have a large impact on local, regional and even global economies. The end results have shaped the built environment of our every-day lives and have often led to an increased quality of life and affluence, though there are many contrary cases as well. In past pre-industrial societies whenever large-scale building projects took place, extensive manual labour was invested from the moment materials were scouted for, extracted, transported, employed and subsequently maintained. Since most ancient societies were based on subsistence economies, important decision-making was a daily balancing act between building work and agriculture. These decisions often influenced strongly the patterns of land use and may have also resulted in circular economic strategies. This session invites archaeological, experimental, historical and ethnographic/anthropological perspectives addressing the socio-economic and political decision-making needed for construction projects to materialize. With economic and technological processes of construction as a focus, we aim to contribute responses to the following questions: 1- How were large-scale buildings constructed from material, logistical and planning perspectives? 2- How and why were these buildings subsequently and diachronically used and maintained by the various groups? 3- What types and levels of resources and investment, human and other, were needed to achieve and sustain these construction projects? 4- Given that construction took place diachronically and geographically more or less worldwide, can we recognise common denominators, and which are these? How can multidisciplinary and cross-cultural approaches further our research in the Ancient Mediterranean? 5- In economic terms, is it useful to quantify the necessary resources, how can it be done, and what can such data tell us?
1. Ann Brysbaert (Leiden University), Logistics and infrastructure in support of building BIG in the Late Bronze Age Argolid, Greece

In past pre-industrial societies, when large-scale building projects took place, extensive manual labour was invested from the moment materials were scouted for, extracted, transported, employed and subsequently maintained. Since most ancient societies were based on subsistence economies, important decision-making was a daily balancing act between building work and agriculture. These decisions often influenced land use-strategies on several socio-economic levels.

This paper focuses on the Mycenaean Late Bronze Age in the Argolid where large-scale building processes have been intensively studied for quite some time now. However, in employing archaeological, historical and ethnographic perspectives on a much ignored aspect of the economics of prehistoric building – its required infrastructure network – this paper seeks to formulate thoughts on material, logistical and planning perspectives that may have been employed to facilitate, maintain and even improve the infrastructure needed to build long-term and on a large-scale. Taking the local topography into account, it provides a more realistic picture about the types and levels of resources and investment that were needed to achieve and sustain these construction projects. As such it addresses both the practical, and the socio-economic and political decision-making, held at several levels, and needed for the construction projects to materialize.

2. Kalliopi Efkleidou (Aristotle University of Thessaloniki), Understanding large urban planning production in Mycenaean Greece

From the Late Helladic IIIA2-B period and on (ca. 1300B.C.), we find a series of large urban planning schemes taking place in the palatial centers of the Mycenaean Argolid, in Southern Greece. Current research has tended to treat different parts of these large building programs individually and not as unit. This approach, however, does not help us understand in depth the principles and aims behind any large urban planning scheme. In this paper, I focus on the changing urban plan of palatial Mycenae and review the various stages of its transformation through the end of the palatial period (ca. 1200B.C.). I use the evidence to argue that this scheme was strategically initialized and financed by a rising elite which founded its power on control of the palatial sector of the settlement's economy (workshops for processing exotic and local raw materials and storages for goods traded) and sought social and political legitimation by establishing a close spatial and symbolic bond with the revered elite ancestors and the divine. Gradually, these three axes (economy, ancestors, the divine) were transformed into the founding pillars of the wanax's power.

3. Daniel Turner (Leiden University), Constructing multi-use tombs in Late Bronze Age Attica and Achaia

In the late second millennium BC, Mycenaeans dug large tombs into hillsides with speed and precision. Many of these chamber and tholos tombs take an iconic shape: 1) a narrow passage (dromos) leading to a façade pierced by 2) a bottleneck entrance (stomion) closed with a rubble wall. Through the stomion lies 3) a vaulted chamber (thalamos) many times the size required for interring bodies and possessions. Digging such extravagant, multi-use tombs required strength, coordination, and confidence. Both the initial construction and subsequent reopening(s) created a spectacle similar to cyclopean wall construction, albeit at a smaller scale. Reconstructing that process has simplified with advances in photogrammetry and comparative labor costs. This paper combines photogrammetric models and comparative labor costs to discuss tomb construction at sites in Achaia and Attica.

4. Yannick Boswinkel (Leiden University), Breaking down monumental constructions: People, costs and techniques

Studying monumentality has many issues, partly because it is such an ambiguous term. However, if one accepts the monumentality of a construction as being bigger and better relative to contemporary structures there might be a means to compare structures. To be able to compare size and quality, one could quantify a structure based on the necessary labour-investments. Quantifying monumentality through
labour-cost studies is not new and has been criticized as well as celebrated in the past. By breaking down a structure to its individual components and how these came to be, it is possible to get an estimate of the workforce that was needed for different stages like quarrying and transporting the material as well as for the actual construction of the building. One of the issues with such studies is the sheer amount of assumptions that are needed at every step of the process of calculating a total sum of investment. A case study from Mycenaean Greece (±1600-1100 BC) will be presented in which fortification walls have been recorded in 3D with high accuracy, using Total Stations and photogrammetry. It will be evaluated whether such high precision recording can add anything to the quality of the labour-cost analysis. If the quality can be increased, then this might increase the usability and the reliability of labour-cost analyses. Ultimately, it might improve our understanding of monumental constructions.

5. Sabine Beckmann, Built to last – Middle Bronze Age landscaping development in the region of Agios Nikolaos, Crete
The mountain slopes west of Agios Nikolaos, settled in Minoan Protopalatial times by over 330 dispersed agricultural sites built with massive foundations, are situated far from known Minoan settlements and palaces. They present an otherwise unknown feature of Bronze Age landscaping, comprising not just dwelling ruins, but also ample traces of small enclosures (pens, gardens) and long enclosure walls (in sum over 150km length). The sites sit rarely further than 300m from each other, and the enclosure walls attribute on average 3.5ha of mixed rocky and arable land to them, defining the sites’ function as “mixed agriculture”.

The massive architecture of the few known until recently preserved ruins has led scholars in the past to see them as military sites, and only the actually extant large number of dwellings and their enclosure walls made clear that these installations were not part of a defence system along a “Mycenaean Military Road” (A. Evans in 1895), but rather of a well organized hinterland landscape, capable of providing the coastal settlements with a range of commodities needed to expand power structures and international trade.
The sheer massiveness of the sites’ constructions also show them to have been an effort suitable to the first Cretan “palatial” society’s political economy – “built to last” as many of them have been re-used in the recent past for mixed agriculture.

6. Jari Pakkanen (Royal Hollow, University of London), Building Big and Greek Classical and Hellenistic Houses? Estimating Total Costs of Private Housing in Attica
The presentation will use different types of source materials to estimate the construction costs of private housing in Late Classical and Hellenistic Attica. The city blocks and houses of the Piraeus are the basis of the first case study and new data from the fieldwork project on the island of Salamis conducted by the Ephorate of Antiquities of West Attica, Piraeus and the Islands and the Finnish Institute at Athens form the second one. Archaeological data, building accounts, other ancient textual sources and modern ethnographical data are the most important categories of evidence. The cost of constructing an individual house was small but the total expenditure of building city blocks in towns and cities was substantial. The ancient remains in Attica are mostly covered by dense modern blocks, so the new archaeological data from Salamis is important. Also, the city blocks in the Piraeus and Salamis follow a rectangular plan, so the excavated remains are sufficient for a reliable reconstruction of a typical insula. A model of how to estimate the total cost of building materials and construction processes of private ancient houses is presented. Econometric quantification can lead to new ways of studying the social and economic significance of construction and upkeep of private houses. The work-rate estimates used in the calculations are based on a range of different sources and it is possible to cross-check their values.

7. Janet DeLaine (University of Oxford), Building for the gods: the so-called ‘Capitolium’ at Ostia
The so-called ‘Capitolium’ at Ostia, built in the early Hadrianic period, was the largest and most imposing of Ostia's temples, representing the greatest input of resources in terms of materials and construction in its religious landscape. The shell is built of brick-faced concrete, the standard building material of second century AD Ostia, but of the highest quality using very uniform brick from an extremely small group of suppliers. The marble elements of the architectural order and surface decoration, on the other
hand, were exceptional in the context of Ostia, with some elements having their closest parallels in the Pantheon at Rome, built just a few years previously. On the basis of this it has been argued that the temple must have been the gift of the emperor Hadrian, as being beyond the resources of the local community. This paper sets out to test our current understanding of this building project by putting it on a firm economic footing, and comparing it quantitatively both to other temples in Ostia and to the Pantheon itself.

8. Roberta Ferritto (University of Reading) - Rosaria Perrella, The impact of the luxury maritime villa construction boom on the prestigious coast between southern Latium and Campania

The proliferation of maritime villas along the coast between southern Latium and Campania led to a progressive demographic, socio-economic, and environmental change. Generally, prior studies have been seen in the Bay of Naples the geographical area of the Italian peninsula where first maritime villas emerged. Actually, comparing our research data, a substantial difference has been observed: it was the coastal Latium the area that first experimented with the construction of maritime villas. This paper will examine the effects occurred in both regions following the intensive building activity of maritime villas along their coasts from socio-economic, productive, architectural and organisational perspectives.

By comparing the information between the two regions, it has been possible to detect common architectural trends from which, depending on the morphology of the territory, we move away. Thanks to the cross-referencing of data, it has been possible to create a dense network of comparisons with similar maritime architectures in the Ancient Mediterranean.

The maritime villa was a true form of economic investment aimed to satisfy both the villa's own needs and local and outside market. A profit-making enterprise typical of our villas came from fishponds with the breeding of high-quality fish. In order to quantify the average income that could be achieved from these structures, we tried to attempt of quantifying the amount of fish that could be grown at the fishponds of villas.

9. Anna Gutierrez Garcia-M. (IRAMAT-CRP2A, Université Bordeaux Montaign), Stone for a provincial capital. Procurement strategies, logistics and dynamics for the monumentalization of Roman Tarraco’s urban landscape

During the last decades, the understanding of the Roman town of Tarraco (modern Tarragona, Spain) has leapt forward thanks to the several archaeological excavations and research programs carried out. Among them, those related with the remarkable nearby quarry of El Mèdol, from where most of the stone used in the building projects were prized off, had shed new light on the extent, chronology and dynamics of the local resources exploitation directly engaged in this phase of great constructive activity and urban renovation.

The discovery of a control point of the production and the remains of a possible Roman shrine as the results of the archaeological excavations undertaken in specific areas of the main quarrying area as well as the location a large collection of ephemeral inscriptions on blocks abandoned in front of the quarry and of a loading bay in a nearby beach provide exceptional information on both the technical, operational and human aspects of the procurement of the most basic raw material needed for Tarraco’s chief large-scale building public project.

On the other hand, the increasing studies on marble and other ornamental stone remains and the advances on Tarraco’s harbour help to understand the various-scale dynamics that provided the decorative stone and sculptures needed to give these public buildings the dignity or decorum to befit its status as capital of the largest province of the Western Roman Empire.

10. Ben Russell (University of Edinburgh), Shipping Building Materials by Sea: Logistics and Planning

Demand for prestige materials, primarily from major imperially-funded projects but also from locally-funded schemes all around the Roman world, put enormous strain on the producers of raw materials
and, especially, transporters. Big buildings demanded big materials and this had an impact on the infrastructure through which these materials were used and the means of transport employed. Purpose-built vehicles are attested in certain cases (the special barges used for moving obelisks being the best-known examples) but in most cases existing vehicle types and infrastructure were used and simply pushed to their limits. Fashions for polychrome stones placed particular strain on systems of supply and will be the focus of this paper. Three topics will be examined:

- What the shipwreck evidence reveals about the size and arrangement of cargoes of stone destined for building, the routes taken by these cargoes;
- The infrastructure at ports around the Mediterranean and how these points of departure and arrival were tied into wider transport networks that facilitated the movement of stone;
- The practical impact of different fashions for stone use on supply networks and the limitations of ancient transport systems on the distribution of stone.

Panel 3.7 Organization of Production and Crafts in Pre-Roman Italy

Organiser: Nadin Burkhardt (KU Eichstätt-Ingolstadt) and Robinson Krämer (Universität Rostock)
Friday | 25 May | 14:30-16:30 | HS VIII

Panel abstract

Recent excavations and investigations in the field of workshop structures, such as Gabii, Herakleia, Kroton, Lokroi Epizephyrioi, Naxos, Selinunt and Kyme show the needs and chances for a new discussion of the organization of production and crafts in Pre-Roman Italy. This panel attempts to examine different organizational structures, specializations and typical features of crafts. Parameters and indicators may be the (I) context (independent – attached), (II) concentration (dispersed – nucleated), (III) scale (small, kin-based – factory) and (IV) intensity (part-time – full-time). The contributions of this panel investigate geographical, chronological and functional patterns for different types and contexts of crafts and productions. These may include, but are not limited to: autonomous individuals, household-based productions, workshops for a regional consumption, attached producers within government or sacred institutions or large-scale productions and facilities (note 1). This panel covers a period from the early iron age to late archaic/early classical times and focusses on different functional senses with a concentration on Italy. In analyzing case-studies we aim to give new insights into modes of organization for productions and crafts in Pre-Roman Italy.

Paper abstracts

1. Robinson Krämer (Universität Rostock), Was there an Etruscan Ritual Economy? Tracing the Organization of Production and Crafts in Etruscan Sanctuaries (8th–5th centuries BCE)

My paper examines the different forms of production and crafts in Etruscan Sanctuaries from the early Iron Age to the 5th century BCE. The main focus of this analysis are not products, rituals of artisans, or operational chains. Instead, I investigate organizations of productions and crafts within the Etruscan Ritual Landscape during the Urbanization processes in the Orientalizing and Archaic periods. A focus will lie on three ‘classical’ productions and crafts: pottery productions, metalworking, textile productions. Furthermore, I will also study the writing process and scribes as well as the standardization of weights in sanctuaries (ponderaria). Both phenomena have not been investigated yet in economic terms – especially not for Etruscan Sanctuaries. I will reconstruct the Etruscan Ritual Economy and patterns of organizations by investigating the above mentioned productions and crafts. To achieve
this goal, ethnographic approaches as well as theories and models from other cultures will be considered.

2. Friederike Bubenheimer-Erhart (Universität Wien), Origins and Early Developments of Etruscan Jewellery Productions

Central Italy is rich in metal deposits, but there are no gold resources anywhere near at all. Surprisingly enough, gold ornaments of the highest quality make their sudden appearance from the late 8th century BCE on. The questions arise of where the raw material comes from and of whom the Etruscan jewellers had learned their craftsmanship from. Since the earliest artefacts are found at places along the Tyrrhenian coast, it seems reasonable to assume, that their appearance is due to overseas contacts. The most plausible source for the raw material is Nubia, which was then belonging with Egypt. As to the Etruscan artefacts, some types seem to be worked upon Egyptian prototypes, for others the prototypes are said to be Phoenician or remain uncertain. The mastery of working techniques such as granulation and filigree is usually ascribed to Phoenician craftsmen, who are known as immigrants to Coastal Etruria. This may account for certain aspects, but certainly not for all. It seems quite likely, that the Etruscans owed at least some of their skills to Egyptian craftsmen, too. The aim of this paper is to shed light on some of the problems concerning the origins and early developments of Etruscan Jewellery productions in order to better understand this highly skilled and brilliantly mastered craft of Pre-Roman Italy as a chapter in the history of gold winning, raw material trade, technology transfer and production in the ancient Mediterranean world.

3. Raffaella Da Vela (Universität Leipzig/URZ), For the pottery and for the potters: an ergonomic approach to ceramic production in Ancient Italy

This paper proposes to analyse the organization of the work within italic and etruscan ceramic workshops (7th-2nd c. B.C.).

The ergonomic approach takes in consideration the efficiency of a workshop, as the whole of structural conditions, which allow to produce more and better with lower energy costs. The research question focuses on the relationship between production and organisation of the work, in particular if the workshops are focussed on the products, on the producers or on the satisfaction of the demand.

The following three parameters are taken in account for the quantitative and qualitative analysis: integration of the workshop in the commodity system (proximity to sources and roads, destination of the products); structural organisation within the workshop and workflows (working times, steps, paths and proceeding); dimensions of the production. For each parameter I will present some concrete case-study in different regions. The elaboration of ergonomic diagramm of production and the observation of the value given to producers and products will be related to the political and economic system in which the workshops were embedded. Through the longitudinal analysis of the archaeological data, the paper aims to detect analogy and differences in the concept of ergonomics within different political and economic systems and mentalities of pre-roman Italy.

4. Nadin Burkhardt (Katholische Universität Eichstätt-Ingolstadt), Structures and patterns of bronze workshops in early Greek settlements in the West

Pithekoussai, the first Greek settlement in the West, is not only known for the famous Nestor cup. The necropolis and the votiv pits offer rich archeological material in ceramics, terracotta-figurine, seals and bronze objects. Some of these bronze objects seems to have been produced on-site. In the località Mazzola a bronze workshop was excavated, built on three terraces, with houses and open areas, which was in use from the 8th to the 6th century BC. In 2016, a new archaeological excavation started in the neighbourhood of this workshop area. In this context was undertaken a new research of the bronze objects, the semi-finished products, the technical equipment, the tools and the traces of the production process.

Commercial opportunities and especially commodity trade are often considered as reasons for the Greek Western colonisation. The archaeological finds in Pithekoussai and Campania argue also for an commerce with ceramic vessels and bronze objects like jewelry. Metalworking and trade can be the
reason for the rapid economic rise of Pithekoussai and Cuma.
The offering of such remains of bronze production in the local sanctuary will be included in the analysis. On the Acropolis in the località Scarico Gossetti, certain quantities of amorphous, unworked iron and a small lump of iron from the island of Elba were found among other votive offerings.
The archaeological remains and finds of Pithekoussai will be compared to similar findings in other Western Greek settlements.

5. Sophie Helas (University of Bonn), Eine eisenzeitliche Werkstatt in Gabii/Latium


Panel 3.8 Women and Men at Work! Entrepreneurs, ateliers and craftsmen in the construction and destruction of Roman tombs

Organiser: Marianna Castiglione (Università di Pisa) and Myriam Pilutti Namer (Scuola Normale Superiore)

Thursday | 24 May | 14:30-16:30 | HS XV

Panel abstract

Funerary Archeology is a widely discussed topic that includes the analysis of archaeological and anthropological data and the exam of literary and epigraphic sources. Scholars have mainly studied the connections between the tomb and its evidences and artifacts, to obtain quantitative and qualitative information. Very few attempts have been done to analyze the system of production at the base of the ‘death market’, excepting some epigraphic studies, because of the difficulty to well identify the ateliers in archaeological contexts.

The “archaeology of technology” related to the tombs was strictly linked with the Roman economic history: despite the lack of data, many workers were involved in the ‘funerary economics’ and in all the activities connected to the tombs’ construction and destruction. If we use a “micro-economic approach” and consider only the craftsmen participating in the execution and lying of stone materials, we should mention marble workers, stonemasons, manual laborers, polishers, experts in writing and sculptors. Particular attention should also be given to the people responsible for the ideation and realization of funerary paintings. Furthermore, there were the entrepreneurs, both men and women, sometimes mentioned in ancient sources but usually neglected by modern literature, and finally the commissioners, the most studied component of this flourishing economy – at least until the 3rd century AD. From this period the market decreased, because of the competition with Christian inhumation practices.

Because of this progressive fall of interest and request of “built” tombs, many laws appeared, in order to impede the spoliation of funerary monuments to obtain lime or building materials for reuse. So, the wealthy ‘market of death’ lives a new life and transforms itself in a new successful one, thanks to the reuse of ancient parts from monumental tombs in the building industry, for structural reasons or for symbolic values.

Thus, the panel aims to create a debate on these two phenomena: the production system connected to the tombs’ creation and construction, considering all the people involved and including the female con-
tribution at the question, as well as the reuse of previous funerary materials in the late antique building industry. Selected case studies could allow both the investigation on the specialization and diffusion of technical and artistic knowledge, and the understanding of social, economic and juridical history of the sites.

Paper abstracts

1. Marianna Castiglione (University of Pisa), Working in/for Pompeian funerary contexts: business, craftsmanship and customers

Even if in studies on Roman economy, the contribution of funerary contexts is often neglected, due to the lacking of archaeological and literarily documentation, tombs and the economy related to their ideation, construction and transformation had certainly a noticeable importance, because of the many activities and people involved. For a better understanding of this topic, this paper will focus on some examples from the large-scale necropolises on the outskirts of Pompeii. They will be carefully analysed with all their features: the exam of the structures and the building materials allow to establish the geological nature and their geographical origin, showing commercial and economic networks; the signs of working tools indicate the technical abilities of craftsmen and stonemasons; paintings, stucco, capitals and statues' realisation give us an insight into the artistic and artisanal world as well as into styles, models and local fashion; inscriptions shed light both on skills of writers and on customers and entrepreneurs, sometimes mentioned as females; stratigraphical and chronological data inform about construction, destruction and transformation of funerary monuments, gardens and burial areas. This paper aims to investigate in depth all these questions, also connecting the funerary evidences with the whole ancient city and some other Campanian centres, in order to enlarge the point of view and find the connection between Pompeii and its hinterland.

2. Stefania Tuccinardi (Università di Napoli Federico II), Mausolei a pianta circolare in Campania: progetti, architetti e officine tra l’età cesariana e la prima età giulio-claudia.

Il funerale di Augusto e il grandioso mausoleo, di tipo a tumulo, che fece costruire per sé e per i suoi familiari rappresentarono sia la massima espressione dei precetti tradizionali e delle forme architettoniche già in uso sia un modello che mai si sarebbe potuto eguagliare. Con la nascita del Principato si verificarono cambiamenti importanti anche nei costumi funerari così come in tutte le altre forme della vita pubblica e privata; la nuova temperie politica fu evidente nella scelta dei tipi architettonici, nelle modalità del rito funerario, nel repertorio della decorazione. Lo scopo della comunicazione è tracciare la fisionomia di questo processo nel quadro territoriale della Campania antica utilizzando come “fossile guida” una particolare tipologia architettonica, quella del monumento a tumulo. Si presterà una particolare attenzione all’uniformità dei progetti individuati in modo da verificare se questi possono essere rivelatori dell’attività di officine specializzate e se scelte progettuali e decorazione architettonica sia siano sviluppate, come sembra, di pari passo. In particolare, attraverso casi di studio specifici, quali la documentazione fornita dalle città di Capua e Nola, verrà analizzata la diffusione di una particolare variante del tumulo propriamente detto che pare potersi attribuire, nella peculiarità del modello di riferimento, a una stessa officina o meglio a gruppi di artigiani che risultano aver condiviso le stesse competenze tecnico-progettuali.

3. Fanny Opdenhoff, Sculpting his own Grave? Artefice and craftsmanship in Tombstones from Bordeaux

The tombstones from Roman Bordeaux present a spectrum that could be found at many sites in Roman Gaul. The range of sizes, subjects, motives and qualities in execution ranges from very simple and modest compositions to ambitious and over life-size monuments sculpted mostly from rather soft and coarse local stones. Overall, they provide interesting impressions of local tastes and conceptions of identities, as well as of craftsmanship, styles and work routines of stonemasons, sculptors and writers. One example from Bordeaux, which seems to be average in many respects, excels with regard to the directness by which it refers to these crafts: It shows a sculptor manufacturing his own tombstone. The
man, sitting inside a niche, is literally just finishing the work on his own image. The inscription further tells us that his brother was involved in the process too. Therefore, this monument gives us unique insights not only into the “styled self” of an individual and the very special subject/object-relation between himself and his workpiece. It also allows for a reconstruction of the role and understanding of a sculptor’s family in their local context.

In this paper I will examine both, the traces of craftsmanship and workflows in the local monuments as a group, and the sculptor’s tombstone as a case study on the roles played by an individual in the design and manufacturing of the monument.

4. Anna Bartol (University of Warsaw), Funerary gardens in Roman province of Lycia et Pamphilia – the process of setting and the utilitarian aspect

This paper examines the process of setting and the utilitarian quality of the funerary gardens in Roman province of Lycia et Pamphilia. Their presence around tombs offered a pleasant site for the commemorators and was certainly significant for the tomb owners. However, more importantly they provided a productive garden to help pay for its upkeep. These gardens were often termed “κηπός” (kepos – garden, orchard), “κηπίον” (kepijon - parterre) or “κηπόταφος” (kepotaphos – tomb garden) in epitaphs, implying economic character of the cultivated land. This paper aims to illuminate the function of these areas lying near the sepulcher on the basis of archaeological and epigraphic data. The findings from the research illustrate the existence of warehouses (aedificia, horrea) in the area of the burial. In my paper, I would also like to give special attention to the mentioned in an inscription - πωμαρίτης (pomarites) and πωμαριτίσσα (pomaritissa) - respectively male and female gardener - and the garden guards residing in the area of the burial.

5. Myriam Pilutti Namer (Scuola Normale Superiore), The afterlife of stones after the disruption of Roman tombs in late Antiquity and Middle Ages

In my speech I will address the issue of the disruption of Roman tombs during the late Antiquity and the high Middle Ages. I won’t consider the cultural phenomenon, very well studied. Instead, I will focus on technical aspects like the possible identification of ateliers at work in the territories of the Roman Empire between the 5th and the 11th centuries. Starting from the case study of Campetti (Veio), where archaeologists have recently found a big deposit of piled fragments of marble dated to the 7th century, I will explore the ‘market of marbles’ considering juridical aspects and the hypothetical profiles of professionals involved. Major interest will be dedicated to the area of the Venetia et Histria, where most of monumental tombs settled in the streets of Roman cities have been looted to build the foundation of different kind of architectures. An overview of well known local case studies of stones which pertained to some funerary monuments (from Venice, Trieste and Verona) will help the discussion to be addressed properly.

Panel 3.9 Messapia: Economy and exchanges in the land between Ionian and Adriatic Seas

Organiser: Francesco D’Andria and Grazia Semeraro
(Università del Salento)
Saturday | 26 May | 14:30-16:30 | HS VI

Panel abstract

Ever since the Bronze Age, the geographical position of Messapia, between the Ionian and Adriatic seas, has enabled the development of relations characterised by continuity within the framework of mobility in the Mediterranean. In the light of the most recent investigations, the panel will adopt a multidisciplinary approach to the regional economy, production and exchange, in a period from the Iron Age to the Roman conquest in the mid 3rd century BC. The panel will focus on certain aspects of the economy in
Messapia, with particular reference to bio-archaeological themes (including livestock rearing and the consumption of animal resources), textile production (to be analysed by applying archaeometric methods to residues of fabric) and imports of luxury products from Greek cities and the Greek colonies of southern Italy. The Iron Age, a period when the Salento was at the centre of traffic and migrations that led to the establishment of the Greek settlement of Taranto in the late 8th century BC, will be the focus of special attention. Of interest are the production techniques of the indigenous settlements and commercial exchange, which is seen from an early period, particularly on the shores of the Strait of Otranto. The presence in grave goods of imported prestige items will be investigated with reference to the forms of self-representation adopted by the Messapian aristocracy in both funerary rituals and manifestations of power within the settlements. The variety of religious manifestations in the Messapian world constitutes a particular case study linked to cultural exchanges, which, thanks to the recent discoveries of places of worship, can now be investigated in detail. Important in this regard are the discoveries made in Castro, where the Athenaion – linked to the myth of Aeneas's first landing on the shores of Italy – was identified. In this site, the abundance of votive offerings, the richness of the structures of the cult and the ways in which the rituals were performed all enable us to investigate the investment of resources in the religious dimension, especially the consumption of collective energy in the manifestations of the cult. A further objective is to reconstruct the economic system underlying the cult in Messapian society, considering its relationships with the other peoples of the Mediterranean.

Paper abstracts

1. Grazia Semeraro (University of Salento), Methods and practices in studies of the economy of Messapia

The paper will discuss some aspects of archaeological research that allow to reconstruct the economic and relational framework of the Salento peninsula during the pre-Roman period.

1) Study of interaction and exchange. From quantitative analysis to the latest cognitive approaches, the research in this field led to a radical revision of the concepts traditionally used to describe the relationships and contacts with neighboring cultural systems (especially with the Greek world).

2) Settlements, landscapes, communities. The global approach to the study of the territory has allowed to reconstruct the development of settlement system over time. Numerous ongoing projects are aimed at reconstructing the cultural landscapes of the region, with specific attention to the human-environment relationship and the processes of definition and socio-political organization of local communities. Experimental archaeology and organization of individual and collective work.

3) Production and consumption of food. From the materiality of objects to their symbolic value in order to reconstruct the economic and social features related to production and distribution of agricultural resources. The contribution of archaeometry, social anthropology and ethnographic research. New projects on production and processing techniques of commodities (wheat, oil and wine).

2. Katia Mannino (University of Salento), Consumption of luxury goods and art among Messapian aristocrats

In the framework of studies into ancient economies, the research by the University of the Salento focused on those contexts of southern Puglia where imported goods have been discovered have thrown some light on the role played among the Messapians by the purchase of luxury goods, above all bronzes and Greek vases. The discoveries in dwellings, sanctuaries and funerary areas reveal that from the 6th to the 4th centuries BC the phenomenon - linked to the dynamics of self-representation on the part of aristocratic groups and the consolidation of power in the settlements - presents features that are distinct to the various types of context. This takes us considerably beyond the generic equation ‘luxury goods = indicators of status’: indeed, analysis of the objects in contexts makes it possible to determine, case by case, the meaning that the purchasers attributed to the luxury goods selected with reference to their ‘function’ and, in the case of vases, ‘images’. Given their symbolic value, the latter were fundamental in the communication strategies adopted by the aristocracies, who, thanks to knowl-
edge handed down from one generation to the next, felt an affinity for the myths and cultural phenomena of the Greek world. These luxury goods constituted an important tool for the aristocrats, for whom the objects were elements of a shared language, used as a strong sign of cultural identity, communicating a range of messages useful for the affirmation of the individual groups.

3. Hedvig Landenius Enegren (CTR Copenhagen) - Francesco Meo (University of Salento), Textile Manufacture in Messapia

In recent years research has highlighted the importance of textiles in the ancient economy. Experimental archaeology undertaken at the Centre for Textile Research (CTR) at the University of Copenhagen in collaboration with the Centre for Historical-Archaeological Research and Communication (CHARC) at Lejre, Denmark has been fundamental in this endeavour, focussing on the technical aspects of ancient textile manufacture. The study of the parameters of ancient textile tools such as the weight and thickness of spindle whorls and loom weights have now made it possible to calculate within a range the type of textiles produced at any given archaeological site.

The aim of this paper is to present a first overview of textile production in Messapia through textile tools and a few mineralised pieces of cloth. The analysis of loom weights from some Archaic domestic contexts such as those at Cavallino and San Vito dei Normanni suggests a production of fine quality textiles in the Archaic period. Decorative schemes on the loom weight material reveal aesthetic choices and/or utilitarian preferences at the time. More importantly, these may also point to cross-cultural contact.

The study of textile tools from Hellenistic contexts such as those from Muro Leccese and the possibility to analyse some fragments of cloth mineralised on fibulae from Vaste give us the possibility to complete the picture of information also for later phases.

4. Francesco D'Andria (University of Salento), Economy of the cult in Messapia

The systematic investigations conducted in Messapia since the 1970s have made it possible to reconstruct the system of settlements, some of which played a dominant role within a “cantonal” division of the region. In this framework we will examine the main places of worship that have been systematically investigated in order to assess the investment of resources by the ancient communities of Messapia in the religious dimension. Account will be taken of the various types and functions of the individual places of worship in the region. Indeed, coastal sanctuaries linked to trading activities, sanctuaries frequented by communities differing in terms of language and culture, sanctuaries situated in strategic locations for navigation (Castro, Athenaiion), Thesmophoric sanctuaries linked to the production of staple goods and sanctuaries dedicated to polyadic divinities and aristocratic cults (Vaste) are all attested.

From the variety and multiplicity of the cults and the procedures linked to the rituals, the various aspects of the economic dimension of worship can be reconstructed. Indeed, they are seen in in the construction of buildings, the use of craft skills imported from other contexts (mainly from Taranto, but also from Epirus and Macedonia), in the acquisition of precious goods and items imported from exotic locations. The case study of the Athenaiion of Castro, with the wealth of mostly unpublished evidence, can provide many useful points for discussion.

5. Jacopo De Grossi Mazzorin and Claudia Minniti (University of Salento), The use of animals in economic practices and ritual offerings of Messapia

In this paper the animal remains from several sites of Messapia are discussed in view of our understanding of the dynamics of animal exploitation in the region from the 8th to the 3rd century BC. Zooarchaeological data were obtained from a great variety of different context types, the most common being residential, suburban and ritual features. Those from residential features observed in many settlements provide significant information on animal management and diet practiced by Messapic communities particularly in view of the relative interaction between local and introduced cultural elements as a consequence of Greek colonisation of southern Italy at the end of the 8th century BC.

The scenario presented by ritual contexts enlightens about the interaction between man and animals in an abstract symbolic system consisting of beliefs, myths, and doctrines of religion, in which the empha-
sis of one of animal species than the other, difference in the composition of the animals offered, their ages and anatomical parts would seem strictly tied to the rituals that were practiced.

Panel 3.10 Contextualizing Craftsmanship in the Ancient World: An "economic" sphere?

Organiser: Mario Denti (Université Rennes 2)
Saturday | 26 May | 09:00-13:30 | HS III

Panel abstract
New methodological approaches and recent finds in archaeological and anthropological fields have been able to gradually soften the visions which limited (and often continue to do so) the craftsmanship sphere of the Ancient World to the exclusive field of the "production" and the "trade" for a long time – i.e., notions belonging to modernist economist conceptions. The critical conscience of the irreducibility and the complexity of the way of thinking of the Ancients, associated to the investigation of historical-political contexts and ideological-cultural elements in which the technological and craftsmanship activities were recorded, help us today to open new chapters on the way to the comprehension of a phenomenon in which not only the ritual sphere, but also requirements, culture and behaviors of the members of aristocracy, have played a role.

Paper abstracts
1. Sandra Blakely (Emory University), Metallurgy between Myth and Production: cognized and operational craft in the Northeastern Aegean
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.

2. Julien Zurbach (Ecole normale supérieure), Domestic vs commercial? Non-elite craftsmen between Mycenaean and Archaic times
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.

3. Despina Tsiafaki ("Athena" Research Center), Crafts and craftsmanship within the societies of Northern Greece in Archaic times

The recent archaeological research conducted in the region of 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 of the inhabitants, 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 subject of the paper. 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.

4. Mathilde Villette (Université Rennes 2), Greeks and indigenous potters in a same craft-working area of the South Italian Iron Age

The analysis of the material culture associated with the study of the structures resulting from the pottery workshops provides a valuable indicator in the understanding of the craftsmanship activity of the ancient societies. They allow, when the level of conservation of the remains makes it possible, to establish the technological choices adopted and to define the level of production of the workshop while questioning the destination of the production.

Remains of Iron Age pottery workshops discovered in southern Italy are tenuous, except for the site of the Incoronata (actual Basilicata), which offers the possibility of analyzing a ceramic workshop in its almost totality and over a time relatively long: between at least the second half of the 8th century BC and throughout the 7th century BC. The other peculiarity of this site is to welcome, around the end of the 8th century BC, greek craftsmen who come to work side by side with the indigenous craftpeople, without sharing their know-how.

In this paper, we will present the remains of the workshop through time and then, propose reflections about the "economic" sphere, namely the technological choices adopted, the level of production and the destination of production, in order to better understand the organization of the societies where the workshops take place and the nature of the contacts between Greek and indigenous (craftmen) of the Iron Age in south Italy.

5. Katherine Harrington (Florida State University), Craft and Community: Social and Economic Adaptation in the Corinthian Potters' Quarter

Corinthian fineware was widely exported in the 7th-6th c. BCE, and excavations in the Potters’ Quarter of the city 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 c. BCE when the rerouting of the city wall destroyed several buildings. This paper focuses on this later period of transformation, and in particular, on a 5th-4th c. BCE house and workshop, the Terracotta Factory, which produced figurines and miniature vessels long after other clay-workers had moved elsewhere. 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 c. by intentionally modifying their range of
products to meet a local, rather than long-distance, market, 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 stele 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.

6. Desirè Di Giuliomaria (University of Bonn), The Roofing Decorative Systems in Rome during 6th c. BC: Dynamics between Monarchy and Craftsmanship

During the Archaic period, sacred and secular buildings in Rome, as well as in Etruria and Latium Vetus, were adorned with roofing decorative systems that conveyed images through acroteria, antefixes and friezes. Usually, scholars deal with the iconography and the general meaning of images, while scarce are the attempts to clarify who was the patron and why he commissioned those specific subjects. Focusing on Rome, the patron is probably the monarchy: during 6th c. BC, at least three kings succeeded one another to the throne. They are referred by sources having different behaviours. Without inspecting into ancient literature, through the analysis of images, it is possible to unveil the socio-political orders then in force. Different personalities are distinguishable behind the craftsmanship of architectural terracottas, in the choice of subjects to depict and workshops to employ. Furthermore, some of those Roman systems spread out in cities of neighbouring, allied or subjugated to Rome. Thus, an issue arises: was still the king who commissioned the embellishment of buildings with the images of own self-representation in those centres, or some cities just wanted to imitate the Urbe, employing same workshops and matrices? This new approach to the Roman context could begin a new address of research to understand better the dynamics between political order and craftsmanship. I hope my speech will stimulate a fervid debate.

7. Elisabeth Günther (Freie Universität Berlin), Economic strategies and their frames of references: The case of the Paestan Asteas-Python-workshop

An extraordinary workshop of potters and painters can be found in the Greek colony Paestum in the 4th century BC: The Asteas-Python-workshop, being active for around 5 decades and producing an impressive amount of vase-paintings. However, the economic strategies of this workshop have not been explored yet. The main painters Asteas and Python (both the only signing painters in South Italy) collaborated with numerous nameless “associates”, who were closely related in respect of style. The huge output of this workshop as well as the wide span of products between (supposed) commissions and mass-products, which were based on the use of templates, the choice of different shapes and the varying complexity of the images make it a unique example to explore the organization of the workshop as well as the interdependencies of economy, product design and iconography. In addition, the images themselves reflect values of behavior as well as a deep interest in the Dionysian circle. Thus, the creation of vessel and painting are not only dominated by economic needs but reflect a complex bundle of socio-cultural frames. This paper aims to disentangle the economic, aesthetic, sociocultural and religious frameworks of the Asteas-Python-workshop, and to combine iconographic analysis with the find contexts in Paestum and Pontecagnano, therewith shedding light on both producers and recipients as the two sides of a not exclusively economic relationship.
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

Organiser: Enrique García-Vargas, Francisco José García Fernandez and Antonio Sáez Romero (University of Seville)
Wednesday | 23 May | 09:00-16:30 | HS IV

Panel abstract

The processing of fish resources into marketable commodities and the production of transport amphorae for their distribution were economic activities developed in almost all corners of the Mediterranean in early stages of Antiquity, although more widely known for the imperial Roman times. However, for several decades the study of the archaeological evidence connected to the Greek and Phoenician-Punic worlds has made it possible to demonstrate on a material basis what was in principle only an intuition: that these activities played a prominent role in the Mediterranean economies of the 1st millennium BC. Thus, long before Rome became a key power the fish-processing for consumption and its exportation packaged in amphorae was an important factor not only from the perspective of food supply but also linked to the interaction of technological and mercantile spheres between the main socio-cultural Mediterranean areas.

So far, the analysis of ancient fishing, salted-fish and salt production or the manufacture of transport amphorae have been addressed in a compartmentalized way. This has resulted in a lesser amount of attention being paid on the fluid technological and commercial connections that would had taken place between different regions and cultures, particularly significant from the consolidation of the Phoenician and Greek colonization processes in the central and western Mediterranean between the 8th and 6th centuries BC. The main objective is therefore to reconnect these unrelated processes, cultures and regions, and also explore how these technologies were disseminated among the local communities shaken by the phenomenon of colonial expansion and its subsequent development, modifying the systems of production and exchange of foodstuffs from the Atlantic to the Eastern Mediterranean.

This session proposes an integrated discussion of the state of the art on fisheries, salt production, the manufacture of salted fish by-products, amphorae and, in general, ceramic manufacture technologies on the Phoenician-Punic and Greek worlds during the 1st millennium BC. The panel has been conceived as a framework for updating information on typologies, influences, products, quantifying, technological and economic transfers, chaînes opérationnelles, trade routes or even experimental archeology trials. The main goal is to provide an up-to-date overview of these issues for the entire Mediterranean basin, taking into account significant case studies, as well as to reflect on the diachronic evolution of these activities and their structural transformations during the initial phase of expansion of Republican Rome.

Paper abstracts

1. Sónia Gabriel (Direcção Geral do Património Cultural), Fish and fishing in the Western Mediterranean: species, techniques and trends

The Archaeological record displays interesting information about fish and fishing in the Roman world. Using different sets of evidence, I will discuss fish and fishing in the Western Mediterranean, illustrating how, by and large, they relate to fish-salting industry, dietary fashion and seafood consumption.

2. Dimitra Mylona (INSTAP Study Center for East Crete), Fish and fishing in the Eastern Mediterranean: species, techniques and trends

Fish processing in Mediterranean antiquity was part of a broader fishing system that provided the raw materials to fish salting industry but also had shaped consumers’ tastes and ideas about the various
types of fish and fish products. This presentation will review the fishing in Eastern Mediterranean in the 1st millennium BC, with emphasis on the exploited species and the fishing techniques used. It will highlight particular features and trends which were crucial for the development and diffusion of fish preservation. Among the issues that will be discussed are the nature of the Eastern Mediterranean fish resources, the types of fishing grounds most commonly exploited and the way fishing technology affected the type and size of catch.

3. Enrique Garcia Vargas and Antonio Saez Romero (University of Seville) - Emmanuel Botte (CNRS-AMU, Centre Camille Jullian), Salt-fish production and trade across the Mediterranean

Since ancient times several areas of the Mediterranean and the Black Sea were outlined because of their fishing wealth and the existence of flourishing businesses based on the manufacture and trade of salted fish by-products, including some cities that reached an international fame (Byzantium, Panormos, Gadir). Great debates have marked the scientific historiography about the origins, diffusion, characteristics and importance of the "industrial fishing" and the consumption of products derived from it (the best known, garum). In spite of the great interest aroused by these questions in the last decades, the origin of this activity, attributed to Greeks and Phoenicians is still far from being fully clarified. In the same way, the discussion about the rise of processed fish production in the first half of the 1st millennium BC remains open (fishing as a sustenance activity?). In the Classical Period salted fish became a luxury food (some categories) and then opened to a wider range of consumers during Hellenism. Other discussions are also active, such as the local or regional recipes for these salted fish and sauces, the supplying for salt, the quantification of the volume of product generated or the relationship of their transport with specific amphorae types. The interest on these issues has so far been uneven, so this paper offers a general overview of the development of "industry" throughout the 1st millennium BC in the Mediterranean area.

4. Tønnes Bekker-Nielsen (University of Southern Denmark), Salt-fish production and trade in Greece and the Black Sea

Salt fish was imported into the Aegean at least as early as the fifth century BC if not before, but to judge from the remains of industrial installations, the apogee of the Pontic salt-fish trade was not reached until the first and or early second century AD. This paper will explore, first, the state of our present knowledge and the evidence upon which it is based; second, the dynamics behind the expansion of the fish processing industry: was it driven by supply (an abundance of fish in the Black Sea) or by demand (rising demand for processed fish in Greece and beyond); third, its socio-economic context: was fish processing a rare example of entrepreneurial capitalism in the ancient world, or embedded in a system of exchange controlled by a landowning elite?

5. Maria Teresa Soria Trastoy (Universidad de Cadiz), Fisheries and salted fish in Ptolemaic Egypt: A state of the art

We present the state of art of fisheries during the Ptolemaic period within the context of the 1st millennium B.C. and within the geographical space that includes Egypt and the Syrian-Palestinian Corridor, taking into account the data provided by the archaeological record, literary, documentary, linguistic and epigraphic sources, as well as iconographic and ethnographic sources.

Fishing activities were developed in marine, fluvial, lacustrine and palustrine environmental frameworks. The archaeological record allows us to define part of the fishing tackle and the methods of capture used, although we have a limited number of materials, some decontextualized and others of doubtful chronological adscription (Late to Greco-Roman Period). The technological breakthroughs that take place, the tradition, innovations and variations suffered in them during this period can be recognized thanks to the classification of the methods of capture and typologies of the fishing tackle that we have previously proposed.

The 1st millennium BC is the best documented period of ancient Egypt. Through accounting documents, correspondence and other matters collected in papyri, we can know the organization and regu-
lation fisheries, some of the methods of capture, professional organizations, distribution routes of the products, or their costs.

Capture, regardless of the medium in which it took place, were processed immediately for their preservation and subsequent consumption. Drying is the most common method, though Egypt was well known for its salted fish since Pharaonic times, both dry and wet salted (brine), which was preserved, transported and commercialized, inside and outside Egypt, in ceramic jars and amphorae. The earliest evidence for the production of freshwater wet-salted fish in the Nile valley comes from Kerma, in the context dated between 800 and 400 B.C. In Pelusium, today Tell Farama, within the industrial area and in the same sector where evidence of purple production was found, are several buckets that could have been part of a saltery complex. In the Red Sea, no evidence has yet been found.

6. Enrique Garcia Vargas (University of Seville), Salt works and tuna traps across the Mediterranean in the 1st millennium BC.

Traditionally, tuna traps and the production of salt have been closely related. The massive capture of tuna in the Atlantic and Mediterranean fisheries must be followed by immediate measures to preserve the product, and historically salt has played a fundamental role in this. The migration routes of the fish, the fisheries and the salt-production areas became, alongside fishermen's villages, the features of a characteristic, and relatively homogeneous from the technological and economic perspectives, 'coastal landscape'. Our contribution aims to examine the literary, epigraphical and archaeological record in order to rebuild this landscape diachronically, throughout the 1st millennium BC, between the Eastern Mediterranean and the Atlantic.

7. Solène Chevalier (Ecole pratique des hautes études), Salt, productive activities and land occupation. An overview of the Tyrrhenian archaeological situation at the beginning of the 1st millennium BC.

In 1991, M. Pacciarelli proposed comparing the Italian remains of a productive coastal activity with the celtic ateliers de briquetage. Since then, all recurring discoveries in the Central part of the Tyrrhenian Coast are interpreted as indicators of salt fabrics set between the Medium Bronze Age and the Orientalizing Period. A methodical study of the archaeological corpus suggests that these interpretations are not always reliable and that the existence of a mixed activity should be considered further, avoiding parallels with the Celtic workshops. This paper proposes to highlight the local technical expertise of these Italian sites which undergo their decline as metallurgy develops on the Tyrrhenian Coast. This chronological interruption will also be explored and compared with Spanish and French archaeological records. Simultaneously with the rise of metallurgy and the decline of salt a/o mixed littoral activities, the development of harbour sites indicates a coastal and maritime economical mutation during the VII BC. This study of characteristically productive coastal sites includes a wider analysis of settlement modalities between the Bronze Age and the Archaic Time which highlights the central role of these areas and their precocity. The collection of the productive and coastal settlements seems to suggest an organization through geographic sectors which precede the setting up of the city-states territories.

8. Edoardo Vanni (University of Siena), Searching for Salt in Italian Peninsula Mobility and exploitation of Salt from Final Bronze Age to Early Iron Age

The Archaeology of Salt has been considered by then as a strong field of study with specific methodologies and issues, thanks especially to numerous research run in Continental and Atlantic milieu. Regarding the techniques involved in the production of salt in Antiquity it has been already challenged by then the fact that in hot climates, the production of salt was made exclusively by evaporation of water. Conversely the extraction of salt blocks obtained by cooking the salt into boiling pots, well-documented in Continental and Atlantic contexts, has been recorded archaeologically in several Mediterranean sites. In Italy this technique seems to be practiced mainly during the Late Bronze Age and the Early Iron Age especially in Central Coastal Etruria. What are the economic and social premises for the spread of this phenomenon? Is there a correlation with the birth of the major Etruscan centers? Who detain the con-
trol of these resources? For what purpose the salt blocks were produced? My assumption is that there is a link between mobility strategies (e.g., transhumance) and salt production in Etruria. First of all salt consumption increased first and foremost to preserved meats and other animal products and it may be necessary to provide additional salt to animal diet. Moreover the salt could have been reduced in blocks to facilitate its transportation for long-distance trade. It is not only a speculation the fact that the shepherds were involved in the production of salt blocks.

9. Francisco José García Fernandez and Antonio Sáez Romero (University of Seville), Amphorae and kiln sites in Southern Iberia Peninsula and northern Mauritania

This is an essential research line for the reconstruction of the regional economy of the 1st millennium BCE, at its peak in the last two decades, but that nevertheless is developed in a very asymmetrical form in the diverse interconnected settlements in the area. On the one hand, since the arrival of the Phoenicians the production of transport amphorae was constant and there is a rich bibliography concerning the typological evolution of the containers and the characteristics and location of the kilns in sites such as the Bay of Cadiz and Malaga's coastline. On the other hand, there are sites or areas with a smaller development of the research, or where arbitrary reasons have resulted in less information about their amphorae forms or pottery production infrastructures (such as the southwest coast of Iberia, the Guadalquivir Valley or Carteia, to cite a few examples). Finally, it is possible to recognize a third set of zones in which the investigation of these issues is still very embryonic, with little information available on the amphorae types or its manufacturing centers (for instance, the rest of the eastern coast of Andalusia, or of the north of present-day Morocco). In any case, it is evident that the production of amphorae was a very widespread and important activity both in the port hubs and in the main river valleys, facilitating trade in many products such as olive oil, wine and especially salted fish.

10. Horacio Gonzalez Cesteros (Austrian Academy of Sciences) and Alfred Galik (Österreichische Akademie der Wissenschaften), Fish-resources exploitation and commerce in the Aegean in Hellenistic and early Roman times. The case of Ephesus.

Ancient writers relate the richness of western Anatolia in several natural resources. Among them, the exploitation of the sea products seems to have played a special role since prehistoric times. It is well-known the catch of the big banks of tuna and other migratory fishes in the north part of the eastern Aegean in their way to and from the Black Sea, but fish practices were not only limited to this part of the region and to this kind of fishes. Ephesus provides us some of the best examples of the exploitation of fish and other maritime resources in the Hellenistic and Roman periods, but also for the import of fish products from other production regions.

In this presentation we aim to make a multidisciplinary approach to the exploitation and consume of maritime resources from three different case studies. First, the analysis of archaeozoological remains, an archaeological well-established discipline in Ephesus. Second, the contribution of material studies, above all amphorae studies, indispensable for the understanding of the arrival of fish products imported from the whole Mediterranean and Black Sea areas. Third, present the evolution of the coastal line and Ephesian coastal landscape for a correct interpretation of the fish exploitation possibilities. Last, for a broader approach is essential to connect the archaeological evidence with the significant epigraphical evidence and numerous literary sources.

11. Darío Bernal-Casasola - Ricard Marlasca - Jose M. Vargas - Jose A. Retamosa (Universidad de Cádiz), Roman fishing strategies in the Western Mediterranean. Sardines, Mackerel and tuna at Gades (Olivillo Project)

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 1 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.

12. Carolina Megale (University of Florence), The cetaria of Caius Caecina Largus at Populonia

The Roman settlement of Poggio del Molino was built on a strip of land not far from the city of Populonia, the port and the main roads. This strategic location (with different purposes at different times) has made Poggio del Molino a multilayered site, continuously inhabited from late Republican times to the beginning of the Middle Ages.

Before becoming a maritime villa, in the Augustan age the complex was used as a farm, with an area for the production of fish sauce; the farm was built on top of a late Republican structure displaying with the features of a defensive building.

The Augustan fish-sauce factory consisted of at least ten salting vats, eight of which are square in shape. They are lined in pairs across from alongside another rectangular vat, larger in size and depth.

The discovery - inside a hypogoeum room which was abandoned at the time - of a betica amphora withtitulo picto indicating the recipient of the container, gives us the name of the owner of the farm and the fish sauce factory: Caio Caecina Largo, of the gens Caecina, from the Etruscan city of Volterra.

The discovery of the amphora with the name of the owner and the research at the cetaria in Poggio del Molino provide a significant contribution to our knowledge of one of the major economic activities in the territory of Populonia in the early imperial age.

13. Rafael M Rodríguez and Diego Piay Augusto (Pontevedra County Council), New consumption in the Northwest Hispanic from the amphoric remains located in indigenous contexts of the Rías Baixas, 1st millennium BC

During the excavations promoted by Pontevedra Provincial Council during the years 2015, 2016 and 2017 in several sites of the Rías Baixas, an important volume of amphoric remains was documented that allow an approach to the introduction of new foods and new guidelines of food consumption from the fourth century BC.

In the present study, an analysis of the amphoric typologies documented in archaeological sites dating from the first millennium BC will be carried out, after which conclusions will be drawn on the eating habits of the peninsular northwest, based on the known data for these amphorae.

14. Darío Bernal-Casasola (Universidad de Cádiz), The transition to the Roman Era. Salt-fish and amphorae production and trade in the Mediterranean during the 2nd-1st centuries BC

Closing the panel "Salt, fish processing and amphorae production across the Mediterranean in the 1st millennium BC. An overview of the technological and economic interactions", some ideas and recent working topics between II - I c. BC will be presented, in order to stimulate the interdisciplinary and to discuss research lines for the next future. The technological Roman innovations will be highlighted, as well as the new archeological evident in the last decade or archaeological work, mainly focused in Hispania.
Panel 3.12 Pre-modern Industrial Districts

Organiser: Michael Herdick, Angelika Hunold and Holger Schaaff
(Römisch-Germanisches Zentralmuseum)
Saturday | 26 May | 14:30-16:30 | HS XIV

Panel abstract

The ancient quarrying and mining district of the Eastern Eifel has been the subject of research by the Römisch-Germanisches Zentralmuseum since 1997. Over the years, mining techniques, production of and trade in the valuable volcanic rocks, and settlement structures have all been investigated in detail. The products – primarily basalt lava millstones, tuffstone building material, and pottery – were extensively traded throughout much of Europe for centuries. A research programme named „The origin and formation of an industrial landscape – the ancient quarrying and mining district between the Eifel and the Rhine“ was launched to examine the wealth of evidence about the ancient mining economy in the region and its significance for the political establishment of Rome north of the Alps. A series of individual studies contributed to the subject, among them several doctoral theses. The programme was accompanied by the development of the Vulkanpark Osteifel, which received twice an Europa Nostra Award for the valuation of this outstanding industrial heritage. The archaeological research falls into four categories: - the stone industry (basalt, tuffstone, pumice) - the economic centre of Mayen - the pottery production - the rural area. These categories engage with each other and as a whole they allow a full understanding of the district's significance. Currently, the project is completed except research on the pottery production which is just in its final phase. Experimental archaeology, too, continues to investigate the potter's production conditions. Another aspect which has lead to further studies is the waterway transport of the heavy goods. Being an industrial district of supraregional importance, the quarrying and mining district of the Eastern Eifel turned out an excellent case study for pre-modern industrial districts in general. So it provided a model how to study ancient industries: In a long-term view and with a holistic approach, that means taking into account economic, social and settlement aspects. As a consequence, pre-modern industrial districts were integrated into the research field „Wirtschaft und Technik“ at the RGZM as a subject of further research. Looking for a comparable district, we started to investigate the ancient pottery centre of Speicher near Trier. It was most likely in a way connected to the Late Roman Imperial residence and therefore offers quite different interesting aspects for research.

Paper abstracts

1. Angelika Hunold (RGZM), The ancient quarrying and mining district between the Eifel and the Rhine - a summary of research

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The ancient quarrying and mining district of the Eastern Eifel has been the subject of research by the Römisch-Germanisches Zentralmuseum in Mainz and Mayen since 1997. The products – primarily basalt lava millstones, tuffstone building material, and pottery – were extensively traded throughout much of Europe for many centuries.

An extensive research programme was launched to examine the wealth of evidence about the ancient mining economy in the region and its significance for the political establishment of Rome north of the Alps. A series of individual studies contributed to the subject, among them several doctoral theses. They engage with each other and as a whole they allow a full understanding of the district's significance.

Being an industrial district of supraregional importance, the district of the Eastern Eifel turned out an excellent case study for the investigation of pre-modern industrial districts in general. So it provided a
model for studying ancient industries: In a long-term view and with a holistic approach, that means taking into account mining techniques, production and trade, but also social aspects and settlement structures. As a consequence, pre-modern industrial districts were integrated into the research field „Wirtschaft und Technik“ at the RGZM as a subject of further research.

2. Lutz Grunwald and Sibylle Friedrich (RGZM), Pottery production for the european market – the Roman and Medieval potter's workshops of Mayen and Weißenthurm

The ceramic produced in Mayen belongs to one of the „index fossils“ of archaeological investigation, not only for the late Antique, but also for the Middle Ages. Focusing on the local pottery workshops and clay deposits in Mayen, this paper presents the „Mayener Ware“ and also gives a summary of ceramic production in the area of the confluence of the Mosel and Rhine Rivers from the 1st to 14th centuries AD. Based on new distribution maps, it is possible to reassess the distribution of the Mayen vessels during the late Antique and Carolingian Period. Furthermore, due to the amount of exports, it is possible to theorize that the trade and export to the key markets was state regulated.

In Weißenthurm during the Roman Period, there was a surparesional production center for high-quality coarse ceramic. Its appearance and workmanship differ from other contemporary pottery, which makes the so-called Urmitzer Wares easy to recognize at other archaeological sites. Even today the Urmitzer Wares are used as a chronological "index fossil" for the so-called Niederbieber Horizon. However, new research has shown that the chronological timespan is much broader than previously thought, and the creation of a geochemical-mineralogical database makes it now possible to determine the export region. Even the exclusiveness of the production center in Weißenthurm has now been called into question.

3. Gregor Döhner and Michael Herdick (RGZM), Technical-historical Comparison of Pottery Districts: Desiderata and Experimental Archaeological Research Prospects

In spite of innumerable firings with reconstructed Antique and Medieval pottery kilns, there is still no transparent production data from kilns of different epochs from any major ceramic production center in Europe. There is an underlying deficiency of in-depth investigations of archaeological pottery kiln complexes; research into the available raw clay resources, its preparation and final composition of the prepared clay is often neglected. From a ceramic technological point of view, the kilns and the wares fired in them must be seen and analyzed as a single technological system. The type of vessel with its specific requirements, such as how they were stacked and fired, is just as influential for the production process as the construction of the kiln itself. A technological assessment of a kiln construction is not feasible, without first taking into account the process of the specific pottery being produced.

At the RGZM Lab for Experimental Archaeology, experimental archaeological research is being carried out that focuses on the technical history of the Mayen pottery center. Using this research as an example, we would like to present how such trendsetting investigation models could look like. The starting point of the project, which started in 2014, is an experimental archaeological evaluation of a Late Antique shaft kiln, as well as the accompanying studies of the material resources of the Mayen potteries.

4. Stefan Wenzel (RGZM), Transport of heavy loads on inland waterways

The river Nette connected the Roman quarry and mining district around Mayen with the important waterway of the Rhine. Starting from the Nette the arguments are presented which speak for the use also of other small water courses for heavy load transport in Antiquity. In this context special reference is given to the distribution of Roman workshops, storehouses and funerary monuments along small rivers.

5. Holger Schaaaff (RGZM), Archaeology of unimagined dimensions - the roman potteries of Speicher and Herforst

In archaeology it has been known for at least 150 years that between Speicher and Herforst in Roman times there existed a pottery centre of European importance. At that place, enormous quantities of pottery were produced from the 2nd to the 5th centuries. A walk through forest and fields still reveals the dimensions of production. The uneven ground, stone accumulations and masses of ceramic sherds
show that the potteries lie very close to the surface. Over time, more than 30 larger workshop complexes were discovered, each of them consisting of several buildings, ceramic furnaces and clay pits, spread over an area of more than 2.5 km².

However because of its large extension, the pottery centre despite many find observations and excavations never could be examined comprehensively. Therefore, an association of archaeologists from Landesarchäologie Trier, Frankfurt University and Römisch-Germanisches Zentralmuseum Mainz now want to investigate the potteries with state-of-the-art methods. They receive great support from the Ludwig Boltzmann Institute in Vienna, sending specialists for geophysical surveys. The aim is to finally appreciate the international significance of these large Roman enterprises. A start has already been made: First geophysical investigations as well as a test excavation show very promising results. Obviously the pottery centre was even larger than we thought it was.

Panel 3.13 The rise of bling: charting the incredible increase in the consumption of decorative metal objects in the Roman Empire

Organiser: Stefanie Hoss (Universität zu Köln)
Saturday | 26 May | 14:30-16:30 | HS XV

Panel abstract

The mass production and consumption of metal objects - and especially of metal objects that were decorative but not essential, such as statuettes, furniture fittings, tableware and decorative parts of dress as well as jewellery – is one of the major differences between the Roman Empire and the periods preceding and following it.

The reason for this is a fairly straightforward one, namely the increase in availability of the raw materials, in part due to new mining techniques, but also due to the increased access to mines that was the result of the spread of Roman control.

Another characteristic is the extremely wide dissemination of these items both in terms of distance as well as in terms most often described as social class or wealth.

This panel seeks to clarify the systems of production and distribution that enabled this phenomenon in order to better understand the mechanisms of cultural supply and demand that form the basis for this ‘explosion’ of metal production during the Roman period.

Paper abstracts

1. Mikhail Treister (Deutsches Archäologisches Institut), The Gold of Phanagoria (Bosporan Kingdom): a complex archaeo-metallurgical study

The paper is devoted to the study of the gold objects from the excavations and chance finds of ancient Phanagoria, the Asian capital of the Bosporan Kingdom. These are ca. 300 individual finds and groups of objects, dating from the late 4th century BC to the 5th century AD (ca. 5% of all burials yielded gold objects), with the peak of the use in the burial rite from the late 2nd century BC to the first half of the 2nd century AD. Examined are various types of funeral (diadems, wreaths, buckles, ghost money) and real jewelry (necklaces, torcs, earrings, bracelets, finger-rings). There were made 284 RFX-analyses of 164 objects, 67 samples were studied optically. The composition of gold was also studied with electron probe microanalyzers. There were also studied the technology of manufacture of the majority of artefacts. There will be discussed in their dynamics: the balance between the "real" and funeral gold objects, the correlation of the types of gold objects and burial constructions, the problem whether (when) gold items were the markers of the elite burials, the questions of imports and local (Bosporan, Phanagorian) manufacture, as well as origin of metal, its composition and technological issues. Such a
complex approach enables for the first time reconstructing the history of gold manufacture and consumption of one of the most important centers of the North Pontic area.

2. Espen B. Andersson, Keeping cash in Roman cities

To accumulate greater amounts of cash money and other valuables, the Romans used, both public and private, a money chest called arca, or arca ferrata. These strongboxes had lock systems of high technical standard, and displayed outstanding artistic quality in decoration. To anybody passing by them, alone their visual appearance signalized capital resources in abundance.

A cassaforte was not a part of every Roman house. This is reflected in the archaeological material where only approx. ten cassaforte are known to date. On the other hand, bronze appliqués found at different sites may indicate that this number will increase.

In Italy, the largest group of cassaforte comes from Campania, above all from Pompeii. These examples are important because they are found in situ. The panic through the eruption of Vesuvius in 79 AD, lead to that most of the cassaforte was left empty. It is possible though, based on what some volcano victims were carrying, to suggest the average sums of sestertii that supposedly were kept in the cassaforte.

That the cassaforte remained where they stood, gives an opportunity to understand more in detail the possible roles of this cash keeping in the city.

The interesting question is what the cassaforte may tell us from the distribution of them; - these monuments not seen in isolation - but viewed in a broad urban perspective.

3. Courtney Ward, Bling It On: Metal Jewellery and Identity on Display in Roman Campania

Jewellery and personal adornment were integral to the creation of identity in the Roman world. Men and women of all social and economic classes wore these objects on a daily basis and as such they formed a fundamental part of Roman life. Literary and epigraphic evidence shows the social importance of jewellery and personal adornment in the Roman Empire. Often these sources associate jewellery with wealth and social rank; however, the archaeological evidence underscores a much broader picture of jewellery use in the Roman world. This paper will examine jewellery finds from the Bay of Naples in order to discuss what the differences in materials, composition and jewellery types can tell us about the sex, age and socio-economic status of its wearer, and how jewellery was used by its ancient owners in the creation of diverse gender identities. Jewellery was produced in the same form or style for different budgets, with items constructed of solid and intricately decorated gold for the wealthy, while a similar form was constructed with little to no detail in less expensive gold foil for those less affluent. This paper will illustrate how jewellery, a necessity for the creation and display of diverse gender identities, was employed by men and women from varying economic and social backgrounds in the first century AD.

4. Josy Luginbühl (Universität Bern), Young ladies with their writing equipment. Indications of literacy in Roman Tombs

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 the writing equipment is essential to writing, it was distributed similarly to these testimonies. Hence including stilis, inkpots and wax-spatulas, which were widely spread throughout the Roman Empire.

As grave goods they were found in the sepulchre of children, men in military service or more interestingly of young women who died before marriage. To all of them writing seemed to be important, as they all ran through the Roman system of education.

Fortunately this writing gear can be linked through their position in a tomb to a specific person and we are able to draw conclusions about the abilities of the person in question and the spread of literacy throughout the empire and the social hierarchy.

Furthermore these writing utensils are an evidence of trade. Especially inkwells in their varied forms and diverse materials can be assigned to a precise place of production and from there retrace their steps to the places they were excavated in the first place.
In this paper the beneficiaries of the Roman education system will be traced by a study of the distribution of the utensils in question.

5. Boris Alexander Nikolaus Burandt (Johann Wolfgang Goethe-Universität), Transformationssprozesse von Tausch- und Gebrauchswerten römischer Fanartikel im Kontext der Gladiatur und Wagenrennen


Panel 3.14 “Craft Economy” and Terracotta Figurines. Approaching systems of production through coroplastic studies

Organiser: Stephanie Huysecom-Haxhi (CNRS-HALMA - Univ. Lille3) and Antonella Pautasso (CNR-IBAM)

Wednesday | 23 May | 09:00-13:30 | HS IX

Panel abstract

Since the first discoveries of the nineteenth century, the coroplastic research has undergone a remarkable evolution. For a long time considered as trinkets, and therefore studied mainly from the point of view of the history of art, terracotta figurines are now studied and published scientifically, according to specific methods of analysis and integrated approaches. Particular attention has been paid in the last twenty years to production techniques and to the reconstruction of the operational sequence, as well as to the human factor behind the crafted object. Archaeologists also have had the benefit of several ethno-anthropological studies that provide thought-provoking theoretical frameworks for an understanding of the economic and social dimensions of craft production in antiquity. The economic approach to coroplastic production encompasses different aspects, such as: — The acquisition and the processing of the clay. — The techniques, sequences and organization of the production. — Trade, diffusion and distribution. — Demand or consumption and their effect on the production. The proposed panel aims to discuss the economic and social facets of the coroplastic production through some examples addressing one or more of the abovementioned aspects and concerning the Greek world from the Archaic to the Hellenistic period.
Paper abstracts

1. Rebecca Miller Ammerman (Colgate University, New York), Toward the Study of the Production of Figured Terracottas from Local Clays at Metaponto

The paper presents an overview of studies conducted on the clays and ceramic materials from two sites of ceramic production at Metaponto. The research aims to locate the sources of clay at each site — Sant Angelo Vecchio and Pantanello — and to identify, in a systematic manner, the properties of the clays. At the same time, the clays are compared to the ceramic fabrics of objects found and produced at each site. The comparative study focuses on several questions. First, to what extent do the fired fabrics differ from the raw clays? Second, what is the degree of variation between the clays found at different sites in the region? Third, to what extent do the fabrics vary between different kinds of ceramic materials, ranging from roof tiles to terracotta figurines? In effect, we have undertaken a methodological study whose aim is to develop a more comprehensive approach to understanding the exploitation of local clays in the production of a full range of ceramic materials including figured terracottas.

2. Antonella Pautasso (Instituto per i Beni Archeologici e Monumentali (IBAM)) - Vanessa Chillemi - Ambra Pace - Lighea Pappalardo (CNR - Italian National Research Council), Neither kilns nor moulds. Indirect evidences for the reconstruction of a coroplast workshop at Katane

The extraordinary discovery, which occurred in 1959 during an excavation of a sewer duct in the center of Catania (ancient Katane), brought to light one of the most important votive complexes of the western Mediterranean, connected from the moment of its finding with the sanctuary of Demeter and Kore. Beyond a large amount of imported and locally produced pottery, the deposit contained more than 10,000 both imported and locally produced terracotta figurines, from the beginning of the 6th to the late 4th century BC.

In 2011, a research project aimed to the integral publication of the coroplastic material has been undertaken by a team of researchers which thus far have almost completed the study of the Archaic coroplastic material.

The present paper intends to demonstrate how the study of the production technique of both mould and handmade terracotta figurines together with the stylistical analysis, can provide crucial information to identify one or more coroplastic workshops, even in the absence of kilns, moulds and tools.

The analysis of some technical features which presuppose specific craft procedures together with the results of the archaeometric analyses have provided the indirect evidences to suggest that a large group of figurines originated in the same local workshop. The analysis of the manufacture technique allowed to make some assumptions on the sequence and organization of the production, the possible presence of apprentices and some stylistic choices.

3. Stéphanie Huysecom-Haxhi (CNRS), Les terres cuites figurées de Kirrha (Phocide) du VIe au IVe siècles avant J.-C. : caractérisation des productions et définition du faciès de l'atelier coroplastique kirrhéen

Les fouilles entreprises de 1936 à 1938 à Kirrha, au lieu-dit “La Magoula”, par M. Jannoray, de H van Effenterre et de J. Roger sous l'égide de l'Ecole française d'Athènes ont mis au jour un large dépôt constitué de milliers de fragments de terres cuites figurées et de vases, en particulier miniature, datés pour la grande majorité de la fin du vie au début du ive siècles. À côté des productions directement importées de la région de Corinthe, la présence de types, en particulier de protomés et de protomés-buste féminines, aux caractéristiques stylistiques originales invite à supposer l'existence à Kirrha même d'ateliers coroplastiques qui ne se contentaient pas d'importer des types étrangers, dont certains pouvaient être reproduits localement sur une ou plusieurs générations grâce au procédé du surmoulage, mais qui étaient également créateurs.

Aucun vestige d'ateliers n'ayant encore été découvert, notre connaissance de ces derniers ne repose donc plus que sur les productions mises au jour. Dans le cadre de ce workshop, on verra ainsi tout ce que l'analyse des terres cuites, depuis leur prise en charge en 2013, peut d'ores et déjà apporter à la caractérisation des ateliers kirrhéens et à la compréhension de leur fonctionnement à l'époque de leur apogée, au ve siècle.

4. Nancy Serwint (Arizona State University), The Terracotta Sculpture from Ancient Marion: Evidence for the Coroplasts’ Craft

The ubiquitous presence of clay allowed for that material to emerge as the most common medium for sculpture in the Mediterranean world during antiquity. With objects ranging from miniature to colossal, the results spanned the spectrum from the sublime to the banal with figurines and statues reflecting a breadth of aesthetic appeal. The artisans who were responsible for such a disparate corpus certainly varied in their artistic capacities, but what proved to be a commonality was a range of technical strategies that could be employed with varied results. This paper will focus on the variety of production techniques that were employed by coroplasts working in the eastern Mediterranean during the first millennium BC. The gamut of manufacturing processes that included hand fashioning, the use of the potter's wheel, and the implementation of the mold will be discussed from the point of view of tactics and stratagems that responded to the demands of an enthusiastic market. Emphasis will be placed on the evidence that has emerged from excavation of the ancient cities of Marion and Arsinoe on the island of Cyprus where an unprecedented number of terracotta sculpture has been recovered. The material is particularly valuable because it not only emanates from an area where local production has been confirmed but also allows for tracking production over time from the Archaic through the Hellenistic periods.

5. Gina Salapata (Massey University), Does size matter in the terracotta serial production of dedications?

Moulds made possible the mass production of numerous inexpensive dedications in the Greek world. The use of derivative moulds in terracotta serial production inevitably results in products that are both smaller and less clearly defined than their prototypes since details are eliminated or simplified. What factors may have influenced the choice of smaller objects by dedicants? Was it simply a matter of lower cost or could there also have been other considerations such as portability, suitability for mass dedications and groupings, or even availability of display space? Furthermore, the symbolic value of dedications, for example, as tokens of participation in a cult activity, would not have been affected by size. And did size matter to the recipient divinity? I argue that small size did not decrease the perceived efficacy or religious significance of an offering. In fact, reduced size would have highlighted the most important features, those that communicate the messages inherent in the form of the dedication. This paper addresses aspects of the economic and social dimension of coroplastic serial production, primarily focusing on a long series of mould-made plaques (6th-4th c BC) from the sanctuary of Agamemnon and Kassandra in Lakonia. These plaques show a wide spectrum of quality and size, ranging from large, detailed images to small and simplified versions.

6. Sven Kielau (Roemer- und Pelizaeus-Museum Hildesheim), Production and distribution of terracottas in Western Asia Minor: demand and supply in Hellenistic times

In Hellenistic times, Pergamon was - probably - one of the centers of a diversified terracotta figurine production. This can at least be supposed, according to the many terracotta findings in several excavations in Pergamon and its region. The output was notably diversified, both in themes and types. Comparisons to the sepulchral figurines found in Myrina and the many so-called grotesques found in Smyrna reveal differences as well as similarities: The style is in a pan-hellenic way more or less related, but some themes are significantly restricted to the intended use (sirenes and nikes for sepulchral use, more elaborated art pieces presumably in houses). The paper aims to examine and outline what can be said about the regional Terracotta production, the demand for such products and the distribution of certain figurines in Western Asia Minor, focussing on the distribution paths of Pergamene figurines.

7. Marina Albertocchi, Terracotta figurines at Iasos, Karia: Some observations on production and consumption

The finds from the investigations conducted in the so-called Thesmophorion at Iasos have revealed a framework of offerings dating from the middle of the sixth to at least the end of the IV century B.C. Among these, terracotta statuettes are the largest core along with lamps and hydriai. Besides some
terracotta figurines from the sacred area have been presented in a preliminary manner by D. Levi and later by W. Johannowsky, A. Romualdi and F. Berti: these publications, however, concerned in particular the iconographic aspect, following a traditional approach in this research field, and the significance of the images in relationship with the cult practised in the sanctuary. The communication points instead to frame the assemblage of the terracottas discovered in a regional context, where the features of the local production can be easily understood from the technical, as well as iconographic, point of view; is moreover significant to investigate the connections with the coroplastic productions of the adjacent areas such as Halikarnassos, Kaunos and Theangela.

8. Maria Adele Ibba (University of Cagliari), Modelli greci nella coroplastica della Sardegna tardo punica e romana (IV-II secolo a.C.)

Nel 1938, a Cagliari, fu scoperto un edificio templare di età tardo repubblicana la cui planimetria, del tipo dei santuari su terrazza di area centro-italica, era fino ad allora sconosciuta in Sardegna. Lo scavo evidenziò, oltre all'edificio templare associato a una cavea teatrale, un pozzo ricolmo di una notevole quantità di materiale fitile in cui spiccava un consistente numero di frammenti relativi a circa cinquantatré matrici per coroplastica, oltre a una ventina di esemplari di terreccotte figurate. In particolare, le matrici erano destinate alla produzione di thymiateria, di placchette, di applique, di piccole figurine umane, divine, animali o di esseri fantastici e, novità per l'ambito sardo, di busti in maggioranza femminili. Va rilevato che in nessun caso si è riscontrata una corrispondenza tra le matrici e le terreccotte figurate. La varietà di argille utilizzate per la loro realizzazione, inoltre, fanno ipotizzare diverse provenienze. La presenza tra le matrici di iconografie che al momento trovano confronto con il mondo greco occidentale, più precisamente con quello siceliota e magno greco, pone il problema se si sia in presenza di importazioni o di derivazioni da positivi importati che, in ogni caso, sono stati poi riprodotti localmente. Partendo dall'analisi degli aspetti tecnologici di tali materiali l'intervento si focalizzerà sui vettori commerciali ad esempi di modelli greci, a cui essi sembrano riferirsi, siano giunti in Sardegna.

9. Geltrude Bizzarro, La coroplastica votiva del santuario settentrionale di Pontecagnano: L'evoluzione dell'artigianato locale in risposta alle esigenze devozionali

Le terreccotte votive del santuario settentrionale di Pontecagnano costituiscono un repertorio variegato ma coerente e di grande interesse per la quantità di informazioni che restituisce sui caratteri dell'artigianato artistico locale e sulle scelte operate dai devoti nel corso del tempo. Le statuette più antiche, risalenti alla prima metà del VI sec. a.C., erano d'importazione, ma già dalla seconda metà del secolo la richiesta del mercato dei devoti diede impulso all'attività degli artigiani locali che elaborarono serie originali che adattavano tipi coroplastici allogeni ai caratteri peculiari della ritualità del santuario. La marca caratteristica del santuario picentino, il sacrificio del porcellino da latte, raffigurato nei primi tipi permane nell'iconografia dei fittili più recenti e contribuisce a connotare il regime delle offerte dell'area sacra di un sito di frontiera che partecipa al più complesso fenomeno religioso etrusco, all'interno del quale l'aspetto demetriaco del rito assolveva alla funzione di mediare esigenze affini a quelle esaudite dai santuari tesmoforici dell'Occidente greco, generando manifestazioni del culto del tutto originali.

10. Maria Elena Gorrini (Università degli Studi di Pavia), Terracottas from Cappadocia

Since 2011, an archaeological mission of ISAW and Pavia University have started excavating a tell at Kinik Höyük, Southern Cappadocia (http://www.kinikhoyuk.org ). This region played a strategic role from Prehistory up to modern times due to its geographical position on the route connecting the Central Anatolian plateau to Cilicia, through the Taurus passes, and far beyond to Syria and Mesopotamia. Despite its importance, so far the province of Niğde has received little attention from scholars, particularly as regards the Bronze and Iron Ages. With a view to bridging this gap, our team from the University of Pavia carried out an archaeological survey in the region between 2006 and 2009, followed by a 10 year
project of excavations. From two operations in the mound a series of fragmentary terracotta statuettes, mostly from Hellenistic times, has been recovered. Most of them represent birds of prey, but bovines, lions and horses are attested as well. A minor number depict female figurines, possibly deities. The purpose of this paper will be to present them, in order to address questions such as their production areas (and commercial routes involved), production techniques, iconographies and function.

Panel 3.15 Villas, Peasant Agriculture, and the Roman Rural Economy

Organiser: Annalisa Marzano (University of Reading, UK)
Friday | 25 May | 09:00-16:30 | HS V

Panel abstract

The appearance and spread of villas both in Roman Italy and abroad has been at the centre of a vast range of studies on the Roman economy and society. From Marxist approaches, which saw in the Roman villa based on slave labour a unit denoting a particular type of agricultural exploitation and 'mode of production' to studies aimed at understanding how settlement hierarchy and modes of landownership changed over time, archaeological evidence from excavations and from field surveys has been central to the debate. In the past, the spread of large villas in Republican Italy has been seen as a phenomenon which displaced from the land small and medium landowners and thus contributed to Rome's socio-political problems from the time of the Gracchi onwards. Recent studies, however, have in fact stressed that large villas and farms were not at variance with each other. The productivity of peasant farmers and the level of competitiveness they had on the market has also been the object of important recent investigations and reassessments. Time seems thus ripe for a more organic evaluation of how the 'villa economy' and the 'peasant economy' operated and to what degree the two were integrated.

This panel proposes to investigate if and how villas and small and medium farms were part of two productive and distributive systems which supported each other (e.g., by giving access to agricultural processing facilities; by growing complementary crops). In the villa category, special discussion will be devoted to imperial estates and how these played a role in influencing the market's demand, with possible trickle down effects on large and small agricultural estates. The main focus of the panel is Roman Italy, but proposals for papers that investigate this phenomenon also in provincial territories are encouraged. Submission proposals from early career researchers are particularly welcome.

Paper abstracts

1. Elena Chirico, Rural villas, farms and productive infrastructures in Roman rural economy

This paper portraits a part of the ager Hebanus, the territory of the colonia of Heba (GR) between the Republican period to the mid-imperial time. Heba was founded in the 1st century BC, north of the colonia of Cosa in the river Albegna Valley. This territory was studied in 1980s by a field survey project related to the ager Cosanus. The main result of the project was the abandonment of small and medium properties, and consequently of peasantry agriculture, after the development of a new type of villa based on slave labour, well represented by the case at Settefinestre. Despite the fact that a lot of excavations are limited to a part of the villas and that many small and medium properties are known by field survey, today, thanks to new research, a different reading of this landscape is possible. In it great estates, like the villa of Settefinestre, co-existed with farms, as Fattoria Colle Lupo, medium villas rusticae, as Campo della Paura, and productive and living settlements as that at Banditaccia - some of them were occupied until the end of 4th century AD. In short, despite the decline of a lot of rural sites at the end of 1st century BC, there were a coexistence of different settlements - large villas, medium and small
farms, houses and productive quarters - in an articulate productive system stimulated by the presence of important infrastructures as the via Aurelia vetus (3rd century BC) and the port linked to the imperial estate of Talamone (end of 1st century AD).

2. Astrid Van Oyen (Cornell University) - Gijs Tol (The University of Melbourne) - Rhodora Veninarucci (University of Arkansas), Planning and investment in a peasant landscape: the site of Podere Marzuolo (Tuscany, Italy)

The site of Podere Marzuolo (Grosseto, Tuscany) highlights the precariousness of firm typological distinctions between villa and peasant economies in Roman Italy. Situated ca. 40 km away from the coast and from the nearest urban settlement of Roselle, Marzuolo finds itself in a fragmented Tuscan topography populated by sites associated with small-scale peasant activity. Marzuolo exhibits many features traditionally ascribed to villa economies. The site, which covers ca. 2 ha, was carefully planned and experienced a sudden, large-scale investment in construction in the early Augustan period, including a central building in opus quasi-reticulatum masonry, and a material assemblage testifying to supra-regional connections (e.g. amphorae, window glass). However, neither the layout of the site nor its material signature conform to the image of a traditional villa rustica. Instead, recent excavations by the Marzuolo Archaeological Project reveal a purpose-built multi-craft community, geared towards production and distribution. This paper uses the new evidence of the 2016 and 2017 excavations at Marzuolo to challenge and rethink the explanatory baggage that comes with divisions between peasant and villa economies: Could peasants innovate? Could landowners invest in sites other than villas and activities other than agriculture, on a more modest scale than the elite-run brick manufactories or mines? Where did risk taking reside in the Roman rural economy?

3. Werner Tietz (Universität zu Köln), Temporary workforce on the Roman villa

This paper will be dedicated to the exchange of workforce between villas and surrounding ‘subsistence’ farms in Roman Italy. The latter often suffered from a lack of arable land, but had a surplus of workers. Those farms could earn cash money to buy goods they were not able to produce themselves, or could be granted access to facilities which demanded investment capital they lacked, such as wine presses or storage close to markets. The farms had to concentrate on grain (namely wheat and barley) to be self-sufficient. The villa always specialized on one or two cash crops. By the end of summer at least a few workers could by hired out to harvest and process olives, grapes or flowers.

4. Candace Rice (University of Alberta), Keeping up with demand: new results on agricultural specialization from the Upper Sabina Tiberina Project.

This paper examines the productive strategies of the Sabine region of Italy, focusing principally on the excavations of the villa at Vacone in the context of several newly investigated villas and farms in the region. The Vacone villa is of particular interest to discussions of imperial-era productive strategies as it contains one of the largest olive oil pressing facilities in central Italy (minimum of three press beds); during the early imperial period, the villa specialized in the export-oriented production of olive oil. By the second century AD, however, specialized production had ceased and was replaced by diversified production of oil and wine. This paper places the Vacone villa within its local and regional context of surrounding Sabine farms and villas and the market town of Forum Novum, and explores the broader historical and economic context in which the productive changes took place. The diversification of production at Vacone surely came in response to changes in the wider economic landscape, seen elsewhere across central Italy. The widespread nature of these changes suggests that demand at Rome was key to shaping central Italy’s economic landscape. While such observations are scarcely new, investigations at the Vacone villa and surrounding sites allow for a detailed look at local responses to wider economic change, both as the owners invested in specialized infrastructure for olive oil and then later diversified to keep up with changing market demands.
5. Claudia Forin - Maria Stella Busana, Economy and production systems in the Roman Cisalpina: some data from the study of the farms and the villae

The paper aims to provide some insights to reflect about the role of farms and villae in the economic history of the Roman Cisalpina. The study started from the systematic census and the analysis of extraurban complexes, archaeologically investigated in Northern Italy, each one integrated into its environmental and settlement context. The complexes generally developed since the Augustan age and they are characterized by a long continuity of frequention, which lasted until the V-VI century CE. If the presence of production facilities is the obvious key indicator for understanding the economic role of a settlement, on the other hand the attestation of rich residential installations (i.e. a real investment of the owner) can return precious indications about the socio-economic level. Therefore, on the basis of archaeological data, we will try to understand whether and how small and medium farms and villae were part of the same production system, perhaps complementary, or if the advent of more structured economic realities (villae) somehow caused the end of the smaller complexes. Some important observations in this regard arise from the diachronic reading of the complexes, closely related to the historical events of the territory. These data support some considerations on the influence of imperial property on the market of the various northern regions, with possible effects on the success or disappearance of certain functional typology.

6. Coralini Antonella (University of Bologna), Villas and farms in the Po Valley, Arimino Placentiam

In the history of studies about rural Roman ec, the researches of household archaeology, from villas to farms, had a leading role. The works by G.A. Mansuelli on Cisalpina, and in particular those on regio VIII, in Aemilia, were pioneering, between 50's and 70's. A half century later, new archaeological evidence from excavations and from field surveys, richer and richer and also more and more elaborate, makes possible new research adresses and needs new readings.

The review of the regio VIII situation, Arimino Placentiam, based on new data from surveys and excavations, allows to point out the coexistence of different and complementary productive vocations, with lots of specializations in various environmental compartments, corresponding to specific settlement patterns.

The critical analysis of these patterns allows to draw again the cultural and economic phsionomy of a strategic region for Roman Italy.

7. Oriol Olesti (Universitat Autònoma de Barcelona), Villas, peasant agriculture and wine production in the Ager Barcinonensis

In the frame of the panel “Villas, peasant agriculture, and the Roman rural economy”, we will analyze the example of the Ager Barcinonensis (Hispania Tarraconensis), where we have identified the existence of different forms of wine production, from the industrial and large-scale production, to the peasant and low-range one. The starting point of our research is the fundi system, and the existence of several wealthy families (identified in the monumental inscriptions, but also in the epigraphy of the production or in the ancient place-names) that employed servi and liberti as instruments for the management of their lands. At the same time, the archaeological identification of several peasant exploitations shows the diversity of this local economy. Despite the importance of industrial wine production and long-distance commerce, the role of the peasant economy should be taken into account, showing the existence of a complex “Social landscape” in Barcino and his territory.

8. Juan Francisco Álvarez Tortosa (Universidad de Alicante), Production models in Roman commercial agriculture: Northwest of the provincia Hispania citerior between 2nd century BC and 2nd century AD

In scientific investigations dedicated to the study of commercial agricultural production of the Roman era, scholars distinguish between two major productive models: The ‘villa economy’ and the ‘peasant economy’. But the configuration of these two distinct blocks has been quite problematic. The ‘villa’ model was constructed from the confluence of too strict a reading of literary sources combined with
the overgeneralization of the interpretative proposals of slave villas originally described by the Italian Marxist school. By the other side, 'peasant economy' model was generated in deliberate contrast to the first model and, therefore, its characteristics are directly opposite to those that are indicated in the villa model. Discoveries made in recent decades within the field of archaeology show that reality is far more complex.

In the central area of the Catalan coast, a region belonging to provincia Hispania Citerior, it has been able to study the evolution of rural settlement between the 2nd century BC and the 2nd century AD. Here it has identified a wide range of production models, where both the 'villa economy' and the 'peasant economy' are only two of the more than 20 models proposed. The results obtained affect the need to update these classic models.

9. Josep Burch (1) · Pere Castanyer (2) · Josep Maria Nolla (1) · Joaquim Tremoleda (2), Interrelation of rural settlements in the framework of an integrated economic system in the extreme northeast of the province of Hispania Citerior Tarraconensis

(1) Universitat de Girona
(2) Museu d'Arqueologia da Catalunya-Empúries

During the Early Roman Empire, many rural settlements were situated in the extreme northeast of the province of Hispania Citerior Tarraconensis. Archeological research carried out in recent years has revealed considerable differences between these settlements, which has led to their classification. The parameters used in the classification were: environment, potential natural resources, communications, relation with urban areas, chronology, dimensions, construction characteristics and use of luxurious elements, number and type of spaces in the settlement, and the economic activity that was undertaken (agricultural, livestock or crafts). Through the application of these parameters, agricultural settlements have been classified into rural neighbourhoods (vici), suburban villas, coastal villas, dependent rural establishments, craft establishments and mansiones. Drawing up this classification was not an aim in itself: the end objective was to determine the system of occupation and exploitation of the territory. It was found that this was organised around the cities that existed in this region — mainly Emporiae and Gerunda. The objective was also to determine how the types of settlement had distinct functions, determined through their complex interrelation.

10. Antoni Martín i Oliveras, Víctor Revilla Calvo and José Remesal Rodríguez (Universitat de Barcelona), Quantifying laetanian roman wine production function (1st century BC-3rd century AD). A microeconomic approach to vineyard's yields and winemaking processing facilities

Viticulture has played an important role in the economy of the Mediterranean coast of Hispania Citerior Tarraconensis between the 1st century BC and the 3rd century AD. The vineyards, wineries and pottery workshops are usually found clustering in specific areas, such as the Laetanian region located in the northeast coast of the Iberian Peninsula. Their spatial and temporal distribution has been previously interpreted as a proof of the existence of intensive and specialized winemaking economy, associated with large-scale production & trading of wine in bulk quantities targeting predominantly to overseas markets.

Despite the significance of wine-growing activity in this territory and its more or less important role in the empire-wide economy, the processes involved in production, trade and consumption of Laetanian wine and its evolution over time, have not been quantifying using formal empirical economic models and further econometric methods.

Here we present a first approach to a microeconomic explanatory data analysis of this ancient wine production function, paying particular attention in vineyard's yields and winemaking processing facilities, taking the values from Roman writing sources, archaeological record, experimentation and ethnographic or current viticulture data.

The main goal of this paper is to explain the different processes and agents involved in this supply chain and evaluate "ab origine" the changing dynamics of Laetanian wine production system.
11. Lisa Lodwick (University of Reading), The organisation of cereal production in Britannia: corn-drying ovens as evidence for agricultural integration

This paper will investigate the role of villas and farmsteads in the agricultural economy of Britannia. Roman Britain was largely a rural society, where the economy was primarily based upon agriculture, alongside mining, metalworking, pottery and textiles. Understanding how the agricultural economy was organised is still an open question, and in the absence of written evidence, archaeological excavations are the primary dataset with which to investigate this. Due to widespread developer-funded excavation, a substantial corpus of c. 2500 excavated rural settlements are now available for consideration, collated in the recent Rural Settlement of Roman Britain project. It is now clear that farmsteads, rather than villas, were the major component of the rural settlement pattern, alongside villages and roadside settlements.

This paper focuses on one aspect of settlements, corn-drying ovens, as a proxy for establishing the location and scale of cereal processing. These ovens were used to prepare cereals for flour and/or malt production, both products considered to be destined for the market. Whilst located at a range of settlement types across Britannia, here a more detailed evaluation of the size, form and location of these substantial ovens will be undertaken. The capacity and function of ovens at sites in the Hampshire Downlands and the East Midlands will be evaluated to address whether villas and farmsteads were integrated or discrete components of the rural economy.

12. Veselka Katsarova and Hristo Popov (National Institute of Archaeology and Museum - Sofia), The role of agriculture for the formation and functioning of local settlement networks in the urban territory of Augusta Traiana (Province of Thrace) in 2nd-4th c. AD

The Roman city of Augusta Traiana (Stara Zagora) granted urban status under Emperor Trajan in the early 2nd c. AD. Together with the right of self-government it received also a large territory that encompassed much of the most fertile and suitable for agriculture lands of the former Thracian Kingdom. Their inclusion in the economic structure of the Roman Empire proceeded in parallel with the Romanization of the Thracian aristocratic elite. This process led to the relatively quick establishment of new economic models that took shape as various types of settlements.

Between 2008 and 2017, various archaeological investigations (excavations, field surveys, and large area geophysical surveys) were carried out successively in the southern parts of Sliven Region. Seven villages, three large villae rusticate, individual farms, and several tumular necropoleis were registered or partially excavated in the investigated micro-region. The combined analysis of the rich and diverse evidence provides the opportunity to distinguish specific settlement models in the southeastern parts of Augusta Traiana's territory in the 2nd-4th c. They emerged from the development of large-scale grain production. This main economic activity greatly influenced the development of the region and of the types of settlements in particular.

The accumulation of new data allows for elucidating important questions about the specifics of the settlements in the Roman Province of Thrace, beyond the major urban centers.

13. Olivera Ilic (Institute of Archaeology SASA), Roman rural settlements in the territory of Central Balkans

After the conquest of southeastern Pannonia and the Central Balkans in the process of Roman expansion to the east, in the newly-created provinces, besides autochthonous rural settlements, which continued to exist for some time, an organised urbanisation of the conquered area also took place following the establishment of Roman administration. According to investigations conducted so far, this process developed more intensively in the Pannonia region than it was the case in the barely accessible mountainous and hilly areas of the Central Balkans. The new organisation of the Roman state resulted in the establishment of new types of rural settlements, vici, which were similar in their type of dwellings to the pre-Roman settlements of the autochthonous populations. It has been concluded, on the basis of the topographic data of registered sites, that Roman settlements were established in the vicinity of main roads and at locations that made possible the exploitation of natural raw materials along with the employment of a labour force from the neighbouring native settlements. Before the agricultural estates
of the type villa rustica were established, such settlements, which to a great extent resulted from de-
ductions of veterans, were important production units which played a part in supplying the urban cen-
tres.

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

Organiser: Dominik Maschek (University of Birmingham) and Ulrike Wulf-Reidt (Deutsches Archäologisches Institut)

Wednesday | 23 May | 14:30-19:00 | HS XV

Panel abstract
Paradoxically, the Roman building industry is both one of the most intensely studied and most widely
ignored fields in Archaeology and Ancient History. Generations of archaeologists have devoted them-
selves to the excavation, recording, preservation and interpretation of Roman architecture. However, they traditionally focused on questions of architectural style, cultural significance and political symbol-
ism of Roman buildings. The question what drives a society to freeing mighty forces and resources for huge building projects and how such building achievements could change the perception of social groups was rarely discussed. However, over the last 20 years a specialized field of research has emerged which approaches the complex logistics of Roman architecture by means of quantitative analysis. It has been understood that only the hypothetical modeling of both labor force and building costs can lead to a valid estimate of a given building's importance in its respective historical context. Pre-industrial construction techniques and the management of building materials and human resources can be put into perspective with the help of 19th century building manuals. Based on the ob-
servation of building materials and toolmarks, the construction effort can be estimated. Correlating this estimate with the available space, the probable maximum of workers can be assigned to the construc-
tion process, thus also providing a framework for the organization of the building site and the most probable duration of the building project. The demand for resources and manpower can finally be translated into hypothetical building costs by considering Roman wages and prices. This sheds an en-
tirely new light on the planning, logistics and administration of building sites. Furthermore, it can also contribute to a better understanding of social organization and their changes. Taken together, all these aspects and analytical steps lead us to new and highly complex models of the building industry in the Roman Mediterranean. The panel aims to demonstrate the value of this methodology by drawing upon a wider range of relevant case studies which date from the Late Republican to the Imperial Period. By looking at the results of recent and ongoing projects, we will also discuss future challenges and per-
spectives for this kind of research within the wider context of studies on the Roman economy.

Paper abstracts
1. Daniel Diffendale (University of Michigan), Reificere aedes Fortunae et Matris: Temple building at Rome in the lead-up to the Late Republic
The venerable twin temples of Fortuna and Mater Matuta under Sant'Omobono in Rome's Forum Boar-
rium were destroyed and rebuilt in the late 3rd century BCE. This reconstruction has been identified as the product of a triumviral commission set up in the year following the devastating fire of 213 BCE (Livy 24.47.15–16; 25.7.5–6). The identification of the archaeological remains with the historical record is of great interest, as it offers a glimpse at a building project commissioned by the Senate and undertaken during the height of the war with Hannibal. The triumvirs employed at least four different varieties of tuff building stone, the properties of each variety being matched to its intended function in the struc-
ture. Quarry marks are attested on only one of these varieties, however. The remains at Sant’Omobono are sufficiently well preserved to allow calculation of the total volume of stone required, in addition to orders of magnitude for mudbrick, timber, tile, and fill. I will look at the extractive resources and labor force required for this reconstruction project, consider its political and emotional valences in the late 3rd century BCE, and contemplate the project’s legacy over the following two centuries.

2. Christopher Courault (Universidad de Córdoba), Construire une ville ex novo en Hispanie. Analyse quantitative du rempart et de l’urbanisme de Cordoue au IIème siècle av. J.-C.

Les traces de la fondation de Cordoue se résument à quelques structures fu, ainsi que des tessons de céramiques généralement descontextualisés ainsi l’investigation a souvent donné une vision sommaire –ne pouvant être autrement étant donné la réalité archéologique–, et une longue discussion sur la chronologie de la fondation de la ville.

Dans des travaux antérieurs nous avons eu l’occasion d’aborder des études quantitatives de l’enceinte républicaine –et son évolution jusqu’à la fin de l’antiquité– dans le but de proposer une réflexion sur son temps de construction et son impact économique ; offrant une meilleure connaissance sur le rempart, ainsi que sur l’exploitation du territoire et de la roche calcaire.

La nouveauté de ce travail est d’établir un cadre idéal sur la répartition des forces de travail en fonction du nombre de citoyens romains, dont pour les carrières; et d’appliquer une vision vitruvienne pour certaines problématiques. D’autre part, la construction de l’ensemble du système défensif passe par diverses étapes qui n’ont pas encore été quantifiées .

Aux nouveaux résultats sur le temps totale de construction du rempart républicain, il faudra rajouter d’autres analyses quantitatives à l’image du système d’évacuation des eaux en-dessous des enceintes. La conséquence de ces indications est que les forces de travail n’étaient pas dédiées uniquement aux remparts, sinon à d’autres projets urbanistiques qui se développaient en parallèle.

3. Pauline Ducret (Université de Paris 8), Quantifying the building industry: A confrontation between archaeological and textual sources

In order to quantify the activities of the building industry, archaeologists try to evaluate construction efforts in terms of costs, delay and manpower, mainly because of the lack of written sources on this matter. However, texts dealing with this subject do exist, and present both a practical and a theoretical point of view. Thus, the confrontation between archaeological and written data is essential in order to propose realistic estimations.

At first, I will collect, in the literary sources, texts that give information about costs, delay and manpower during the Roman republic. This would be a way to provide average figures which may be useful to delimit theoretical projections. I will then expose my own estimations about materials, manpower and delay for the construction of a late-republican villa in Sperlonga and confront our figures with some Cicero's texts about the construction of his own villas and domus. This may exhibit some material limitations that we cannot see on the archaeological data.

Finally, I would like to examine the Roman juristic theories about cost and delay in construction. What did the Romans do when they were confronted to unexpected costs or delays? What were the juristic procedures and guarantee for owners who wanted to make their constructions finished? And, finally, did the Roman jurists provide theoretical expectations about price and delay?

4. Dominik Maschek (University of Birmingham), Assessing the Economic Impact of Building Projects in the Roman World: The Case of Late Republican Italy

According to David Harvey, urbanization can be understood as a process which first and foremost is geared towards the constant absorption of excess capital. Based upon the analysis of both literary and archaeological source material, it is obvious that this was also the case in Late Republican Italy. The demographical, political and economical transformations of the 2nd and 1st came at an unprecedented pace and scale and put the traditional social system under enormous strains. However, the differences to modern (urban) capitalism were striking. In the towns of Late Republican Italy we do not find many upstart investors but first and foremost the members of local, landowning elites who were not only in-
interested in financial but also in social capital. Euergetism and conspicuous spending played a key role in their investments – and building projects were high up the list of prestigious donations. Traditional scholarship has focused more on the ideological and aesthetic qualities of such monuments and buildings. However, their wider significance for the economy of Late Republican Italy has never been analyzed at a larger geographical scale, going beyond the narrow focus on isolated buildings or specific building types. Therefore, the aim of this paper is to present the first results of a macro-study of the Late Republican building industry, based upon volumetric modelling and on an in-depth analysis of supply-chains and architectural logistics. The results call for a profound re-assessment of the impact of building projects on the Roman economy.

5. Dennis Beck (Deutsches Archäologisches Institut, TOPOI), Import and use of marmor Numidicum in the Late Republic and Early Imperial Period. Considering Rome and the Italian Regions

„M. Lepidus Q. Catuli in consulatu conlega primus omnium limina ex Numidico marmore in domo posuit magna reprensione“

The present paper focuses on a selection of some archaeological contexts from Lazio and Campania, which offer distinctive chronological markers for the export and import of marmor Numidicum in the late Roman Republic and the early Roman empire. First of all, the use of marble in architecture is of particular interest, second a discussion of the new aspects to the marble trade and networks during the period of 2.-1. centuries BC as well as new assumptions about the actors, administrative staff and main stakeholders considering the marmor Numidicum.

6. Javier Á. Domingo (Pontificia Università della Santa Croce) - Paolo Barresi (Università Kore di Enna) - Josep R. Domingo (Universitat Rovira i Virgili) - Patrizio Pensabene (Sapienza University of Rome), Una propuesta de método para la reconstrucción de los costes de los teatros: los casos de Madauros y Leptis Magna

Cada vez es más frecuente introducir en el estudio de la arquitectura romana el análisis de su coste económico. De hecho, en los últimos años se ha desarrollado una metodología que permite calcular de manera aproximada este valor, teniendo en cuenta la gran cantidad de variables que intervienen en todo proceso constructivo (volumen y coste del material utilizado, coste del transporte, de la mano de obra, tiempos de producción, fases constructivas, etc.).

La dificultad por valorar económicamente todas las variables ha impulsado la aplicación de esta metodología de cálculo a edificios de los que se conoce su coste real, generalmente gracias a la epigrafía. De este modo se ha buscado una verificación empírica de la validez del sistema de cálculo utilizado y, al mismo tiempo, mejorar nuestra comprensión del grado de implicación de cada una de las variables que deben tomarse en consideración en el coste final de un edificio.

Siguiendo esta línea de investigación queremos aplicar la metodología de cálculo a dos teatros norteafricanos, de uno de los cuales conocemos su coste de construcción y del otro el coste de la reforma del frente escénico. El análisis de estos edificios permite aplicar la metodología de cálculo contemporáneamente a un edificio realizado en piedra local (Madauros) y otro en el que fueron utilizados diferentes tipos de mármoles procedentes de diversas canteras (Leptis Magna).

7. Simone Mulattieri (Humboldt-Universität zu Berlin), Eterogeneità nelle forme di horrea laziali: dalla costa all´entroterra

Das antike Latium, welches sich in dem Gebiet zwischen dem Fluss Tiber, den Sabiner Bergen und der Stadt Sinuessa und dem Tyrrhenischen Meer erstreckte, eignet sich vortrefflich für eine Untersuchung der Distribution von Waren im Römischen Reich: In Bezug auf seine transportwirtschaftliche Position war es zum einen Endpunkt der Versorgung mit Waren und Lebensmitteln, da Städte und Siedlungen Endabnehmer der Produkte darstellten, zum anderen war das Gebiet auch eine Transitzone für angrenzende Gebiete, in welche Erzeugnisse überführt wurden. Über die Distribution von Waren können Rückschlüsse auf die antiken Wirtschaftsabläufe und der zugehörige Infrastruktur gezogen werden. Der Vortrag soll nun die Möglichkeiten der Identifizierung und Unterscheidung unterschiedlicher hor-

8. Ulrike Wulf-Rheidt (Deutsches Archäologisches Institut) - Evelyne Bukowiecki (Ecole française de Rome), Building with bricks. The social and economic impact of building material for extra-large projects in Rome

One of the building materials for the imperial residences on the Palatine Hill in Rome, the bricks, is used as a case study for the supply mechanisms for extra-large buildings projects. It can be shown how the process of standardization is closely related to an industrialization of the Roman building industry and the extremely well organized logistic of the construction site. The standardization in the production of brick derived also from the desire to control the production and supply of this building material from early imperial times onward. The choice of the building materials and its use in construction had also social and economic factors. It allowed an increase number of unskilled workers and a minimal demand for skilled workers. Generic calculations for the needed buildings materials can show the impact of the production, transportation and organization of mayor building projects in Rome.

Panel 3.17 Light in Context. Productions, solutions, consumptions and representations of the light and its devices for and in ancient spaces

Organiser: Maria Elisa Micheli (University of Urbino ‘Carlo Bo’)

Wednesday | 23 May | 09:00-13:30 | HS III

Panel abstract

Artificial lights have marked deeply the cultural, economic and technological system of ancient societies. Materials, tools, objects, fuels expressed different relationship between products and costumers as well as between public and private destinations in the ancient spaces. Therefore artificial lights are good indicators to filter and explain socio-cultural phenomena. The present panel discusses selected study-cases from Greek and Roman world and also compare them to modern lighting productions, in order to analyze the manufacturing process, functional and contextual uses, rituals and perceptive practices of lighting systems and devices.

Paper abstracts

1. Laura Ambrosini (Consiglio Nazionale delle Ricerche), Light in Antiquity: Etruria and Greece in Comparison

Light in ancient Etruria has certainly had great importance as evidenced by all the religious doctrines and practices concerning lightning, the light par excellence. This study focuses on Lighting tools in Etruria and the comparison with similar instruments in Greece. Knowledge of their structure is essential because this enables us to define their different functions and uses in these different cultures. Greeks did not use candlestick-holders, and objects that have been improperly identified as candelabra (i.e., as supports for illumination with candles) should more properly be classified as lamp/utensil stands. The Etruscans, on the other hand, preferred to use torchlight for illumination, and as a result, the candelabrum—an upright stand specifically designed to support candles made of resinous fibers that were saturated with flammable substances—was developed in order to avoid burns to the hands, prevent fires or problems with smoke, and collect ash or melting substances. But they also used utensil stands similar in shape and form to the Greek lamp holders, which were placed near the kylikeion at banquets. Kottaboi in Etruria were important utensils used in the context of banquets and symposia, while in Greece, kottaboi they were interchangeable with lamp/utensil stands. All in all, this analysis demon-
strates that there are both formal and functional differences between Greek and Etruscan lighting tools which can be traced to social and cultural differences.

2. Małgorzata Kajzer (Jagiellonian University in Kraków), Unity in diversity. The variety of oil lamps found in different areas of the city of Nea Paphos, Cyprus

Oil lamps – as a basic source of light during antiquity in Mediterranean – can provide different kinds of knowledge about people, culture and organization of space. As a pottery material they are indicator of exchange and even trade between different regions. The case study concerns Hellenistic and Roman lamps found in Nea Paphos, ancient capital of Cyprus. 112 analysed objects, chosen from the whole assemblage, were found in different parts of the city, including the agora, residential area and the theatre. They represent variety of types and fabrics distinguished during the macroscopic studies. The differences and similarities between the sites will be discussed to show the deviations among finds coming from places representing different functions inside one city centre. Moreover, the problem of local and imported objects will be taken into account to illustrate the potential role of oil lamps in distribution of goods. The presence of Athenian, Rhodian, Levantine, Knidian or Ephesian production defined among the lamps from Nea Paphos is a good evidence for the importance of these production centres throughout times. The considerations about diverse aspects will create the opportunity for a discussion about the significant meaning of oil lamps in the archaeological research.

3. Custode Silvio Fioriello (Università di Bari Aldo Moro), Oil for lamps. Apulian study-cases

The systematic collection – which is here for the first time – of the literary, epigraphic and archaeological sources relating to olive cultivation and olive oil production in Apulia in the Roman period, allows to reconstruct a well-structured and productive framework. Furthermore, the comparison with the solid data relevant to the entire regional compartment allows the hypothesis of a specialized olive oil chain also in the production of fuel oil. The synoptic analysis of the collected data draws an economic profile of integration between agricultural and artisan productions and then outlines a multifaceted landscape, far from the historiographical stereotypes that link Apulia to the Cicero's image of the region as a very unparalleled pars Italiae (CIC, Att. 8, 3, 2) and provide interesting prospects for the continuation of research also in the field of eco-sustainable valorisation and inclusive communication of the results achieved.

4. Manuela Broich (University of Cologne), Duration of burning and soot production of ancient lamp oils

The basic for illumination in the ancient world was oil, which was burned in different types of lamps. Most of the lamps were made of clay, but metal and glass lamps are also known. But what kind of oil has been used? Of course olive oil but are other oils also possible, for example if there is no possibility to get olive oil? How bright was the flame? Is there a difference between the oils while they are burning, for example in time? Which oil can be used as burning material? In different experiments have been three types of oil tested: olive oil, walnut oil and linseed oil (all known in the ancient world). The tests will show, if it is possible to burn this types of oil, how long they will burn and how much soot will be produced. Because of the idea that also glass vessels like cage cups were used as lamps the experiments were carried out in glassware. Therefore several cooling liquid could be tested in this case: water and a mixture of water and wine.

5. Laurent Chrzanovski (International Lychnological Association), Lighting design in Late Hellenistic and Roman period. Clay polylychnes lamps

Among the ancient artifacts related to lighting devices, clay polylychnes lamps offer relevant information not only about their relationship with the precious artifacts having similar shapes, but also about production-centers, and function-systems. The propose of the state of knowledge on these artifacts will create the opportunity for a discussion about the socio-anthropological ways of use and destinations.
6. Maria Elisa Micheli (Università di Urbino Carlo Bo), Lighting design in Late Hellenistic period. Marble chandeliers from Fianello Sabino

The case-study concerns few great marble chandeliers by the Roman villa in Fianello Sabino; they were sculptured in Delos in the second half of 2nd century B.C. They are discussed from a double point of view: marble-manufacture and function-system. Their virtual display offers also an interesting opportunity to prove intensity and perception of the lighting phenomenon in a closed space.

7. Giandomenico De Tommaso (Università di Firenze), Lighting design with transparent effects.

The glass lamps

In the field of lighting, glass is used both in public and private architecture, with non-transparent window slabs (predominantly for thermal space) and lamps. In the second case, lamps have been attested for a long time, both cups in suspension and alone. One hypothesis to be verified is the possibility that diatreta may have been used like lamps, placing inside a single wick.

8. Anna Santucci (Università di Urbino Carlo Bo), Painting lights. Light into a room, light on objects

Greek and Roman wall-paintings offer the more significant evidence on the perception of the lighting phenomenon in the space and on the objects. The paper aims to analyse some examples of such aspects in the classical world in order to observe how light and lighting were painted and used in constructing visual representations.

9. Anna Santucci (Università di Urbino Carlo Bo) - Paola Lassandro and Marina Zonno (CNR - Consiglio Nazionale delle Ricerche), Lighting a funerary interior. The Roman Tomb N83 at Cyrene in a 3D perspective

The lighting in a funerary space assumes different values and functions. Roman rock-cut Tomb N83 at Cyrene offer a controlled study-case for analyzing quantity and quality of the lighting performance in a 3D perspective. Starting from the archaeological and historical reconstruction of the context, the 3D model will simulate the interior lighting of the tomb using virtual prototypes of ancient lamps. The 3D models contribute also to develop interpretive virtual models application for valorizing and promoting the cultural heritage.

10. Massimo Zammerini (Università di Roma La Sapienza), Stone, marble and glass: lighting design in the Modern and Contemporary

Starting from the new sources of lighting, which have today introduced a new aesthetic in the lighting fixtures, the paper wants to introduce materials and shapes of ancient artifacts in the contemporary dimension of the architecture and the design; the purpose is to evaluate their possible use and their effects.

Panel 3.18 Strictly Economic? Ancient serial production and its premises

Organiser: Arne Reinhardt (Universität Heidelberg)

Thursday | 24 May | 09:00-11:00 | HS III

Panel abstract

Which factors cause and determine ancient serial production? As an early stage within today's mass production, serial production takes a central place in manufacturing and the industrialization of the modern era. In the modern era, the underlying factors for serial production are high demand and rationalization. But how does this concept translate for antiquity? What other factors must we take into account (may these be of economic, aesthetic, ideological, or other nature) that could have shaped and influenced ancient form(s) of serial production? Though there seems to be little doubt that the serial
production of artifacts played an important role in ancient cultures, research on this topic is still in its infancy considering how complex this phenomenon was. Likewise, only few attempts have been made to characterize and define the specific characteristics of ‘serial production’ in antiquity. The panel proposed here attempts to address the questions mentioned above by discussing coherent groups of ancient material under the premise of ‘serial production’, focusing on companion pieces and multiple sets of homogenous artifacts of corresponding origin (i.e. same authorship, place of origin (‘workshop’), date, size, material, technique, and/or style). In order to avoid confusing ancient forms of serial production with modern concepts, each paper should be based first and foremost on a close study of an ancient group of materials, which provides the foundation for further thoughts and critical discussion of the resulting significance for our understanding of ancient serial production and its relations to ancient economies. Interesting questions might be: Does ancient serial production necessarily imply the (re)production of large numbers and is it always connected with supraregional commerce? When is this the case, and why? How did traditional crafting techniques encourage new methods of serial production and how were they altered (standardized, improved upon, made ‘more economic’) by the high demand that only serial production could satisfy? How did production for local usage contexts (such as sanctuaries and cemeteries) or cultural technologies (such as architecture) form the basis for serial production, and in turn, influence regional trade? Suitable groups of materials for innovative research into these questions include Graeco-Roman sculpture and sculptural decoration, coroplastics, ceramics, and many more.

Paper abstracts

1. Simona Perna, A Case of Serial Production? Julio-Claudian “tureen” funerary urns in calcitic alabaster and other coloured stone

From the Augustan period vase-shaped urns carved from calcitic alabaster and other coloured stone came into use in wealthy Roman burials across the Western Empire. The “tureen” is the predominant “standardised” type as reflected by the current survival rate of over 63 examples. Stylistic analysis reveals the existence of a basic model with idiosyncratic features: the body occurring in three variants or subtypes (A, B, C); the loop handles carved in one piece with the body with a prevalence of leaf-shaped lower attachments; multiple elements carved separately and then added by means of a tennon/pin and then glued: a convex lid; a piriform-pointed finial and a flared foot. The metrological analysis also reveals a constant thickness of the body's walls and parts and the application of a system of proportions. The stylistic homogeneity of the contextually dateable examples suggest that the production peaked from the Julio-Claudian to the Flavian periods, whilst showing a fairly coherent workshop tradition particularly in Rome where all three subtypes are attested. However, limited variants within the type may represent the “signature” of a workshop/artisan working or customization. The making of the tureens involved skilled artisans, tools and techniques that differed from those of other stone containers. The limited number of extant examples and their recurring features, particularly the technical similarities, hints at a possible small-scale luxury serial production.

2. Manuel Flecker (Eberhard Karls Universität Tübingen), Die Werkstatt des M. Perennius und die Entwicklung von serieller Produktion reliefverzierter arretinischer Sigillata

Bedingt durch den Einfluss östlicher Sigillatawerkstätten beginnt man im 1. Jh. v. Chr. an verschiedenen Orten in Italien mit der Produktion von rot-engobiertem Tafelgeschirr zu experimentieren. Während sich das neue Verfahren generell rasch durchsetzt, so entwickelt sich mit Arezzo ab augusteischer Zeit ein herausragendes Produktionszentrum, dessen Produkte bald zum Synonym schlechthin für feines rotes Tafelgeschirr werden. Die Erzeugnisse der arretiner Werkstätten heben sich dabei durch ein eigenes Formenspektrum, durch ihre herausragende Qualität und zusätzlich durch die Herstellung reliefverzierter Trinkgefäße heraus. Innerhalb kürzester Zeit wird Terra Sigillata aus Arezzo nicht nur in alle Teile des Mittelmeeres exportiert, sondern von Arezzo aus werden große Filialbetrieb u.a. in Pisa und Lyon gegründet. Die Werkstatt des Perennius ist dabei möglicherweise nicht nur der allererste Betrieb,

3. Christoph Klose (Friedrich-Schiller-Universität Jena), Seriality and Restoration: The 'Restored Coins' of the Roman Empire

Due to their crafting technique, coins constitute a well-suited material group for studies of serial image production. Coinage's innate double nature consisting of types and die-identical series results in a two-fold form of serial image production – both forms are pivotal for discussing serial production of images in antiquity: on the one hand mass production by use of the same dies; on the other hand reproduction of the same images by use of different individually cut dies. While the former marks a simple procedure of mass duplication of identical images by means of the same prototype, the latter is an example for antiquity's manifold phenomena of prototype copy and transfer to new objects/media. Thus, questions of reproduction, seriality and copying can be broken down to the die engravers (signatores, sculpctores). Conclusions about the operational process of copying can be gained by close comparison of coins struck from different dies but showing the same image with minor variations.

The 'restored coins' of the Roman Empire compose an esp. appropriate group for studying modes of image seriality. In these series that copied obverse and reverse images of prior issues (up to 300 years old in the time of Trajan) similarities and variations can be detected not only within the issue but also in comparison between prototype and later reproduction and sometimes even in comparison to variations of different prototypes. They thus open up a new level of insight into image seriality.

4. Mariachiara Franceschini (Universität Zürich), Ikonographische Serien in der attischen Vasenmalerei: Technische Vereinfachung oder semantische Strategie?


5. Sabine Patzke and Elisabeth Günther (FU Berlin), Comparing Innovative Strategies: Serial Production of Etruscan ceramica sovraddipinta and the Paestan Asteas-Python-workshop

This paper discusses the evolution of serial production in Etruria and Paestum during the 4th and 3rd centuries B.C. The comparison of the use of applied color, standardized iconographic patterns, and shapes in both regions sheds light on different strategies of the painters to shape serial production techniques.

Etruscan ceramica sovraddipinta is defined by its technical properties – the clay-based orange or white paint was applied over the black glaze that covers the vases entirely. While the earlier vases resemble contemporary red-figured vases the later ones display a repetitiveness of their pictures that is usually
interpreted as the result of a standardization process. In contrast, the contemporaneous Asteas-
Python-workshop in Paestum is characterized by iconographic properties, i.e. the use of standardized
“stock figures” and a homogeneous design. However, the template-like figures, their recurring combina-
tions and the additional use of applied color ask for a comparative discussion of the strategies behind
the designs of the vases.
This paper will show how the assumed impoverishment of ceramica sovraddipinta vases and of stan-
dardized “stock figures” in Paestum might have been of economic advantage. Paradoxically, the serial
production of the ceramica sovraddipinta as well as the Asteas-Python-workshop allowed for a conve-
nient manufacturing of commissioned (non-serial) works.

Panel 3.19 The Role of Water in Production Processes in Antiquity

Organiser: Elena H. Sánchez López (Universidad de Granada)
Saturday | 26 May | 14:30-16:30 | HS VIII

Panel abstract

"Water is a precious natural resource (...). It has a wide range of applications in our daily life and it is a driver
for economic prosperity. Water can be used for energy production and it is necessary for the development of
industrial and agricultural activities" (Water JPI SRIA H2020).

Water has been highlighted as a precious natural resource and an essential element for live. Archaeo-
logical, historical and anthropological studies have analysed the water supply systems in different peri-
ods and regions. But, by contrast, very few has been said about the uses given to this water, apart from
baths or fountains display in Roman times.
However, we may draw attention to the fact that water is fundamental for the economic prosperity of
any society, as it is vital in the development of many economic activities, both now and in the past. The
objective of the panel about "The role of water in production processes in Antiquity" will be to analyse
the use of water in productive activities from Iron Age to Late Antiquity.

The purpose is to analyse the use of water in craft and production activities, and the archaeological evi-
dences related to the water management across the Mediterranean Region. Within those consuming
water activities might be highlighted for example different building activities, food production, pottery
making, metallurgy, mining or textile manufacture. In those productive activities, water was sometimes
one of the elements used in the making process, in others cases it was used for the cleansing of raw
material or facilities, but it could also be the water-power what was used.
In summary, water management studies can (an might) go further than just analyse the water supply
and distribution systems (wells, cisterns, and aqueducts, later on). It is essential that we ask (ourselves
or the archaeological record) which was the use given to the water. In this case, the panel will focus on
one of the less highlighted uses: those related to the production processes.

Paper abstracts

1. Elena H. Sánchez López (Universidad de Granada) - Juan Jesús Padilla Fernández (Universidad
Complutense de Madrid), Not only clay. The role of water throughout the pottery making
process

In most cases the studies about pottery workshops in Antiquity, only analyse two elements: one of the
activities in the production processes, the firing of the wares, thoroughly studying the kilns, and the re-
sults of the production processes, the pottery itself.
So, only in very few cases other structures or activities within a potter’s workshop and the pottery pro-
duction process are really taken into account. But three elements are essential in the pottery production process: apart from the clay, vegetable combustible and water were also essential. It is true that in many cases, those two other raw materials and their uses are difficult to identify in the archaeological record. But, especially in the case of the water supply or water management, the presence of water channels, vats or cisterns, is frequently noted, even if the structures remain un-described, as a result of a lack of interest toward them.

This paper will analyse the pottery production process, identifying water consuming activities, and studying their archaeological evidences. Furthermore it will propose a first approximation to the real water needs of a potter’s workshop in Antiquity.

2. Cecelia Feldman, Water in craft production and manufacturing in Roman Asia Minor

In contemporary western society, the concept of a “carbon footprint” is well-established. This idea acknowledges that there is a carbon cost underlying many of the products and processes that make up the fabric of western life and culture. Operating in the same vein is the concept of a “water footprint” which accounts for the water used in producing the power, food, and goods upon which society relies.

As in modern society, water was also a critical ingredient involved in many of the products and processes used in the ancient world. An investigation of this “water footprint” provides a critical perspective on the important role that water played in the productive economy. In this paper, I survey the types of evidence that point to the use of water in craft production and manufacturing processes in Greco-Roman Asia Minor (especially ceramic production and water-milling), and argue that this analysis forms the basis of a methodology for investigating the myriad ways that water was incorporated into the productive economy. In addition, a focus on the relationship between productive activities and the proliferation of aqueducts that accompanied the spread of Roman imperialism provides a means to explore the spatial dynamics and scale of economic activity in the Roman provinces.

3. Davide Gangale Risoleo (University of Pisa), Water for the villas: water distribution for production processes

The contemporary archaeological debate frequently discussed the presence of water in Roman villas, mainly focusing the alternative between decorative and functional aims. The past researches have deepened the decorative and functional value of water in a residential building, trying to study the water as a luxury element - highlighted with pools and fountains - or as an enhancing economic tool. However, the point is: how can we architecturally and structurally decline the functionality of water in a villa? Furthermore, is it possible to identify technological differentials in water supply in relation to the productive process? Sometimes, water supply was secured by connecting it to a central system, like a city aqueduct, supplying the villas along its way in the suburban area. However, this was not the only possible solution. In fact, there are also villas, securing their own water supply through private aqueducts, built, by public concession, for the exclusive use of a villa or a group of them. These particular cases seem to conceal a meaning that goes beyond the display of wealth and glamour. A new construction of an aqueduct was a huge expense, higher than connecting to an existing public network. Therefore, could we interpret this effort as the need of particular productive processes? Finally, is the huge expense for the construction of a private aqueduct justified by the gains that would have generated a certain agricultural or handicraft production?

4. Javier Martínez Jiménez (University of Cambridge), Water and building in Late Antiquity

The role of water in building projects is usually underestimated when simply not taken into account. Mortar, lime, bricks and plaster all need water in quantity, not only in their production but also when used in a building site. In this paper I want to address how water was used, and where was it obtained, in building projects in late Antiquity, underlining the role of continuing functional aqueducts in the enabling of large construction projects in the late antique West.
5. Beth Munro (University of London), Water use in metal and glass recycling workshops in late antiquity

In the 4th to 8th centuries CE, the recycling of glass and metal objects in makeshift production spaces was done widely throughout cities and villas of the former Roman Empire. These recycling workshops, as spaces specifically devoted to the reprocessing of disused metal and glass objects, were often located in abandoned rooms in public and private, often high status, Roman buildings. The workshops are detected archaeologically because of the remains of metal or glass working ovens, or by the presence of material waste, slag, or sometimes finished products left behind. Notably, these production spaces are often located near water sources – in or near fountains, latrines, public and private baths, or dining rooms with water features. In part, the workshops may have been located here because these spaces contained the highest quantities of iron, lead, bronze, and glass features to recycle. But it is often overlooked that these spaces may have still contained or had access to water, which would have been essential to these workshops, and the technology of reprocessing these materials. This paper will examine the location of water sources, channels, drains, and water storage vessels in relation to recycling workshops and look at whether the proximity of such features can help us understand in greater detail the production technology and workforce organisation for glass and metal recycling operations in late antiquity.

Panel 3.20 The Production of Portrait Statuary in Roman cities. An economic factor?

Organiser: Thoralf Schröder (University of Cologne)

Saturday | 26 May | 09:00-11:00 | HS II

Panel abstract

Portrait statues are one of the most important features of Roman visual culture. They were set up in nearly every province of the Imperium Romanum. So obviously there was a high demand for this kind of sculpture. However, aspects of production and economics rarely played a role in the archaeological discussion of these artefacts.

Based on specific stylistic characteristics scholarship has detected several production centers for different types of sculpture. The best known case certainly is that of the marble sarcophagi. With Rome, Athens and Dokimeion at least three large-scale and exporting production centers have been identified. Needless to say, many more workshops existed and some of them also exported their sarcophagi. For Athens there is evidence that even most of the objects were produced to be exported. Consequently, the “sarcophagi industry” must have played a significant role in the economic landscape of the city.

For other stone artefacts such considerations were rarely undertaken. For portrait statuary it was often tacitly assumed, that they were produced for the local requirements. This might be true for the majority of cases, but there is evidence that at least some prominent workshops produced for export also. Maybe even some sorts of brands existed. There is a small number of “schools” that signed their works more or less frequently in the Imperial period (e.g. Athens or Aphrodisias). Did they also do this in order to advertise their products, and thus for economic reasons? The examination of these aspects of local and export production could therefore provide even more enlightening insights into the role of sculpture as an economic factor. If we furthermore consider the full range of the sculptural production of workshops in a prominent city like Athens (e.g. ideal sculpture, grave and votive reliefs, portraits, sarcophagi etc.), the impact on the economy must have been much larger than acknowledged to date.

In this panel the focus is directed on portrait sculpture, because this was a consistently requested commodity within the Roman empire. Many different questions arise in this context, for example: Which role does the production of portrait statuary play within the urban industrial and economic land-
scape? How important is export business? Can we determine regional or chronological differences in dealing with these objects? After taking a fresh look at various aspects of this topic we can perhaps re-evaluate the economic role of portrait sculpture within the Roman city.

**Paper abstracts**

1. Eva Christof (Karl-Franzens-Universität Graz), *Financial expense and forms of financing as aspects in the life cycle of Roman portrait statues*

One of the highest honours attributed to a person in antiquity is the erection of a portrait statue in a public place in the middle of the city. This kind of statues, mostly manufactured in bronze or marble, usually life sized or slightly bigger, gets elevated by a base, which also bears the honorary inscription telling who the person is. In order to get special information about production costs and about different kinds of financing we should investigate these topics considering the whole lifecycle of a portrait statue. This includes the inspection of social and legal conditions as well as the framework of production. Since the statue prices mentioned in inscriptions in Northern Africa and Italy always mean the total costs, it is necessary to make an assessment of the individual costs, which lead to the total. The price of a portrait statue shall also be compared to other financial expenditures of the Roman elite, in order to get a sense of the related value.

2. Cruces Blazquez Cerrato (University of Salamanca) and Santiago Sánchez de la Parra Pérez, *Investments of Hispanoroman elites in metal statues: A first costs evaluation from the Epigraphy*

It appears that provincial cities, following in the footsteps of Rome, contained a large number of statues. They are crucial to understanding the history of Rome. This sculptural field has recently begun to be explored from new perspectives.

The local elite, thirsty for protagonism in political and administrative city institutions turned to the donation of infrastructure and ornamental elements as a tool of propaganda. Placed in public and private spaces, they had dedicatory inscriptions stating the incentive and cost.

Epigraphic documentation constitutes the starting point of this paper and its focus is the study of Hispanic inscriptions wherein the financial investment of gold and silver statues is referenced. The formulas ex argenti libris and ex argenti pondo are recurring and they allude to the weight in pounds of the silver contained in the statues followed by those epigraphs. Comparing the weight in pounds contained in the statues, and taking into account the fluctuating prices of the precious metal, we have drawn some interesting conclusions regarding the economic value of those donations in Hispania. We have found that there were stages in which the donation of statues was more prevalent than other acts of evergetism. The geographic distribution of the inscriptions suggests a strong relationship between those donations and urban and economic development.

3. Panagiotis Konstantinidis - Marios Mylonas - Stylianos Katakis (National and Kapodistrian University of Athens, Greece), *Economic and commercial aspects of portrait statuary from the city of Epidauros and the sanctuary of Apollo Maleatas and Asklepios*

The present paper aims to outline the preliminary conclusions concerning the commercial and economic aspects of portrait statuary in the city-state of Epidauros and its dependant sanctuary of Apollo Maleatas and Asklepios during the Hellenistic and Roman periods.

By taking into account both the epigraphical testimonies (esp. inscribed statue bases) and the extant sculptures from the region (including new finds), the paper attempts to explore the economic and commercial parameters of honorific statuary, such as the amount and type of public treasury expenses or the individual costs for the commission of sculptural monuments. The study will also examine the extent of imports of ready-made works from leading artistic centers and issues concerning: a) itinerant artists, b) the production of local workshops, c) the marble trade in the area, d) the second lives of statuary monuments.

The paper draws upon the ongoing research program regarding the sculptural production of the city of...
Epidauros and its renowned sanctuary of Apollo Maleatas and Asklepios, undertaken by the Department of History and Archaeology of the University of Athens.


Among the most interesting aspects of economy in the ancient world is the cost concerning the renovation of a public building, such as a temple. Renovation works were mostly connected to natural disasters, change of the adorned deity or the necessity for different cult practices. Among these frames, the temple of Kybele in Olympia should be examined. The initial architectural phase of the building is dated to the Classical Period, although its exact date is in doubt. The temple was renovated in the Imperial period, emphasizing on its decoration with portrait statues of the Julio-Claudian and Flavian dynasties. Aim of this paper is to examine the cost that this renovation required, concerning the statues that were made for the temple, as well as their astronomical orientation.

5. Alice Landskron (University of Graz), A Coin from Side and the Distribution of Portraits

The numerous sculptural finds from Side – statues and portraits - are of high quality. Scholars assume that sculptural workshops were established in the harbor town of Side. There is also epigraphic evidence for workshops that were located outside and near the city walls. Before the middle of the 3rd c. AD Side was twice neokoros. A coin of Caracalla features an enthroned Athena on the reverse, holding a bust of the emperor while there is a ship behind the goddess. So it is likely that the emperor Caracalla sent a bust by ship to the temple in Side. Using the example of the Antonine coin, the paper deals with epigraphic and written evidences on the subject and with questions concerning the distribution of imperial portraits:

- Can we take this image on the reverse as an example for the distribution of a prototype of the imperial portrait from the city of Rome?
- Where did the sculptors in Side come from?
- How was the production of imperial portraits organized in Side?
- Can we proof exports or/and imports of portraits and sculptures from and to Side?
- Does the picture on the reverse refer to a gift sent by the emperor on the occasion of the second neokoros?

Panel 3.21 Farmhouses in Macedonia from the 4th Century. B.C. until the Roman Era: Rural landscape and rural economy

Organiser: Evangelia Stefani and Polyxeni Adam-Veleni
(Archaeological Museum of Thessaloniki)
Wednesday | 23 May | 14:30-19:00 | HS V

Panel abstract

Excavations carried out in Macedonia during the last two decades have brought to light villas, farmhouses and stockbreeding installations dating from the 4th century B.C. to the Roman era. The image that we have now about the countryside of the large cities developed in Macedonia in the Classical era and the subsequent periods has diversified considerably compared to what we knew to date. The countryside of Northern Greece is full of farmsteads, whose inhabitants live and produce according to the economic requirements of the rapidly developing urban centers but also according to the possibilities offered by the microenvironment of each region. The farmhouses are sometimes along major roads on east-west axes, sometimes near big cities and in other cases in remote, rural regions, even in semi-mountainous areas. The economic activities were developed according to their natural landscape and the emphasis was given on crops, livestock, or the craft production and trade. Concerning the agricul-
tural production we can remark a wide variety of activities from the cultivation and storage of cereals and pulses to beekeeping, wine-making and other relevant activities. Livestock production has been found to be exercised both as a permanent parallel work of large farmhouses and also as an activity of herdsmen who moved their herds to higher grounds during summer, while spending winter in villages around the valley. Also we have found aquaculture facilities. In crafts there is evidence for stone and metal processing. Moreover, monetary treasures that have been found in several farmhouses of Macedonia indicate the anxiety of the residents in periods of political uncertainty and economic instability and their study provides useful information for both the coinage of the kingdom of Macedonia and monetary circulation. The panel aims to detect the development of the rural economy and the rural settlements in Macedonia from the Classical era to Roman times, in order to identify not only the different economic characteristics of each era but also the changes that took place within the wider social and political framework. Since the heyday of the Macedonian kingdom and its big urban centers until the transformations of the Roman period, the rural economy of the area is examined as a way of understanding the historical features of these periods.

**Paper abstracts**

1. Polyxeni Adam-Veleni (Archaeological Museum of Thessaloniki), The farmsteads economy on the road from Macedonia to Thrace

In the countryside of the East part of ancient Macedonia on the road from Macedonia to Thrace have been excavated more than seven farmsteads, whose inhabitants live and produce according to the economic requirements of the rapidly developing urban centers but also according to the possibilities offered by the microenvironment of each region. The farmhouses are sometimes along major roads on east-west axes, sometimes near big cities and in other cases in remote, rural regions, even in semi-mountainous areas. The economic activities were developed according to their natural landscape and the emphasis was given on crops, livestock, or the craft production and trade.

The agricultural production has a wide variety of activities from the cultivation and storage of cereals and pulses to beekeeping, wine-making and other relevant activities. Livestock production has been found to be exercised both as a permanent parallel work of large farmhouses and also as an activity of herdsmen who moved their herds to higher grounds during summer. The monetary treasures that have been found in those farmhouses on the road from Macedonia to Thrace indicate also the anxiety of the residents in periods of political uncertainty and economic instability.

2. Katerina Tzanavari (Archaeological Museum of Thessaloniki), Family oriented farms along via Egnatia. The case of ancient Lete

Ancient Lete is located at the western part of the Langadas basin in North Greece. The site of the city on the communications axis linking the Thermaic gulf with the eastern Macedonia, led to its development into one important city. Moreover, an important factor in the economic development of the city is the fact that via Egnatia passed through the region, and its proximity to Thessaloniki, an important commercial port.

After the defeat of the Macedonian army by the Romans in 168 BC, the Macedonian kingdom was dissolved. Roman legions appeared in the area of Lete almost immediately after the conversion of Macedonia into a Roman province, in 148 BC. The fact that the names of great Roman families are attested in inscriptions from Lete suggests that Roman citizens gradually settled here and engaged in finance, banking and trade. They played an active role in social life and held public office.

The surrounding area of ancient Lete was the scene of large-scale agricultural production that supplied the urban population. Historical and epigraphic evidence attest that large rural estates in the area were managed by members of the Roman elite. But what was the context of rural life and what methods were used to exploit the land? An attempt is made here to provide answers to these questions by presenting the results of the excavation of four rural installations discovered in the territory of Lete.
3. Evangelia Stefani (Archaeological Museum of Thessaloniki), Farmsteads in semi-mountainous areas: aspects of the rural economy in the 4th c. BC Macedonia

This paper presents the data from two recently excavated farmhouses of the 4th century BC. in semi-mountainous areas of the mount Vermion. The farmhouses, although located on the slopes of the mountain, are close enough to major cities of the Macedonian kingdom and also near smaller cities and villages. Through the study of the excavation data we can assume that the economic activity of both farms was focused on livestock farming, although each one responded to a different economic model: in the first (site Galanovrysi), besides the exploitation of the animals, we have data about organized storage and craft activities. These elements allow us to speak about permanent residence in the farm and organized exploitation of various natural resources.

On the other hand, the second site (Arapis), has characteristics of a non-permanent livestock establishment. Probably the stock keepers did not live in the farm permanently. They either settled there in the framework of their seasonal livestock activities, or lived in the nearby village.

A common point between the two farmsteads is the feeling of insecurity that seems to have occupied the inhabitants around the end of the 4th century. B.C. and which is reflected in the numismatic treasures found here.

The discussion about these two farmsteads gives the opportunity to approach aspects of the rural economy of Macedonia during the period of great flourish of the kingdom and at the same time a period with intense war activity.

4. Evi Margaritis (The Cyprus Institute), Rural economy in ancient Pieria: beyond self sufficiency

This paper explores the farming regimes and economic organization of three Hellenistic country houses and an urban building located within the harbor zone of a polis in the region of Macedonian Pieria. The focus of the study is the evidence of the plant remains that suggest that the sites employed different agricultural practices and had diverse economic functions. The large estate of Platania shows that a diversified regime was practiced; the site of Kompoloi, on the other hand, represents a specialized industry, focusing primarily on the cultivation of vines and the production of large quantities of wine, while Douvari, a small farmhouse, most likely belongs to the agricultural territory of the much larger estate of Kompoloi. The urban building at the site of Krania is identified as a kapeleio, offering food and drink to visitors to the harbor area, rather than being a domestic establishment. This paper examines the economy of the sites, how they were managed in the routines of everyday life, and addresses questions of seasonal or permanent occupation of houses located in the Greek chora.

5. Eleni Gerofoka (Ephorate of Antiquities of Pieria), Analysis of the agricultural management of a Hellenistic Pieria farmhouse based on archaeological evidence and archaeological relevance

In the present paper we examine the agricultural management of a Hellenistic farmhouse excavated at "Tria Platania", in Platamonas of Pieria, based on the raw material that came from its excavation, taking into account the current trends of research in the field of residential architecture and ancient economy. We consider productively the archaeological material in relation to the archaeobotanical and zooarchaeological remains, the inscriptions and ancient literary sources and we attempt to integrate all the facts into the historical, economic, political and social context of this era, in the particular region and generally in Macedonia. So we establish a compact body of historical conclusions regarding the individual crops in the farm, the storage of the produced product and its trading. Furthermore, we consider the farmhouse in relation to the seasonality, the livestock model with which it is associated and the human potential that uses it.

According to the conclusions of the study, the farmhouse at "Tria Platania" was a large, autonomous economic entity, which was based on mixed agricultural-livestock and craft activities. The farmhouse served as producer of agricultural surplus that was channelled through commerce mainly on a local scale. The isolation of the farmhouse is only geographically determined, since its economic activities were part of the economic, social and political life of the city.
6. Eleni Klinaki (Ephorate of Antiquities of Pieria), Currency from two farmsteads in the ancient Leivithra plains in Southern Pieria

A late-classical / early- hellenistic farmstead of at least 1,350m² was unearthed in ancient Leivithra plains ("Kompolo"). The wine – making complex was constructed on the site of a preexisting vineyard and was consisted of two inner-facing buildings, a farmhouse and a wine cellar (pitheon). It was established in the times of Philip II and ruined by the Gauls during their invasion of Macedonia (279 B.C). A number of 194 coins and two bronze coin hoards were found.

A small supplementary farmhouse was excavated nearby ("Douvari I"). It was most probably constructed in the times of Cassander and was firstly destroyed by the Gauls, but soon reconstructed to function until the 2nd century B.C. and the invasion of the Romans. A number of 17 coins and a bronze coin hoard came to light.

The political and economic conditions in the Macedonian kingdom in the times of Philip II and thereafter, determined the intensive agriculture of the countryside and the construction of big farm units for specialized farming. The coins, linked to the function of the farm units in Leivithra plains, are mostly represented by royal mint from the time of Amyntas III to Perseus. There are also some civic issues from Peloponnesse, Central Greece, Thessaly, Chalcidice and Eastern Macedonia. They mostly indicate the local coin circulation in late Classical – early Hellenistic Macedonian countryside, which seems not to be differentiated from that of the urban sites of the kingdom.

7. Ioanna Vassiliadou (Aristotle University of Thessaloniki), Pierian-Macedonian pitch. A brand name agricultural product of ancient Macedonia

Pitch residues found on pitched shreds mainly of wine vessels or on coated pieces of wood as well as freestanding remains of pitch pieces, revealed from various archaeological sites of ancient Macedonia, were identified as the pitch of Herodotus «...τῆς Πιερικῆς πίσσης...», the later Macedonian pitch of both literary and epigraphical sources.

The main objectives of this paper are, on the one hand, to present the pierian-macedonian pitch, a royal agricultural product, as a whole from classical to roman period and, on the other hand, to highlight issues such as its management, trade and distribution throughout the Mediterranean world according to literary, epigraphical and archeological evidence.

Matters of technical diversities of the procedure of pitch production in the Greco-Roman world will be pinpointed, based on both archaeological and literary evidence.

8. Kostas Ketanis (University of Thessaly), Roman control and management of the rural economy in Macedonia

The roman conquest of Macedonia (battle of Pydna, 168 BC) changed not only the system of administration but also rural economy of the region.

The study of the Roman history of Macedonia and especially of its countryside, is quite limited. Although, in recent years, archaeological excavations have revealed many buildings related to rural life and rural production in ancient Macedonia (for example farmhouses), very little is known about the roman agriculture policy in this area.

The information we have from the ancient texts (literary sources and inscriptions) about the primary production sector in ancient Macedonia are few.

In this study there will be an attempt to explore the ways in which the Romans influenced, defined and controlled agricultural production in Macedonia.

Land ownership (land categories, landowners and cultivators, purchase, sale and land taxes), land cultivation by Romans and natives (cultivated species, prices, taxation and trade), territorial disputes, the Roman cadastre, infrastructure projects to improve agricultural production etc., as well as the ways in which the Roman administration managed them all, are some of the issues to be studied.
9. Angeliki Koukouvou (Archaeological Museum of Thessaloniki), Villa rustica at the Beroia countryside (Macedonia, Greece)

In 1999, during the construction works of the new Egnatia Highway in Emathia Prefecture (Macedonia, Greece) the Ephorate of Antiquities unearthed part of a Roman villa rustica between the Messi and Kydonochori villages. The villa was founded in the early Roman period (1st c. BC) and was used as late as the 4th c. AD. It was situated in the plain below the eastern foothills of Mount Vermion where the city of Beroia was located. The latter flourished in Hellenistic times and experienced through Roman period a remarkable development in all aspects. The architectural remains, storage rooms with pithoi, cisterns relating to wine production etc., were partly excavated, as the building continues under the modern National Road. Nevertheless, it is clear that they belong to a building complex in an agricultural property. An interesting feature of this farmhouse consists the existence of a cistern constructed to be used as a fish tank (a vivarium).

The excavated farmhouse, unearthed in the proximity of one of the most important cities of the Macedonia Province, gives the opportunity to a better understanding of the rural strategies implied during imperial period in the Macedonian countryside and the relations of the latter with its urban centres considering production, distribution and consumption of supplies.

Panel 3.22 Local Styles or Common Pattern Books in Roman Wall Painting and Mosaics

Organiser: Renate Thomas (Römisch-Germanisches Museum, Köln)

Saturday | 26 May | 09:00-13:30 | HS VIII

Panel abstract

This panel will concern the question whether it is possible to identify local workshops in Italy and the roman provinces or whether the organization of a workshop with a changing constellation of painters and the common use of pattern books does imply an almost universal stylistic development throughout the whole Roman Empire. Do the economic resources of the workshops have an influence on the quality of the painting and for example the choice of special expensive colors? Up to which degree can changing dependences be observed between wall painting and mosaics concerning forms and patterns.

Paper abstracts

1. Renate Thomas (Römisch-Germanisches Museum), Musterbücher in der römischen Wandmalerei

Es ist zu beobachten, dass in der römischen Wandmalerei an weit voneinander entfernten Orten ähnliche Motive und Muster erscheinen. Dieses Phänomen lässt sich nur mit Musterbüchern erklären, die den Werkstätten zur Verfügung standen. In dem Vortrag soll es darum gehen zu zeigen, woher die Vorgaben in den Musterbüchern kommen, woraus sie sich zusammensetzen und wie sie von den Werkstätten oder einzelnen Malern individuell mit einander kombiniert, ergänzt, gespiegelt oder verändert werden können.

2. Irene Bragantini (Università degli Studi di Napoli "L'Orientale"), Pittori e pitture tra l'Italia e le province occidentali

Affrontare il tema dell'economia della produzione della pittura romana rimane un compito non facile e siamo ancora ben lontani dall'aver raggiunto un consenso su questo argomento, mentre l'evidenza archeologica continua ad essere sollecitata per fornire informazioni sul sistema dei rivestimenti funzionali e decorativi, risultanti dalla collaborazione tra artigiani diversi. Entrando in un ambiente decorato, l'os-
servatore non percepiva alcuna interruzione tra le superfici di pareti, pavimento e soffitto: dal momento che i diversi gruppi di artigiani entravano sul cantiere in momenti diversi e con materiali diversi, come dobbiamo considerare questa circostanza? Si tratta di un caso? O di un intento perseguito, che necessitava pertanto di un coordinamento tra i diversi gruppi di artigiani? Riscontriamo la stessa situazione nelle province, in particolare in quelle occidentali, che attestano una diffusa adesione al modello italico, come confermato e ulteriormente evidenziato da rinvenimenti recenti. Come si produce questa uniformità? Si è ipotizzata l'esistenza di pittori itineranti, ai quali sarebbe dovuta questa diffusione. Considerando il modo in cui la pittura è prodotta e la necessità della collaborazione tra diverse manualità, possiamo considerare questa una ipotesi valida? Come avrebbe potuto funzionare questo sistema? E come dobbiamo considerare questa evidenza, confrontandola con contesti delle stesse zone che presentano realtà diverse?

3. Clelia Sbrolli and Monica Salvadori (University of Padova), Nilotic landscapes and pygmies in the pictorial production of a "Fourth-Style" workshop in Pompeii

The paper aims to analyze the pictorial production of a high-profile pompeian workshop of “Fourth Style”.

In particular, the depictions of nilotic landscapes from different urban contexts (Sarno Baths, House of Pygmies) will be studied in order to recognize the work of the same painters’ workshop. The research will be conducted through the detailed analysis of the different aspects of the composition: construction; narrative groups; figurative elements; use of color and pictorial technique.

4. Eric Moormann (Radboud Universiteit) - Domenico Esposito (Freie Universität Berlin), Roman Wall Painting Under the Flavians: Continuation or New Developments?

Since August Mau’s distinction of the four Pompeian Styles, the last of them has caused a lot of discussion as to its genesis, development, and end, whereas the first, second and third styles seem to be rather well defined and clearly recognisable. Nowadays most scholars see a rather lengthy era of the Fourth Style, that is the second half of the first century, maybe even continuing until the time of Hadrian. Within this long period – and already in the Vesuvian towns only – distinction has been made between Claudio-Neronian and Flavian paintings, although the chronology is not easy. Such distinctions have often been based on ill-defined stylistic criteria, since the hard chronological data were long time neglected. Having a greater insight into some chronologically well-defined cases, we may cast a closer look onto the material and try to get a better outcome.

In these two papers the speakers want to reconsider data and opinions concerning the material in central Italy, the heartland of the development of fashions in Roman mural painting, and try to answer the question put in the title.

5. Coralini Antonella (University of Bologna), Local styles in Roman Apulia

As demonstrated by the last International Colloque of the Association for the Ancient Wall Painting (Lausanne, 2016), a lot of work remains to be done for a deeper knowledge of ancient painting, region by region.

Nowadays, beyond the Vesuvian sites, there is a lack of systematic researches about the material evidence in Roman Italy and consequently it is very difficult to verify the presence of local styles. A very interesting case-study is the territorial and cultural areas of the actual Puglia (Daunia, Tarentino and Messapia), where the styles from the Central Italy seem to have been transposed and reworked into forms often original.

6. Stella Falzone (Centro Studi Pittura Romana Ostiense) - Paolo Tomassini (Université catholique de Louvain) - Martina Marano (Centro Studi Pittura Romana Ostiense), Decorating the Harbour of Rome: Dynamics of Production and Craftsmanship in Ostian Wall Paintings

The painted decorations of Ostian insulae are known by all for their excellent preservation state and for the importance they represent as one of the only testimonies of Ancient Wall Painting from the 2nd to the 5th c. AD. However, it is surprising to see they have never been studied through a technical point of view, using them as a medium to understand the production dynamics of the workshops. The Hadrianic
complex of the Case a Giardino constitutes an excellent case of studies, where we can follow the practice of a single atelier, working together with the builders of the building and replicating the same models in a very short span of time. Recent studies have shown a very different situation for previous periods, in the Republican and Alto-imperial times, where local workshops of very high level operated in various points of the city, painting decorations worthy of the richest domus in Rome. Between the 1st and the 2nd c. AD, the status itself of wall painting becomes different, and it is well reflected in Ostia, where we see a radical change in the technique and in the quality of the decorations. This paper will try to understand the reasons of that change and to propose a first synthesis of the Research laid by the Centro Studi Pittura Romana Ostiense in the last years, in order to reconstruct the working practices of Ostian painters through time.

7. Barbara Tober (Universität Salzburg), Ephesos – Palmyra - Noricum


8. Katharina Meinecke, Pattern Books or Textiles as a Means of Transfer? The Example of the Grid Pattern

An extremely popular pattern across the Roman and Byzantine world was a grid made up of lozenges, which could enclose different iconographical motifs, e.g. small human or animal figures, birds, plants, vessels, or more abstract ornaments such as rosettes and spades. It is attested in any kind of 2-dimensional interior decoration, in wall paintings, stucco, and mosaics, examples ranging from early imperial wall paintings, as in the Villa Varano in Stabiae, to Late Antique church mosaics in the Near East (6th cent.). The same pattern is even found on 3-dimensional objects such as the Byzantine silver bucket from the Vrap treasure (7th cent.).

One possible explanation, especially for the occurrence in different 2-dimensional media, may be that painters, who made the designs, were shared among workshops. The wide geographical and chronological persistence of the pattern as well as its occurrence on 3-dimensional objects may rather point to the use of pattern books. The grid pattern is also frequent on textiles though. Especially on some of the late church mosaics and on the Vrap bucket, the bold and simple motifs filling the lozenges resemble the textile patterns. Could, particularly in Late Antiquity, the textiles, which were easy to transport and widely desired as an elite marker, have replaced pattern books as a means of transfer?

Exemplified by the grid pattern, this paper seeks to explore the possibilities of pattern books and textiles as modes of transfer for iconographies.

9. Erhan Aydoğdu Rhan and Ali Kazım Öz (Dokuz Eylül University), Geometrical Analysis of the Triple Leaf Pattern in Metropolis

In this paper, the triple leaf pattern located in the floor mosaics of the Reception Hall in Metropolis ancient city has been analyzed geometrically. It has been determined that the triple leaf pattern considered as a floral pattern had been derived from the solution of a geometry problem. In addition, by comparing the abstract state and the actual state of the pattern, the effect of practical necessities arising from the material and workmanship on the pattern has been evaluated. This standart drawing obtained geometrically reveals stylistic development of the pattern, from the regular leaf pattern to the
twisted leaf figure. It has been thought that geometry studies on mosaics could contribute to the stud-
ies about identification of the local workshops in Roman period and to the conservation practices.

10. Simone Dilaria, Cristina Boschett, Claudio Mazzoli and Monica Salvadori (University of Pado-
va), Making Roman mosaics in Aquileia (I BC – IV AD): technology, style and workshop practices.
Two case studies from Domus delle Bestie ferite

The aim of this research is the analysis of mosaic materials and the identification of the practice of
making in Aquileia, discussing two emblematic case studies from Domus delle Bestie Ferite, built in the
late Republica and rebuilt and redecorated until the Late antiquity.

We analyzed in detail two representative mosaics dated to the middle-late 1st century BC and to the
4th century AD, respectively. We will display the technical changes involved in their production. Our
methodology integrates the visual examination to the archaeometric analysis (OM, XRPD, SEM) of mor-
tars and tesserae, in order to understand the constructive process of mosaics in all their phases: from
the setting of the foundations to the laying of the surface.
The first case study is a fine example of geometric mosaic, with figural elements. In its production, we
recognized high quality standards. The tesserae include mainly local limestones, with some marbles
and few glasses in the figural panels, certainly the most prestigious parts.
The other case study is the so called mosaic delle Bestie ferite, from the subject represented. This mo-
saic is characterized by a certain degree of inaccuracy in the setting of mortars and tesserae, despite
marble, glass and gold-leaf tesserae were used extensively.
The analysis of the two mosaics allowed us to discuss issues related to the social organization of deco-
rator teams in Aquileia and to evaluate the concept of quality throughout five centuries of mosaic pro-
duction.

Panel 3.23 Unfinished Details in Ancient Architecture. Consequences of
financial shortages, organizational constraints or aesthetic ignorance?

Organiser: Natalia Toma (Deutsches Archäologisches Institut) and
Frank Rumscheid (University of Bonn)

Wednesday | 23 May | 09:00-13:30 | HS XV

Panel abstract

Almost every Greek or Roman building, whose above-ground 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 Lau-
ter’s article ‘Künstliche Unfertigkeit. Hellenistische Bossensäulen’ (1983) and Thanassis E. Kalpaxis’ mo-
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 pu-
blcations 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 ‘sys-
tem errors’ in all areas of ancient architectural construction. Scholars of archaeology, architecture, epi-
graphy, economic history, and history of law are invited to present overall approaches or to discuss
case studies answering the following questions:

• Which originally unfinished architectural details were regarded as flaws and which were accept-
ed as new architectural forms? When and how changed the ancient definition and perception of
‘unfinished’?
• 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 keep by leaving details incomplete?
• Did the specific organization of the construction site and the efficient professional specialisation of the craftsmanship favoure the phenomenon of unfinished details?
• Are there any examples from literature and inscriptions or visible at the material giving evidence for not accepted and afterwards removed incompletenesses?
• To what extent influenced the unfinished architectural details the material and aesthetic value of a building?

Paper abstracts

1. Matthias Grawehr (University of Basel), Heben, Stemmen, Schauen. Funktionen von Buckelbossen in der antiken Architektur

The bosses on the backwall of the propylaia to the Athenian Akropolis have long since become an iconic example of the aesthetics of unfinished architecture. In general, there has been a feeling of unease about the exact purpose of such knob-like protrusions: For lifting, levering or the decorative effect? In this paper, the forms and functions of knob-like bosses will be traced from the early beginnings in the late Bronze Age down to Late Antiquity. It will become clear that there is no single explanation that fits all the evidence. The original purpose as notches for lifting and levering is hardly to be doubted. But, in addition there are specific cases, in which bosses were used to record or to identify the contractor who provided the stone. Bosses could soon also become signifiers for certain structural functions of the stones that carried them. In such contexts they could be transformed into decorative features by manipulating the basic shape or by arranging them to form decorative patterns. Finally, the explanations offered for the various reasons for the existence of bosses can be taken as a starting point to consider 'unfinished' architecture in a more comprehensive way.

2. Therese Paulson (Stockholm University), Polygonal columns: unfinished construction or inexpensive fashion?

In Pergamene architecture a 20-sided polygonal or faceted column shaft is commonly used both in finished and unfinished columns. We have fully faceted column shafts both with and without surface treatment, unfinished faceted column shafts with fluting on the necking of the capital and the lowest part of the column, as well as unfinished round column shafts with facets on the necking of the capitals where also the lowest part of the column is faceted. In other geographical areas these combinations do not occur in one same town, there are unfinished columns of a polygonal shape or there are finished 20-sided polygonal columns. 20-sided polygonal columns are generally used together with Doric capitals, and this is confirmed by Vitruvius. In Pergamene architecture these columns were combined with several different shapes of capitals. Pergamon is likewise the only city were 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. In the case of Pergamon, were the columns left unfinished due to lack of money, or did the unfinished construction turn into a new inexpensive fashion?
3. Reinhard Heinz, Das vollendet unvollendete Mausoleum von Belevi


4. Georg Plattner (Kunsthistorisches Museum Wien), Intentionelle Unfertigkeit in der römisch-kaiserzeitlichen Architektur in Ephesos und Kleinasien

In der Diskussion um Unfertigkeiten antiker Architekturen werden zunehmend Aspekte intentionell nicht ausgeführter Arbeitsschritte herausgearbeitet, die als Zeit-, Geld- oder Aufwandsersparnis bewertet werden können. Unfertige Bauteile wurden in Didyma gar als Schaustücke zum Beleg handwerklicher Kunstfertigkeit interpretiert.


Dreifelsendens Gebäude mit auch markant sichtbaren Unfertigkeiten teils Jahrhunderte lang benützt worden, 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.

5. Fulvia Bianchi - Matthias Bruno (École française de Rome), Il Complesso Severiano di Leptis Magna: il cantiere e la decorazione architettonica tra finito e non finito

Con l'avvento dei Severi la stagione della marmorizzazione a Leptis Magna raggiunge l'apice. La realizzazione del Complesso Severiano incide profondamente nell'assetto urbanistico della città. Straordinaria è la quantità dei materiali impiegati, il calcare delle cave di Gadatza, per le strutture ed elementi decorativi, e marmi bianchi e colorati per l'ornato architettonico e fusti di colonna.

Le dimensioni Urbane del complesso e il suo buono stato di conservazione, come il grande numero di elementi architettonici offrono l'opportunità di comprendere le modalità progettuali del cantiere imperiale e quelle di produzione degli elementi architettonici. L'analisi sistematica di questi ultimi ha evidenziato come limitata sia stata la scelta delle qualità marmoree impiegate, cipollino e granito di Assuan per i fusti di colonna, proconnesio e pentelico per gli altri elementi della decorazione architettonica. Nel primo caso i manufatti, importati grezzi, sono rifiniti in situ, nel secondo caso, i capitelli e le basi in marmo attico sono stati importati già rifiniti, pronti per essere messi in opera, gli elementi architettonici in marmo asiatico, invece, arrivano sbozzati dal Proconneso e sono lavorati sul posto da maestranze specializzate. Inoltre, gli elementi delle trabeazioni e le basi di colonna in proconnesio, pur presentando
differenti gradi di rifinitura, vengono comunque messi in opera secondo modalità e criteri che non inficiano l’unità e il valore estetici del monumento.

6. Natalia Toma (Deutsches Archäologisches Institut), Effizienzstrategien kaiserzeitlicher Marmor-Bauunternehmer. Der Fall des Stadion-Osttor in Milet


Als Beispiel zur Rekonstruktion des Bauprozesses eines mit importiertem Material errichteten Bauwerks dient das Osttor des milesischen Stadions. Seine Bauteile sind großenteils erhalten, was eine zuverlässige Rekonstruktion der verwendeten Mengen an Baumaterial sowie Beobachtungen zum Fertigungsgrad einzelner Bauteilserien erlaubt. Anhand der Kalkulationstabellen, die Pegoretti 1863 entwickelt hat, lässt sich der Zeitaufwand für die Herstellung jedes Bauteils und für jeden Arbeitsschritt bestimmen, wobei zwei Szenarien durchgespielt werden: erstens der Import von rohem Baumaterial, das vor Ort zu Bauteilen behauen wurde, und zweitens der Import von Halbfabrikaten, die auf der Baustelle nur fertiggestellt und versetzt worden sind.

7. Ursula Quatember (Karl-Franzens-Universität Graz), Honoring one’s Pledge? Benefactors and their Building Donations in Roman Asia Minor

My paper will focus on the specific issue of benefactors in Roman Asia Minor and the buildings they commissioned. Expectations and ambitions to erect spectacular monuments were high, especially during the Roman Imperial period. At the same time potential donors might 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 to laws concerning these official pledges. At the same time, benefactors wanted to make sure they were absolved from their legal obligations once they turned over their building to the city.

I would like to use both written sources and monuments in order to show how this complex process worked, and, where it sometimes might have failed.

Panel 3.24 Quantifying Ancient Building Economy

Organiser: Cathalin Recko and Michael Heinzelmann
(University of Cologne)

Thursday | 24 May | 09:00-13:30 | HS I

Panel abstract

In recent years, the study of ancient construction has focused more and more on setting the different aspects of building into an economic framework. Not only construction processes and the organization of building sites are now examined in more detail, but also the quantification of building materials, labour-time and number of employed workmen (skilled and unskilled) are receiving increasing attention due to their potential to shed light on the scale of a building project and its impact on the overall economy. The goal of this panel is to bring together different approaches to the study of building economy, ideally from a wide range of chronological contexts.
Paper abstracts

1. Simon Barker (Norwegian Institute in Rome) - Ben Russell (University of Edinburgh), Historical sources, labour figures and ancient stone working costs

There can be little doubt that huge amounts of time and labour were needed for architectural stone-work in ancient building projects – but what can we say about the cost? Occasionally costs are preserved, but this is rare, making any comparison difficult. One response to this problem, of course, is to think of cost not as a monetary figure but in terms of labour input expressed in man-hours. The barrier, however, is the lack of recorded labour figures for construction in the Roman world.

To-date, research on the economics of ancient building has made use of 19th-c. building manuals. In a 2009 paper, delivered in Paris, the present authors sought to check the validity of figures for ancient Roman stone-working calculated from 19th-c. building manuals. Through the use of pre-industrial documentary evidence and testimonies from modern stone masons, we reaffirmed the utility of such analyses of the economic implications of Roman stone-working.

This paper will provide further insight into the economics of stone-working practices during the Roman period through the further use of 19th-c. manuals. It will demonstrate their potential application to look at the ‘cost’ and economic implications of different types of architectural stonework. This will be accomplished by examining the labour differentials of various types of stonework from walling to detailed carving, in order to establish ratios of cost and therefore the economic repercussions of different architectural stone.

2. Monika Trümper (FU Berlin), Quantifying Remodeling Processes: The Republican and Stabian Baths in Pompeii

The Republican Baths and the Stabian Baths in Pompeii were built in the 2nd half of the 2nd c BC and both remodeled several times before the eruption of Vesuvius in AD 79. While the Stabian Baths were continuously used as publicly owned and operated baths, the Republican Baths were replaced by private residential structures in the early Imperial period. The aim of this paper is to focus on the most significant of these remodeling processes and to analyze and quantify the logistics, time, and work force that they may have entailed. Identification and assessment of major changes in these buildings is based on fieldwork carried out between 2015 and 2018 (project EXC Topoi C-6-8). Hence, the Stabian Baths saw a major expansion and modernization of technology after AD 62, whereas the most extensive remodeling of the Republican Baths was the transformation into a domestic garden peristyle around 30-20 BC. With the help of 3D models it will be demonstrated which parts of the buildings had to be destroyed, how destruction debris could have been managed (reused or removed), which parts were newly built or rebuilt, and which efforts, material, and means this did require. Visual and numeric modeling will allow for assessing the scale of the remodeling projects, and for identifying possible differences between private and public construction enterprises.

3. Cathalin Recko (Universität zu Köln), The construction of Pompeii's sacred buildings and their role within the local building industry

The concept of estimating labour and material requirements for Ancient construction and their important role in economics are well established by now. However, the detailed study of multiple buildings as opposed to individual ones, opens an even wider field of possible research questions. The comparison of quantified material and labour for different buildings from the same city allows a more distinguished evaluation of each building's significance and economic standing within the built environment of the city.

In this paper, the sacred buildings of Pompeii serve as a case study to show how buildings with the same function compare with each other regarding the choice of materials, their specific use, and the labour they required. Furthermore, the buildings and structures will be embedded in the local construction industry and its traditions.
4. Silke Müth (The National Museum of Denmark) - Jean-Claude Bessac (CNRS), Economical challenges of building a Geländemauer in the middle of the 4th c. BC: The city wall of Messene as an example

The city wall of Messene, a ‘Gelaendemauer’ of 9 km length, belonged to the strongest of its kind in the 4th c. BC and now represents one of the best preserved Greek fortifications. It protected not only the large new capital of the Messenians, but also a vast space of arable land. Moreover, Messene's enceinte included highly representative aspects which turned it into a monumental symbol of the city's new freedom and independence. All these superlatives raise, however, questions about the necessary means (material, workforce, time and funds) to achieve such a huge monument and about the economical challenges this implicated for its builders – questions that have been addressed by the authors while investigating this city wall in a four years’ field project.

The proposed contribution will analyse the economical background of different choices the builders made concerning building materials, quarries, ways of transport, construction techniques and masonry forms, and it will investigate the workforce, time, amount of material and funds used for the erection of towers and curtains, by using results of experimental archaeology amongst others. In this way it will become clear on the one hand that the shape of Messene's fortification is much more influenced by economical decisions than hitherto suspected, which is also valid for many other city walls, and on the other hand the economic challenges a city wall in general represented for its community will be appraised.

5. Seth Bernard (University of Toronto), The Energetics of Polygonal Masonry: Building the Colonial Walls of Cosa

This paper presents the results of a project to study and model the building techniques and labor costs of the walls of Cosa, the Latin colony founded in 272 BCE. Not only is this the first such analysis of Italian polygonal masonry, but an understanding of the labor costs of Cosa's walls has the potential to inform several historical debates. After much revisionist work on Cosan archaeology, the walls remain one of the few major monuments dated to the colony's earliest years. Viewed in socioeconomic terms, the walls' building process forms singularly direct evidence of the early colonist's economic capacities. Furthermore, the 1.5 km circuit is perhaps the best-preserved example of Italian polygonal masonry outside Latium. Otherwise rare in Etruria, most other polygonal walls (Orbetello, Populonia, Pyrgi, Saturnia) postdate and even relate to Cosa's walls. The connection between a Latin building technology and Cosa's status as colonia Latina appears significant, and the walls thus offer evidence about the circulation of building techniques around Hellenistic Italy.

Energetics modeling of Cosa's polygonal masonry presents different challenges than serial techniques such as brickwork or ashlars. However, close technical study shows a systematic logic supportive of such analysis. The paper quantifies the labor costs of the walls' chaine operatoire based on early-modern comparanda and mathematical analysis relying on photogrammetry and field survey undertaken by the author.

6. Steffen Oraschewski (Universität zu Köln), Ancient working processes and efforts considering large-scale constructions made of timber in Rome

Among the greatest achievements of the Romans are their efforts in building and engineering. Remains of Roman architecture throughout the Mediterranean and beyond bear witness to this fact until today. In the present project Roman building and construction techniques will be examined from an economic point of view. The main questions are the quantities of each material used for a specific monument, the work employed and an estimation of the number of workers needed to create such large-scale projects. In my work, I treat some of the greatest buildings Rome has ever produced. Imperial architecture in Rome stands out both for its dimensions and very much for the splendour of its decorations, too. And yet there is a big quantity of material used by Romans for monumental buildings which do not get the same amount of attention as others. A prime example of this kind of material is timber, due to its general lack of conservation. In my paper, I try to zoom in on the use of this material in large-scale buildings, presenting my work using the examples of the roof truss of the Basilica Ulpia in the forum of Tra-
Jan and the so-called 'Porticus' at the topmost floor of the Colosseum. I am very aware of the fact that my proposals of reconstruction can only be considered as one way to revive the characteristics of these important architectonic elements in some of the most famous buildings dating to ancient times.

7. Ana Portillo Gómez and Manuel Dionisio Ruiz Bueno (Universidad de Córdoba), Considerations about the costs of the polychrome decoration and the constructive materials of the temple of Divus Augustus at Colonia Patrícia (Córdoba, Spain)

Our proposal is focused on the valuation of the pictorial materials used in the decoration of the colossal temple that dominated the provincial forum of the capital of Baetica, as well as on the typology of the imported and regional materials used in this building. Our aim is to evaluate the factors that contribute in the use of polychromy and its direct consequences in the economy of the building costs which fluctuate according to the origin and nature of the pigments used. We will take into account the use of other materials for the decoration of the temple of Divus Augustus at Córdoba, such as the gold-coloured painting of some architectonical elements, which increased the final cost and the value of the building. In relation to the construction materials used in the temple of Divus Augustus, we will study other features which increased the cost of the building, such as their typology and origin, or the number and type of services required, that is, the volume of the materials needed, the extraction of the stone from the quarry, the rough down of the pieces, its transportation, the carving work by specialized workers. Taking the temple of Divus Augustus of Colonia Patrícia into consideration, we would like to bring new ideas to this discussion. Our main goal is to provide new information about the final steps of the building process of these monumental constructions, the color application and its cost.

Panel 3.25 Production of Tiles and Bricks

Thursday | 24 May | 14:30-16:30 | HS III

Paper abstracts

1. Carlo De Domenico (University of Pisa), Stamps for Buildings: Marking Roof Tiles and Architectural Terracottas in Greece from Archaic to late Roman Times

Inscribing building material has been a widespread craft practice of the workshops in Greece since the Archaic age to the late Roman times. Roof tiles and clay antefixes were usually marked before being baked with symbols and names to signal ownership, destination, guarantee of quality of the product and conformity to the official metrological standards.

This field of research in Greece has been little explored until now. Apart from the collection of stamps of Corfu (Kindt 1997) and Constantinople (Bardill 2004), my recent works on Athenian and Corinthian productions have attempted to shed a light on the role of the marks in the building industry of two crucial contexts of Greece (De Domenico 2015; eadem cds).

The aim of this paper is to provide an overview of the stamping process in the tile workshops: specifically I investigate its acquisition, development and spread in Attica and Peloponnes, and, through a comparative analysis on typologies of materials, categories of stamps, I pay particular attention to the principal centers of productions, Athens, Corinth and Sparta, and to the prosopography of the producers.

2. Luigi Vecchio (Università degli Studi di Salerno) - Luigi Cicala (Università di Napoli FEDERICO II), I mattoni di Elea-Velia: archeologia ed epigraﬁa della produzione

L’analisi delle produzioni laterizie di Elea-Velia in età ellenistica, peculiari per forma e sistema di bollatura, viene affrontata, nell’ambito di un ampio progetto di ricerca, attraverso una lettura organica dei caratteri archeologici e epigrafici. La produzione, interessante per modalità e ampiezza, è caratterizzata da un elevato livello di standardizzazione, legato ad un intervento statale di particolare rilevanza. Lo
studio, di cui si presentano i risultati finora raggiunti, propone, innanzitutto, una lettura contestuale, relativamente a messa in opera, tecniche edilizie, tipologie architettoniche, ciclo di vita e reimpiego. Viene poi preso in esame il sistema di bollatura che prevede due bolli: uno 'variabile' costituito dall'abbreviazione di un antroponimo, variamente interpretato (indicazione del magistrato o del proprietario o del gestore dell'officina), l'altro 'costante', composto dalla sigla delta-heta (abbreviazione dell'aggettivo demosios) che allude allo Stato. Elea-Velia si dimostra un osservatorio prezioso per lo studio dell'organizzazione della produzione laterizia in Magna Grecia, offrendo numerosi spunti di discussione sui criteri, le scelte operative e le figure di un "sistema" che coinvolge gran parte delle risorse artigianali della città.

3. Heinz Sperling, Rekonstruktion von Betriebsmodellen antiker Produktionsanlagen mit Hilfe von Prozessketten-Analysen Methodik und Fallstudien bei der Ziegelherstellung in römischer Zeit


Anwendungsbeispiele - Rekonstruktionen möglicher der Betriebsmodelle - mit hohem Detaillierungsgrad, z. B. für eine Brennsaison für einen Brennofen in der römischen Militärziegelei Dormagen, liegen vor.


The use of brick to the length and breadth of the Roman Empire seems to be greatly depending on the availability of raw materials in each zone. However its use on public buildings have been the focus of the majority of investigations, taking as a reference the architecture of Rome itself. In Hispania the governments of Trajan and Hadrian have been considered the culmination of the use of brick, even though the oldest evidence date from the 2nd century BC regarding the need of using this material in thermal buildings. However, the presence of bricks in domestic contexts has just been treated by the investigations. In this article we want to draw attention to several urban excavations as in the lower Guadalquivir, where the bricks and the tegulae begin to arrive in the period of the Civil Wars, in particular in relation to the colonization policy started by Julius Caesar.

Although brick production is at least attested in the colony Romula Hispalis (Seville) in the reign of Claudius, our hypothesis is that the deductio of this colony was the arrival of these materials as a reference ideological evidence of the new legal status, understanding brick as the specifically Roman material that brings together a series of ideological values which are manifested in its use. In this sense, Seville as one of the most important ports in the Western Mediterranean will be fundamental in understanding the arrival of these materials.
Panel 3.26 Serial Production

Thursday | 24 May | 11:30-13:30 | HS III

Paper abstracts

1. Elisabeth Trinkl (Karl-Franzens-Universität Graz), Serial production in Classical Greece: Attic figural vases.

The mass production of pottery is well known at least through the production of Megarian bowls and Terra Sigillata. Nevertheless, much earlier the Athenian pottery workshops of the 6th and 5th century tried to produce series of nearly identical vases in the shape of heads of humans and animals, manufactured by the use of moulds. Especially in the Attic figured production we usually analyse the individual hand of a potter or a painter. Concerning the figural vases this is not an issue – the only exception could be the initiator(s) of the series.

The use of the mould obviously indicates an intentional serial production. Nevertheless, based on the preserved samples the number of single items of each series was rather small. Why was this new production process initiated at all, yet also ceased only a short time later in Greece: maximisation of profits, lack of adequately trained personnel, temporary fashion? The paper will focus on the rise and the fall of the mould-made figural pottery in Athens, especially tackling the relatively small number of items of each series in comparison with later mould-made pottery, and investigate the geographical and chronological distribution, the functionality and the interpretation of the depicted heads.

2. Harald Schulze (Archäologische Staatssammlung), Blei als Material für die Serienproduktion von Votivgaben


3. Dagmara Wielgosz-Rondolino (University of Warsaw), Serial production or individual orders? Palmyrene sculpture from the 1st to the 3rd century AD.

Palmyrene sculpture arouses great interest as a spectacular expression of local art. Formed by complex process and influenced by various cultural traditions, it maintained until the end its original character and style. Palmyra itself presents very rich and diversified spectrum of sculptural material, both in relief and in round as well as in form of architectural elements. At least two local limestone quarries supplied the raw material. Within the quarries the workshops operated responsible for the form shaping process defining the basic design of the object. Extremely rich sculptural evidence clearly proves that the serial production in Palmyra influenced each category of sculpture, although with different intensity in different historical periods. This phenomenon can be understood in strictly socio-economical terms: the economic growth of the city and its society increased the demand of self-representation objects, or in terms of strong local tradition and convention. No doubt, both are valid. In order to understand the long-term process of sculptural production in Palmyra, a holistic approach is required. In my opinion, Palmyrene sculpture should be interpreted as a whole, ruled by a single collection of socio-cultural factors.

4. Eleonora Cussini (Università Ca' Foscari Venezia), Serial production or individual orders? Palmyrene inscriptions on sculpture from the 1st to the 3rd century AD

This contribution focuses on the epigraphs written on the artifacts discussed in the paper by Dagmara Wielgosz-Rondolino. Here the discussion aims at investigating given formulaic texts attested in hun-
dreds of specimens. Special attention is given to the picture resulting from the study of the different text-types: epitaphs, dedicatorily and honorific inscriptions. The discussion of the epigraphic records is strongly connected to the previous paper on Serial Production or Individual Orders in Palmyra: the artifacts - their written and visual parts - are studied as a whole, to evaluate the degree of individualization of the texts in the context of a production in series of the artifacts they were written on.

Panel 3.27 Roman and Late Antique Glass Production

Saturday | 26 May | 14:30-16:30 | HS IV

Paper abstracts

1. Paola Puppo, Tiburtini calices or gemmata potoria in thin walled ware: A luxury roman production of the first imperial age

Gemmata potoria is a particular production of the ager Romanus, represented by drinking vessels (beakers, mugs and small cups) decorated with vegetable motifs and embellished with gems of colored glass paste (pasta vitrea). This type of pottery, dating from the Augustan to the imperial period until the Flavian age, was found in funerary contexts (an example comes from the child's grave of the necropolis Settecamini) and religious contexts (many specimens have been found at the Ara Maxima in the Foro Boario and in the sanctuary of Tivoli, both dedicated to the worship of Hercules Victor). The precious decoration à la barbotine is made with points, stems and drops arranged to form phytomorphic elements with inserts of glass paste of blue gradation encapsulated in clay. These drinking vessels have a limited spread, closely linked to Rome: the specimens come from Tivoli, Rome, Palestrina, Privernum, Ostia. The examples founded in the urban contexts provide significant elements to identify the sources and the cultural traditions that this ware reflects. It hasn't been produced only for the libations in the funeraries and sacred contexts, but it may have been used on request by rich customers as it proved by Seneca (Epistulae to Lucilius). The production seems to lie in Tivoli, whose figurinae workshops were already fully actives in the production of fine tableware such as the so-called Italo-megarian bowls) and the thin walled ware.

2. Frank Wiesenberg (Universität zu Köln), New light on old panes. Current results obtained by experimental archaeology: Making Roman window glass

Beginning in the first century AD, window glass was commonly used in Roman building architecture. They served as passive illumination in bath houses 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. Flat, square or rectangular glass panes on the one hand, round and domed window glass (so-called oculi) on the other. Both are thick-walled, and feature a matt and a glossy side, which easily distinguishes them from the later blown Roman window glass (so-called cylinder-glass).

These two early Roman window glass types were reconstructed during the 'Borg Furnace Project 2015' in the Archaeological Park Roman Villa Borg's hot glass workshop. Using a flat ceramic support, by stretching and pulling a gather of hot glass to create a square shape, Mark Taylor and François Arnaud re-created several of the matt-glossy window panes typical of the first century AD. The observable characteristics and tool marks matched those of the Archaeological Park Roman Villa Borg's Roman fragments.

Furthermore, Mark Taylor reconstructed one 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 identical to those seen on the Roman fragments. According to current research and knowledge, the slumping method seems to be the correct technique for making domed Roman window glasses, and the stretching and pulling method is likely to be the
method of manufacturing the early Roman matt-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.

3. Miguel Cisneros (Universidad de Cantabria) - Nova Barrero (Museo Nacional de Arte Romano de Mérida) - Alfredo Encuentra (Universidad de Zaragoza) - Esperanza Ortiz - Juan Paz (Museo de Zaragoza) - Pilar Caldera de Castro (Museo Nacional de Arte Romano de Mérida), Semiprecious stones and blue glass: An approach to the imitation phenomenon in Hispania during the Roman period

The oldest recorded glass, dating from circa 23rd century B.C., is blue and consists of a preformed cast bar originating in Eshnunna (Mesopotamia). The earliest creations made of this material were beads that imitated semiprecious stones such as lapis lazuli or turquoise.

This paper documents blue glass skeuomorphs and verifies equivalent stones revealing concurrences from a morphological viewpoint and in terms of shapes, uses or contexts, including better known glass creations imitating lapis lazuli, turquoise and sapphire, as well as blue/white designs replicating cameos.

Glass craft experimentation reveals particular artistic licences so relationships may be established with other stones not blue in colour whose decoration patterns are well defined and whose manufacture in glass could fall within the group of inspirations, interpretations or versions.

Original and imitation objects were mainly used as containers, personal adornment, ornamental inlays, games and opera sectilia.

This paper presents instances from Emerita Augusta, Colonia Celsa and Caesar Augusta. Conclusions contribute to qualifying data provided by classical authors and to presenting data on social and economic aspects regarding the users of this type of product, for imitations though they may be they may not be assumed to have been accessible to all.

This investigation work is part of the project Ficta Vitro Lapis: Glass imitations of stones in Roman Hispania (HAR2015-64142-P) (MINECO/FEDER, UE).

4. Ella Magdalena Hetzel (Universität zu Köln), Das Handwerk im römischen Köln

For more than a hundred years, a vast amount of evidence regarding the flourishing craftwork production of the Roman period has been secured and documented within the urban center of Cologne. This abundance of archaeological source material determines how the economic situation looked like. In that purpose archeological evidence concerning profit optimization, investments, organization and requirement structure will be discussed.

In the archeological magazines of Cologne a wealth of sources for economic evidences is stored. These findings indicate pottery production, glass manufacturing, metal and wood working as well as the processing of animal and agricultural products. Overall 44 pottery workshops and 10 secondary glass huts have been documented. Furthermore there are scattered features, which correlate to non-ferrous metal industry, processing of marble inlays, production of glue and manufacturing of animal bones as well as bakery production.

In the analysis various economic topics will be treated, which all require different approaches. The research project will deepen the scientific debate connected to the economic structures of the Imperium Romanum. By means of the doctoral thesis modernist opinions will be strengthened and further developed. Through elaboration of single economic curves as well as a view on framework conditions, precise and meaningful results on the economic development will be supported.

5. Çigdem Gencler-Guray (Ankara University), Early Byzantine Glass Production in Nysa on the Meander

Nysa, which is among the important cities of the Karia region, is located in the northern part of both the region and the River Meander, laid by a sheltered hill towards the south of the Messogsis Mountains. A road that is coming through Central Anatolia passes through the city to reach the other cities of the
Karia and Ionia regions, therefore the city has always been a part of the critical transportation and trade routes.

In spite of the lack of sufficient data regarding the glass production in Anatolia during the Roman and Pre-Roman periods, many glass furnaces and production remains belonging to Early Byzantine Era can be acquired in various Anatolian cities. The main reason behind this situation should be the perceivable cultural transformation experienced in these cities during the transition period between the Roman and the Byzantine eras.

During the excavations performed in Nysa, various findings regarding the glass production has been found in Agora, in a shop along the Colonnaded Street and near the north-west part of the city. Other materials found together with the glass finds, certify that the examples coming from all of the three locations are belonging to the Early Byzantine Era. In the presentation, a general evaluation about the results of the archeometric studies performed on the furnaces, glass finds and glass forms found in Nysa will be raised, and a discussion will be made regarding the glass forms produced or used in the city.

Panel 3.28 Food Production and Consumption

Friday | 25 May | 14:30-19:00 | HS XVI

Paper abstracts

1. Stavros Dimakopoulos (Aristotle University of Thessaloniki), Educating farmers: Economic strategies in ancient Greek and Roman literature and their applications in the agricultural landscape

Agricultural activity comprises a social practice that incessantly evolves from generation to generation over the centuries. Various agricultural practices take place within the rural landscape, and each time the landscape itself indicates the ways this activity must be developed. Despite the almost automatic and self-evident way that this production took place, the need for a systematization of this knowledge emerged during certain historical periods through written texts. Xenophon’s Oeconomicus, among many others, is a prime example of such an increased interest in writing and transmitting the experience of the agricultural process during the 4th century BC in Athens. The purpose of this paper is not simply to identify the key points of those texts, but rather to assess their pedagogical dimension based on the historical context of each period as well as to link them to specific archaeological remains. It is therefore attempted to relate the words of advice by authors such as Xenophon, Columella and others concerning the management of the country house, the organization of the countryside and the optimization of agricultural productivity to the realia, that is, the archaeological remains themselves. In the end, the pedagogical/educational value of these texts is evaluated, as well as the extent to which they affected agricultural production and the optimization of the rural economy in specific periods and areas.

2. Giulia Falco (Polo regionale di Catania per i siti culturali), Snow and ice in Antiquity: supply, preserving, trade, luxury and daily consumption

Because of their multiple uses, snow and ice were widely consumed in Antiquity. Both written sources and archaeological evidence testify they were used in medicine, as well as to prepare and preserve food and to cool beverages, especially wine. In the 3rd millenium BC, some kingdoms of the Near East, such as Mari, already had an organization for provision, transport, conservation and distribution capable of making frozen snow available far away from the supply area in any season of the year, though torrid climates. While snow was a luxury good reserved for regal banquets and diplomatic gifts in the Near East, in Greece and Rome it seems to have been easily accessible with variety of cost and quality. It was used not only for chilling beverages, preserving meat, preparing specific dishes as well as in frigidaria of
the thermae, but also for luxury pleasures. Indeed, specific paraphernalia was adopted both for purifying and consuming it.

In medicine, recourse to ice was under dispute between Hippocrates, who was contrary to their consumption, and Asklepiades of Bithynia, whose therapies, on the other hand, centred around the use of ice.

The paper will focus on the ways and means of supplying, trading, conserving and consuming snow and ice through Antiquity, as well as on their continuity in Mediterranean area up to the introduction of modern techniques of refrigeration in the 20th century AD.

3. Vedat Keleş and Michael Deniz Yılmaz (Ondokuz Mayis University), Fishing, processing and the production of marine food in Parion

Parion, a colony founded in 709 BC, located on the Anatolian bank of the Propontis is a significant littoral city which 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 being a polis until the Roman sovereignty was mentioned by many ancient writers regarding its different aspects. One of the aspects which is made mention of is the marine food procured and processed in Parion. Marine food attested in Parion through ancient writers, archaeological evidence and epigraphic sources range from fish and salted fish to crabs and oysters.

The intention of this paper will be to approach ancient fishing by the archaeological material related to the procuring, processing and production of the aforementioned marine food species along with evaluating the species and techniques used with the modern Turkish and Greek terminology and techniques of fishing in order to establish the species known to mankind today, together with establishing the production techniques. Material regarding this paper are the ancient writings, archaeological evidences and epigraphic evidences related to the topic. Consequently this paper is aimed to establish the place, techniques and diversity of fishing in Parion; regarding the disciplines of archaeology, economy, sociology and biology.

4. Anna Depalmas (University of Sassari) - Cinzia Loi (Ispettore Onorario SABAP-CA) - Alessandra Pecci (Universitat de Barcelona) - Nicolas Garnier (Laboratoire N. Garnier / Ecole Normale Supérieure de Paris AOROC) - Alessandro Usai (MiBACT), Wine in Sardinia. New archaeological data and research methodology

Wine is an important drink in the history of Sardinia. Recent research has allowed to date back of the introduction of wine production and consumption in the region. The combination of botanical finds and chemical residues allows to suggest the production and consumption of wine already from the Middle Bronze Age. The Bronze Age settlement of Sa Osa (Cabras), is one of the few Sardinian archaeological sites, which allows us to reconstruct a complete picture on the development of the exploitation of natural resources, agricultural technologies, as wine's production. The discovery of wild and domesticated grape seeds in Sa Osa wells suggests the presence of sufficient quantities to production of the drink.

The stone presses constitute a fundamental element of the agricultural production process and they are of significant interest due to their historical and archaeological value. These artifacts, being considered less valuable than others, have enjoyed relative anonymity. Those that have survived often have missing parts and are deprived of their original context in the landscape; therefore, it is difficult to interpret their typology and age. However, they represent an interesting feature that could be related to ancient wine production. A total of 150 fixed rural wine-presses have been found and 50 movable containers possibly connected to at least 30 other wineries, suggesting the widespread of wine production for a long period of time, that needs further investigation.

5. Corinne Dubler, Quentin Desbonnets and Ivan González Tobar (Université Paul-Valéry, Montpellier) - Stéphane Mauné (CNRS), OLEASTRO - Neue Ergebnisse des französisch-spanischen Forschungspro gramm

Dieser Beitrag soll unser internationales Forschungsprogramm OLEASTRO «OLEiculture et production d'AmphoreS en Turdétanie ROMaine», das durch das LabEx Archimède in Montpellier und der Casa de


Ziel dieses Beitrages ist die Präsentation neuer Erkenntnisse und ersten Ergebnissen zu diesem zentralen wirtschaftlichen Phänomen. Zudem gibt uns dieser Kongress die Gelegenheit, unsere Forschungsthemen einem breiten, wissenschaftlichen Publikum, das sich speziell an den angelsächsischen-germanischen Raum richtet, vorzustellen.

6. Felix Teichner (Philipps-Universität Marburg) - Joao Pedro Bernardes (Universidade do Algarve) - Florian Hermann - Ricardo Soares (Câmara Municipal de Vila do Bispo), Boca do Rio (Algarve, Portugal) – A center of export oriented garum production on the shore of roman Lusitania

Located in the extreme southwest of Iberia, the area of Sagres includes several small fishing ports and archaeological sites (as those around the palaeoestuary of Boca do Rio). These sites still preserve records and elements of a long fishing tradition, as well as from its Atlantic and Mediterranean influences, and the geo and bio-indicators of ancient coastal cataclysms.

Through a transdisciplinary fieldwork and an integrated research, the autors seek to clarify the coexistence of these fishing populations with the geo-coastal dynamics and with the communities of seafarers.

On the shores of the old lagoon and paleoestuary of Boca do Rio, archaeological research detected an intense fishing and saline occupation with more than two thousand years, whose locations alternate between the beach and the interior lands. In these sites, it is possible to observe the evolution of the instruments and fishing gear. Concomitantly, Boca do Rio natural characteristics yield exceptional conditions for the observation of coastal geodynamics and their effects on the local communities. Moreover, in the surrounding region, the geo-indicators of ancient coastal cataclysms and their consequences are very well preserved. In addition, geo-sedimentological research has demonstrated the frequent invasion of the paleoestuary by high-energy marine events, such as the 1755 Tsunami, whose impact and destructive force can be measured.

7. Nabil Kallala (Université de Tunis) - Carme Belarte - Joan Sanmarti - Joan Ramon - Bouthéïna Maraaoui Telmini - Francisco Cantero - Dani López - Marta Portillo - Sílvia Valenzuela (Spanish National Research Council, IMF-CSIC), L'économie vivrière d’Althiburos de l’époque numide à la lumière des découvertes archéologiques récentes

Althiburos est une cité numido-romaine du N-O de la Tunisie. Elle était connue jusqu’ici surtout par ses fameuses mosaïques et le culte de Baal Hammon. Les recherches récentes tuniso-catalanes ont amélioré et diversifié très largement nos connaissances sur ce site, notamment la période numide, grâce à une approche qui incorpore, en plus des méthodes traditionnelles, l’archéométrie et de l’archéobiologie, pour mieux connaître l’histoire et la genèse de sa société en connexion avec son économie. On a pu établir ainsi que son histoire numide remonte au Xe s av. J.-C pour s’étaler tout au long de la période dite préromaine. Les données archéo-zoologiques et archéo-botaniques nous ont permis de parvenir à des résultats neufs et tout à fait intéressants sur l’agriculture, l’élevage, l’artisanat et l’alimentation. Les Numides s’avèrent être non seulement des producteurs de céréales, mais aussi de raisin, de grenades, dès les Xe s av. J.-C., de même qu’ils pratiquaient l’oléiculture et savaient réduire le fer, dès le Ville s av. J.-C., et consommaient toute sorte d’animaux, bœufs, moutons etc. Loin de vivre en autarcie, ils entretenaient des relations commerciales avec les Phéniciens de la côte tunisienne, mais

Panel 3.29 Production and Distribution of Roman Pottery

Saturday | 26 May | 14:30-16:30 | HS XIII

Paper abstracts

1. Georg A. Th. Pantelidis (TU Darmstadt), Regional patterns of pottery use and distribution in times of political and economic change: A case study from Acarnania in Western Greece

In the course of the romanization of the Eastern Mediterranean territories since the 2nd c BC, the Hellenistic kingdoms and koina were transformed successively into Roman provinces, resulting in massive changes in all areas of life for the population. Against this background, the Greek landscape Acarnania is a promising area of research: It is located just south of the gulf of Actium, where, after the battle between Octavian and Antony in 31 BC, extensive regional transformations took place. According to written sources, large parts of the Greek population were moved to the newly founded city of Nikopolis by means of synoikismos and rural land use was restructured. The paper deals with the material culture of this epochal transition, which can be directly linked to a historically documented system change and focuses its effect on the distribution and use of ceramic vessels in Acarnania. Based on the development of three specific pottery classes (tableware, cooking utensils and terracotta lamps) from the 2nd c BC to the 2nd c AD, it is shown that ceramic artefacts are a direct information source to describe both the production (manufacturing technology, design, etc.), as well as the consumption (need, function, use, etc.). The continuity and change of certain technical and economic variables of artefacts indicate which patterns of the regional economy continued to be practiced and those that were abandoned after the regional system change, owing to the foundation of Nikopolis.

2. Kamila Nocniń (Jagiellonian University in Kraków), Cooking pottery as a missing link in the regional patterns of distribution. Case study based on cooking pottery from the Agora in Nea Paphos (Cyprus).

Pottery distribution may reveal an information about ancient trade and economy that has not been discussed by literature sources or another archaeological data. Traditionally, the regional distribution patterns are based on table ware or amphorae studies. In recent years a growing research on cooking pottery shows that also this category of pottery may be a relevant source of an information. This is well illustrated by kitchen and cooking pottery from the Agora in Nea Paphos (Cyprus), unearthed during the excavation yielded by Jagiellonian University in Kraków. Methodically provided excavations as well as systematically studies of the assemblage of cooking pottery coming from well stratified contexts, shows a new links in circulation of goods in Hellenistic and Roman periods. The aim of this paper is to present the distribution patterns in Cyprus itself, with special emphasis on regional connectivity. Moreover, the regional exchange in the Eastern Mediterranean will be discussed from a diachronic perspective.

3. Mongi Nasr (Faculté des Lettres et Sciences Humaines de Sfax, Tunesie), L’atelier de céramiques de Sidi Aïch (Vicus Gemellae): productions et commercialisation

La contribution que j’ai l’honneur de vous proposer sera consacrée aux dépotoirs de l’atelier de céramiques de Sidi Aïch, situé à environ 36 km au nord-ouest de la ville de Gafsa, l’antique Capsa. Ces dépotoirs renferment un matériel aussi riche que varié. Son étude nous a permis d’établir des typologies propres à cet atelier (vaisselle de table, poinçons décoratifs, lampes, vaisselle culinaire...). L’importance de ces typologies découle du fait qu’elles viennent combler un véritable manque auprès des chercheurs s’intéressant aux productions régionales et locales des ateliers continentaux. En effet, elles représentent des outils indispensables non seulement pour déterminer les différents types de
céramiques produits par cet (s) atelier (s), de détecter son rôle et son poids économique, de délimiter son espace vital et de dévoiler ses circuits préférentiels, mais aussi pour réduire l'espace du chaos qui règne dans les dépotoirs des autres sites de notre région (la Byzacène du Sud-ouest). Un chaos dû à l'existence d'une forte proportion de produits de Sidi Aïch mêlés aux produits d'autres petits ateliers locaux, ce qui rend toute tentative de les appréhender sans connaître les productions dudit atelier une véritable perdition dans une situation labyrinthique. Enfin, l'étude de ces dépotoirs nous a offert l'occasion de proposer une chronologie approximative quant à l'activité de cet atelier et de distinguer deux notions : « période de production » et « apogée de production ».

4. Sergiu Matveev (Moldova State University), Roman pottery kiln from the 3rd-4th centuries in the prut and dniester interfluves

The establishment of the Sântana de Mureş-Černjachov culture in the north-western Pontic area at the end of the 3rd century BC marked the beginning of a new stage in the evolution of the barbarian world in the region. This evolution was strongly determined by influences from the provincial Roman world. One of the great achievements of this entity was the making of ceramic vessels, which in their quality competed with those imported from the Empire.

The purpose of this paper is the study of the problem of pottery craft through the barbarian pottery kilns at the Danube border of the Empire, in the space between the Prut and the Dniester Rivers. Of the 1150 archaeological sites belonging to the sedentary population of the first half of the 1st century BC known in this area, ceramic kilns or kiln groups were discovered at only 18 sites. Usually they are part of the kiln type with grill or two-chamber kilns, separated by the support of the grid on the middle wall or central pillar in two variants. The small number of known complexes, compared to the number of settlements and ceramics made in such installations, has marked the historiographical discourse of the 20th century, but also of the last two decades. The place and role of the Roman Empire in the context of the given issue is to be reassessed to determine the degree of technology transfer or own contribution of the barbarous environment to the production of fine and coarse ceramic assortment.

5. Leah Reynolds (Cardiff University), Pottery and exchange at the imperial fringe: the case of Wales

As a region which was largely aceramic before the Roman Conquest, pottery in Wales has received relatively little attention. Where attempts at analysis have been made it has generally been in relation to larger, military assemblages - yet almost all excavated rural sites of the Roman period produce pottery in a region which supported a relatively limited local production into the Roman period.

This paper will therefore consider the evidence of continental and British regional imports at Welsh rural sites to identify the extent to which rural sites were engaged in Roman networks of exchange at the imperial fringe and how far these consumption practices reflect active engagement by the local population. It will also consider methodological approaches and the difficulties of studying Romano-British ceramic exchange in a region with comparatively little pottery, and how one can meaningfully engage with the data.
Session 4: System of Extraction: Mining, pollution, technology

Panel 4.1 Roman Mining: Dimensions, scale and social and territorial implications

Organiser: Brais X. Currás (Coimbra University) and Oscar Bonilla Santander (Universidad de Zaragoza)

Wednesday | 23 May | 09:00-16:30 | HS VII

Panel abstract
Research on ancient mining has evolved in recent decades from the traditional technological studies to a broader historical view. Nowadays, the study of Roman mining is carried out taking into account its territorial dimension, social and economic implications and juridical aspects. The purpose of this session is to bring together the different visions of Roman mining that are currently being developed in European research. We would like to create a space for discussion on ancient mining landscapes which addresses the current debate on the impact of mining on the economy of the Roman Empire. From a territorial approach we intend to advance in the study of the forms of work organization in the mines, the structure of settlement, and to understand how mining evolves between the end of the Republic and the High Empire.

Paper abstracts

1. Alfred Hirt (University of Liverpool), Mining and Territory. Access to and Possession of Metal Resources in Roman Spain
The current reconsideration of mines and mining and their legal and historical contexts in post-conquest areas of the Iberian Peninsula have significantly evolved earlier scholarly views on the extractive industry in the Roman provinces of Hispania citerior, Baetica, and Lusitania. This discourse, however, has been limited to Spanish academia and not enjoyed wider reception beyond specialist circles. The aim of this paper is to critically question the present picture emerging from the summative analysis of archaeological surveys and finds and contrast this with current thoughts on post-conquest reshaping of conquered space, ownership of resources, and on legal concepts such as ager publicus. The focus of the paper will be on the Iberian Peninsula.

In the gold mines on primary deposits of the Iberian Peninsula the mineral had to be treated next to the own mine. This phase of the mining process described by Pliny the Elder allowed the gold to be released from the rest of the ore and the waste rock. The material evidence and some of the instruments used in this part of the mining process have been documented in several mines of the Northwest of the Iberian Peninsula, such as Tresminas (Vila Pouca de Aguiar, Portugal) or Pino del Oro (Zamora, Spain). This paper discusses the current state of the issue and its implications in other technological and social aspects of mining areas.

3. Antonio Rodríguez Fernández (Institute of History, CSIC), Metalla publica and Mining Manpower. Instruments of Social Control in Northwestern Hispania
We seek to provide a summarized view of different legal and administrative issues which affect gold mining management and development in Northwestern Hispania. Beyond the role of the local ciuitates, we will explore other administrative instruments used to manage and control the workforce using a comparative method with other personal fiscal obligations related with conventus framework.
4. Beatrice Cauuet (University Toulouse, CNRS), Evolution and technical transfers in the Roman gold mines of Europa

Gold has been heavily exploited in Western part of Europa in the 1st Century AD by the Romans, especially in the Iberia Peninsula. Then from the 2nd Century AD, this type of precious metal production has moved to Dacia and to the Eastern part of Europa.

We will present the similarity and the difference of technical practices between Western and Eastern world during the Roman domination, to see in the mining techniques what was transferred or simply adopted from local traditions.


Since 2007, archaeological works carried on the rich silver-lead district of Cartagena, south-eastern Spain, have bring new and original evidences on mining and metallurgical activity in what was the main Mediterranean centre for the production of lead and silver during the late Republic, 1IInd and 1st c. B.C.

We will present a summary of the results of the archaeological study of a well-preserved Roman mine and that of the excavations carried in the meantime on a workshop complex for mineral treatment, including an ore washing plant, the first ever archeologically documented in Roman Spain. The project includes geochemical analysis, and especially LIA, on different material and artefacts (ore, washing sediments, litharge) uncovered on the excavations. Combined with archaeological and epigraphical data, the LIA can contribute to better know the organisation of Roman mining and metallurgy activity in Cartagena.

6. Brais X. Currás (University of Coimbra), Indigenous settlements and Roman Gold Mining in Northwest Iberia: a Postcolonial approach

Along the most important gold mining areas of Northwest Iberia we find a particular type of settlement, situated halfway between indigenous tradition and the social breakdown introduced by the Roman Empire: the so called Roman mining castros. This kind of site keeps elements from Iron Age settlements, the castros (ditches and ramparts defining the perimeter, dwellings, pottery, etc.) but, at the same time, they are embedded within the Roman new world: "Mining castros" are located inside the gold mines, built using the new hydraulic technologies and having access to the commodities and goods arrived with Rome. This kind of site has an ambiguous character. They illustrate the survival of the indigenous settlement type, but within a completely transformed territorial structure that marks the total dissolution of the social and political organization from Iron Age.

The materiality of these settlements allows us to reflect on the process of the so called Romanization. From postcolonial theory and the new approaches in the study of Roman provincial societies, in this paper we will consider the ruptures and continuities, the cultural conflicts generated by the Roman conquest, and the agency of local groups in a context of domination.

7. Rubén Rubio (Universidad de Salamanca), Hillforts and gold mines: the landscape of the upper Sil (Northwest Iberian Peninsula) between protohistory and the Roman world

In the framework of a research project focused on the evolution of the landscapes between the Early Iron Age and the Late Roman period in the river Sil upper basin (NW Iberian Peninsula), a wide range of archaeological prospections and excavations have been carried out. The surface field surveys have allowed to recognize a large set of Roman gold mines as well as seventeen hillfort settlements which precise chronology remains uncertain in many cases.

The implementation of new exploitation policies of the territory at the beginning of the Roman Imperial time, especially the systematic gold mining, caused great transformations in the ancient landscapes. These visible changes were linked to the creation of new settlements and the disappearance of some of existing ones. At the same time, the pre-Roman astures communities would have suffered significant social stress due to the transition from a model of self-sufficient and apparently non-hierarchical settlements to a global scale in which economic orientation followed the guidelines of imperial interests.
The execution of several campaigns of excavations in seven archaeological sites of the mentioned zone (six hillforts and a mining reservoir) allow us to have a better comprehension of these phenomena. In this way, we are able to identify the changes in the environment and the evolution of the occupation and exploitation strategies of the territory.

8. Linda Gosner (University of Michigan), Mining, Mobility, and Movement: Regional and Imperial Connectivity in the Mining Landscapes of Roman Iberia

From the American gold rush to Spanish colonial silver mining in Peru, the exploitation of metal resources has often stimulated episodes of migration to support mining and related industries. Mining in the Roman Empire was no exception. In this paper, I explore diachronically the changing patterns of movement—both of people and the goods that accompanied them—in and out of major mining districts in the Iberian Peninsula, a place long known as a rich source of metals in antiquity. Following Roman conquest of this region beginning in the late 3rd century BCE, the scale of mining increased dramatically and this growth catalyzed episodes of migration of people and movement of materials in ways that stimulated both regional and empire-wide connectivity. I argue that the migration of Italians into Iberia soon after Roman conquest contributed to the diversification of communities in mining landscapes, and the development of lasting connections between these areas and other parts of the empire. By contrast, in later centuries, increased movement of people and goods within the peninsula stimulated regional connectivity, cementing intra-provincial ties and connections between mining districts. Understanding connectivity brought about by the demands of mining ultimately sheds light on the organization of labor, the complexities of local and imperial economies, and the lived experience of empire in the mining landscapes of Roman Iberia.

9. Emmanuelle Meunier (University of Toulouse, TRACES), Mining during the 1st c. BC in South-Western Gaul. Discussing the Roman implication from the case of the Arize Mountains district (Ariège, Pyrenees)

The recent archaeological investigations carried out in the argentiferous copper mines of the Arize Mountains allowed to review the chronology of their exploitation. If the activity during the 1st c. BC is confirmed, we now know that the mines were first opened during the IVth-IIIrd c. BC and probably interrupted during the IInd c. The resumption of the exploitation at the end of IInd or beginning of the Ist c. BC, in the context of increasing regional contacts with Roma, leads to a reflection about the identity of the managers of the mines. The involvement of Italians is recognised in other mining districts, closer to the Mediterranean coast at the same period. Could they play an active role in the resumption of the Arize Mountains district?

In this area, apart from the main communication axes, it does not seem that the Roman presence could have been very strong during the 1st c. BC. Furthermore, the way of mining does not show major changes between the IVth-IIIrd c. and the Ist c. This make plausible that the descendants of the first miners went back to the mines on their own. The role of Roma, in this context, would have been to stimulate the demand for metals, allowing these small exploitations to work with a relative autonomy. However, the interruption of mining at the beginning of the 1st c. AD could be related with a political decision. Indeed, a new stage of activity recorded in two of these mines in the XIVth c. AD refutes a general exhaustion of the mineral deposits.

10. Oriol Olesi (Universitat Autònoma de Barcelona), Mining in the Roman Pyrenees, from Late Republican period to Late Antiquity

The research in the Oriental Pyrenees in the last 15 years has pointed out the importance of mining activities in the zone from Late Republican period to Late Antiquity. The importance of the Iron exploitation (identified in several Pyranean regions, from the Pallars to the Canigó zone), specially in Late republican and Late Antiquity period, shows the occupation of high lands and the setting up of different strategies of production. More recently, the identification of silver and gold activities in the zone shows again these diverse and complementary strategies of production, and their relation with the forms of control and exploitation of local communities and the natural resources.
11. Joan Oller Guzmán (Universitat Autònoma de Barcelona), Wadi Sikait and the emerald mining in Roman Egypt: some questions on the productive process

The current area of Wadi Gemal, in the Eastern Desert of Egypt, can be identified with the ancient emerald mining region of “Mons Smaragdus”, quoted by several ancient authors as Strabo, Pliny the Elder, etc. Although different archaeological studies have been conducted on the sites located on this area, still little is known about the organization of this production that had an important economic impact in the area during Roman times. This study will offer an approach to several questions regarding the productive process involved in the emerald mining as, for instance, how the emeralds were extracted, who worked in the mines, who was in charge of this production or how the emeralds were distributed through the Empire. We will take as a starting point the data available from the most important of these sites: the mining town of Sikait, the ancient Senskis, a huge Roman mining settlement where several houses, buildings and even temples are preserved. The analysis of these structures, combined with the data coming from the mining shafts identified in situ during the archaeological campaigns conducted by the Berenike Project, provides basic information for trying an approach to the emerald production in this area, densely documented by the existence of other mining settlements near Sikait, as North and Middle Sikait, Nugrus, Wadi Umm Harba, Umm Kabu, etc. Finally, this information will be compared with other examples of Roman mines and quarries from the Egyptian area.

12. Dragana Mladenovic (University of Southampton), Roman Gold and Silver Mining in the Central Balkans and its Significance for the Roman State

This paper offers a reassessment of the archaeological evidence for the organization, scale and significance of the Roman silver and gold mining in the Central Balkans, an area thus under-represented in the syntheses of mining in the Roman Empire. Though the significance of the local mining industry has been hinted at by the editors of the Oxford Studies in Roman Economy first volume, Quantifying Roman Economy (1), a delay in publication of the 5th volume on Mining, has led to this evidence still being largely unknown and the scale and importance of Roman mining activities in the region continue being critically underestimated. The aim of the paper is thus to present and raise awareness of this evidence, while making a case for the Central Balkans being the empire’s main source of silver bullion from the second half of the second century AD onward.


13. Marco Conti (Sapienza, Università di Roma), Roman Mining in Asia Minor

The study of the roman mining system is dramatically troubled by inescapable factors such as the scarcity of ancient literary and epigraphic information, the erasure of ancient and early Byzantine evidence due the reuse in later periods of the same extracting sites, and the loss of memory caused by the abandonment of the mines, be they caved, water-filled or simply exhausted. Nevertheless, in the past it was possible to reconstruct how the system worked in the western half of the Empire, at least in a general way. This paper's aim is focused on giving a tentative answer to some questions about key elements of the metal-acquiring process in the eastern provinces. Combining data from different sources it was built a working hypothesis about the management system of the extractive operations in the East, that appears to have peculiar characteristics. The changes in the complex relationship between cities, landowners, social elites and the imperial authority were the main elements that forged this strong identity, close-knit to its historical background. In this system, during the first three centuries AD, the role of the imperial officers constitutes the most striking feature in the eastern regions, especially because it is very different from what is known about their counterparts in the west. Besides the public officers, the cities and the local elites had a role in the mining industry, with a relevance unheard of in the west.
14. Oscar Bonilla Santander (Universidad de Zaragoza), Ancient mining landscapes in the Iberian System (Spain)

The Iberian System is located in the center of the Iberian Peninsula in the region named in ancient Celtiberia. The region has important mineral deposits of iron, copper, lead and silver that were exploited from the Iron Age until the present time. The mountainous territory was organized by the Roman state in republican time and during the high empire for the exploitation of the mining resources of the territory transforming radically the productive landscapes. Large-scale production begins in the second century BC after the conquest of the territory by the Roman state with the creation of new fortified mining villages that will manage the production of metal for long distance commercialization. With the restructuring of the territory in time of the emperor Augustus and the concession of the title of municipality to the cities of Turiaso, Bilbilis, Calagurris and Clunia the production continued until the beginning of the second century AD when the mining towns that structured the mining operation were dismantled.

15. Mátyás Bajusz (University Babes-Bolyai), Roman quarries on the north-western border of Dacia Porolissensis

The scientific research of stones, as prime building material and the provenience of these have been almost totally neglected throughout the scientific research of Dacia province. Only three or four researchers could be enumerated starting from the end of the 18th century and 19th century who were intrigued to study and note the most important quarries of the region. Currently I am studying the stone as the base building material in Dacia and the process of its mining. My actual project is to map all the quarries serving the settlements and fortifications of the north-western border of Dacia Porolissensis, and based on the location of each site I am trying to model the possible roman routes of the transportation of the mined stone. In addition to these my interest is widened to the social background and human resources of the process of quarrying. Concerning the aforementioned area, I managed to identify 18 quarries of four different kinds of stone. The situation is complicated by the fact that a certain percent of the quarries are currently active, or have been used throughout the centuries, so during the research has rise a need for the methods of geology and ethnography too.

Panel 4.2 Mining Landscapes

Organiser: Frank Hulek (University of Cologne) and Sophia Nomicos (University of Münster)

Thursday | 24 May | 09:00-16:30 | HS VII

Panel abstract

The economic importance of raw material exploitation, especially metal mining, for communities in antiquity has long since been addressed, but only during recent decades have scholars increasingly focused the material remains. These include not only the primary mining remains such as underground workings, process residues and installations for beneficiation, but also habitational sites and infrastructural remains that emerged in the course of exploitation.

In view of the fact that mining can contribute or even stimulate changes of a given economic system of a society, a perspective beyond technological aspects in order to better understand these interrelations seems necessary. Consequently, taking into account also the secondary structures, such as agricultural installations, burial sites, sanctuaries or infrastructural remains may display the networks that contributed to the success of ancient mining operations. Also, the occupation of raw material deposits by foreign communities has left traces in the literate and archaeological record. Such operations necessitated the introduction of new technologies as well as administrative measures. To identify and describe
indications of this process in the archaeological record by, for example, addressing questions of technological transfer seems a promising approach. Moreover, on a landscape level the question of the ecological imprint and thus of the sustainability of raw material production in antiquity may be addressed.

The intention of this panel is to provide an insight on existing and emerging research on landscapes that were distinctly transformed by mining. It aims, furthermore, at discussing how mining could affect not only the natural but also the cultural landscape. By focusing on select case studies the intention is to identify the material characteristics of such areas, to highlight and explain differences and to discuss possible recurring infrastructural and organisational patterns.

Paper abstracts

1. Effie Photos-Jones (University of Glasgow), Μιλτωρύχοι & φαρμακοτρίβες: the elusive mineral medicinals ‘industry’ of the Greco-Roman world

Unlike the production of metals, ceramics, textiles or glass, the industrial minerals industry of antiquity, the rocks and minerals that were extracted, processed, traded and dispensed across the Greco-Roman (G-R) world, remains largely un-explored. As pigments, mordants, cosmetics, washingpowders or medicines, they were integrally associated with the daily lives of the people of antiquity, across social, cultural and economic strata; and yet as an ‘industry’ they are elusive. Dioscorides (DeMateria Medica, Book 5) and Pliny (Nat Hist Book 35) suggest that the same minerals served aspigments and medicines, or medicines and mordants and no effort is made to draw a line between different applications. Pharmacotrites (those who grind drugs or colours, Demosthenes.48.12; AelianNatura Animalium 9.62) seem to have provided the same materials to both painters and doctors. Could that be true? Was it a case of one mineral deposit quarried, ground-up, packed in ceramiccontainers, shipped and dispensed to different minerals merchants? Did it undergo a single treatment or different ones, each targeting a specific market? It is suggested that the lowly status of thepharmacotrites or the miltorychoi (those who dig for μίλτος, Pollux.7.100) should not detract fromthe fact that the industry may have been more nuanced and there may have been a wealth of empiricalknowledge which is currently invisible. To investigate the industry requires a broad-based approach taking in not only the archaeology, geology, mineralogy or geochemistry of the minerals but also their ecology, i.e. the microorganisms (bacteria, algae, fungi) which live in their immediate surroundings and affect their properties. This is because, unless the minerals have been heated to high temperatures, these microorganisms are likelyto follow the minerals to their final destination, for example as medicines. Furthermore, as regardsmineral medicinals, an additional parameter needs to be investigated, namely bioactivity. This is a quantifiable parameter, defined broadly as the effect (positive or negative) of a substance (in this case the G-R mineral and associated microorganisms) on a living organism (plant, animal or human). To illustrate these points we draw examples from our long-term work on Melos, W Cyclades, one of the key industrial minerals producers (alum, sulphur, Melian Earth) in the Roman world (Photos-Jones and Hall 2014; Photos-Jones et al 2016), and also our current work on the bioactivity of themiltos of Kea, NW Cyclades (Photos-Jones et al, in review).

2. Thomas Faucher (University Orleans/IRAMAT-CEB, CNRS), Ancient gold production in the Eastern desert of Egypt: Samut as a case study

In order to verify the intensity of the Carthaginian exploitation of its territorial resources and to define its pattern of exploitation in Iberia, we have developed a survey in the hinterland of the Barcid colony of Qart Hadash (Cartagena, Murcia, Spain). The selected area, between Trujillo and Carrasquilla’s Ramblas (Campos de Cartagena), as a result of its geo-physical features and the dominant resources, had also allowed us to evaluate the Carthaginian attitude towards the use of certain resources such as salt, silver and other metals mining, agriculture, fishing, or stone quarries. The preliminary results that will be presented at this conference will show the compatibility of mining
with other economic activities, focusing specially in the Carthaginian period and the subsequent Republican Roman exploitation of the landscape.

3. Hannah Friedman (Texas Tech University), Feeding the Miners in Faynan. The Discovery of a New Floodwater Farm at Jabal Hamra Alrbieg

The Wadi Faynan in Southern Jordan is in many ways a unique archaeological landscape. Multiple cultures were drawn to the region due to its plentiful copper ore. The landscape then is a palimpsest of mining activity, from cold working of copper in the Chalcolithic through to the modern period as a tourist/educational attraction. The Roman and Byzantine period saw one of the most intense periods of exploitation in the region with a large investment of resources by the Roman State. Moreover, the area is very well preserved giving unequalled access to past mining infrastructure.

This paper will present some of the results of the Barqa Landscape Project (BLP). The BLP has been focusing our archaeological survey on the little investigated south of the Faynan valley to gain a more complete understanding of human activity across the landscape. Our studies have located a new floodwater farm at the isolated Jabal Hamra Airbeig, 5km south of the center of Roman activity, Khirbet Faynan. The farm lies adjacent to the route leading to the Umm al-Amad mine; famous for having the largest underground gallery in the Roman Empire. It also is removed from the center of metallurgical activities in the Wadi Faynan, measurements of pollutants such as heavy metal toxins were found in much smaller amounts than those recorded at other farms utilized by the Romans. In this presentation JHA will be discussed as a possible communications and supply site for the metallurgical industry taking place in the rest of the Faynan valley during the Classical Period.

4. Beatrice Cauuet (University of Toulouse, CNRS), The impact on territories of gold and tin mining in Gallia from Iron Age to Roman time

Recent archaeological researches had broad to light many new informations on the mining practices for gold and tin metals throughout Gallia, especially in the Iron Age. The mining was either done on reef lodes than on alluvial deposits for both metals. Some of the works are rather superficial even if spread on large areas, others especially in rock mines are much deeper and wider. All these extractive activities have been taken place in the mountains areas of the country, as Brittany, Massif Central and Pyrenees. Their impacts are mainly on the landscape and the territory occupation, as well as on the resources in wood or water. They also revealed new occupied areas with population and economy not considered in the History until then. With the Roman period, part of these mining activities were either stopped or pursued depending of the regions, the nature of the deposits or the general economical politic of the moment. We will go through the main aspects of this tema.

5. Raphael Alexander Eser (Humboldt-Universität zu Berlin) - Fabian Becker (Freie Universität Berlin), New insights into an old iron mining landscape: Elba Island

While the ancient mining of iron ore and its further processing on Elba Island is an undeniable fact, the duration of iron production and its impact on the island's landscape is still not clear. Modern research assumes different beginnings for the exploitation and smelting of iron from the 9th to the 5th c. BCE. In contrast, the end of iron production is dated exactly to the late 1st c. BCE and linked to written sources such as Pliny's senate decree on abolishing mining in Italia (HN 3,138) as well as a presumed lack of wood.

Our paper presents recent archaeological results of an interdisciplinary research project on ancient iron mining and smelting on Elba. On the basis of new data and the current state of research, several aspects are discussed: 1) chronology and topography of iron mines and smelting sites; 2) handling of the necessary resources as well as transport on and around the island; 3) economic role of the Elban iron. New radiocarbon dates and so far underestimated archaeological finds indicate a new chronology of iron production from the 6th c. BCE to the 2nd c. CE. The topo-chronological evaluation shows a concurrent acceleration of smelting even in remote areas of Elba in order to make use of the local wood and water resources as well as already existing maritime trade routes. The continuation of Elban iron
production after the presumed date of the senate’s prohibition is contrary to current opinion that Roman imperial Italia obtained iron only from the provinces.

6. Norbert Hanel (Universität zu Köln) - Bärbel Morstadt (Ruhr-Universität Bochum), The Iglesiente. Archaeological and historical landscape studies of the mining area in Southwest-Sardinia from the Early Iron Age into Late Antiquity

Sardinia was famous in Antiquity for its silver, lead, copper, and presumably zinc deposits. The metal abundance is considered to be the main reason for the Phoenician, Punic, and Roman interest on this island in the first millennium BC until Late Antiquity. Nevertheless, the exploration of Sardinia as an important mining region in these periods has scarcely been done, neither with the use of the ore-resources, the installation of the mines, the smelting and working places, the transport and trade of the ores, nor the therewith connected administrative and socio-historical aspects.

In a three-year-project, the development of the local infrastructure (e.g., roads, settlements, sanctuaries) in correlation with the ore deposits, and the smelting and working places of the chaîne opératoire, in combination with the historical background from the 1st millennium BC until the Late Roman period in the Iglesiente – the most rich in ore-region in Sardinia – shall be systematically explored and set into a broader context. Evidence is available by archaeological, literary and epigraphic sources and shall be combined by newly created data by different methods.

7. Nerantzis Nerantzis (University of Lille 3), The organization of mining and metal production in Aegean Thrace from the Archaic to the Roman period

The significant metal deposits of the North Aegean had been renowned in the ancient world as briefly mentioned in myths and historical accounts. Long before the arrival of the Greeks in the Thracian littoral, the processing of minerals to produce copper, lead-silver and collection of alluvial gold was common among the native populations. With the gradual establishment of Greek colonies and emporia in the Archaic period, an increase in mineral exploration and metal production is manifested by relevant archaeological findings. Interdisciplinary research in this region was initiated in the early 1980s when several mining shafts and metallurgical sites have been located across Mount Pangaeon and the Lekani mountain range. In recent years renewed interest on the study of mining landscapes in Aegean Thrace combined with new excavation projects brought about important new information. This paper discusses the issue of mining and metallurgical activity across this region from the Classical to the Roman period in the light of recent archaeological data. The ongoing excavation project at Pistyros (Pontolivado), a Thasian emporium west of the Nestos estuary has yielded large volumes of metallurgical slag. Initial examination has confirmed that these residues derive from the reduction of iron ores in furnaces and forging of the blooms as well as copper and lead/silver extraction dating to the Classical and Hellenistic periods. While the evidence for mining exists at various localities in the Lekani, presumably in Thracian territory, secondary processing and manufacture of objects was achieved within this Greek fortified emporium. In this context, accessing, controlling and negotiating mineral resources among the indigenous Thracian populations and the inhabitants of the Greek settlements are fundamental in understanding the organization of metals production in the North Aegean.

8. Eva Steigberger and René Ployer (Bundesdenkmalamt, Österreich), Noricum. Economic Factor Alps

The presentation deals with the cultural landscape of Noricum before and during the Roman Empire. Mining as a major economic factor changed the landscape significantly and makes it possible to discern large-scale structural pattern of trade towards the South and Italy and towards the North and the Limes. Wealth in a region with only small-scale agriculture had to come from other sources and the influx of money developed a need to luxury. The remains still visible in the landscape of the region combined with finds lead to an identification of those economic roots. The Archaeology Department of Austria’s Monuments Authority organized projects with new results towards the understanding of the economic factor Alps, that shall be presented and show, how iron, salt, marble and their trade defined the inner alpine region of Noricum for centuries.
9. David Quixal Santos (Universitat de València), Metallurgy in the Eastern Iberian Peninsula during the Late Iron Age (3rd - 1st centuries BC)

In this paper we will focus on the mining and metallurgy in the Eastern Iberian Peninsula during the Late Iron Age (3rd to 1st centuries BC), concretely in the interior of the province of Valencia (Spain). In this area we have documented three huge territories controlled by three important Iberian oppida: Ke-lin (Caudete de las Fuentes), Edeta (Llíria) and La Carència (Torís).

We have compiled abundant information about the processes of exploitation and transformation of the metal from the 4th/3rd centuries BC to the Imperial period. The main activity was the siderurgy, but we have also many evidences of working with other metals such as lead or bronze. We have documented surface and gallery mining, presence of reduction and forging slags in numerous sites, existence of metallurgical furnaces and a big number of tools. We will also present all the new discoveries from the siderurgic furnace of Los Chotiles (Sinarcas), which has been excavated during the summer of 2017.

10. Victor Martínez Hahnmüller and Roald Docter (Ghent University) - Carmen Ana Pardo Bar- rionuevo (University of Almería), More than silver. Rural Exploitation at Qart Hadasht / Carthago Nova hinterland

In order to verify the intensity of the Carthaginian exploitation of its territorial resources and to define its pattern of exploitation in Iberia, we have developed a survey in the hinterland of the Barcid colony of Qart Hadasht (Cartagena, Murcia, Spain).

The selected area, between Trujillo and Carrasquilla’s Ramblas (Campo de Cartagena), as a result of its geo-physical features and the dominant resources, had also allowed us to evaluate the Carthaginian attitude towards the use of certain resources such as salt, silver and other metals mining, agriculture, fishing, or stone quarries.

The preliminary results that will be presented at this conference will show the compatibility of mining with other economic activities, focusing specially in the Carthaginian period and the subsequent Republican Roman exploitation of the landscape.

11. F. Javier Sánchez-Palencia Ramos (Instituto de Historia, CSIC) - Brais X. Currás (University of Coimbra), Roman Gold Mining in Lusitania: Territory and Society

The systematic study of the territory carried out during the last years with the support of remote sens- ing techniques has revealed an important mining area in Lusitania. It is, undoubtedly, one of the most important gold mining regions of the Roman Empire. The aim of this paper is to present a synthesis of the principal gold mining Lusitanian landscapes. We will focus on Aurifer Tagus, one of the most famous gold-bearing rivers of Antiquity, referred as such in the classical sources since the end of the Rep- ublic. The Alva valley and the Cavenes del Cabaco will complete the picture of the Lusitanian mining landscapes.

From a perspective that insists on the non sector-based character of ancient mining, we will present Lusitanian mines not as an isolated element but from a broader and more inclusive focus, considering its social and economic component as one of the many dimensions that define the landscape. We will pay attention to the role of mining within the broader framework of the political transformations from the Augustan Principate and we will take into account its relation with the role played by the army in the organization of the territory. We will also analyze the agricultural landscapes associated with the mining landscapes.

12. Linda Gosner (University of Michigan), Imperial Mines and Local Industries: Communities of Practice and Cross-Craft Production in Roman Mining Landscapes of Southwest Iberia

The landscapes of the Iberian Peninsula were famous in antiquity for their abundant metals, and schol- ars have long recognized the contribution of mining in this region to the Roman imperial economy. Studies of the economic role of mining—and other large-scale extractive industries—often focus on big questions: how much was extracted and where did it go? Recently, however, archaeological research on mining landscapes has allowed scholars to consider the impacts of Roman imperial mining on local economic organization.
In this paper, I examine subsidiary industries in the mining landscapes of the Iberian Pyrite belt in southwest Iberia during the early Empire, including the role of potters, smiths, carpenters, and basket-makers in supplying the tools necessary for underground copper mining. Roman mining stimulated pre-existing local industries (ie: esparto grass basket-making) but also brought about the import of technological traditions (ie: Hellenistic water-lifting devices) for use in novel ways. Here, I consider the contributions of craftspeople in subsidiary industries to the operations of Roman mining, as well as the ways that mining stimulated cross-craft production across industries through the sharing of resources, equipment, and ideas. I shed light on how large-scale mining altered local economies and labor organization, and ultimately, how economic interactions in mining landscapes stimulated the formation of diverse communities of practice among inhabitants.


The possession of mines or other soil resources is usually recognised as basis for either private or public wealth. By going deeper into the matter, it becomes quickly obvious that the situation is much more complicated and depends on further parameters. These reflections and the researchers curiosity were at the beginning of scrutinising the question about the profit of the Roman goldmines in the Northwest of the Iberian Peninsula in the 1st and 2nd century AD.

Most discussions on the profit of mines in antiquity are connected to the extensions of the deposits and such factors as the, often falsely, evaluated quantity of extracted material and the speculative percentage of its gold-content, in short of the quantity of ore.

Such an understanding of the matter caused to the proposition to approach the topic by a wider range of single valued factors. These are based on modern evaluations of a newly detected deposit and its probable profit. They include not only the quantity and quality of the ore, the difficulties of the exploration and the costs of the extraction of the metal from the ore, but also such decisive factors as the actual need of the product and therefore its price (see e.g. the increase of the price of Lithium in the last years), the political and economical situation of the country, the infrastructure needed for the exploration and the difficulties of its setup, just to refer to a few.

The results of the archaeological investigations on the Roman goldmines in the Northwest of the Iberian Peninsula and especially in the territorium metallorum Tresminas / Jales in the North of Portugal in the last decades allow to discuss a new approach to the concept of profit in the 1st and 2nd century AD.

A new understanding of its highlights underlines as well the significance of a so far only sparsely considered and simultaneously very important sector of Roman economy.

Panel 4.3 From the Quarry to the Monument. The process behind the process: Design and Organization of the work in ancient architecture

Organiser: Adalberto Ottati (Pablo de Olavide University, Seville) and Maria Serena Vinci (Université de Bordeaux Montaigne)

Saturday | 26 May | 09:00-13:30 | HS V

Panel abstract

The project and the organizational aspects of the work represent the first fundamental steps to reach a good final product within the economical and constructive complex system of a building's setting up. It deals with processes hardly decipherable and that we can understand only after an accurate observation and analysis. The skilled workers are a crucial element, guarding the technical knowledge and expertise about extractive and constructive working processes that guarantee the successful work-out of the "cantiere di costruzione". Within this context, the discussion will focus on two main topics: - Quarry marks or notae lapicidinarum - Carving lines in architecture and on artifacts The complexity of the ex-
traction processes and of the storage, trade, control and accounting procedures determined the need of a sort of tracking code: quarry marks consequently generated a sort of code to track the materials from the extraction point to their final placement. At the same time, the carving lines represent guidelines useful to the building planning and positioning of stone and marble elements. In this way, marks and carving lines stand as two aspects of the three-dimensional materialization of the project and organization processes within the building activities. In this context, the skilled workers use systems to communicate and transmit their knowledge: these systems are actually difficult to interpret, but they had to be clear and easily accessible to them. This session focuses on a wide range of subjects covering different chronological ranges and geographical areas. The goal is to set up a debate deepening our knowledge of the construction systems and to identify differences in working and transmission procedures of technical expertise by skilled manpower. It would be of the most interest to outline the system of connections existing among the workshops. Indeed, in any age, there must have been a sort of network linking the quarry to the monument in a bilateral way. Finally, to analyze and trace the production process of ancient architecture to the nota lapicidinarum and carving guidelines will allow to reach original and innovative considerations on workshop's networking employed in the extraction and constructive activities.

**Paper abstracts**

1. Adalberto Ottati (Pablo de Olavide University, Seville) - Maria Serena Vinci (Université de Bordeaux Montaigne), Carving instructions, quarry and construction marks for stone artifacts production in Roman world

Recently a field of research, aimed to study stone/marble artifacts production not only for their function as final product, but also for examining the elements for their making process, is getting a space. Within this kind of approach, incised preparatory lines and mark-guidelines observed on several stone artifacts, are fundamental. Too often these incisions have been relegated as “marks of making”, underestimating their meaning: they are significant clue for study and really understand technology and know-how of the ateliers in the working process of marble objects.

This contribution aims to propose an overview of different characteristics of the making process by observing, above all, architectural marble elements, proceeding from different archaeological contexts, in order to highlight the potential of this field of research for investigating the transfer of knowledge in ancient world from the foreman to skilled specialist manpower.

This study is part of a research project aimed to study the transfer of ideas and knowledge for technology in ancient world, possibly identifying regional influence or local traditions.

2. Begoña Soler Huertas (Universidad de Murcia), Signum lapidarium: Classification and meaning in the roman period

Mason's marks are among the most intensely studied topics within the field of 'archaeology of construction'. A large diversity of such marks have been identified to date, on an equally diverse typology of masonry work, which suggests that these marks followed a coded language which included all stages of construction, including the transportation, commercialisation and erection of the masonry blocks.

Glyptography distinguishes between personal signatures, either individual or collective, and practical signs, including quarrying marks and others connected with the positioning and assembling of the block in the final construction. Evidence concerning the organisation of quarry work in the Mediterranean region, as well as evidence pertaining to supply and redistribution centres, suggest that some of these marks refer to the quarrying stage, and would be executed within the source areas, while others were related to quality control and commercialisation, and would be inscribed further down the line. This contribution aims to examine a selection of incised and painted marks on stone, including alphabetic and numerical signs, lineal marks and ideograms. Although the coded language employed is hard to interpret, the global analysis of these marks and their respective archaeological contexts (exploitation areas, harbour warehouses and construction sites) suggests that these marks were used in a wide variety of situations.
3. Tentori Montalto, From the quarry to the inscription in the Greek world

A considerable part of the material coming from the quarries became monuments bearing inscriptions. In particular some typologies of manufacts, e.g. stelae, araee, milestones, were created in the sculptor's workshop. But can we distinguish between miner, sculptor, and stonecutter? What do their ancient names actually indicate? And, for instance, who engraved the guidelines? The studies on this issue (in particular: G. Susini, Il lapicida romano. Introduzione all'epigrafia latina, Bologna 1966) show how hard it is in many cases to distinguish between lapicida, lapicidarius, quadraturarius, sculptor, and sculptor. However, Greek sources, above all the epigraphical ones, prove insightful for this issue, as I recently remarked (M. Tentori Montalto, II lapicida greco, Epigraphica 76, 2014, pp. 17-46). Therefore, I would like to discuss the most representative ones, such as payment's registrations (IG VII, 3073 and IG XI, 2, 161) and sculptors' signatures (IG I3 680, 763, 788, 1218, 1344), with the aim of distinguishing different type of works which implies a different skill set. How do these sources contribute to our knowledge of the passage from the quarry to the inscription? This paper aims at displaying a chronological continuity or discontinuity in the process of the production of inscriptions in the Greek world, underlying similarity or difference throughout the centuries and possible correspondence with the Latin sources.

4. Alberto Dalla Rosa (Université Bordeaux Montaigne), Supplying grain to imperial quarries: how to approach different sources and contexts?

The exceptional documentation available for the imperial quarries of Mons Claudianus in Egypt allows for a detailed insight into the practices and the problems linked to the supply of provisions for the workforce of this large imperial exploitation. Other contexts are far less documented, but that does not imply that we cannot reconstruct at least some of the aspects of the supply organization. Recent studies have shown that epigraphic or archaeological data can reveal how the grain needs of workers employed on large extraction sites had a profound impact on the exploitation of arable land in a more or less large region. The purpose of this paper is therefore to compare the documentation coming from the regions surrounding different imperial quarries (Dokimeion, Simitthus, Mons Claudianus and others) in order to show how the combination of different kinds of sources can help us to reconstruct some general traits of the grain supply and to understand the adaptations needed for the different local contexts. A particular attention will be devoted to the evidence concerning the development of private and imperial estates in these regions. The geographical extension and the nature of the competences of imperial freedmen procurators managing the quarries will also be scrutinized in order to better determine the role of these officials in the organization of the supplies.

5. Gianfranco Paci, Materiale da costruzione e marchi di cava nelle città romane dell'area medioadriatica

L'uso di materiali lapidei è condizionato, in quest'area, dalle caratteristiche geologiche, che evidenziano da un lato l'assenza di marmi, dall'altro la disponibilità di arenaria e di una certa varietà di rocce calcaree.


Resta difficile, al presente, conoscere l'entità dei flussi di approvvigionamento e soprattutto i rapporti quantitativi, nel tempo, tra marmo lunense e marmi d'importazione. Ciò dipende dal fatto che, salvo eccezioni (come quelle su Urbs Salvia e Forum Sempronii), manca una indagine di carattere generale sulle singole città antique del territorio riguardanti l'uso dei materiali lapidei in edilizia ed in particolare dei marmi; così come è finora mancata una ricerca volta all'individuazione della cave antique.

6. Maria Serena Vinci (Université de Bordeaux Montaigne), Notae lapicidinarum from a limestone quarry: preliminary considerations on quarry labels and their function in building process of early public architecture at Tarraco (Hispania Citerior)

The notae lapicidinarum marked on the architectural or stone elements it's largely attested for the roman period. However, signs, letters or inscriptions represent a difficult subject to approach in relation to their interpretation which is largely cryptic and inaccessible.

In early imperial age, Tarraco (modern Tarragona, Spain), capital city of the largest Roman province in the Western Mediterranean, experienced an intense building activity that totally modified its architecture and urbanism. This intense construction activity is testified by the impressive architectural remains of the Provincial Forum, but also by the exceptionally well-preserved evidences of stone supply, such as the large quarry of El Mèdol.

A remarkable collection of quarry marks are preserved on a large number of blocks proceeding from the provincial monument, but above all from the site of the limestone quarry; the majority are carved labels and a small group are painted marks (red paint or ), which only rarely are preserved, especially on building materials.

This contribution aims to approach the study of an important group of notae lapicidinarum, related to the construction of the major monument of the Citerior capital city, in order to better understand the organisation of the building industry for the construction of a public architectural complex, which process starts in the quarry site, extracting materials, and is completed placing the materials in the construction site.

7. Navarro Caballero (Université de Bordeaux Montaigne) - Angeles Magallón Botaya and Paula Uribe (Universidad de Zaragoza), Marcas epigráficas en la Presa Romana del Muel (Zaragoza)

La Presa Romana de Muel (Zaragoza) es uno de los monumentos hidráulicos romanos más relevantes de Hispania. Situada a 30 km de Caesaraugusta y destinada a almacenar agua para abastecer a la colonia y territorios agrícolas cercanos a la misma, ofrece datos significativos para comprender el proceso de organización y explotación del territorio de Caesaraugusta. Se trata de una presa de gravedad sin escalones. Mide 10,35 m de altura máxima y 7/8 m de anchura en el coronamiento y 11,54 m en su zona inferior de anchura. Respecto a su longitud, se estima que pudo alcanzar los 100 m. Construida en época augustea, la presa quedó prácticamente fuera de servicio a finales del siglo III p.C. debido a los aportes de los aluviones del río Huerva que la colmataron rápidamente y han facilitado su excelente conservación.

Mención especial merece el conjunto de marcas epigráficas, del que nunca conoceremos su número, al estar situadas en lugares inaccesibles e invisibles dentro del muro de la presa. Constituyen un unicum por su variedad y datos que ofrecen para el estudio y conocimiento de la explotación de las canteras y de la construcción de la presa. Junto a la presa se encuentra la cantera de la que se extrajo la piedra empleada en su construcción, lo que ha permitido analizar el proceso de extracción de la piedra y la secuencia de la realización de la misma. El conjunto de presa, embalse y cantera romanos de Muel conforman un conjunto único en Hispania.

8. Arleta Kowalewska and Michael Eisenberg (University of Haifa), Masons’ Marks of Antiochia Hippos and Roman Syria-Palaestina

Masons’ marks are a well-attested phenomenon among Classical-periods sites; however, often they are not fully documented and researched. The lack of a comprehensible database impedes interpretation of these marks and the possibility of their further use as archaeological evidence, which the paper strives to relive to an extent.

The first part of the paper presents results of a survey conducted at Antiochia Hippos (Sussita) of the Decapolis. The survey yielded identification of almost 400 marks engraved in stones in the quarry for accounts and indication of assembly order. The second part introduces additional masons’ marks documented on local building stone in various Roman period sites of Syria-Palaestina, from rural sites of the chora of Hippos, through other cities of the Decapolis, to Herodian and Nabatean constructions.
The gathered material gives insight not only as to the function of the marks, consequently indicating how the construction process of different structures was organized, but also as to a relative and absolute dating of the constructions that the marks appear on, and in some cases the ethnicity of the local stonemasons. The study of masons' marks of Syria-Palaestina reveals some curious trends connected to their dating and geographical distribution, such as the particularly numerous occurrences on the first and second century C.E.–dated basalt monumental architecture that indicate a certain work organisation of local basalt craftsmen at the time.

9. Atienza Fuente (Universitat Rovira i Virgili), Marcas y Trazados de replanteo, puesta en obra y elaboración de elementos constructivos pétreos en la arquitectura pública de Valeria (Cuenca, España)

La monumentalización arquitectónica que tiene lugar en la ciudad hispanorromana de Valeria (Cuenca, España) en torno al cambio de era afectó a gran parte de la ciudad. El desarrollo del proceso constructivo se realizó cuidando los aspectos técnicos de cada una de las fases: desde la extracción de los bloques pétreos, el diseño y la labra de los elementos arquitectónicos, para finalizar con su puesta en obra.

Las excavaciones arqueológicas han exhumado el área forense de la ciudad, donde se concentraban los edificios más importantes. La mayoría de estos edificios se encuentran prácticamente arrasados. No obstante, muchas de las estructuras conservadas y de los elementos arquitectónicos recuperados presentan en sus superficies marcas, trazos y líneas, así como agujeros u oquedades labradas que arrojan una valiosa información sobre la organización y el desarrollo de los procesos constructivos que allí tuvieron lugar. Encontramos marcas y líneas incisas para el exacto posicionamiento de los bloques pétreos, que denotan una cuidada y estudiada planificación técnica del proyecto de edificación; trazos grabados en los bloques pétreos que sirvieron para resolver problemas geométricos y, también, para tener una referencia precisa a la hora de esculpir y elaborar basas y capiteles; y, finalmente, una gran variedad de huecos labrados a propósito en los elementos arquitectónicos que sirvieron tanto para la puesta en obra de los mismos, como para su fijación definitiva tras su puesta en obra.

Panel 4.4 The Exploitation of Raw Materials in the Roman World: A closer look at producer-resource dynamics

Organiser: Dimitri Van Limbergen and Devi Taelman
(Ghent University)

Friday | 25 May | 14:30-19:00 | HS III

Panel abstract

Pre-industrial societies were all dominated by agricultural production. What distinguishes them is the importance of the non-agrarian sector of the economy against that agricultural background. While not escaping the limits of an organic economy, the Romans stand out for having developed a wide range of manufacturing businesses and services (e.g. construction, fuel supply, metal- and pottery production). This development stimulated the widespread and large-scale extraction of raw materials like stones, ores, clay and wood. Compared to other premodern economies, raw material consumption rates in the Roman world were thus high. The way in which both renewable (wood) and non-renewable (stone, minerals, metal, clay) resources were exploited is an important determinant for the functioning and longevity of a pre-industrial economic system. Even in a territory as large as the Roman Empire, such activities put considerable pressure on the land. Strategies of resource-exploitation and conservation were thus essential in dealing successfully with this situation in the long-term. The question of how the Romans dealt with the uncertainty of natural reserves and the unpredictability of consumption is very
much at the core of the debate on the non-agricultural ancient economy. The issue revolves around whether their decisions and actions merely reflect a ‘substitution of resource sources’ mentality – that is, exploiting a particular resource until depletion, after which new possibilities were simply explored further afield – or if optimal extraction strategies may be identified. In other words, how rational were the Romans in their exploitation of raw materials, and to which extent did they counteract over-exploitation for economic and ecological reasons? With this panel, we would like to explore if, when, where and how the Romans pursued a harmonious balance between the limited availability of a particular resource and the law of supply and demand. We are hereby particularly interested in identifying measures that show environmental concerns in their management strategies. This may be through specific case studies on both smaller and larger territorial scales, or by reflecting on the issue on a more theoretical level. We especially welcome proposals that focus on innovative approaches and/or draw on inter-disciplinary datasets (geo-and bioarchaeology, paleoecology, etc.).

**Paper abstracts**

1. Wim De Clercq (Ghent University), Salt for the Soldiers. The technology and economy of Roman salt-making in Northern Gaul

Historical and archaeological sources bear extensive testimony of the large-scale extraction of salt in the most Northern parts of Gaul. Several find complexes in the coastal areas of the civitates Menapiorum and Morinorum (now Belgium and France) as well as textual evidence attested in Italy and Gaul point to the importance of this resource-exploitation in a remote area of the Roman Empire. The technological and social organisation of the extraction strategies of this seemingly inexhaustible resource in a difficult landscape-context as well as the complex social and economic mechanisms that seem to have been at stake in the transaction of the salt to the military and civil consumers will be at the centre of our talk. It will be assessed whether technological constraints in the salt-works, environmental conditions in a continuously changing landscape or even the social context were putting constraints on the exploitation of salt. Specific attention will also be drawn in this context to the specific use of various types ceramic containers and supports in the salt works.

2. Fernando Lopez-Sanchez (University of Oxford), Fishing factories and the limits of navigation in the Ancient Roman Mediterranean

This paper explores the narrow links existing between the creation and exploitation of fishing factories and the navigation across the Mediterranean Sea during Ancient Roman times. It is maintained that the extraction of salt and many of the activities carried by many fishing factories established along some strategic points in the coasts of the Mediterranean Sea were not fundamentally private enterprises directed to private consumption, but activities orientated to the supply of food to the sailors of fleets connected with the Roman State. We explore the dependence of Roman navigation in the Mediterranean Sea on the periodical migrations of some species of fish in its waters. We also explore the limits imposed on Roman official navigation by the capabilities of the fishing factories charged with the supply of salty fish and other products to Roman sailors.

3. Tibor Grull (University of Pécs), From knowledge transfer to transplantation. Economic role of medical plants in the Roman Empire

Transfer of natural resources–including plants–is a constant phenomenon accompanying colonization. “Plant imperialism” had a powerful impact in the history of mankind: new food plants caused radical changes in the dietary customs (potatoe, corn, rice), and had long-term effect on our everyday life (sugar, tee, cocoa, tobacco). Some economic plants transformed entire industrial sectors (rubber), and some helped to treat successfully endemic deseasees (quine). This lecture focuses on the transfer of medical plants in the Roman Empire, viz. knowledge transfer, transplantation, and product transfer. (1) “Knowledge transfer” always preceded exploitation of nature. The number of medicinal plants recorded almost trebled between 400 BCE and 250 CE as the Greeks discovered more about the regions beyond the Mediterranean. (2) The second phase is the exploitation of nature and transfer of plants. Exotic
plants were often transferred far from their original biotope and were grown in gardens. Roman herb gardens had important economic value: they provided medicine for the population. (3) The third phase is the commercialization. Medical plants and pharmaceuticals became conventional commodities in the Roman Empire, as it has been proved by archaeology and epigraphy respectively. (4) Considering that the average health condition of the Roman population was in all probability quite poor, the “medical industry” had a considerable economic value in the Roman Empire.

4. Fabian Becker (Freie Universität Berlin) - Raphael Alexander Eser (Humboldt-Universität zu Berlin) - Brigitta Schütt (Freie Universität Berlin), Elba deforested? New perspectives on the ancient bloomery smelting landscape of Elba Island (Tuscany, Italy)

Elba Island was—together with mainland Populonia—the center of bloomery smelting in Roman Italia. Whereas mining on Elba and smelting in Populonia continued until the 2nd c. CE, most Elban smelting sites were abandoned in the 1st c. BCE. This abandonment is commonly explained with deforestation—i.e. a lack of fuel wood to run the furnaces. Our paper reassesses this ‘deforestation hypothesis’ in the context of the common understanding of ancient metallurgical centers as hotspots of deforestation and Grove and Rackham’s skeptical view on the ‘ruined landscape’ theory.

After shedding light on (i) the development of the deforestation hypothesis in travel narratives from the 18th and 19th c. and (ii) the Roman forest management system as evident in the pattern of smelting sites on Elba, we focus on new (iii) sedimentological evidence and (iv) results from wood resource modelling.

Sediment sequences obtained on Elba suggest that the morphodynamics—especially floods and erosion on the slopes—accelerated during the period of Roman smelting. In addition, charcoal content in the sediments increased and a uniform species composition suggests a human imprint. Nevertheless, the resource modelling indicates that wood availability and regrowth most likely exceeded wood consumption.

In synopsis, our results indicate that there are good reasons to doubt that deforestation was the (only) reason for the abandonment of smelting sites on Elba Island, although smelting had a significant local impact.

5. Christophe Vaschalde (LabEx Archimède - Archéologie des Sociétés Méditerranéennes) - Corinne Rousse (Aix Marseille Université) - Gaetano Benčić (Zavičajni muzej Poreštine) - Benoît Brossier (Institut des Sciences de l’Evolution de Montpellier), Production and management of fuel for the imperial ceramic workshop of Loron (Croatia). An archaeological and anthracological approach

The great workshop of Loron (Tar-Vabriga, Croatia) corresponds to an out of standard complex of pottery production, known as the property of senators and emperors, from Domitian to Hadrian. Built on the seashore around 10 AD, on the territory of the colony of Parentium (Poreč), it was mainly dedicated to the large-scale production of Dressel 6B oil amphorae, intended for exportation. From 2012 onwards, an international scientific program focuses on the exploitation of natural resources, especially fuel to supply the high yield kilns. The methodological approach, based on archaeological and bioarchaeological datas (anthracology and dendrometry), shows that the amphorae production is based on a rational management of forest, and a sustainable land investment. The recent excavation of one of the kilns, perfectly preserved, with a set of intact carbonized logs of wood discovered in the præfurnium can precise the management of the fuel and the functioning of the kilns in the last phase of activity of the complex. The results will be compared with the datas of other ceramic workshop centers, in Gaul and Baetica, on which similar interdisciplinary studies have been conducted. The case of Loron is one of the few examples of application of bio-archaeological approach on a potters’ workshop during the High Empire. The problematic of deforestation during the Antiquity is renewed thanks to this approach.
6. Gabrielle Kremer and Sophie Insulander (Institut für Kulturgeschichte der Antike, ÖAW) - Michaela Kronberger (Wien Museum) - Martin Mosser (Stadtarchäologie Wien), Stone supply for Carnuntum and Vindobona. Provenance analysis in a historico-economical context

The paper as a part of the interdisciplinary project „Stone monuments and Stone Quarrying in the Carnuntum – Vindobona Area“ (FWF P 26368-G21) highlights chronological developments and the role of distance and accessibility for ancient stone supply in Carnuntum and Vindobona.

For Carnuntum, where far more than 2000 sculpted Roman stone artefacts made from Neogen calcareous sandstone and limestone are known, the petrographic analysis of selected object groups throws new light on the initiation and development of local and regional quarrying activities implemented by military troops since the mid-1st c. AD. Local supply from the immediate vicinity of Carnuntum has been complemented from the beginning by rocks from the Wolfsthal quarries and the Leitha Mountains area. The question arises how the choice of material is related to the types of monuments, workshops and lithological properties.

For Vindobona, the analysis of about 200 Roman stone objects, including all types of artefacts from art works to quernstones, suggests that three quarrying areas were significant. After the installation of Roman troops, stone material for construction and infrastructure was quarried from the immediate vicinity as well as the region south of Vindobona. In contrast, for gravestones, altars etc., finer-grained rocks from the Leitha Mountains area, located about 35 km from Vienna, were important, which shows that longer transportation routes were accepted in exchange for a higher-quality result.

7. Florent Delencre and Jean-Pierre Garcia (Université de Bourgogne-Franche-Comté), Stone resource economy during the 1st century BC in Aeduans and Lingons territories

Stone is a major element in Roman construction and its systematic use contributed to the complex process of economical and cultural changes known as romanization. It is accompanied by new quarries, appearance of new tools and new know-how required in order to extract and to implement these materials.

The analysis of building stones supply appeared as relevant for several archaeological sites, dated from the 1st century BC, belonging to two territories located in Centre-Eastern Gaul: Aeduans and Lingons ciuitates. Indeed, in spite of their belonging to two different Roman provinces, their relationship to Rome seems alike: these two territories are called foederati ciuitates.

The highlighting of differential origins for stones according to construction needs (use of resources near the sites for masonry elements, choice of peculiar stones for specific architectural elements) marks precise selections depending on economical, technical, and aesthetic criteria. Buildings on Lingons territory are characterized by an exclusive use of local stones, never exceeding a 25 kilometres distance, whereas the Aeduans can occasionally choose resources farther. These discrepancies raise a question concerning the insertion of various building sites in economical and architectural problematics. Moreover, they show that both building materials and stones can be considered as cultural markers, linked to a global transformation of construction and perception of material resources in the environment.

8. Maddalena Bassani (University of Padova), Beyond health. The exploitation of the thermomineral resources in artisan activities

The study of the thermomineral resources in Roman age, conducted at the Department of Cultural Heritage of Padua University during several years, constitutes a research topic widely analysed. From the archaeological evidences attested in the Euganean area, the research has examined both the thermomineral sites in ancient Italy, recorded by means of a GIS database, and, more recently, those of the western Roman provinces.

Thanks to an extensive analysis of the structural and infrastructural records, the results have been multiple. On one hand, in the most known cult-healing perspective, several data related to the different dynamics of public and private settlements at the curative springs are collected and published. On the other hand, it has been possible to recognize, in certain contexts, clear traces of a non-therapeutic exploitation of the mineral sources and of their by-products (i.e. stony deposits, muds, pure elements, as
in the case of the sulphur).

In this sense the paper will offer a detailed overview of the use of thermomineral resources for hand-made and commercial activities, starting from the archaeological records already studied. It aims at profiling both a wide number of Roman sites not strictly classifiable as curative settlements but, rather, as artisanal establishments and, also, it intends highlighting, where possible, affinity with mining practices and productions consolidate in post-antiquity age.

Panel 4.5 Roman and Late Antique Industries

Saturday | 26 May | 11:30-13:30 | HS II

Paper abstracts

1. Dagmara Wielgosz-Rondolino (University of Warsaw), Marmora Asiatica. Polish studies on marble quarries in Asia Minor

Three years ago Institute of Archaeology of the University of Warsaw has launched an interdisciplinary project, “Marmora Asiatica. Towards archaeopetrology in Poland,” financed by the National Science Centre of the Republic of Poland and supported by the Ministry of Culture of the Republic of Turkey. The main objective of the project is to document the archaeological settings as well as topography and geology of the most important ancient marble quarries in Asia Minor. Another goal is to develop an extensive database of petrographic and geochemical properties of white and grey marbles.

An international mission carried out three research seasons of fieldwork: the first, in 2014, focused on the quarries of İscehisar (ancient Dokimeion) and Göktepe, the second, in 2015, on the quarries of Altintaş and Aphrodisias, and the third one (2016) on the ancient quarries of Prokonnesos (Marmara Island).

The major aim of the surveys was to locate and record ancient quarries as well as to collect marble samples to provide mineralogical, petrographic and geochemical characteristics of the marbles for the database.

Mapping was carried out with a total station and GPS-equipment, although the most important and useful for this kind of documentation was a three-dimensional scanner. This allowed for estimate the volume of stone extracted and make a three-dimensional model of the best-preserved quarries.

2. Younes Ameur (University of Tunis), Marble stones of Jbel Tebaga of Medenine (Tunisia) and their uses in Roman Buildings

Jbel Tebaga of Medenine is located in the South-east part of Tunisia, about 25 km West-North-West of the town of Medenine. During the surveys several ancient open air quarries of onyx and grey marble limestone were discovered. Traces of block extraction and cutting marks are well preserved on the cut-rock faces of these quarries. According to the petrographic and chemical analyses the blocks extracted from these quarries were used to build and decorate the buildings of both Roman cities of Jecktis and Meninx.

This paper deals with onyx and marble limestone quarries, and their extraction techniques. Then we will demonstrate through petro-chemical analyses how extracted blocks were employed in buildings of the two neighbouring Roman cities.

3. Zdravko Dimitrov (National Institute of Archaeology and Museum - Sofia), The Travelling Stonemasons in Roman Thrace – new evidences about the distribution of marble, about the spread of architectural traditions and sculptural models in the Principate

Dozens of years ago prominent scholars like M. Squarchiapino, J. Toynbee, J. Ward-Perkins and Y. Mladenova studied in depth the transfer of architectural patterns and sculptural models in the Roman Empire on the basis of the distribution patterns of marble. The ideas and stone carving methods were
spread by the travelling groups of stonemasons, mainly from Anatolia. Masters from Aphrodisias, Nicomedia, Ephesus and Pergamon were commissioned to produce various works in different areas of the Roman world - Italy, Hellas, North Africa. There is a wealth of information about this process from Roman Thrace. Nowadays we can trace this phenomenal distribution not only of stone works, but of architectural patterns, ideas and methods of work, by further studying and analysing the numerous new finds unearthed during archaeological excavations in Bulgaria. The workmanship of the Anatolian masters in Thrace can be perceived in the Roman colonies of Ra-tiaria and Oescus, in the Thracian cities of Odessos, Tomis, Marcianopolis, Abritus, Augusta Traiana and Philippopolis, and especially in the Roman villas in Southern Bulgaria - Kasnakovo and Armira. The recently found architectural and sculptural details substantiate the thesis of the remarkable skills of the travelling Anatolian master-masons carrying out special commissions. This was an essential sector of the Roman economy during the Principate, which was facilitated by the intensive distribution of stone materials – marble and limestone.

4. Khaled Al-Bashaireh and Abdul-Qader Al-Housan (Yarmouk University), Marble trade in Jordan during the Byzantine period: Hayyan Al-Mushrif, a case study

This research investigates the source of marble elements uncovered in situ at the Middle Church of Hayyan al-Mushrif archaeological site, northeast Jordan based on physical, mineralogical-petrographic and geochemical analyses using optical microscopy, X-ray diffraction, and mass spectrometry. The church was remodeled and a rectangular sanctuary was added during the Byzantine period. This sanctuary was bordered with a marble chancel screen. Analytical results were compared with the main reference databases of known Mediterranean marble quarries exploited in antiquity. Proconnesus-1 from Saraylar (Maramara, Turkey) is the most likely primary source for marble trade during the Byzantine period, while Proconnesus-2 from Çamlık (Marmara, Turkey) is a minor source. It is likely that the low cost, availability of ecclesiastical products of standard sizes, large labor forces and advanced transportation methods were the principal reasons for the success of Proconnesus (or Marmara) in supplying ecclesiastical marble for the construction of new churches arising from the spread of Christianity during the Byzantine period.
Session 5: Distribution: trade and exchange, monetarization, credit,
networks, transport, infrastructure (e.g. ports)
Panel 5.1 The Friction of Connectivity – Greco-Roman trade in archaeology and texts
Organiser: Peter F. Bang (University of Copenhagen)
Mark L. Lawall (University of Manitoba)
John Lund (The National Museum of Denmark)
Thursday | 24 May | 14:30-16:30 | HS VIII
Panel abstract
Throughout the 20th century, archaeologists developed ways of applying quantitative data to traditional questions of scale of production, ﬂuctuating levels of imports etc. But historians on both sides of the
old primitivist-modernist divide often relegated archaeology to a largely illustrative role vis-à-vis textbased history. Interest in New Institu¬tional Economics (NIE) has opened up signiﬁcant new pathways
for a productive collaboration between archaeology and history investigating the ancient economy,
since NIE emphasizes the development of institutions to reduce transaction costs or points of friction in
economic systems. Such interest encourages both historians and archaeologists to redeﬁne the questions being asked of the archaeological record and the texts. An important task for an institutional history of ancient economies is the identiﬁcation and evaluation of those factors adding to the cost or effort of transactions. Distance alone and the relative costs and risks associated with overland and maritime transport have long been recognized as factors well suited to archaeological inquiry. Already in
the 1970s and 1980s, economic geography was suggesting ways that diﬀerent economic systems could
modify the basic distance decay model. Such modiﬁcations do not depend on geography alone. Historians have begun to identify and continue to debate the impact of institutions such as systems of measurement, long-distance communication, taxes, and political alliances in increasing or decreasing the
'distance' between transactors. Sophisticated ways of modeling ancient travel are increasingly being
compared with patterns in the archaeological record. Other factors, not least information asymmetry,
also slow or impede transactions. Texts, especially papyri and to a lesser extent stone inscriptions, shed
some light on the changing transactional friction caused by such uncertainties. Study of economic artefacts including transport amphorae, coins, ceramic epigraphy, and even the architecture of market locations are equal if not greater contributors to this line of research. The papers in this session will bring
specialists in the historical, text-based study of ancient economies with particular interests in transaction costs and friction together with specialists in transport amphorae, coins, and architecture.
Paper abstracts
1. Mark Lawall (University of Manitoba), Archaeology of friction and integration: transport amphoras, geography and economy (5th and 4th centuries BC)
Economic geographers have long recognized that a simple distance-decay model rarely describes or
predicts distributions of goods with accuracy. Modiﬁcations to the model often stem from the recognition of institutions, whether physical structures or cultural practices, as facilitating trade (integration) or
impeding it (friction).
Transport amphoras – as the most common container for wine, oil and many other agricultural goods,
and identiﬁable as to region and date of manufacture – are particularly suited to the study of friction
and integration in the Classical economy. Recent decades have seen an explosion of publications from
across the Mediterranean world allowing a suﬃciently precise description of distribution patterns and
their changes over time.
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Topography alone is a poor predictor of these patterns. Further factors to consider include political or military interests, pre-existing social or economic pathways connecting regions, and the amphorae themselves. Amphora shapes might provide important information as to point of origin and qualities of the original contents; however, some jars' shapes deliberately obscure such information, instead offering only the most generic knowledge to the consumer. Stamped impressions indicated the place and date of production and often name individuals involved either in the organization of production or filling of the jars. Graffiti and dipinti provided information about owners, contents, or other qualities no longer decipherable.

2. Kristian Göransson (Swedish Institute in Rome), Cyrenaica and its neighbours: evidence of trade and absence of evidence

Several Greek cities along the Cyrenaican coast, such as Apollonia, Taucheira and Euesperides, flourished as important nodes in long-distance maritime trade with the rest of the Greek world. But what were the commercial contacts with the Cyrenaican cities' immediate neighbours, Tripolitania and Egypt, like? Excavations in Cyrenaica have yielded a fair amount of Punic material but very little from Egypt. Did Cyrenaica import commodities from Egypt, and if so what was such a trade made up of? How did the markets operate and what might have been traded in return from Cyrenaica to its eastern and western neighbours? This paper aims at investigating the sources – texts as well as archaeology – available from the Archaic to the Hellenistic period in an attempt to answer these questions.

3. Jennifer Gates-Foster (University of North Carolina at Chapel Hill), Distant Contacts and Local Imitation: Early Ptolemaic Transport Amphorae from Egypt's Eastern Desert

The excavation between 2013-2017 of the Ptolemaic fortifications at B'ir Abbad and B'ir Samut in Egypt's Eastern Desert has yielded a wealth of new information about the networks of supply that supported Ptolemaic exploitation of the region's resources during the late fourth and third centuries BCE. The ceramic assemblages from the two installations reveal a diverse array of sources for the pottery supplied to the fort, which in turn suggests a wide-ranging web of economic and social connections between the fort's inhabitants and the Egyptian countryside, as well as the Aegean. Notable among this data is the presence of a very large number of amphorae, now known to be used both as vessels for the storage and transport of water, and, in reuse, as repositories for grain and other commodities stored in the forts. The amphora assemblage from both installations contains a range of imported Aegean amphora as well as many locally-produced Egyptian amphorae in a range of forms. Some of these local products precisely imitate Aegean types, while others present a distinctive form that is best understood as a mélange of attributes borrowed from imported types, but combined with local elements to produce a form that is neither imitative, nor entirely free from the influence of Aegean models. This paper offers an overview of the amphora assemblage from these two sites and considers the economic and social implications of their form and use in the third century BCE.

4. Sitta von Reden (University of Freiburg), Greco-Roman trade and institutional change in a frontier zone of the Ptolemaic and Roman Empire (300 BCE to 300 CE)

It has long been recognized that the Eastern Desert in Egypt served as an important imperial periphery for supplying imperial centers such as Alexandria and Rome with “luxuries”, that is, low-volume and high-value goods. Intense archaeological research has confirmed the frequency and scale of this trade the value of which is impressively illustrated by the Muziris papyrus of the 1st century AD. This paper aims to go beyond assessments of scale and value, asking how imperial change affected the economies of the peripheries institutionally. Contractual security, stable currencies, stable currency exchange, increasing technological knowledge, control of dangerous environments, and above all much greater transparency (and thus accessibility) of local exchange networks are among the most important of these.
5. Roberta Tomber (British Museum), Trade beyond the Empire: the Quantification of Roman Amphorae and Implications for Indo-Mediterranean Trade

Classical historians and archaeologists have long sought to understand the ancient economy through the study of artefacts. A variety of reasons – their durability, abundance and potential for source characterisation – make ceramics particularly amenable for investigating the economy. Of the different functional categories of pottery, transport amphorae primarily containing wine, oil and fish products, are thought to be particularly indicative of the agricultural economy so important throughout the Mediterranean world. The now established trend for quantification has resulted in a fairly comprehensive overview of amphora distribution throughout the Mediterranean, which provide a basis for investigating the forces behind this distribution. Related but separate from this distribution is Roman amphorae found beyond the Empire, throughout the western Indian Ocean and India, where they generally but not always occur in smaller numbers than in the Mediterranean. Furthermore they tend to be mostly wine amphorae, although from a variety of source areas. By comparing the distribution of Roman amphorae throughout the Mediterranean with the Indian Ocean, this paper will investigate the similarities and differences of trade in these two regions, focusing especially on suppliers, consumers and the role of institutional backers.

Panel 5.2 Tolls and Ancient Economies

Organiser: Gabriele Cifani (University of Rome, Tor Vergata) and Julien Zurbach (ENS, Paris)

Friday | 25 May | 14:30-19:00 | HS VII

Panel abstract

Tolls and customs duties imposed on road-users and goods played a crucial role in pre-modern economies, but in ancient economic history they have been considered mainly as part of the main income of the state and not often in terms of their direct or side-effects on mobility and exchange. The importance of tolls, however, has never been fully evaluated or debated in recent reconstructions of Early Iron Age and Archaic Mediterranean economies, which have focused mainly on trade circuits and activities of production without giving due consideration to the systems which controlled the distribution of goods and the mobility of people. In archaeological literature, the Archaic Mediterranean is often considered to be a kind of open ground as far as cultural encounters are concerned. We would like to draw on recent work (notably Moreno Garcia, ed., Dynamics of Production in the Ancient Near East 1300-500, 2015, and recent books by the two presenters of this proposal), and to reconsider the true economic factors linked to interconnections and the development of early states in the Mediterranean between the Late Bronze Age and the Archaic Period. The objective of this panel is to offer fresh perspectives by comparing diverse categories of sources concerning the role of tolls and customs in ancient Mediterranean economies. Literary sources in all languages, the evidence of day-to-day practice in Egypt and the Levant, and the archaeological evidence of routes and territorial control for the purposes of imposing taxes will be discussed, as well as ethnographic data. In particular, the panel will consider the evidence from Egypt, the Near East, Archaic Greece and Italy.

Paper abstracts

1. Gabriele Cifani (University of Rome, Tor Vergata) - Julien Zurbach (Ecole normale supérieure, Paris), An introduction to Tolls and the Economic history of the archaic Mediterranean societies

Tolls and customs duties imposed on road-users and goods played a crucial role in pre-modern economies, but in ancient economic history they have been considered mainly as part of the main in-
come of the state and not often in terms of their direct or side-effects on mobility and exchange (but see Peter Bang, The Roman Bazaar). It is no surprise, then, that recent evolutions in fiscal history also consider them from this perspective.

It is also striking that a reference in this sphere (A. Monson, W.Scheidel ed., Fiscal regimes and the political economy of Premodern States, 2015) refers to tolls as fiscal instruments and economic factors in the Near East, the Hellenistic states and the Roman Empire.

Furthermore, the importance of tolls, however, has never been fully evaluated or debated in recent reconstructions of Early Iron Age and Archaic Mediterranean economies, which have focused mainly on trade circuits and activities of production without giving due consideration to the systems which controlled the distribution of goods and the mobility of people.

In archaeological literature, the Archaic Mediterranean is often considered to be a kind of open ground as far as cultural encounters are concerned. We would like to draw on recent work (notably Moreno Garcia, ed., Dynamics of Production in the Ancient Near East 1300-500, 2015, and to reconsider the true economic factors linked to interconnections and the development of early states in the Mediterranean between the Late Bronze Age and the Archaic Period.

The aim of this introduction paper is to focus on the economic relevance of tolls, above all in the first half of the first millennium BC, and their role in laying the financial basis of the archaic states.

2. Julien Zurbach (Ecole normale supérieure, Paris), Indirect taxes in the Formative period of City-States

It is well-known that indirect taxes were the essential fiscal resource of Ancient Greek city-states: this old idea has recently been demonstrated by Migeotte. I will concentrate on Archaic Greek city-states. Taking into account texts and inscriptions from ca 750 down to 450 BC, it is possible to discuss the origins of the levies on moving goods in the context of institutionalization of the city-states, the relations of this system to earlier (Mycenaean, Homeric) systems of levies on traveling people or exchange places, and to examine the factors by which this became so important to the Greek poleis. The first set of questions would lead to a history of indirect taxation, from probably informal levies where force would play a role to formal systems defined by law or international agreement. The second set of question invites to place the development of indirect taxation in the general evolution of taxation. Here the question is the relationship to the explosion of financial needs caused by the maritime revolution of the late 6th cent. and to the probable reduction of direct income from land taxes (on the first point van Wees 2013 is decisive). The question then is: which factors do lie behind the apparent crucial importance of indirect taxes to Greek city-states?

3. Damien Agut (CNRS), The Egyptian Custom on the Mediterranean Sea during the Persian Period (5th and 4th centuries BCE)

The Egyptian documentation dated to the Persian period (5th and 4th centuries BCE) contains many precise indications concerning the functioning of the custom of the Mediterranean Sea. In extracting and confronting the relevant documents, this paper aims to propose an analysis of the nature of the levies on imports (1) as well as the way in which customs revenues were also used to fuel local institutions, mainly local temples (2). In conclusion, we will examine the manner in which construction lumber for the ships, one of the most commonly imported goods collected by the custom, was employed by the royal administration (3).

4. Laetitia Graslin, The economic policy of neo-assyrian and neo-babylonian kings regarding long distance trade

In Mesopotamia, the first millennium is a time of construction of big empires. In an enlarged geographical space, the issue of control of trading paths and goods gets even more relevant as before. Different kinds of geographical areas are concerned: the mountain frontier with Iran, the maritime coast on the Mediterranean, the desert-fringes or the disputed frontier between Assyria and Babylonia. The appearance of new trading patterns requires to find new solutions, for example to collect tolls on difficult-to-
control Arabian tribes. To the historian eyes Mesopotamian kings have often been denied any economic awareness and their fiscal policy reduced to a predatory economy. However, both textual and archaeological evidence shows that the empires took a large variety of measures, of fiscal, legal or military nature. They tried to take profit of the resources of long distance trade, even in its emerging forms. They also encouraged importation of useful commodities in Mesopotamia, while diverting the traffic of strategical goods from hostile neighbors. This paper provides an overview of the fiscal or legal measures taken by mesopotamian kings to take profit of long distance trade. We will try to understand the nature of the royal policies: were they mere accumulations of one-off measures or did they reflect a good understanding of the new economic background? What were the economical and geographical consequences of the mesopotamian fiscal policy related to long distance trade?

5. Gabriele Cifani (Università degli studi di Roma "Tor Vergata"), Tolls in the early roman economy

Early Rome was a frontier city lying between the Latins, Etruscans and Sabinians; her rapid urban growth can be explained by the equally rapid evolution of a Late Iron Age economy based on regional and long-distance trade. Apart from agriculture, pastoralism and the salt trade, the bulk of the Roman economy in this phase and later can be accounted for by tolls on goods in transit through the Lower Tiber Valley, between Etruria and Campania, along the coast and from the coast to inland areas and vice versa.

Tolls should be imagined as belonging to the economy of the public sphere, because only city authorities could have collected tolls for transit within the city. However, in the secondary centres of the Roman community (such as Crustumerium, Decima and Laurentina), tolls would have been collected and retained by local aristocracies, the wealth of whom was exhibited in their luxurious burials.

In the 6th-5th century BC the reorganisation of the fluvial and maritime ports by means of public sanctuaries and market places (emporia) shows the decisive role played by the central authorities in reorganising the places where trade took place and consequentially the growing interest of the state in the economy, which may have involved the institution of specific taxes in the form of customs tariffs or duties on port services.

6. Juan Carlos Moreno García (CNRS), Tolls at Heracleopolis Magna: monitoring trade at the borders of the Nile Delta

Heracleopolis Magna, in the Fayum area, played a crucial political and economic role in the late 3rd and early 1st millennium BC. The reasons underlying such a prominent position still remain obscure, but some epigraphic evidence suggests that Heracleopolis exerted some control over foreign trade in both cases. This could explain why Heracleopolis was closely linked, in the late 3rd millennium BC, with trade routes that arrived into the Fayum across the Western Delta. Conflicts over the control of Heracleopolis also erupted during the early 1st millennium BC, when Nubian rulers tried to control Middle and Lower Egypt as a first step to extend their domination over the area of Gaza and the Southern Levant, in opposition both to local rulers and Assyrian kings. The ultimate goal seems to dominate the trade routes that connected northeastern Africa and Southern Arabia to the Mediterranean, when customs and tolls were a source of considerable income for the polities in Southern Levant and, possibly, also in Lower Egypt. In both periods, it is interesting to observe that the rise of Heracleopolis to a prominent position was connected in some way with the prosperity of trading activities across the Western Delta and the consolidation of political powers in this area (Kom el-Hisn, Sais), a trend that crystallized with the foundation of Alexandria.

7. Mario Lombardo and Flavia Frisone (University of Salento), The hidden resources of “empires”. Tolls, economy and political systems in Archaic Southern Italy and Sicily.

The creation of extended political and territorial systems is a relevant phenomenon in Magna Graecia and in Sicily during the archaic period. The most renown and significant cases, as well as the best documented ones in literary sources and material evidence, are those of Sybaris, Kroton and Syracuse. In addition to the enhancement of their power, those enlarged states show a clear interest in strategies
for controlling settlements, human mobility and production which included tolls, customs duties and other forms fiscal measures. Usually the economic aspects of these systems have been marginally considered or studied with reference to only some types of evidence (e.g. coinage). The paper aims at focusing the role of economic factors in the development of these regional powers and of their territorial networks, with a special attention to the systems by which they controlled goods production and distribution as well as people’s mobility. A thorough examination of the evidence (literary sources, coins, inscriptions, but also archaeological documents) relating to forms of indirect control or exploitation, through taxes and tolls, of the productive activities, as well as of routes and territorial resources, will be presented, with the aim of showing that it was an inherent aspect of those complex systems as, to use the Greek term, “archai”.

8. Sven Günther (Institute for the History of Ancient Civilizations), Indirect Taxes, Tolls, Dues and the Formation of Political Economies in Archaic Greece

Archaic Greece did not only see the emergence of poleis and their “state” institutions but also, and parallel, the formation of political economies as an important and integral part of these new “city-states”. Though driving factors like ship-building for military and trading purposes, coin-money, taxes and tributes as well as politico-social representation have already been examined in respect of state-formation, mainly for Athens (see van Wees 2013; further literature and discussion in von Reeden 2015, 130), the appearance of political economies, exceeding the typical household economy, has mainly been researched with a focus on geo-economic, political and social factors as well as within frameworks of price-setting, business-strategies and money-control / -circulation (cf. Eich 2006).

The paper adds the perspective of indirect taxes, tolls and dues to this still incomplete mosaic. I shall show the deep interdependencies between the rise of state institutions and administration of finance, the extraction of indirect levies and the development of political economies. Particularly, the “framing”-effects of such levies in times of Archaic tyrannies and power struggles among the elite will be analyzed, a first step to control, use and exploit business activities for the establishment and stabilisation of frequently challenged rules.

9. Peter Kritzinger (Universität Jena), Überlegungen zur Praxis der Zollerhebung in der römischen Antike


Panel abstract
This panel session will look at the ancient coastal settlements of Greece from the perspective of the maritime cultural landscape. The coastal settlements were economically important often acting as transition points, trading and distribution centres. They were often the first point of contact for seafarers, travellers and migrants and played an important role in the diffusion of cultural, political and religious ideologies. Their roles sometimes changed in times of war and peace and they became places where technological advancement was used to change and manipulate the local natural environment.

The aim of this panel session is to move away from the traditional approach of looking at coastal sites individually and to consider sites and monuments as part of a wider cultural landscape. The theoretical concept of the maritime cultural landscape offers a means of overcoming the boundaries of terrestrial and underwater archaeology and of increasing our understanding of the relationship between humans and the sea. This panel session will explore the cultural, economic, political, religious, social, technical, industrial and environmental aspects of this landscape.

Paper abstracts
1. Marco Schugk, Between locality and regionality: Aspects of innercycladic networking, a view on the early Bronze Age settlement of Koukounaries on Paros

Since the end of the last glacial maximum and the resulting rise in the sea level the closely packed islands of the Cyclades in the southern Aegean incorporate a unique habitat in the whole Mediterranean, whose incomparably maritime fragmentation not only offered its inhabitants promising opportunities but also faced them with logistical challenges. Although several thousand years passed by from the first daring explorations into this archipelago to the establishment of stable settlements, the Cycladic culture reached its climax in Early Cycladikum II, whose prosperity is often emphasized by its established oversea contacts ranging from the Helladic mainland in the east over Crete in the south to Anatolia in the west. But apart from the few proto-urban centres of this period, the majority of the Cycladic people organized themselves in countless smaller settlements spreading over the entire archipelago. On the basis of the early Cycladic artefacts in the settlement's area of Koukounaries on Paros – especially pottery, idols and obsidian – it is shown exemplarily that active participation in maritime networks including possible seafaring activities was only of secondary importance beyond substantial factors.

2. Michael Loy (University of Cambridge), Reconstructing Archaic period interactions and exchanges through the material networks of the southern Aegean

That the number of cities and archaeologically visible settlements in the Aegean increased across the seventh and sixth centuries BC (the ‘Archaic period’) is not disputed; however, the interactions and exchanges exercised within and between cities and regions remains more obscure. An interest in site- and survey-level archaeology for this period has rendered much good-quality and usable data, but there have been few studies which have synthesised this material on a macro-regional Aegean scale. This paper, therefore, draws together and considers three datasets from sites all around the Aegean Sea (pottery, inscriptions, coins) and what the distribution and quantification of these various object types can tell us about the nature of the ancient economy. Given that exchange systems between sites had direction and intensity, economic transaction can thus be finely measured. Formal network analysis and statistical modelling will be used in order to interpret this material, in a methodology which integrates Big
Data from multiple different excavation and survey projects. Specifically, this paper will consider what social and economic factors can be read through our interpretation of material networks, and to what extent coastal and island communities were united in exchange with their external contacts, and to what extent they acted autonomously.

3. Chiara Maria Mauro (University College Dublin), Closed harbors: an open question. A study based on Archaic-Classical evidences

Although scholarly publications regarding ancient Graeco-Roman harbor systems often mention the expression «λιμήν κλειστός», the meaning of this term still remains obscure. While in the past several theories have been put forward, the academic world still diverges on the correct way to interpret this expression. This paper reconsiders the meaning of «λιμήν κλειστός», focusing on the ArchaicClassical eras and comparing the written sources and the archaeological information that is available today. Analysis of these two types of evidence in combination suggests a possible new interpretation.

4. Katerina Velentza (University of Southampton) - Brandon Braun (UCLA), The Maritime Cultural Landscape of Rhodes: Collecting the Existing Evidence

This paper looks at the maritime cultural landscape of the Greek island of Rhodes. Situated in the southeast Aegean Sea, in close proximity to Asia Minor, Cyprus, the Levantine coast and Egypt, Rhodes has been recorded in ancient sources as an important maritime and naval power of the Hellenistic and Roman times. From the third century BC, the island flourished financially due to its technologically advanced fleet and the development of trade, competing with contemporary maritime powers of the Eastern Mediterranean such as Athens, Delos, Ptolemaic Egypt, and Rome. Despite the literary evidence for this economic development and the wide distribution of Rhodian amphorae sherds all around the Graeco-Roman world from the Mediterranean to continental Europe and Roman Britain, several aspects of the maritime cultural landscape of Rhodes have been largely unexplored. No research so far has attempted to put together all of the material evidence that illustrate and prove the unique circumstances of the maritime, naval and economic prominence of Rhodes. This study, by looking at the material record in combination with inscriptions and other literary sources, reconstructs several social and political aspects of the maritime cultural landscape of Rhodes. Through the study of excavated artefacts and archaeological remains, we can comprehend the circumstances that led to the maritime, naval and economic empowerment of Rhodes in the specific environment and historical context of Antiquity.

5. Michael Curtis (University of Nottingham), The economic impact of the transition from the Hellenistic to the Roman period as seen in the maritime cultural landscape of Crete

The late Archaic/early Classical periods saw renewed settlement along the Cretan coasts. New harbours and waterfront areas were constructed as a new generation of settlements, maritime enclaves and transition points arose along the coastline. Many of these settlements went on to become important trading and distribution centres, acting as reception points for seafarers, travellers and migrants and, in the process, being subjected to a diffusion of various cultural, religious and political ideologies. Their harbours were visited and used by commercial, naval and pirate fleets active in local and cross-Mediterranean waters. The Roman invasion of the island in 69-67 BCE heralded the commencement of a period of change in the coastal settlements as part of the adjustment to the new provincial status and access to a far wider marketplace. Changes took the form of a strategic attempt to channel imports and exports through certain harbours, possibly as a means of tighter control and to ease the administration of taxes such as the portorium. This led to specific investment in some of the harbours and an air of prosperity.

This paper will examine the changes that took place in the maritime cultural landscape between the end of the 1st century BCE and the 1st century CE. It will attempt to present the maritime landscape as it was at the point of the Roman invasion and examine how this changed over the following century as harbours and supporting infra-structure was reorganised.
6. Jane Francis (Concordia University), Coast and Hinterland in Graeco-Roman Sphakia (West Crete)

The Sphakia Survey Project in west Crete identified hundreds of sites with Graeco-Roman phases, based mainly in pottery. One important area for the development of the area is the peninsula of Loutro, stretching out into the Libyan sea and providing Crete with a rare year-round harbour. Above Loutro rise the southern slopes of the White Mountains. The ceramic record from this area demonstrates what one would expect: large amounts of imported pottery close to the harbour. The sites in the hills above also contain similar material, but chronologies do not always match up, and it is clear that at least some of the upland sites are not dependent on the nearby coastal anchorages for the acquisition of imported goods.

This paper explores the coast and hinterland regions around the Loutro peninsula, beginning in the Archaic period and continuing through Roman. Aside from south-coast harbours, various other systems for the transport and importation of non-local commodities are considered within the context of Crete’s particular history in order to understand reliance on water-borne movement versus land-based conveyance that is almost certainly not static over time.

7. George W.M. Harrison (Carleton University), The Ins and Outs of Cretan Commerce

A sufficient amount has been written on the Cretan economy, to which have been added numerous talks which have not been published but whose results are known. An examination of the disparate material indicates that it needs to be placed within a framework that foregrounds the data to evaluate better and more securely surmises that have been made about prosperity in Crete during the Roman Empire.

This paper begins with an assessment of the essential studies of physical remains by especially Baldwin Bowsky but now even more importantly Gallimore and correlates information from those scholars (among others, such as Francis, working on ceramics and on trace remain analysis) with work by Theodoulou, and others, on the harbours themselves. It should now be possible to place objects on ships and ships in ports to a degree that has not been possible before and one that shows a Cretan economy far more robust than one might have presumed or even suspected.

Panel 5.4 Trade in Ancient Sardinia

Organiser: Salvatore De Vincenzo (Università degli Studi della Tuscia)

Friday | 25 May | 09:00-16:30 | HS VIII

Panel abstract

The themes of this panel are the modes of trade in ancient Sardinia. What are the trade routes involving ancient Sardinia? Which areas and cities in Sardinia are most involved in these exchanges? Which products are exchanged and how is the island’s production affected by trade? Which patterns are observable in importing and imitating foreign goods, which were carried to the island by traders? How do these aspects vary over time, from Archaic times to Late Antiquity?

This analysis on ancient trade in Sardinia will be carried out predominantly based on pottery contexts. But of course, other trade goods like iron ore, of which Sardinia possessed great amounts, thereby shaping trade routes from the first millennium BC onwards, will be taken into account as well. The chronological phases in question range from Archaic times to Late Antiquity, comprising transactions of indigenous people, Carthaginians, and Greeks, with particular regard to the trade in the Roman era.

Various aspects will be covered, one of the presentations analyses the trade of Archaic and, more in general, pre-Roman Sardinia, with particular reference to the Greek pottery trade. A second presenta-
tion will focus on the trade in Sardinia since the early Roman presence on the island until the middle Imperial age. Special attention will be given to Nora, one of the most significant centres of the island from the Archaic age onwards, analyzing the key elements related to production and trade of the city between the middle and the late imperial age by reviewing the material culture.

Another speaker will analyze data resulting from an examination of the most significant attestations of cults on the island, with particular regard to coroplastic artifacts offered as votives in a phase of transition from the Punic to the Roman era, in order to highlight the commercial and cultural dynamics of these sacred contexts.

The last presentation will examine the Late Antiquity trade on the island, especially with regard to 4th to 7th centuries AD along the central west coast of Sardinia by taking into consideration especially the materials found during the excavation of Cornus.

**Paper abstracts**

1. Salvatore De Vincenzo (Università degli Studi della Tuscia) - Chiara Blasetti Fantauzzi, *Introduction: Trade in ancient Sardinia*

The themes of this panel are the modes of trade in ancient Sardinia. What are the trade routes involving ancient Sardinia? Which areas and cities in Sardinia are most involved in these exchanges? Which products are exchanged and how is the island's production affected by trade? Which patterns are observable in importing and imitating foreign goods, which were carried to the island by traders? How do these aspects vary over time, from Archaic times to Late Antiquity?

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2. Chiara Blasetti Fantauzzi (Georg-August-Universitaet Goettingen), *Import of Greek Pottery in Sardinia*

This paper analyzes the trade in Archaic Sardinia, especially the Greek pottery trade. In particular, it will attempt to outline the traded classes of Greek pottery, the commercial routes connected to Sardinia as well as the island most involved urban centers in this trade.


I rinvenimenti di anfore rodie in Sardegna concernono soprattutto i siti di Tharros e Karales. Scoperte sporadiche di anse sono state effettuate anche ad Alghero (Nuraghe Palmavera), Calasetta, Nurachi, S. Gavino Monreale, Olbia, Nora e Neapolis. L’importazione del celebre vino egeo va dai primi decenni del II secolo sino alla fine della medesima epoca. Tale datazione è complessivamente valida per tutta l’isola, se si considera anche la sequenza dei fabbricanti noti, oltre che a Tharros e Karales, a Nurachi, Calasetta, Nora e Neapolis. Il primo ad avanzare un’ipotesi scientifica sul commercio di anfore rodie in Sardegna fu G.G. Porro, il quale sostenne che tali contenitori arrivarono sull’Isola durante la dominazione punica e per il tramite della Sicilia. Mezzo secolo più tardi, G. Pianu ipotizzò un commercio diretto fra la Sardegna e l’isola dell’Egeo, spostando l’arrivo del vino rodoc all’epoca della conquista romana. A. Mastino propende per una redistribuzione delle anfore rodie in Sardegna a partire dalla Sicilia o dal Nord-Africa. Alla luce di nuovi studi sui contesti di rinvenimento delle anfore rodie in Sardegna e nel Mediterraneo occidentale, questo paper ha l’obiettivo di inserire l’Isola in un quadro geografico più esteso, analizzando le dinamiche economiche, sociali e culturali che hanno reso il vino rodoc un prodotto ‘globalizzato’.
4. Salvatore De Vincenzo (Università degli Studi della Tuscia) - Matthias Block, Production and Trade in Sardinia in Roman Times

This paper will focus on the trade in Sardinia since early Roman times on the island until the middle Imperial age. This analysis on ancient trade in Sardinia will be carried out predominantly based on pottery contexts. But of course, other trade goods will be taken into account as well. Special attention will be given to the most significant urban centres of the island.

5. Chiara Pilo and Stefania Dore (Ministero dei beni e delle attività culturali e del turismo), Imported pottery in the inner areas of southern Sardinia during the Roman period

The aim of this paper is to investigate the circulation of imported pottery in the inner areas of southern Sardinia during the Roman period. The analysis will be carried out considering some case studies in the historical regions of Marmilla, Trexenta and Sarcidano. The material consists of ceramic finds, mainly from necropoleis but also from settlements, most of them not already published. Pottery products (fine ware, lamps and amphoras, etc...) especially from Africa, Italy and Gallia were traded within the rural areas along the main roads leading to the centre of the island and were largely used by the local inhabitants. The diffusion of imported pottery triggers also the phenomenon of imitation: vase shapes and types typical of foreign productions were reproduced in local fabrics as well. For example, a recent study of imperial grave goods found in the territory of Nurallao, has shown the presence in the region of Sarcidano of vessels made in Africa (among which a rare exemplar of Hammamet 1 amphora), in central Italy as well as local products.

The provenance and the distribution of imported pottery can contribute to shedding new light on trade and exchange in inner Sardinia during the Roman period.

6. Emiliano Cruccas (Università degli studi di Cagliari), Productions, trade and pottery in the Roman city of Nora (South Sardinia) between the middle and the late imperial ages

The aim of this study is to underline, through an analysis of material culture, the key points related to productions and trades in the roman city of Nora (South Sardinia) between the middle and the late imperial ages (IInd - IIIth centuries AD / IVth – VIIth centuries AD). In particular, I try to analyze some changes in the importations and productions of pottery in relation to goods imported and produced in loco between the Severian (the floruit period of the municipium) and the late imperial age, until the abandonment of the roman settlement (VIIth - VIIIth centuries AD).

7. Romina Carboni (Università degli studi di Cagliari), Cult places and votive objects as markers of commercial and cultural relations in Late Punic and Roman Sardinia

The aim of this paper is to show data coming from an analysis of most significant cultic finds from Sardinia, concerning both structures and votive deposits, with reference to coroplastic objects, between late Punic and Roman era. The purpose of this study is to highlight commercial and cultural dynamics, which on one hand introduce new religious languages and, on the other, facilitate a renewal of earlier cults. These phenomena, very interesting and, at the same time, difficult to understand, show the contemporary presence of local and external traditions.

8. Filippo Pisciotta, Production and Trade in Sardinia in Late Antiquity

This paper will examine the Late Antiquity trade on the island, especially with regard to 4th to 7th centuries AD along the central west coast of Sardinia by taking into consideration especially the materials found during the excavation of Cornus (Oristano).
Panel abstract

Interactions between Greeks and native populations were very complex, not only at the cultural but also at the economic level. Systematic studies of these economic interactions and of broader frameworks concerning these questions are, however, still underdeveloped. We propose to focus on how “Greek colonization” changed local economic strategies and affected local societies. What questions do we need to ask to grasp the full complexity of the phenomenon (L. Foxhall)? We also investigate local economic trajectories, for example in the Black Sea (R. Posamentir), where contact with the Greeks stimulated the production of certain goods on an almost industrial scale, but left other aspects of production and consumption remarkably untouched. Colonization and culture contact can also be related with a notable rise in the production of transport amphorae in the Mediterranean. Amphorae for the transportation and storage of agricultural produce became widespread in the Aegean of the 8th century (A. Kotsonas) as well as in the Bay of Naples, and the latter region also saw the installation of a flourishing perfume trade (L. Donnellan). The production of new pottery types, and especially their now perished contents, indicate that, in the Early Iron Age to Archaic period, important transformations of local economies took place. Through this process, once peripheral areas were drawn into overseas networks of production, exchange and consumption, thus creating a new Mediterranean cultural geography. Studies on the institutional side of transforming economies of "Greek colonization" are also underdeveloped, and weight standards are a case in point. The "Chalkidian" colonies of the West developed a shared weight standard of 5.7 grams for coins (P. van Alfen). Whereas the unity created through shared weight systems is clear, local differences also created disunities suggests the impact of local economies and institutions. The case studies convincingly demonstrate that previous studies of the economy of “Greek colonization”, in terms of gift giving do not account for the complex changes and non-linear developments towards more formal forms of economic exchange. The modes of economic interaction in the colonial landscapes of the Mediterranean and the Black Sea need to be studied beyond "the gift" and beyond traditional divisions of cultural and economic centers and peripheries.

Paper abstracts

1. Lieve Donnellan (VU University Amsterdam), Beyond the gift: economic development in the Bay of Naples

Amphorae for transportation and storage of surplus agricultural produce are a conspicuous and early development in the Bay of Naples, the latter region which also saw the installation of a flourishing perfume trade. The production of new pottery types, and especially their now perished contents, indicate that, in the Early Iron Age to Archaic period, important transformations of local economies took place - a process in which previously marginally located areas of the Ancient World were drawn into an overseas network of production, exchange and consumption. Traditionally, however, marginal regions in the Mediterranean and Black Sea are perceived as having been developed only upon the arrival of Greek colonists, who would have founded systematic agricultural practices, and installed institutions to negotiate trade, after an initial phase of a gift-giving economy with local populations. Evidence, compelling us to rethink this view, is increasing rapidly. Interactions between Greeks and native populations were very complex, not only from a cultural point of view, but most certainly also from an economic perspective. Systematic studies on these economic
transformations and broader frameworks on how to address these questions are still underdeveloped. We need to focus on how new connectivities changed local economic strategies. The deep impact of human mobilities need to be studied beyond “the gift” and beyond traditional views on cultural and economic centers and peripheries.

2. Antonis Kotsonas (University of Cincinnati), Transport Amphorae and the Economy of Greek Colonization

Economic considerations have loomed large in discussions of the cause(s) of Greek colonization. Traditionally, historians and archaeologists have developed very different perspectives on the subject. Historians typically draw form ancient foundations stories and the substantivist/primitivist approach to Greek economy in emphasizing the significance of land and agricultural resources. Archaeologists overlooked this discussion for long and approached the economy of Greek colonization from an empirical perspective based on concepts like “trade before the flag” and the study of the distribution of fine ware ceramics. Jean-Paul Morel has explained that both approaches have largely missed the importance of transport amphorae for the study of the subject. As containers of agricultural products that were shipped over short to very long distances in the Aegean and the Mediterranean, transport amphorae can bridge the disciplinary divide on the matter and can generate original insights on the economy of Greek colonization. My paper builds on Morel’s work and emphasizes how recent discoveries of early transport amphorae enrich and challenge our understanding of this class of material and of the early Greek economy in general. It also uses the case study of coastal Macedonia for the purpose of demonstrating how these ceramics can revolutionize current ideas on the economy of Greek colonization.

3. Richard Posamentir (Eberhard Karls Universität Tübingen), Beyond the gift: Rethinking the economy of Greek archaic `colonisation´ The Black Sea perspective

Our view on the economy of settlements around the shores of the Black Sea is still coined by the idea of intended exploitation of certain economically important resources - such as land, grain, slaves, fish, metals, wood and many more. Even though this view has rightly and for various reasons been challenged within the last years – most of these commodities had major significance from a later time on - it is still widely believed that such kinds of resources played an important and even trigger-like role in this process. Doubtlessly, during the Soviet era local research in archaeology and ancient history focused on economical questions, introducing a politically appropriate view to this discussion. Nevertheless, it is clear that the ‘colonization process’ in the Black Sea Area was significantly different from those taking place in other areas at the fringes of the Greek world: There seems to be no Bronze Age antecedents unlike in the North Aegean or the West and written sources are much scarce. In fact, Ionian settlers founded dozens of rather small and – with exceptions – not remarkably important daughter cities that never fulfilled certain requirements in terms of representative appearance. In my paper I will try to focus on the question of how exchange of goods worked with people from indigenous sites, additionally I would ask which economic relations might have been of significance in order to integrate the various Black Sea cities in a wider Hellenic network.

4. Peter van Alfen (American Numismatic Society), (Dis)unity in the Archaic Monetary Systems of the Western Chalcidian Apoikiai

Among the earliest producers of coinage on Sicily were the apoikiai of Euboian Chalcis: Himera, Naxos, and Zancle. Beginning at some point around 530 BCE these polities issued coins weighing ca. 5.7 g, which some have taken to be a third of the Euboian stater of ca. 17.3 g. Chalcidian colonies elsewhere, such as in the northern Aegean, did not use this 5.7 g denomination, nor is it known anywhere else except for two other Chalcidian apoikiai in Italy–Cumae and Rhegion–which both produced a series of 5.7 g coins in the late sixth century as well. Not all scholars agree that the 5.7 g denomination is related to the Euboian weight standard. Regardless of the origins of the 5.7 g denomination, the shared use of this unusual denomination among the Chalcidian apoikiai suggests that there was considerable economic cooperation. Even so, deviations from the presumed ideal 5.7 g weight at each of the production centers along with the circulation patterns suggest that there was disunity as well.
In this paper I explore these tensions of (dis)unity within the monetary systems of the western Chalcididan apoikiai. Informed by recent studies of the comparative roles of economics vs politics in the creation of monetary policy, I consider how (dis)unity might have been shaped by decision makers seeking to address the political and economic pressures they faced from both domestic and international quarters.

5. Lin Foxhall (University of Liverpool), Widening horizons: Greek overseas settlement and changing economic behaviours in the western Mediterranean

The impact of Greek settlement on the economies of the indigenous cultures of southern Italy and elsewhere in the Western Mediterranean was considerable. But, investigation of the specific processes and elements of this impact have largely been limited to either broad-brush overviews or isolated case-studies. How did contact with incomers change the economic strategies, practices and activities of indigenous societies, or indeed their internal dynamics more broadly? How can we document these changes systematically, and at a meaningful level of detail which takes account of local and regional variations in intercultural relationships? This paper will explore how we might best address these key questions.

Panel 5.6 Distribution of Greek Vases

Thursday | 24 May | 14:30-16:30 | HS II

Paper abstracts

1. Filippo Giudice (University of Catania) - Marco Stefano Scaravilli, L’isola di Taso ed il suo ruolo nel commercio della ceramica attica figurata dagli inizi del VI al IV secolo a.C.

Il presente lavoro, dedicato al sito di Taso, rientra nell’ambito del progetto Post-paralipomena dell’Archivio Ceramografico dell’Università di Catania, finalizzato alla costruzione dei quadri di riferimento delle importazioni di ceramica attica nei vari mercati del Mediterraneo.


2. Eleni Zimi (University of Peloponnese), Change and continuity in the function of Attic pottery in Cyrenaica: the case of Euesperides

It is adequately documented that Attic pottery circulated in Cyrenaica between the sixth and the third century BC, either via maritime trade or through inter-regional exchange. Yet, previous research has narrowly focused on often selective presentation and treatment of the wide range of Attic forms, both of figured and of black-glazed pots, yielded primarily from sanctuaries and cemeteries, and little attention has been paid to the study and analysis of function and context of Attic imports over time. The material evidence from the systematic excavations at Euesperides – the most westerly Greek settlement in Cyrenaica – held between 1999 and 2007, offers the opportunity to approach Attic pottery in Cyrenaica under the light of fully quantified domestic assemblages which enables the exploration of change and continuity in the function of Attic imports and, ultimately, in the consumption behaviours of the settlers, as well as to juxtapose it with relevant corpora from sanctuaries and cemeteries in the wider region. Thus, this paper aims to: a) address questions such as where and how Attic imports were used, what was their meaning for the people who owned them, and, then, by comparing contexts, b) to explore the consumption trends for Attic pottery at the site-specific and regional level, in a long time
frame, c) to outline patterns of change in different phases of the city's life, and c) to assess the role of tradition in the local consuming habits.

3. Marcella Accolla, Imports of attic black-figured vases and attic red-figured vases at Gela in the second quarter of the V century B.C.

The present contribution focuses on the analysis of imports of attic black-figured vases and attic red-figured vases, that are present at Gela in the period between the 475 and the 450 B.C.

The research work has focused on the systematic study of painters who are present with its production in the colony founded by Greek people, coming from Rhodes and Crete, on the southern coast of Sicily, in 689-88 B.C.; later was evaluated their diffusion through the markets of the Mediterranean to identify, where possible, tracks of diffusion.

Initially we started from the acquisition of data relative to the attic vases with certain geloa provenance, traced in the lists published by C. H. E. Haspels and by J. D. Beazley, inclusive of subsequent updates. These data have been added those derived from new acquisitions, from recent excavations or never included in those lists. This has allowed us to identify, also thanks to a painstaking work of attribution for pots not attributed, conducted by Elvia and Giada Giudice, numerous painters that are present at Gela in the period taken into consideration.

The production of each painter was subjected to a quantitative and qualitative analysis that can give answers to our questions in relation to the markets and to routes of distribution, as well as information relating to the preferences of the commissioning on forms and subjects.

4. Bettina Kreuzer (Bayerische Akademie der Wissenschaften, CVA), The Leagros Group and the Mechanisms of Trade: Trademarks Revisited

Graffiti and dipinti under the foot of Attic Vases have been identified as trademarks by Rudolph Hackl (as early as in 1909) and Alan Johnston (1979 and 2006). Johnston's lists of marks and his explanations have provided the means to explore the details of the mechanisms of trade.

In order to understand these details better, my paper will focus on one particular workshop, the Leagros Group. This most productive of the Late Archaic workshops at Athens provides a rare corpus of dipinti and graffiti since all of the 136 hydriae as well as many belly amphorae, neck amphorae or olpai feature marks, many of them different, abbreviating the names of traders, sometimes written on top of each other, and/or shapes and numbers of pieces transported in one batch. Recently, some of the batches have been the focus of an article by Adriano Maggiani. I will widen his approach and add all available evidence in order to reveal a new overall picture: Who ordered the vases in the Kerameikos, who was responsible for the transport to the west and which shapes did the batches include? Having collected and evaluated all the information, a brief comparison with contemporary workshops will clarify the status of the Leagros Group in the distribution network of the late 6th cent. BC.

5. Isabella Hodgson (University of Bonn), Modern marketing theory and ancient ceramics

Modern marketing theories can create a better understanding of the distribution and the development of ancient artefacts. E. M. Rogers' Theory of Diffusion, used today to plan marketing strategies, provides insight into the dynamics within the groups of buyers of given products. In ancient times, like today, innovations will first have been adopted by comparatively educated, wealthy and well networked pioneers, the so called early adopters, before reaching the broad mass of customers. Here E. M. Rogers differentiates further between groups with different social backgrounds. The changing buyers appear to have influenced the artefacts and their characteristics, shaping the stylistic and typological development e. g. of the polychrome ceramics from Canosa. The theory of diffusion and the product life cycle theory of R. Vernon furthermore support the intuitive evolutionary model of the development of a group of artefacts: A small scale beginning with many variants is followed by growth, maturity and decline. The applicability of such theories in antiquity will be discussed using different ancient groups of artefacts.
Panel 5.7 Regional Exchange of Ceramics– Case studies and methodology

Organiser: Verena Gassner (Universität Wien)

Wednesday | 23 May | 09:00-13:30 | HS VIII

Panel abstract

Pottery vessels and other ceramic objects constitute important sources for issues of trade and exchange in antique societies as they are available in great quantities and as their provenance often can be determined by archaeological or archaeometric methods. Most studies on exchange of ceramics concentrate however on aspects of long-distance trade as differences between wares and/or types produced in different, far distant regions can be recognized more easily. This fact together with the psychological fact of the greater attractiveness of these items might have lead to an exaggerated perception of goods of oversea trade in the archaeological record.

In contrast aspects of regional exchange between neighbouring cities have not found the same attention in the field of Mediterranean archaeology though they might give important insights into the problem of regional connectivity and also have had greater importance than normally assumed, as can be attested by the analysis of the finds from Velia. Certainly one of the reasons of this deficit can be found in the difficulty to distinguish ceramics produced within one region clearly and unambiguously as they often share the same repertory of shapes or decoration styles. Thus fabric analyses play an important role for the identification of provenance.

The proposed panel comprises case studies from different areas and different periods of the Mediterranean, focussing on the methodological approach and the possibilities to identify regional exchange.

Paper abstracts


During the second half of the 20th century, the excavation of over 1500 graves of the Greek colony of Pithekoussai revealed a striking presence of imported ceramics among grave-goods. Recent studies of local productions, from Cuma, Pontecagnano and Capua, have yielded evidence that propose a new perspective on the archaic Campanian economy. This became the focus of my PhD, devoted to “Exchanges in archaic Campania (8th-6th century BC): an essay of economic history based on ceramics”: the importance of regional exchanges versus the long-distance importation of ceramic goods.

First I will present the state of the local art production in archaic Campania. The second part of my intervention will present some results of my PhD. I used a qualitative approach inspired from the anthropology of consumption to contextualize the finds of “exogen” ceramics in graves from Pontecagnano, Pithekoussai, Cuma, Capua. I further included a few examples from Calatia and the Sarno Valley. This study was completed by a database and a GIS, to give a more global vision of the phenomenon. This paper will also provide some insights about the economic mechanism that could have been behind those exchanges and their actors, with a dynamic geographical approach. I will then be able to propose some conclusions about the exchange of regional ceramics, their different reception and consumption in each site at each period.

2. Nora Voss (University of Vienna), Trade in the Dekapolis region

During three survey campaigns around 50.000 ceramic sherds were gathered in the vicinity of the ancient cities of Abila, Umm el-Jimal and Gadara in northern Jordan. Produced over the course of roughly a thousand years, between the Hellenistic age and Umayyad times, the shards originate from a variety of vessel types used in different areas of daily life, ranging from simple storage jars to expensive fine wares.
Due to the characteristics that only finds from a survey can offer – variety of form and chronological diversity – the ceramic material discussed in this paper offers a broad base for an in-depth analysis of the local production and use of ceramic vessels. Furthermore, it provides a key to a more detailed understanding of trade routes and commercial exchange both amongst the cities situated within the ancient Dekapolis region, and between those cities and neighbouring regions. Considering the poor state of conservation as well as their provenance from a modern surface, the investigation’s first goal is to analyse the materials used in their production in order to locate their origin. This information, in combination with the investigation’s focus on three cities belonging to a region that is well-defined geographically, promises a detailed view of the trade routes and economic behaviour of the region’s inhabitants. Also, it offers a valuable tool for identifying the broader dynamics of regional and interregional contact and exchange in the ancient Levant region.

3. Paola Vivacqua and Maria Teresa Iannelli (Superintendence for Archaeology, Reggio Calabria and Vibo Valentia province), Ports and trades in central-Tyrrhenian Bruttium between II BC and II AD: the case of Vibo Valentia

The Roman conquest of Bruttium in II BC determined the political and infrastructural reorganization of the Greek poleis with the exploitation of the territory based on the system of villas, the building of the Annia-Popilia road and the renovation of the main ports: Crotone on the Ionian coast and Reggio Calabria and Vibo Valentia on the Tyrrenian coast. In particular, the port of Vibo Valentia is a strategic, military and economic point in central-Tyrrhenian Bruttium. Archaeological research has highlighted the port facilities in the area between Bivona and Trainiti. A bulwark, consisting of two fauces protecting the port access and a long dock have been identified. The amphorae recovered in the port area, city and territory reveal wide-ranging commercial traffic mainly with the Iberian Peninsula and the Aegean Islands between the II BC and II AD. Foodstuffs were distributed in a capillary manner through land, river or sea docks, such as Portus Herculis quoted in the classical sources. Local productions of thin-walled, coarse ware and amphorae are well attested. The archaeological and archaeometric studies of the local containers highlighted a new container, the kados, used for carriage of pitch, produced in the Bruttium. The analysis of the production and distribution in the Mediterranean area of the amphorae reveals the economic and productive vitality of Bruttium, and suggests new trades involving the center-Tyrrhenian Bruttium that will require in-depth analysis.

4. Barbara Borgers - Gijs Tol - Tymon de Haas (University of Cologne), Cooking vessels as indicator for regional trade in the Pontine region, central Italy

Cooking vessels hold significant potential for understanding aspects of production, trade and exchange. Owing to their use in everyday life for the preparation of food, cooking vessels occur in vast amounts on archaeological sites. Their composition tends to be coarse with large inclusions, which provides important indications on how and where they were made. Recent work on Roman cooking vessels, combining petrographic and chemical analysis, has provided reliable information about their provenance, and indicated that they could travel considerable distances. The application of scientific techniques, then, provides data that is vital for understanding the wider economic phenomena that underlie these vessels' manufacture and distribution. This paper presents the work on cooking pots from the Pontine region, Southern Latium, which covers a temporally broad picture (the 6th and the 1st centuries BC). Using petrographic analysis, this work examined compositional and diachronic variation in this ceramic evidence, with the aim to trace their networks of production and distribution within the region of study. The results indicated that cooking pots were produced and distributed locally between the 6th and the 4th centuries BC, whereas regional and interregional products circulated within the region between the 4th and the 1st centuries BC – a proposal that matches well with the fundamental changes in social and political life that occurred in the wider region through this time-span.
5. Antonella Mandruzzato (Università degli Studi di Palermo), Roman Pottery from Lilybaeum. Some remarks on imported products and transmarine contacts

The excavation carried out in the so-called ‘zona mura’ within the ‘Lilybaeum Archaeological Project’ (Archaeological Park of Marsala) led by a team of Palermo and Hamburg University in 2007/2008, brought to light thousands of pottery sherds and several architectural remains dated in Roman times. Interpreted as fortification walls, the architectural structure is linked to three insulae situated in the southern part of the surveyed area.

The paper under discussion will present the preliminary results of the ongoing pottery study by working out the role of Roman Lilybaeum in regional and interregional trade. One prominent research objective is the analysis of the dynamic pattern of relations between different production-centres of ceramics deriving from the ‘zona mura’. The pottery – fine table ware and cooking ware – mostly is identified as African and Pantellerian ware, but there are samples of regional and unknown provenance as well. The results confirm the prevalence of North African pottery imports at Lilybaeum in Roman times, but also the presence, at least in some periods, of regional exchange and west Mediterranean trade in Roman age.

6. Vincenzo Castaldo (University of Edinburgh), Exchange and regional trade in late antique Campania: an interpretative model of distribution of vesuvian large based dishes

Existing work of the late antique economy in Campania still shows a discrepancy between studies of the trade on long distance and that regional and on micro-regional scale.

The present paper examines the late antique trade networks in Campania through the study of a particular production of large based dishes. This handmade dish in local clay is an important archeological marker for a particular fabric composition rich in vesuvian volcanic inclusions. The study of this less known pottery class offers an important sample of data to better understand the local roads/networks of distribution and the intricate campanian interconnectivity systems in late antiquity. The goal of this study therefore is to make an accurate examination of published material in reference to this local production including the collection data for all the late antique sites where this type of dish was found. In add an important part of this paper will focus on the new important data come from the recent excavation of the roman villa of Masseria De Carolis in Pollena Trcchia where this production is attested with the largest numbers of samples.

7. Petya Ilieva (Bulgarian Academy of Sciences), Between Therme and Troy: the ceramic exchange in the regional network of the Northern Aegean

In the second half of the 8th and the early 7th century BC a dynamic exchange network developed in the multi-ethnic Northern Aegean basin, best illustrated by changes in the ceramic repertoires of a number of local sites. It encompassed the coastal zone between the Thermaic Gulf to the west and the city of Troy to the east, incorporating the islands of Thasos, Samothrace, Tenedos and Lemnos. This regionally developed exchange was not restricted to distribution of various locally manufactured ceramic groups in neighbouring sites. It included transmission and adoption of technological know-how too, most likely facilitated by the work of itinerant potters. The distribution pattern of a regional group of standardised Subgeometric, fine painted tableware, known as G 2-3 Ware, mirrors this process. The argument is supported by micro-XRF analysis of 120 samples from various sites. The results indicate multiple centres of manufacture rather than centralised one followed by commercial exchange and suggest an on-site small scale production. The process had significant impact on the native Thracians living on the islands of Samothrace, Thasos and the opposite coastal areas. It not only led to the adoption of new ceramic technology, wheel-made vs the native hand-made, but to introduction of new shapes whose usage was perhaps linked to the introduction of new social practices as well.

8. Torben Keßler, Reading connectivity on decorative grounds. A GIS-based approach to investigate interregional relations in Early Iron Age Greece

The most reliable data regarding characteristics of ancient pottery that is provided by the publications of archaeological excavations is its decoration. Far too often, especially in older reports, the shape fea-
tures can't be read from the photograph, or the colour of the clay is subjectively assigned. This fact is taken as a basic reason to approach the question of interconnectivity between sites or regions starting from the different decorative elements that have been used to embellish ceramics. The timespan in focus is the 12th to 8th century BC, the areas under scrutiny are the Corinthia and the Argolid. Some major transformations take place during this period which starts with a century of a certain stability, continuing through a long phase of darkness into the beginning of the emergence of the Greek polis states. The two regions are only the launching pad for a study that is being conducted concerning the whole area of the Corinthian gulf during the transition from the Bronze to the Iron Age. By mapping the different decorative elements in concordance to certain ceramic shapes it is tried to deduce spacial units whose interpretation is a matter of debate. Are they more than economic contact zones? Apart from this qualitative question, an answer to which is hard to find, it is hoped, at least, to declare periods of higher/lower connectivity between regions that might point to a more vivid picture of the Dark Ages than has been drawn so far.

9. Maria Trapichler (University of Vienna), Black - Glaze Pottery: Regional Productions and Trade between Paestum and Velia from the 5th to the late 3rd c. BC

As the research of the last decades showed, a greater part of the black - glaze pottery found in Velia dating from the 5th BC onwards turned out to be imported from the neighbouring city of Paestum and another - still unidentified - production centre in the region, while the local Velinian production of black glaze ware never outreached a low degree of 10-15%.

In Velinian contexts of the 2nd half of the 5th c. BC the development of a new class of black glaze ware was observed, characterised by a specific typology deriving from attic prototypes. This class eventually dominates in Velinian contexts of the 4th c. BC, but is but rarely attested in Paestan contexts. By fabric analysis the production sites of this new class of black glaze pottery were identified to a minor degree in Velia, to a considerable part in Paestum and especially in another production centre, which by archaeometric analysis of fabrics and clays could up to now localised somewhere in the neighbourhood of these two cities.

In the 3rd cent. BC. in Velinian contexts a new class of black glaze pottery of obviously only regional distribution appears, again produced in several sites, located to a minor degree within the bay of Naples and again above all in Paestan workshops.

The paper will discuss the archaeological and archaeometric methods for the identification of these various production centres of black-glaze pottery and the role of Paestum as exporting production site in the region of Western Lucania.

Panel 5.8 The Production and Distribution Network of the Bay of Naples: From a regional to a Mediterranean perspective

Organiser: Marco Giglio (Università degli Studi di Napoli L'Orientale) and Luana Toniolo (Parco archeologico Pompei)

Wednesday | 23 May | 14:30-19:00 | HS IX

Panel abstract

Campania has always played a key role in the agricultural and ceramic production in the Mediterranean well before the Romans arrived. The foundation of the colony of Puteoli (194 BC) was a crucial moment of change for the region since its harbor from the mid-second century BC. became an essential node of density for the Roman trade routes, especially the ones directed to the Eastern Mediterranean. Puteoli came to be the hot spot where all the foodstuff produced in the Phlegraean fields, in Neapolis and the Vesuvian area was gathered and then traded towards Rome and the main harbors. The area was well-known for its wine production, transported in locally produced amphorae, and for its fine ware (Cam-
pana A and at a later time fine ware, both from Puteoli and the bay of Naples). From this period onwards, this area became one of the most important productive and trading centers of the Roman world as far as regards wine and fine pottery, a secondary tradable good. At the turn of the century, the products of this area were widespread all along the existing trade routes, as confirmed by the large diffusion of pottery and foodstuffs coming from Campania and recovered in Spain, southern France, Cyrenaica, Greece, Syria and Palestine and towards most of the areas located along the Germanic limes or in the northeastern provinces (especially in castra as Oberaden and Haltern). Even if the main trade routes have now been identified, many questions still need to be answered, as far as regards the quantification of the Campanian products in these regions, the social forces involved in these exchanges, the secondary trade routes and the potential consumers of the products. The panel aims to analyze the ceramic production in the bay of Naples from the late Republican to the early Imperial period and its distribution across the Mediterranean, through sea-routes or internal road and viceversa, to investigate the main products and foodstuffs imported in the Campanian centers.

**Paper abstracts**

1. Marco Giglio (Università degli Studi di Napoli L'Orientale) - Luana Toniolo (Parco archeologico di Pompei, Grande Progetto Pompei), Pompeii as hot spot of Mediterranean trade: new datasets for the Late Republican period

Le nuove ricerche condotte a Pompei negli ultimi anni hanno messo in luce numerosi depositi riferibili ad un orizzonte cronologico tardo-repubblicano, portando alla ricostruzione di un panorama delle produzioni e dei consumi molto articolato e complesso. Pompei, come è noto da tempo dalle anfore vesuviane note in numerosi siti, era infatti un importante centro di esportazione di vino ma anche un centro in grado di consumare derrate e merci provenienti dal Mediterraneo orientale e meridionale (anfore orientali e puniche; contenitori iberici; servizi da tavola orientali) tramite la mediazione del porto di Pozzuoli. Oltre a questo commercio a lungo raggio si sviluppò un'intensa rete di scambi su scala micro-regionale e regionale con i centri del golfo di Napoli e dell'area flegrea, testimoniata dalla presenza di produzioni neapolitane di vernice nera e di terra sigillata, oltre che di ceramiche comuni. L'analisi di nuovi contesti, con dati quantitativi, e la revisione di vecchi contesti con nuovi metodi statistici permetterà di valutare l'incidenza di tali produzioni locali, regionali e mediterranee nel tessuto economico pompeiano e il loro mutuo interagire.

2. Stefania Siano (Herculaneum Conservation Project), Campanian productions and imported pottery at Herculaneum. The ceramic assemblage coming from the excavation of the septic tank of Cardo V

When Vesuvius erupted, Herculaneum had an efficient system of water drainage with subterranean sewers. As part of the Herculaneum Conservation Project, the two principal sewers that ran on a north-south axis through the town to the shoreline were cleaned out. The septic tank that runs under Cardo V is a large tunnel measuring up to 3.5 metres high that had never been completely excavated and a half-metre deposit of ceramic and organic waste along its entirety was found. The 85-metre tunnel is linked to chutes that flowed from the latrines and kitchens of the homes and shops above. Instead of draining into the sea, this sewer was more like a giant septic tank that collected human waste, food scraps and discarded objects.

The ceramic assemblage found in the septic tank represents an extraordinary sample of the instrumentum domesticum used in the years immediately preceding the eruption of 79 A.D. in the shops and modest habitations connected to them, which faced the Cardo V of the Insula Orientalis II. The paper provides an overview of the Vesuvian area productions attested in the context, analyses the presence of tableware and cooking ware imports from Eastern and Western Mediterranean, and gives an overview of the amphorae assemblage, adding one more piece of knowledge to the production and distribution network of the bay of Naples.
3. Giovanni Borriello (Università degli Studi di Napoli "L'Orientale") - Vittoria Carsana - Franca del Vecchio - Daniela Giampaola, Pottery from the ancient harbour of Neapolis (1st BC – 1st AD)

The archaeological researches about the building of the Naples underground station Municipio (Lines 1 and 6), gave back a trench of the ancient harbour of Neapolis, used by the Hellenistic until the Late Roman Period. The stratigraphic sequence of the different harbour seabeds gives us a highly amount of findings, like urban waste, ships board equipment, or lost objects during loading and unloading of goods. The great quantity of pottery data allows an evaluation of the trade routes' complexes, which were representative of the Neapolis harbour during all its life. The topic of this analysis is the presentation of the pottery during the Late Republican and Early Roman Imperial periods, characterized by the significat presence of local production goods, to be export or for local supply, and for the imported goods. The examination of the pottery finds focused on the trade routes markers (amphorae and fine ware), enhances the knowledge about the economic trades on production and used goods in Neapolis during this period.

In addition to the goods trade, an important role is playing by the Terra Sigillata, especially the Bay of Naples production, which improves the data on the vessel morphologic repertoires, and about the workshops realizing them that held a prominent role in the production and diffusion of this pottery in the local and provincial areas.

4. Gianluca Soricelli (Università del Molise) - Vincenzo Di Giovanni - Costanza Gialanella - Celestino Grifa - F. Garcea - L. M. Proietti, Contesti di età augustea dal Rione Terra di Pozzuoli

Tra i contesti ceramici di età romana scavati in questi ultimi anni nel Rione Terra di Pozzuoli, assumono un significativo valore quelli rinvenuti al'interno del cd. "pozzo montacarichi", che permettono di avere un quadro della produzione e della circolazione della ceramica nel porto fllegreo tra media e tarda età augustea.

Funzionale, verosimilmente, al sollevamento del materiale da costruzione destinato agli edifici pubblici che sorgevano sulla sommità del Rione Terra (esso è ubicato a pochi metri dal tempio di Augusto) il cd. "pozzo montacarichi", esaurita la sua funzione, venne colmato versando al suo interno scarti di lavorazione di marmi e macerie alternati a scarichi di rifiuti. Questi ultimi si presentano coerenti nella loro composizione, con molti materiali ricomponibili pressoché integralmente o per larga parte; sembra, inoltre, possibile osservare un sia pure ridotto scarto cronologico tra i diversi contesti ceramici, suggerendo che la struttura sia stata colmata progressivamente, sia pure in un ridotto arco cronologico, tra il 10 a.C. e, al più tardi, il 10 d.C.

5. Diana Dobreva and Anna Riccato (University of Padova), Patterning campanian ceramic exchange in northern adriatic region: The coastal and inland evidence

Recent data put into account the importance of the Campanian centres in the Mediterranean market but a comprehensive model of their role in the northern Adriatic trade is still far from being defined. This paper aims to reconstruct the distribution patterns of Campanian pottery of the Late Republican and Early Imperial period through a comparative analysis of some case studies from Aquileia and its region. Updated ceramic evidences of Internal Red Slip and other Tyrrhenian cooking wares found along the upper Adriatic coast put into light the existence of dynamic trade routes, possibly related also to the presence of southern Italic population in the area. The paper will consider the potential consumers of these products and their role in the local market. It will take into account also the phenomenon of the globalization of food preparation practices and the adoption of new eating habits, which could explain the success of Campanian cooking wares in the northern Adriatic region.

6. Eleni Schindler Kaudelka (Archaeologischer Park Magdalensberg), Vesuvian pottery imports on the Magdalensberg

In der Stadt auf dem Magdalensberg wurden bei Grabungen mehr als 1.000 cumanae testae gefunden, während nur sehr vereinzelte Terra Sigillata Funde aus der Vesuvregion gezählt werden. Auch die Zahl der campanischen Amphoren ist mit knapp 100 im Verhältnis zu 5.000 Importen aus dem adriatischen Raum und 2.500 aus dem östlichen Mittelmeerraum verschwindend gering. Andere Keramik kommt
Black gloss pottery, traditionally called Campana or Campanian fine ware, is one of the most important ceramic production of classical antiquity. However, its morphological heterogeneity, together with the large number of workshops involved in its production, makes provenance attributions of finds from consumption sites extremely complex. This issue poses a challenge in addressing broader questions such as the distribution circuits and trade routes that this popular ware followed and their evolution over time. To shed light on this problem, archaeometric research has come to form an integral part of archaeological studies carried out mainly in the Italian Peninsula itself, both on workshops and on consumption centres. However, archaeometric studies are scarce outside the Italian Peninsula. The aim of our project is to contribute to a better understanding of the Campanian pottery distributed in Hispania by means of a systematic archaeological and archaeometric programme. To this end, more than 100 samples archaeologically classified as Campanian (A, A late, Etruscan, Cales ancient, middle and late), recovered from the coastal sites of Emporion, Ilduro, Iluro and Baetulo were selected. The main objective of our research was to gain a clearer idea of the provenance of the pottery. Besides, trade networks that supply the Roman town of Cosa and Hispania, have been explored to see whether artefact distribution follows the same pattern inside and outside the Italian Peninsula.

Panel 5.9 Economy and Cultural Contact in the Mediterranean Iron Age

Organiser: Martin Guggisberg and Matthias Grawehr
(Universität Basel)
Thursday | 24 May | 09:00-16:30 | HS IV

Panel abstract

The panel will focus on economy as a driving force for cultural contact. It will debate the interconnectivity of economical and cultural zones in the Mediterranean Sea and beyond, especially on its Eastern and Western shores. The Ancient World has long been understood as a cluster of cultural entities that interacted. When historians and archaeologists acknowledged that the concept of ‘culture’ as a stable entity is fundamentally problematic, a larger variety of factors have come into consideration. ‘Culture’ is now seen to be fluid in nature and to have fuzzy edges. It circumscribes a network that has an ever-changing amount of connections to other networks, making it difficult to delineate extensions or boundaries. In this debate economy can offer a down-to-earth approach of studying interregional and intercultural exchange. Economical networks can be elucidated through the mapping of resources, trade routes and the traveling objects themselves. Studying economy in the environment of cultural contacts or vice versa, means to lay bare the interfaces between networks and to follow connecting lines into the core of ‘culture’. Contributions to this panel should tackle the questions of resources and trade routes (1), of commodities (2) or of settlements as interfaces (3): (1) Where did the trade routes start, run and end? What boundaries or borders were crossed? How was information about supply and demand transmitted along the routes? (2) Finally attention can be given to the commodities themselves: What was traded? Which objects traveled afar? How were they enacted as ostentations of cultural interaction? (3) How did settlements act as interfaces between different economical and cultural
zones? Could a settlement provide exclusive or cheaper access to resources? What did render a settlement an attractive meeting point?

**Paper abstracts**

1. Martin Guggisberg and Matthias Grawehr (University of Basel), *From Household Production to Early Market Economy. Perspectives from East and West*

In the Mediterranean Iron Age Greeks and Phoenicians began to develop long distance trading networks. Commodities, people and knowledge were shifted along familiar routes. Correspondingly local economies moved farther away from subsistence, to supply the market with their goods. Natural resources became increasingly important. Perspectives on the 'global market system' in the Early Iron Age can be gained from East and West:

Trade in the Eastern Mediterranean Iron Age is mostly assigned to Phoenician actors. Less studied are the operations of Aegean-based traders, exchanging goods and ideas with the Aramean states in Northern Syria. The commodities that circulated in these trading networks until the destruction of the Aramean states in the late 8th century BCE can be traced through archaeology and the Assyrian sources.

In the Western Mediterranean written sources are lacking and reconstruction of trade networks has to rely on archaeology. In Central and Southern Italy textiles and textile production served as an important means of social distinction among the native elites. The question therefore arises as to the economic and cultural significance of the wool production and of sheep farming.

In general textiles served as highly esteemed trading goods in the entire mediterranean world in both East and West and provide a good example for regional specialization within a gradually evolving transmediterranean market economy.

2. Andrea Celestino Montanaro (CNR - Italian National Research Council), *Amber trade in western adriatic between the iron and the late archaic age. Workshops, artisans and artifacts, exchange networks.*

The existence of high value objects such as amber in elite graves or in sanctuaries must be considered in light of its role as ingredient in a larger network of cultural relationships. Amber was internationally recognized prestigious and valuable object, suitable for exchange, gift-giving, and status display.

Amber trade in Italy during the Iron Age has had a great development with the appearance of figured ambers. The different subjects represented reflect the plurality of cultural and commercial relations established among Greeks, Etruscans and Italic peoples.

The Adriatic appears to have been the main destination for the amber intended for the Italian markets. Once at the Adriatic, amber must have been moved by water along the coast, finding its way inland along the river valleys and mountain passes.

Among the most active centers of the Orientalizing, Verucchio is the main poles for the sorting of amber, thanks to its strategic location, allowing it to control the traffics coming from Northern Etruria (Ve-tulonia), Northern Europe and the Adriatic. Its production is very fine and characterized by a wide variety of ornaments, also popular in other geographical and cultural districts located along the Adriatic coast.

Amber sculptures of high stylistic level appear during the 6th cent., found in the rich italic tombs (Basilicata, Apulia and Picenum), traced back to workshops localizable in Picenum, Canosa and Armento, in which certainly worked artisans from Ionia and from Etruria.


Excavated in 1970, the “Circolo delle Fibule” of Sirolo (Ancona) was the first burial complex of its type to be discovered in the necropoleis of the ancient Picene settlement of Numana. The “Circolo” included nine graves, probably belonging to the same family group. It derives its name from the peculiar burial custom of covering the bodies of the deceased with a large amount of fibulae – over 400 specimens in
one of the graves. Almost 50 years later, the “Circolo delle Fibule” is being investigated in a research project funded by the Fritz Thyssen Stiftung, and carried out in collaboration with the RGZM of Mainz, the Polo Museale, and the Soprintendenza Archeologia of the Marche Region.

The study of the grave assemblages offers the opportunity to formulate new hypotheses about the local manufacturing of some types of fibulae, as suggested by their recurring features and concentration. The distinctive local character of many of the grave goods is balanced by the presence of some imported items, which display the broad connections between Numana and other regions in the Mediterranean as well as East and North of the Alps. In this respect, some amber findings are especially revealing of the prominent commercial role played by Numana and its harbour during the 6th century BC. When analysed in their diachronic development, the grave assemblages shed light on the dynamics of economical and trade relationships hidden behind the curtain of the funerary practice.

4. Holger Baitinger (Römisch-Germanisches Zentralmuseum), Exploitation of Resources and Trading Networks in the Archaic Western Mediterranean – the Evidence of the Metal Objects

The access to important and sought-after resources plays a central role in today's globalised world, and sometimes involves remote regions as important nodes in large-scale communication networks. However, the uneven distribution of mineral resources already facilitated wide-ranging connections in the Archaic period, which often crossed cultural boundaries and networked unequal partners. A particularly important example is the access to metallic resources, which were mined and smelted in only a few regions.

Recent research has increasingly shown the extent to which such material was exchanged and traded in the Archaic Western Mediterranean, especially on the island of Sicily. Frequently, fragmented bronze objects are proving wide-ranging contacts, which on the one hand connected the Greek colonies of the coast with far-off regions, such as southern France, but which on the other hand also stimulated dealings between the Greek settlers and the indigenous Sicilian hinterland.

5. Marek Vercik (Charles University Prague) - Jana Mokrisova (UCL), Metals on the Move: Metalurgy and Technological Transfer on the Western Anatolian Littoral

It has long been acknowledged that the central part of the eastern Aegean coast - in the historical times known as Ionia - played a vital role in the cultural connectivity between Anatolia and the Aegean region in the 2nd and 1st mil. BCE; a conduit through which eastern cultural impulses reached the Greek koine. However, significant economic patterns of exchange that lay behind the increased connectivity have rarely been analyzed in detail. This contribution will map out one of such patterns of economic interaction: metallurgy.

Literary evidence seems to indicate that Ionians were conscious of and interested in the highly-developed metallurgy of the neighboring regions of Anatolia. Yet, until recently the archaeological evidence from the pre-Classical periods was largely absent. New data gathered from examination of metal-working installations from Ionia however, can inform our understanding of the circulation of products and the related technology, an integral part of socioeconomic exchange.

Our aim, hence, is to trace the economy of metallurgy diachronically from the Late Bronze Age down to the Archaic period, focusing on the main metals (copper, iron, silver) and based on 3 pillars: raw materials, production, and technology. By doing so, we will highlight the shifting exchange patterns within Anatolia and identify possible Ionian innovations. We hope to demonstrate that the western Anatolian littoral was not a mere conduit; rather, it was an active arena of innovation.

6. Albert Nijboer (University of Groningen), Prospecting, early colonization and the transfer of technological know-how in the western Mediterranean from 1000 to 700 BC

The creation of the urban Classical World covering eventually the whole Mediterranean, is accompanied by technological transmission starting with the structural use of iron in Italy and on the Iberian Peninsula from the 10th century BC onward. Subsequently other metallurgical know-how, concepts of monumental architecture, the alphabet, weights and novel ceramic production techniques were passed on till around 700/600 BC. It required some form of cooperation between indigenous and seafaring groups.
such as the Phoenicians and surfaces as a coastal phenomenon. From ca. 800 BC onward Greek-speaking groups moved westwards, especially to Italy; groups such as the Euboeans with their short-lived overseas trading network of the 8th century BC. The local polities involved, were dynamic receivers of goods and expertise transforming some of their own material culture in a decidedly hybrid blend. Most new manufacturing techniques produced initially high value - low output commodities for which there was a significant demand due to ongoing social ranking. Some of these commodities gradually altered into low value - high output goods by increased demand being produced in specialized workshops. This signifies centralization and eventually urbanization in some regions. From a cross-cultural, comparative perspective, it appears that all urbanization is accompanied by some form of craft-specialization that resulted in a number of commodities that became available for many.

7. Veronika Sossau (Universität Basel), Ionians in the Black Sea – Economical Resources and Beyond

Despite many years of research on colonization and the common skepticism against mono-causal explanations, migration towards the shores of the Black Sea in the framework of the ‘Great Greek colonization’ is still often understood as a), an involuntary act (including more or less despair), and b), as an attempt to access economic supplies the Ionian poleis lacked. In that sense, apoikiai are up until now often treated as dependent enclaves of their hometowns. It has, however, come clear in the past years of research, that in many cases a controlled reflux of specific goods (i.e. grain which takes a lot of time, experience, and effort to be grown in numbers that enable it to be exported) can hardly be expected in the early stages of ‘colonization’. In my paper, I’d like to address two main aspects:

a) Rather than focusing only on specific resources, I want to explore the role of connectivity to other existing networks during the foundation of apoikiai (the Ionians were not the only players at the shores of the Black sea).

b) I’d like to go beyond the limited economical understanding of resources and propose mobility / migration as a resource itself. It enabled actors belonging to competing Ionian elites an additional opportunity to avoid violent conflicts as well as subordination. While migration does involve costs, it also offers the opportunities to carry on political responsibility, to live in political self-determination, establish new networks and refresh old ones.

8. Rosalba Panvini and Marina Congiu (Università degli studi di Catania), Commerci, economia e strutturazione sociale delle comunità indigene della Sicilia centrale. I casi di Sabucina, Polizzello e Vassallaggi

Il contributo intende ricostruire, attraverso l'esame di alcuni contesti di Polizzello, Sabucina e Vassallaggi, un quadro esaustivo dell'economia delle comunità sicane che vi abitavano. Durante il VII-V sec. a.C. tali siti mostrano chiari segni di ricchezza, evidenziabili attraverso materiali d'importazione ritrovati nei luoghi di culto e nelle aree funerarie. Anche le produzioni locali evidenziano forme e repertori iconografici indicativi dell'alto livello raggiunto dagli artigiani non soltanto a seguito del contatto con i Greci. Le importazioni di materiali provenienti sia dall'Attica (ceramiche a fig. nere e rosse), ma anche dalla Grecia dell'Est, attestano i commerci intrattenuti dalle comunità dei tre centri; non mancano i manufatti bronzei in materiale pregiato (argento, ambra ed avorio) utilizzati come offerte alla divinità e nella composizione dei corredi.

Grazie all'esame di alcune tipologie e classi di materiali, oggi, si è in grado di conoscere le fonti di sostentamento delle comunità sicane (cereali, zolfo e salgemma) il cui relativo surplus veniva utilizzato per gli scambi commerciali con altre genti. La varietà e la composizione dei corredi funerari consente di ricostruire l'esistenza di ceti anche elitari cui era affidata la gestione delle risorse economiche e ai quali erano riservati gli oggetti di importazione più pregiati. Ne scaturisce un quadro significativo per conoscere la composizione socio-culturale ed economica della gente sicana dell'età del Ferro.
9. Eicke Granser (Ruhr Universität Bochum), Pithekoussai (Ischia) – Colonization vs. Participation

At least after the foundation of Pithekoussai on Ischia during the 8th century B.C. the occurrence of Greek objects in grave contexts of the Campanian mainland became notable. Since the first discovery of these grave goods the intention of Euboean mission westwards and the impact of their appearance in the central Mediterranean is controversially debated. Most approaches have been heavily involved in the concept of Greek colonization. It has been emphasized that Greek migration westwards was driven by the constant search of resources and new markets. With regard to an absence of a superordinate force, it should not be asked for an overriding macro-economic plan of an alleged homogenous entity; it should be asked for the options of interactions of small scale groups in a very dynamic setting of mutual encounters. In the heterogeneous cultural landscape of Campania scattered local networks are detectable. That situation offered Greek settlers the unique option to take over a role as mediator between the existing networks. My paper aims for an examination on a micro-level with the focus on the Italic Fibuleas and local made Pithekoussanian-Cumanian pottery. Each group will be studied in terms of distribution in Campania and its appearance in the necropolis of Ischia. Furthermore, I like to present an outlook on possible trade routes between Campania and Ischia with regard to the characteristics of the landscape by using GIS based maps.

10. Joanna Smith (University of Pennsylvania), Seals in the Economy and Culture of the Iron Age Mediterranean

Seals offer means of tracing trade routes, commodities exchanged, and the movement of people in the Iron Age Mediterranean. Seals are small objects that were carved in intaglio and made of stone or composite materials. People pressed seals into clay or wax in economic or legal transactions as marks of responsibility or authority. Seals had amuletic qualities, were worn on the body, and were closely tied to the identities of their owners. Tracing interconnections through seals in the Iron Age often depends on evidence from seals rather than their impressions in clay. Clay seal impressions are rare in the due to the increased use of perishable writing materials in the first millennium BCE Mediterranean. Seal shapes, materials, and carvings reflect choices made by seal owners. A person may own a seal made centuries before or in a place far from his or her home. Changes to a seal design over time, inscriptions, settings, and find contexts aid reveal not only how seals as commodities were traded, but also how people traveled and which routes they took. This paper offers an overview of how seals delineate potential trade routes and then focuses on the evidence provided by seals from Cyprus, drawing particularly on new evidence from the city-kingdoms of Marion and Kourion. People in these city-kingdoms owned seals of all shapes and materials that point to interconnections within the island as well as overseas with Assyria, Persia, Phoenicia, Egypt, Ionia, and mainland Greece.

11. Andrea Perugini (Ghent University), Trade networks across the Strait of Sicily: an overview from Uzita, Malta and Marsala in the second half of 1st millennium BC

The Strait of Sicily has always been a very prolific and promising area for Mediterranean archaeology and studies. Its location in the middle of the basin and the cultures that inhabited its shores during centuries have continuously given it a primary role. In the Classical and Hellenistic periods, Phoenicians and Greeks (and Romans eventually) ruled this part of the sea and the commercial routes passing through it. They were the main actors of Mediterranean trade, and the archaeological evidence recovered indicates a high rate of exchange and interconnections. This paper focuses on amphora finds from a selection of sites facing the Strait of Sicily as the primary sources to the pottery study of trade networks. Through a cross-study approach involving typology and fabric, and combining data stemming from published and unpublished items, this paper will tackle some of the open questions regarding production and distribution in ancient Mediterranean.
12. Angela Trentacoste (University of Oxford) - Ariadna Nieto-Espinet and Silvia Valenzuela Lamas (CISC), Livestock management, agricultural investment, and cultural change in Late Iron Age Italy

In late prehistoric societies, animals held both cultural and economic value. Not only did they provide food, transport, and a means of communicating with the divine, but livestock also functioned as valuable, tradable commodities and a long-term store of agricultural produce. In Italy during the Late Iron Age, the relationship that some communities had with their livestock underwent significant change. Our zooarchaeological research demonstrates that management patterns in northern Italy shifted dramatically with Etruscan exploitation of the Po Plain. During the same period, this area also witnessed a significant expansion in inter-regional trade with Greece and Celtic Europe. Recent research has demonstrated that cultural contact with Greek colonies in southern Italy and France had an impact on animal usage; did Greek–Etruscan contact in cities like Spina affect agricultural strategies in the Po Plain? How did Etruscan versus contemporary Celtic and Venetian settlements respond? This research analyses animal husbandry strategies and livestock size to reveal new data on cultural versus agricultural boundaries and the role of the local environment in determining productive strategies. Subsequent stages of the research will use isotopic and DNA analysis to investigate livestock mobility and genetic diversity of Iron Age animals, which are thought to be determinant factors that could shape animal husbandry production and livestock morphology.

13. Elisabetta Lupi (Leibniz Universität Hannover), Luxury from the West. The tarantinon in Attica and Boeotia

According to Hesychius and Photius, the tarantinon was a cloak of diaphanous material for women. This garment is mentioned in inscriptions from the sanctuaries of Artemis Brauronia in Attica (4th century BC) and Demeter in Tanagra (3rd century BC) in lists of votive objects offered to the goddesses by women. Since the 4th century BC, literary texts refer to fine textiles named tarantinon, tarantinidion, taranteinon and tarnation. Many scholars consider the presence of these terms as evidence of a textile trade between Taranto and Greece flourishing since the Peloponnesian War. Indeed, Taranto was renowned for its wool and textile industry until the Roman period. My paper investigates the significance of these terms, which might be related to the origin of the garments or the quality of the wool. Also, it is uncertain whether the textile trade first appears in the 4th century BC or whether it dates back to trade routes that existed already in the 11th century BC.

Panel 5.10 Ingots of Metals

Organiser: Norbert Hanel (Universität zu Köln)

Wednesday | 23 May | 17:00-19:00 | HS VII

Panel abstract

Indicators of metal trade within the Roman Empire and beyond In the middle of the ‘chain of operations’ (chaîne opératoire) in a broader sense, where the various technological, economic, historical and social steps are reflected – starting with mining activities/raw material exploitation and ending with the metal final products – ingots are a welcome archaeological type of find. The preserved or sometimes only documented items are the carriers of different metals and their routes can nowadays often be followed from the smelting sites to craftsmen and consumers within the Roman empire. The ingots themselves offer a wealth of information ranging from the knowledge gained from natural science methods, especially concerning the provenance (lead isotope analysis, trace element analysis, etc.), from the forms of the ingots, the different situations of their discovery and find locations up to the numerous
epigraphic elements (moulded and chiseled inscriptions, stamps and graffiti). In the context of this discussion, ingots of important metals (gold, silver, brass, copper, lead, iron) are to be presented for the first time in comparison to the framework conditions of the Imperium Romanum. Can we suppose differences between precious metals (gold, silver) and other metals (copper, lead, iron) during transport? Gold and silver ingots are missing, for example, in the numerous shipwrecks of the Mediterranean sea as well as in the Atlantic. Since the ore deposits spread over different provinces, questions arise about the distribution of the ingots in local, inter-regional and long-distance trade. Not always it was possible to choose low-cost sea transport; fluvial and overland-transport must kept in mind. Ports of trade are important as starting point, intermediate and/or terminal stations. We have to assume a network of different merchants (negotiatores, mercatores) including maritime (Mediterranean navicularii, Channel/ North Sea ? moritices) and fluvial shipowners (caudicarii, nautae). Even transport of lead to India is attested by ancient authors (Plin. 34, 163; peripl. M. Erythr. 49; 56). Last but not least: How can we reconstruct a widespread distribution of metals within the Roman Empire apart from the main routes of trade?

Paper abstracts

1. Rainer Wiegels (Universität Osnabrück/Buchenbach), Some remarks on the gold- and silver bars of the Late Roman period


2. Sabine Klein (Deutsches Bergbau-Museum Bochum), Submerged Witnesses of the Past: Roman Copper Ingots from the Mediterranean Sea

Copper metal became particularly important in the Roman Empire, since it was processed on industrial scale and by standardized metallurgical procedures. For archaeometallurgical aspects, copper ingots are the most important link in the sequence from copper ore to metal product. The studied copper ingots belong predominantly to cargoes of ship wrecks from the South coast of France, Corse and Cadiz. They were sampled by drilling, so that the gained material could be used repeatedly for several analysis methods, and is still not consumed. Bulk chemical composition with WD-electron microprobe, microstructural evaluation and the lead isotope composition with a multicolonlector mass spectrometer at Goethe-University Frankfurt was performed. The presentation shall give an overview of the occurrence of ingots, composition and finesse of the traded copper metal as well as the raw material provenancing towards the mineral sources, which were exploited for the production of the Roman copper ingots.

References:
3. Michael Bode (Deutsches Bergbau-Museum Bochum) - Norbert Hanel (Universität Bochum), Brass trade in the Roman Empire - a lead isotope study on Roman brass ingots from Corsica

In Roman time, coins, vessels, weapons, fibulae or metal plates for instance have been made to some extent of brass. Increased demand is particularly visible with the introduction of brass coins by Augustus and leads to the question about the origin of the raw materials copper and zinc. Most promising tool for the provenance of metals still is the lead isotope comparison, which in case of brass reflects the lead composition in the zinc component. Zinc is mostly present as calamine, which is closely related to lead minerals. Lead-zinc ores are located in Roman mining districts e.g. on Sardinia, in Germany, Britain, the Cevennes mountains in South France or the south-western Alps. With 21 brass ingots in a shipwreck off the east coast of Aléria (Corsica) an absolute outstanding find has been made in 1980. It can not only be dated very precisely into the end of the 2nd century AD, but also bears the chance to trace back the zinc's origin as ingots are as far as known not of mixed metal sources. Roman brass workshops are known from France as well as from Germany and Britain, but on the other hand Roman calamine exploitation in the provinces nowhere can safely be located so far. Although with the lead isotope method it is possible to clearly exclude German and Sardinian ores, a further limitation becomes more difficult as lead isotope data overlap. With this paper we like to present all relevant analytical and archaeological information and hand it over for a discussion.

4. Peter Rothenhöfer ((DAI, Kommission für Alte Geschichte und Epigraphik München) - Norbert Hanel (Universität Bochum), Lead Ingots and Roman Mining Activities on the Balkans

A detailed study of the Roman lead ingots from the Balkans, of their epigraphic elements together with lead isotope analysis, revealed new insights into Roman mining activities. Many of the previous views and concepts concerning e.g. mining areas and provenances must be revised, and new data - for instance concerning a metallum Messallini - can be added.

The chronological framework starts with the ingots from the Comacchio wreck (c. 35/30-12 BC) and ends with an 4th century ingot recovered at the legionary fortress of Novae/Shvistov.

5. Christian Rico (University of Toulouse, TRACES), Iron Trade in the Early Roman Empire: the case study of Gallia Narbonensis

The talk will propose an overview of the Roman iron trade in Western Mediterranean sea, specially off South Gaul coasts, illustrated by several shipwrecks found near Saintes-Maries-de-la-Mer and the Rhône mouth. Archaeological and epigraphical data, combined with physics, allow us to characterize the trade in its volume and its duration, and to understand its organization. The aim of the study is to replace the iron trade in the whole metal trade in Western Mediterranean sea during the Early Roman Empire.

Panel 5.11 Politics of Value: New approaches to early money and the state

Organiser: Elon Heymans (Tel Aviv University) and Marleen Termeer (Leiden University)

Friday | 25 May | 09:00-11:00 | HS IV

Panel abstract

As one of the most enduring icons of economic life, money has been a common feature and central focus in complex societies from antiquity to the present. Arguably, it gained weight as a key feature of Mediterranean economies in the course of the first millennium BCE, mostly in the form of coinage. But money is more than just coin, and its significance more pervasive than just to the strict sphere of what is usually known as “the economy”. This session explores how a more inclusive understanding of early money sheds new light on both ancient economies and the relation between money and the state.
Money was sanctioned for use and its value was constructed through exchanges and payments in a range of specific contexts, such as religion and cultic institutions, cultural and colonial interactions, elite strategies, military or economic expansion, and in the articulation of political messages. The use of money (whether metal bullion, coin, or other 'money-stuff') was part of political and social strategies, being subject to what has been termed 'the politics of value' (Appadurai 1986).

Against this background, money has been regarded one of the more prominent means for political entities – states – to assert themselves, i.e. by controlling the issue of coinage and exploiting them as media for political messages. It is therefore hardly surprising that money and its rise to prominence in the embedded economies of the ancient Mediterranean have been predominantly associated with the state, in theoretical opposition to the market (Hart 1986). We wish to subject this assumed relation between the spread of early forms of money and the state to debate.

For this session, we are interested in critical perspectives on the relation between money and the state, including the issue and spread of money by individual actors or social groups. Examples could range from money-stuff regulated or appropriated by the state, to coinages unrelated to state authority. Our focus is not on coinage as a material category within a specialized discourse, but on early money in its wider social settings and the question what it can tell us about the organization of communities. We welcome contributions that focus on these issues in any part of the Mediterranean and/or neighbouring regions, from the Bronze Age to late Antiquity.

**Paper abstracts**

1. **Elon Heymans (Tel Aviv University) - Marleen Termeer (Leiden University), Introduction: Re-thinking early money and the state**

Shunning a definition of ancient money, Schaps remarks that ‘for the historian tracing the beginning of an idea, a definition is a hindrance’ (2004, 3–4). Similarly, predefined ideas about money’s relation to society may be misleading when trying to understand its early development. As we note in our session abstract, in ancient studies, money, and especially coinage, has been predominantly associated with the state, in theoretical opposition to the market (Hart 1986). In this paper, we use examples from early Roman Italy and the Iron Age eastern Mediterranean to argue that a strong focus on the state, as a context for the appearance of early money, may obscure our understanding of the range of different ways in which money could be socially embedded.

In Italy, it seems that the adoption of coinage by Rome – which was an addition, rather than a replacement of weighed bronze as money – was not so much a result of internal needs or developments in the Roman state, but rather a way to facilitate interaction with others on the Italian peninsula. In the Iron Age eastern Mediterranean it was the collapse of state control and its effects on trade networks at the end of the LBA, rather than a process of state formation, that led to a proliferation of the use of (precious) metal as a means of exchange, and ultimately as a form of money.

Rather than seeing the state as a determinant, these two cases serve as a starting point to explore the relation between money and the state.

2. **David Wigg-Wolf (Deutsches Archäologisches Institut), The adoption of money by non-state societies: the example of Iron-Age northern Europe**

As a result of contacts with the Mediterranean world, the societies living north of the Alps in the pre-Roman and Roman Iron Age adopted coinage at various times. These were groupings with very different social structures to the Greek poleis, Hellenistic states or Rome, and their use of coinage could differ from that of their southern neighbours in many ways. This paper will examine how the ‘Celti’, and later the ‘Germani’, came to adopt and subsequently use coinage. Particular attention will be paid to the role of (non-)state and market as factors, and the actors involved.

The emergence of coinage in the North followed a very different trajectory from other areas; for example there was no long-standing tradition of hacksilber such as had existed in the Iberian peninsula. In early 3rd century BC Gaul it was probably returning mercenaries who brought back coins, triggering its
production there. But did trade and the market play no role, for example in the contact zone near the Mediterranean coast? Tacitus writes of Germani near the limes ("proximi") who were using coin in much the same way as the provincial population: is this visible in the archaeological and numismatic record? A consideration of the hows and whys of coin use can in turn throw light on the structure and organisation of the Iron Age populations of northern Europe.

3. Andreas Murgan, Between lumps and coins – Italy in the first millennium BC

The 'invention' of coinage in the 7th cent. BC in Asia minor as an important milestone in the development of the ancient societies spread soon across the whole Mediterranean area. Already in the 6th cent. BC coinage appeared in South Italy, issued by the Greek cities. Meanwhile, the Italic peoples had been using raw and formless pieces of copper alloy for centuries and continued to do so. The so-called aes rude was accompanied by heavy cast bronze bars and coins much later in the 3rd cent. BC. Although trade between the Greek and Italic cities flourished, most of the latter ones did not take over the idea of coins for almost three centuries. Only in the late 4th and 3rd cent. BC many non-Greek peoples, like the Romans or the Etruscans, started to issue coins, which however did not replace the former forms of money: the archaeological record contains lumps and bars in contexts of the 2nd and 1st centuries BC. Two different types of money seem to have been in use simultaneously: the coins, officially issued by authorities, carrying specific messages, and the unformed objects, without a recognizable authority or message, being thus anonymous. The introduction of coins by the Italic peoples occurred in troubled times that culminated in the 1st and 2nd Punic war. This paper wants to shed light on the question, why this change happened at exactly this moment, focussing on the social, political, and ritual aspects of money within the framework of state, religion and private market.

4. Nicholas Borek (Goethe-Universität Frankfurt am Main), More than Just Coins: A Metrological Approach to Studying Coin Hoards from the Western Mediterranean c.550-470 BCE

The value of a hoard was not always determined by the number of coins it contained but the amount of silver it represented. This certainly appears to be true for coin hoards found in the Western Mediterranean during the Archaic period. For this reason, it is important to consider an approach that accounts for the metrological rather than strictly numismatic aspects of these hoards. By analyzing the contents of all known hoards from the region, including those found in "An Inventory of Greek Coin Hoards", the "Coin Hoards" series, and other recent publications, it might be possible to determine if the coins were counted or weighed in certain cases. The results have broad implications. One of the traditional distinctions between bullion and early coinage is that the value of a coin was guaranteed by the minting authority. This characteristic, which was established by stamping coins with the mark of the state, is said to have eliminated the need for weighing coins. However, a number of coin hoards indicate that their contents were probably weighed in the manner of bullion. This suggests that concepts like the state's "guarantee" of value were less entrenched and slower to take effect in local contexts than it is assumed. More importantly, it fits a larger narrative in which the state and its role in the use of coinage were not fully developed in this region during the Archaic period.

5. Merav Haklai (Ben-Gurion University, Israel), How money defined the Romans

Scholarly discussions often focus on what money is and how to define it. This paper, however, does not aim to pursue how the Romans defined money, rather how money defined the Romans. The appreciation that money is a convention to use symbols to represent value is far from new. Already Plato (R. 371b) regarded money as a symbol created for the sake of exchange, implying that money was an outcome of economic interaction. Roman legal sources preserve another approach that gives the state a pivotal role in creating money (Paul. Dig. 18.1.1.pr.). Such an approach is not surprising coming from jurists living in the Roman empire, where money was used by the state in almost every aspect of its sovereignty. Yet, the importance of money in Roman political tradition was not initiated by Roman imperialism, neither by Roman familiarity with the Greek invention of coinage. Centuries before the Romans knew coins, before they established their empire, even before the res publica was founded – the
Roman state used money to define members of its community. This paper argues in favour of an umbilical relation between money and the Roman state. It focuses on the archaic Roman state and the revolutionary Servian reforms, which redefined money while simultaneously using it to define who was a Roman and what his civilian obligations were.

Panel 5.12 Revisiting the Roles of Roman Mediterranean Ports

Organiser: Simon Keay (University of Southampton)

Thursday | 24 May | 09:00-11:00 | HS VI

Panel abstract

Over twenty years ago in 1997 Xavier Nieto proposed a new interpretation of the role played by Roman Mediterranean ports, putting forward a model that emphasized distribution and re-distribution at the expense of cabotage. He argued for a hierarchy of ‘main’ and ‘secondary’ ports, as well as direct relationships between distant ‘main’ ports, and the regionally based dependence of ‘secondary ports’ upon the ‘main ports’. These ideas were based upon his belief that the way in which homogeneous or heterogeneous cargoes were stored on shipwrecks provides us with a clue as to whether a cargo was loaded at a main or secondary port.

This model has made a very important contribution to our understanding of the organization of Roman Mediterranean commerce. Since then, however, continued research into ports, shipwrecks and their cargoes and epigraphic and historical records means that the time is ripe to further explore his concepts and their implications for our understanding of Roman Mediterranean commerce. In particular, new research suggests that the notion of ‘main’ and ‘complementary’ cargoes is perhaps not as clear-cut as it might at first appear. Also, the sheer density of coastal sites involved in ship-based activity would appear to be at odds with the binary concept of main and secondary ports. The time is ripe, therefore, for building upon and enriching earlier research into the roles into Roman Mediterranean ports.

This panel is based upon research being undertaken by the ERC Advanced Grant funded Rome's Mediterranean Ports (RoMP)/Portuslimen project. It is an inter-disciplinary project that is analyzing archaeological, geo-archaeological, historical, epigraphic and iconographic evidence from a range of some 32 early Imperial ports from across the Mediterranean. The character, development and roles of ports, as well as their administration and connections, are the main focus of the research. The papers that are presented here will address issues that are central to offering a more nuanced reading of port functions. All the papers work from the belief that ports should not be viewed simply as self-evident inter-connected nodes. They argue instead that they should be understood as being embedded within a series of interlocking port-systems composed of a complex hierarchy of sites at the regional level. In this context, the value of such concepts as transshipment, entrepot, roadstead and hubs are looked at in terms of the available archaeological evidence from the port systems of Rome, Tarraco and Narbo. Furthermore, the structure of commerce and trade, the roles of their performers involved, and the cycle of mediation followed by traded goods from production and consumption will also be discussed. These papers will also explore the articulation between the archaeological evidence (including the epigraphy of merchandise) and the written sources for understanding trade patterns. There will also be reflection on research into later periods which have promoted more complex patterns of port hierarchy that are also relevant to the debate.
Paper abstracts

1. Simon Keay (University of Southampton), Towards a Revised Understanding of the Commercial roles of Portus and Ostia

It is a paradox that despite the many years of archaeological and epigraphic research which make Portus and Ostia amongst the best documented ports of the Roman Mediterranean, much remains to be understood about the roles that they played in supplying Imperial Rome and in broader commercial activity across the Mediterranean.

After decades of research focused primarily upon Ostia, recent work has focused upon Portus with a view to defining its extent, character and relationship to Ostia and Rome. This has suggested that following its enlargement by Trajan, Portus became the principal focus of import, trans-shipment and storage of goods bound for Rome, a large proportion of which would have been contracted by the State. It has also been suggested that the port must have been involved to at least some extent in export and re-distribution as well. While this could have been supplemented by goods stored in warehouses at Ostia, the likely congestion that would have built up on the Tiber and Portus is an argument that has suggested that a significant proportion of the warehouse capacity at Ostia could have been destined to serve the storage needs of its own population or, indeed, could have been re-distributed to elsewhere in the Mediterranean directly from Ostia itself.

Recent geophysical surveys in the Isola Sacra shed further light on this issue. It suggests that the northern limit of Ostia was not formed by the Tiber, but that it lay c. 300m to the north of it in the southern part of the Isola Sacra. This new northern sector of the river port was comprised of very large warehouses and other public buildings of likely early Imperial date. It was bounded by a substantial wall circuit to the north which continued the line of the Republican wall to the south. Another discovery has been a major new canal that ran southwards from Portus parallel to the Via Flavia. Current evidence suggests that its southern stretch lay a short distance to the west of the newly discovered warehouses and that it flowed into the Tiber on the western side of Ostia.

At one level, this new evidence underlines the close relationship of Portus and Ostia and supports the idea that they were part of an integrated port system geared to serving Rome. At another, however, it greatly increases the storage at Ostia, seemingly far exceeding what would have been needed for the needs of its population alone. This suggests that Ostia must have played a major role in the supply of Rome together with Portus. If so, it raises questions about how the port authorities at Ostia and at Portus were able to successfully coordinate the movement of traffic up and down the Tiber to Rome, without incurring severe congestion. An alternative possibility is that the newly discovered warehouses were designed to facilitate shipment of cargoes that were received from Portus and were destined for re-export to the Mediterranean at large from Ostia. Given the well-known dangers of the mouth of the Tiber and the shallowness and small scale of the harbour at Ostia, this could only have been accomplished with the use of lighters serving larger capacity ships moored offshore.

This paper reviews these issues and argues that the roles of Ostia and Portus in supplying Rome cannot be considered in isolation. They were clearly complementary, and also need to be understood in the context of their relationships to other attested ports, anchorages and road stations within the broader port system of Imperial Rome. The paper ends with a brief evaluation of the roles and relationships of Portus and Ostia to some of these, which range from Santa Severa and Centumcellae in the north, down to Ardea, Antium, Terracina and Puteoli in the south.

2. Pascal Arnaud (Université Lyon 2), Main and secondary cargoes in the light of charter-parties and fiscalitý

One of the grounds of the notions of main and secondary cargo is the postulate that “secondary cargoes” circulated for nothing and for that reason could be of little commercial value. They allegedly circulated because transported for free, while the main cargo would have alone justified the cost of transportation from a point to another.

This point of view is partly supported by the possibility, described by the Digest, of hiring an entire ship (ex aversione) whose capacity, expressed in modii or in amphorae had been stated. Then the fee was
paid for the full capacity of the boat, and it did not matter whether the boat was loaded at her full capacity or not, and what she was loaded with. But that kind of contract seems to be relating to the ship as an object, and not to transportation.

Transportation was usually subject to specific contracts, usually called nautotikai, very similar in form and content to medieval and modern charter-parties. Extant charter-parties, and some of their usual clauses preserved in the Digest, inform us that all items brought into a ship were identified in the contract and that a special fee was agreed for each of these items. The price was calculated on the ground of unitary cost of the piece for all kinds of species to be transported multiplied by the number of pieces per species.

In the case of mixed cargoes, all elements of the cargo were subject to specific fees. No element of the cargo was transported for free. There was likely no “main” or “secondary” cargoes, but various kinds of merchandize on board that all were subject to transport fees and all were intended to be sold at destination with substantial benefits. They were just complementary from an economic point of view and could hopefully generate profit in a distant market.

Destination(s), loading and unloading times and conditions were also clearly specified in the charter-party, as well as penalties and fines in case one of the contractors would fail to respect the agreed terms of the contract.

The point of view of Roman charter-parties leads us to a much more planned model of trade, both at long and short distance, that leave little space for tramping patterns of trade. It illustrates how different was the interest and value of time for the merchant and for the shipper. The latter’s point of view has long been under-evaluated.

The Annona is a case per se. In order to fit with the shipper’s interest and prompt wealthy investors to build larger ships and to put these at the service of the Annona, shippers were allowed to bring altogether with public grain, private cargoes, at least until AD 395.

Unloading part of the cargo en route and reloading it was obviously possible. It had to be planned and was probably difficult to imagine outside of a single fiscal district.

More attention paid to the point of view of the shipper unveils part of the frames of port networks of the Roman Mediterranean.

3. Emilia Mataix (University of Southampton), Taking a closer look: reconsidering cargoes from the perspective of the epigraphy of merchandize (scripta commercii)

The material remains of Roman wrecks and their cargoes help characterized the mechanisms employed in trade in the Roman Imperial era. The merchandize traded through Roman Mediterranean ports was a key element for the agreements of sale and lease and hire. Elements of these contracts, as well as of the mechanisms and principles of Roman law that guided them, are evidenced though the inscriptions written in merchantise. This approach challenges the model proposed by Nieto in 1988, describing the notions of “main” and “complementary” cargoes. This theory just considers the value of the goods, and not the importance of the cargo or the role of law to shape the commercial relations held by the parties in trade. In addition, his theory was based upon the perspective of the shipper, and not the merchant, who shipped a whole or partial cargo along a specified route. Through the evidence of the cargoes from different wrecks and the material record evidencing the agreements sale and transport, I will distinguish diverse scenarios of distribution.

This communication will also consider the role of port systems, where connectivity between the different installations and places that composed them was key to ensuring the movement of ships and their cargoes. Furthermore, the significance of structures involved in the transhipment of goods or the warehouses where cargoes were stored, is analysed in terms of the issues that were considered by the parties involved in commerce when ships were loaded and before they set sail. Particular focus here will be upon the evidence provided by the epigraphy of merchandise and the legal sources. I will first challenge the idea that there was a hierarchy of transported goods within a cargo from the perspective of Roman legal sources and the epigraphy of merchandise that describes trade agreements. Secondly, I will use the conclusions drawn from this to study some specific examples of wrecks from different are-
as and trading routes. I conclude by arguing that there was no such thing as a 'typical' cargo and the different goods carried on Roman ships were transported and sold in different ways.

4. Marie-Pierre Jezegou (DRASSM-Ministère de la Culture, France), L'activité du port de Narbonne dans le cadre du modèle redistribution/redistribution: retour sur un échantillon d'épaves du golfe du Lion et du littoral provençal de la fin de la République au IIIe siècle

L'activité du port de Narbonne dans le cadre du modèle distribution/redistribution : retour sur un échantillon d'épaves du golfe du Lion et du littoral provençal de la fin de la République au IIIe siècle. Les fouilles récentes du port de Narbonne ont révélé l'implantation et l'entretien continu, durant au moins quatre siècles, dans un contexte environnemental difficile, d'un des plus importants ports de Méditerranée occidentale. Néanmoins à ce jour, si son activité économique est bien perçue à travers l'iconographie et l'épigraphie amphorique et surtout lapidaire, aucune étude n'a tenté d'évaluer, à partir d'un corpus d'épaves pourtant abondant bien que pas toujours exploitable en terme d'assemblage des cargaisons en raison le plus souvent de naufrages à faible profondeur, la place de Narbonne dans le cadre du modèle évoqué ci-dessus. Loin d'être uniquement un grand port d'importation et d'exportation, Narbonne a pris également une place importante dans les échanges interprovinciaux et régionaux. Si à ce jour, le maillage portuaire du Narbonnais et des territoires voisins ne se perçoit pas encore aisément, faute d'études en ce sens, la complexité de l'activité ré-distributrice et l'évolution de ses modalités sur plusieurs siècles peut être envisagée. Dans cette optique nous essayerons également d'évaluer le ratio entre pertinence et contraintes des schémas « cargaison principale et secondaire » et « port principal versus port secondaire ». La diversité des entreprises commerciales que l'on perçoit à travers l'hétérogénéité de la navigation se révèle bien plus complexe et elle témoigne surtout de l'évolution des contextes socio-économiques.

5. Nicolas Carayon (University of Southampton), A functional approach to the harbour system of Narbo Martius

The recent research undertaken in the area of Narbonne (France) has revealed a great number of sites occupied during the Roman period. These sites are located along the ancient Atax River, around the lagoon and on the islands of the lagoon. They were provided with natural or artificial harbour facilities. The question of their implications within the harbours activities of the emporion of all Gaul in the words of Strabo (4, 1, 12) is now relevant. Within the framework of the ERC Rome's Mediterranean Ports Projects, we demonstrates that the port of Narbo Martius must be considered as a harbour system instead of a centralised city-port. The nature and the harbour potential of the numerous coastal sites make it possible to suggest different hypotheses about the functioning of one of the more important ports of the western Mediterranean. This paper aims to reconsider the river, lagoon and maritime port of the capital of the Roman province of Gallia Narbonensis by emphasizing a functional approach. It raises the question of the relationship between the urban river port at Narbonne and the secondary harbour sites, implying both private and public development, transhipment and other ports operations. The functional approach also investigates the possible integration of several specialised sites that are not usually considered as forming part of ancient ports (namely quarries, workshops, rural sites) within the harbour system.
Panel 5.13 Networks at Work: Trade and transport of Roman building materials in the Mediterranean

Organiser: Lynne Lancaster (Ohio University)
Thursday | 24 May | 14:30-16:30 | HS I

Panel abstract
This session focuses on the different modes of medium- and long-distance trade and transport of building materials, such as roof tiles, bricks, timber, and stone. The goal is to understand better the overlapping factors that affected the development of supply networks over time as the Roman Empire expanded, developed its infrastructure, and eventually shifted its focus eastward from Rome towards Constantinople. Much of the evidence for trade in building materials comes from shipwrecks, which allow a glimpse into the types of cargos that were carried on various sized ships. Recently discovered shipwrecks carrying building materials contribute to a growing database of such finds that goes well beyond the material collected in A. J. Parker’s seminal work, Ancient Shipwrecks of the Mediterranean and the Roman Provinces (1992). Moreover, previously known wrecks are being reassessed with an eye towards determining the agency behind the seaborne transport network of building supplies and assessing the changing patterns of connectivity over the long term. Supplementing the evidence from shipwrecks are the results of archaeometric studies using new and more accurate methods, such as isotopic analysis, trace element analysis, as well as more traditional petrological methods, all of which are revealing much about the origins and movement of volcanic ash, marble, and terracotta building materials around the Mediterranean. Tree ring analysis has even provided a means of pinpointing sources of building timber revealing hitherto unknown patterns of distribution. Literary, inscriptional, and legal sources then yield insight into management of public and private forests for supplying the timber. Written sources also contribute evidence for the infrastructure that allowed such medium- and long-distance trade to develop. Papyri document the means used by the imperial administration for the extraction and transport of precious colored stone from the Eastern Desert of Egypt and reveal a complex interplay between the administration, the military, and local governments. Taken together with quarry marks, such documents allow a deeper understanding of the nature of the imperial stone supply system in this corner of the Empire. Finally, the Marzamemi "Church Wreck" provides a glimpse into the provision of stone building elements as the priorities of the imperial administration shifted with the rise of Christianity. The cargo raises new questions about the organization of the building industry during this period of transition. By employing a variety of sources of evidence relating to different types of building materials, the papers in this session set the stage for a broader discussion of the changing role of the distribution and transport networks within the areas of the Roman Empire bordering the Mediterranean and of their relevance for the broader economy.

Paper abstracts

1. Elizabeth Jane Shepherd (Ministero dei beni e delle attività culturali e del turismo), Selling tiles by the thousands. Roman CBM cargoes in the Mediterranean

I have stressed, in the past years, how different technical overlapping devices in Roman plain tiles point to different geographical and cultural areas of production in the Mediterranean countries (Shepherd 2015), also possibly answering problems posed to builders by changing climatic factors (Shepherd 2016). It is now time to apply these patterns to the “closed context” BCM loads preserved in shipwrecks, analysing the results in order to determine their possible provenance and also their final use. Many of the shipwrecked cargoes are in fact specialized consignments for specific building programs, and not simply return cargoes, as was commonly thought in the past decades. This is clear also from an important addition to the number of known BCM shipwrecks: a new, well preserved wreck recently found off
Sardinia, carrying a whole cargo of tiles.
These are some of the results to be gained by this research: a) identification of new patterns in this particular kind of commerce; b) identification of likely production areas; c) identification of the people behind it (brickmakers, traders, builders, patrons).

Shepherd 2015

Shepherd 2016

2. Francesca Diosono (Ludwig-Maximilians-Universität München), Timber transport and trade in roman Italy

Studying wood as an element of the culture and economy of the ancient world means almost trying to materialize a ghost. This statement is not only due to its high perishability (it literally disappears in most cases virtually within a short period of time), but also from the fact that today wood and timber are materials with a limited use, now replaced in many fields by other raw materials and techniques. In order to understand the fundamental importance of wood in Roman times, it should be recalled that it was the main source of energy and heating, one of the fundamental materials for built structures, roofs, fortifications and means of transport, for making furniture, tools and utensils, the most popular object for writing on, one of the most appreciated agricultural products, one of the most important elements present in domestic and everyday life but also a luxury good.

Given that timber, because of his organic nature, is not very resistant to the passing of time, it is natural that the archaeological data seldom provide information about it from the material point of view; that is why it is necessary to carefully analyze the literary sources and compare them, when possible, with archeometric data. The purpose of this paper is to compare for the first time two different disciplinary approaches: the historical one and the one based on the results of the archeobotanical disciplines (especially anthracology and dendrochronology). Concrete examples will be considered in Italy and also Eastern Mediterranean, in which historical sources are confirmed or denied by archaeological data. It will thus be seen that the timber trading and transport situation (both large- and small- scale) in Roman times was much more complex and multi-faceted than is traditionally considered, and it was not solely based on principles of speed and affordability.

3. Lynne Lancaster (Ohio University), Transport and Trade of Volcanic Building Materials in the Mediterranean: State of the Question

In recent years, scholars using new methods for determining rock provenance, such as trace element analysis, have broadened our understanding of transport and trade of volcanic building stones in the Mediterranean. The newly published ROMACONS project focused on trade in volcanic ash for hydraulic mortar in harbor construction, the results of which indicate that by the late 1st c. BC volcanic ash from Campania was the gold standard. Nevertheless, for terrestrial structures volcanic ash from other sources (Sicily Channel, Aegean Islands) was also traded for making mortar. Moreover, pumice and volcanic scoria were in demand as lightweight materials for concrete vaults as shown by the Campanian materials employed in vaults in prestigious structures in Rome from the mid 1st century BC and later. Africa Proconsularis was supplied with scoria from nearby volcanic islands, Sardinia and Pantelleria. These building materials may well have been secondary cargo that traveled with the grain mills of volcanic stone exported from both islands. Further east, scoria from Cilicia had a regional distribution by both land and sea. These new results suggest that different factors were at play according to location and purpose. Possible influences include the role of the imperial administration (e.g., Rome, harbor works) the presence of pre-existing networks for other goods (e.g., Sicily Channel, Aegean Islands), and the efficacy (real or perceived) of such specialized building materials.
4. Justin Leidwanger (Stanford University), Contextualizing the Late Antique Stone Trade: The Marzamemi “Church Wreck” Reconsidered

Since 2013, investigations of the famous Marzamemi “church wreck” have aimed to shed new light on this monumental 6th-century CE assemblage off the Sicilian coast. With a load of more than one hundred tons of prefabricated religious and decorative architectural elements, the site has long been associated with the massive building program that followed Justinian's brief re-conquest of the late Roman west. Five fieldwork campaigns to date, however, have raised critical questions about the longstanding narrative of an imperially sponsored “flat-pack” structure designed for rote assembly at a single destination. Alongside re-evaluation of the major architectural elements, analysis of the shipboard assemblage, secondary cargo, and broader historical context provides new clues about private commercial and directed exchange, local and imperial patronage and propaganda, and maritime connectivity more generally. From cooking pots, iron fasteners and tools, to transport amphora lids, mineral pigments, and stone and glass “samples,” recent finds offer a window into the logistics and mechanisms of stone transport that were fundamental to massive late antique elite urban building programs. At the same time, a more holistic view of the shipwreck assemblage demonstrates the complexity of interrelated processes that fostered and sustained socioeconomic connectivity more generally through these final years of large-scale trans-Mediterranean exchange.

Panel 5.14 Trade and Commerce in the Harbour Town of Ostia

Organiser: Alice Landskron (University of Graz)

Thursday | 24 May | 11:30-13:30 | HS VI

Panel abstract

Manifold evidence for trade and commerce have come to light in Ostia: inscriptions, images on mosaics, reliefs etc.

Epigraphic evidence and images provide information regarding many club houses and guilds, as well as private financing of public buildings such as baths, sanctuaries, and public gathering places. The mosaics of the Piazzale delle corporazioni, the court of the guilds, which is situated in the Area sacra, provide unique and comprehensive information on the economic growth and trade in the harbor town and, further afield, in Rome. It can be identified as a unique example for the documentation and organization of commerce and trade in Ostia, highlighting its importance as a hub city. This area was intended as a place of interaction of mercantile and sacred events.

Furthermore, the large number of archaeological and artistic remains which feature different kinds of work, or spatial areas in which occupations were practiced, provide excellent information on how society in Ostia and beyond reacted to the demand for craft and trade, and how such commerce was represented both communally and individually. Researchers have recognised in this a new social class that was developed in Roman society, showing proud individuals who were well accepted as skilled craftsmen and professionals since they played an important role within society. Numerous guilds and guild houses were established in Ostia since early imperial times. Often, liberti became affiliated with guilds and collegia in order to enhance and strengthen their social prestige. There is epigraphic evidence of about 60 collegia in imperial times, most of them situated along the main streets.

The aim of the panel is to discuss what kind of trade and commerce is represented in written and visual sources, and what information these sources provide about the people who were involved in the economic processes of production and especially of distribution in Ostia.

The proposed panel deals with contributions on visualizations as well as epigraphic evidence in the context of trade and commerce in Ostia. Papers could also deal with people or individuals involved in
trade and commerce, with forms of representation of merchandising, with the function of guilds, or with infrastructural facilities. Furthermore, questions regarding the value of specific kinds of trade and commerce within Ostian society could also be addressed.

### Paper abstracts

1. Simone Ciambelli (Università di Bologna/Université de Poitiers), The patronage of professional collegia and the social rise of the collegiati in Ostia (II-III centuries AD)

The aim of this paper is to demonstrate that the professional collegia, especially those linked with the annona, could be considered the protagonists of the «social revolution», to use Russel Meiggs' fortunate expression, which exploded in Ostia during the II century AD. To do that I will analyse a particular aspect that comes from the abundant epigraphical sources: the patronage over the professional associations.

In the first part, I will briefly introduce to the different professional collegia attested and I will show the high heterogeneity of the social profile of the 90 patrons identified in the Ostian epigraphical material. In the second part, I will focus my attention on the social rise of the collegiati through the title of patron. In fact, a remarkable number of patroni, about the 26%, comes from the collegial milieu and, thanks to this prestigious title, they became a part of the new Ostian élite with the co-optation inside the ordo decurionum. This aspect of the patronage is a peculiarity of Ostia, in fact in the rest of the Roman world the patronus collegiorum usually comes from a different social class than collegiati. I will conclude that the professional collegia played an important role in the Ostian society and some locupletes members of them were even capable to replace a part of the old local nobility, distrustful to the collegial world of craftsmen and tradesmen and still tied with the traditional aristocratic ideology, based on the economy of agriculture.

2. Ghislaine van der Ploeg (University of Cologne), Trade, Identity, and Mobility: the Case of Lucius Caecilius Aemilianus

Increased mobility was one of the characteristics of the Roman Empire. Improved infrastructure, trade links, and Roman citizenship enabled people to move around the Mediterranean and settle in a new place. The harbour city of Ostia, with its vast movement of people and goods, was emblematic of this phenomenon of mobility and connectivity. People from all over the Roman Empire, including many from the Roman North African provinces, lived and worked here. Evidence for this is especially visible in the Piazzale delle Corporazioni with its many stationes relating to African cities such as Carthage. This paper will explore these connections between Africa and Ostia by studying an inscription erected by an African veteran, decurio, and duovir, Lucius Caecilius Aemilianus, who dedicated this inscription while he was living and working as a wine trader in Ostia. In this inscription, he displayed an interesting combination of both his military past and his Ostian commercial present career as he was a member of the corpus splendidissimum importatorum et negotiantium vinariorum. This paper will examine why Aemilianus chose to display this in such a way and it will show how his past military career aided his present one in Ostia. It will also explore how a newly-arrived individual had to establish their identity in Ostia via social networks and the important role the collegia played in this.

3. Paola Baldassarri (Città Metropolitana di Roma) · Simona Faedda (UB Barcelona), Spain-Ostia-Rome: evidences of economic and artistic relationships from the excavation of Palazzo Valentini in Rome

The archaeological excavation beneath Palazzo Valentini have brought to light a residential quarter of the Middle and Late Empire. The two sumptuous domus had two building phases, dating to the 2nd and to the first half of the 4th century AD. In this late phase they probably became a single, large domus with annexed thermae, belonged to the highest social class, senators or high dignitaries of the imperial court.

They could have a Spanish origin or at least relationships with the Spanish provinces: traces are evident in the presence of Iberic amphorae, from Baetica, representative of a domestic life. It reflects the eco-
conomic situation that links Rome with Baetica. In the opus sectile pavements it has been recognised the broccatello of Tortosa, a Spanish marble but rarely outside. One of them can be compared with two other pavements from Italica and Sevilla and with an opus sectile floor of the Domus of Amore and Psyche at Ostia.

All these clues could suggest a triangular relation between Rome, Ostia/Portus and Spain. A Spanish origin or large properties in a Spanish province could constitute the richness of the owners of the domus, based on traffics of goods, not only food staffs, but also furniture and marbles, from Spain in direction to Rome through the harbour of Portus. In reverse ideas and cartoons for the decoration of Spanish domus could have started from Rome and reached the province. A foothold domus in Ostia could have supported the control of their overseas affairs.

4. Ria Berg (University of Tampere), Iconography of the Modius in Ostia - Visualizing Ethnicity and Exchange

This paper discusses the uses of the image of the grain measure modius in the iconographic contexts of the harbour town of Roman Ostia. The modius, a large cylindrical container of standard size, was the most important instrument for controlling the amounts of grain arriving to the harbour and transferred to its horrea. In Ostian mosaics, this vessel became the symbol of some economic actors of primary importance in the Ostian society: the guild of grain measurers and the naviculari responsible for the grain transport from different areas of the Mediterranean. Interestingly, in the mosaics of the Piazzale delle Corporazioni, this modest trading container is represented in a similar way as the sacral vessels such as kraters and kantharoi: central in position, heraldically surrounded by symmetrical elements and topped by crowning leaves. In fact, modius, as the headress of various divinities, in primis Serapis, could also be bestowed with religious significance. In Ostian coroplastics and minor arts (statuettes, plastic vases and lamps), the polos-headdress is one of the primary markers of ethnicity and otherness, besides divine status. In this contribution, the iconography of modius, as represented on a wide spectrum of supports in the material culture of Ostia through the imperial age, will be analyzed as a symbol of intercultural exchange and of translating and interpreting measures between different commercial areas, and the sacralization of such communication.

5. Marcello Turci (Aix-Marseille University), The development of the maritime district of Ostia from the 3th to the beginning of the 6th century A.D.

The maritime district of Ostia was interested during the Hadrian's period by an overall urban reorganization, evident in sumptuous thermal complexes, like the baths of Porta Marina, probably erected by the imperial family, the Silenus baths, located as the previous ones on the shoreline and the Terme Marittime as well, in close relationship with the residential complex of Garden Houses.

This framework, consolidating in the 2nd century and during the Severan dynasty, is in contrast with the situation starting from the late 3rd century and the beginning of 4th century. In fact, after the period of “Military Anarchy” we can see, on the one hand, the resumption of a construction activity at the baths of Porta Marina (whose inscriptions provide documentation of restorations until the beginning of 6th century); on the other, the edification of little balnea along the coastal road.

The renewed building impulse seem to find its economic roots into the development of the coastal road network, with the creation of the Via Severiana and probably with the building of the Aurelian forum erected ad mare and where the praetorium publicum was late established (Aurel., Historia Augusta, XLV, 2). Thermae and balnea, as evidenced by Y. Thébert, reflects roman society politically, socialy and, in the end, economically.

Aim of this contribution is to put in lights how interregional trade along the coastal road from the cities of the Italia suburbucaria in direction of Rome, became an important impact factor for the development of the suburban district of Ostia with the restoration of ancient baths and the creation of new ones.
Panel 5.15 Greek and Etruscan Vases: Shapes and markets

Organiser: Dimitris Paleothodoros (University of Thessaly, Volos)
Thursday | 24 May | 09:00-13:30 | HS II

Panel abstract
The communis opinio regarding the diffusion of Attic painted pottery privileged the workshops of the Athenian Kerameikos and claimed that foreigners and non-Athenian Greeks bought whatever was produced without discrimination. A number of recent studies, however, have given rise to the awareness that workshops organized their production in order to fulfill specific demands from clients and that agency rested with traders and consumers as well as producers. Much of this recent work has elucidated the mechanisms of adoption and commercialization of specific shapes aimed at the Etruscan and Campanian markets. This session aims at broadening the spectrum by also taking into consideration other areas of the Mediterranean world (northeastern Italy, mainland Greece, the Italic world). Central are the use and the role of imported vases in a variety of contexts, although tombs predominate by necessity, and the way these imports interact with local production. The aim of the session is to explore the fluidity of use and meaning of Athenian vases in different contexts; how shapes and subjects are negotiated between consumer and producer; and how middlemen and networks of contacts and exchanges are operative in the process of popularizing vase shapes and types of decoration.

Paper abstracts
1. Delphine Tonglet (Université libre de Bruxelles-F.R.S.-FNRS), A useful melting-pot: towards a definition of Etruscan banquet sets in funerary contexts
This paper presents part of my ongoing research on Etruscan communal banquet practices between the 10th and 6th centuries BC. Communal banqueting is archaeologically represented in vase assemblies within funerary and other contexts. Shared by many Mediterranean regions, it was a characteristic elite institution that expressed cultural identity and status. Here I wish to show how vessels locally made in Etruria were grouped with imported and/or imitated Greek vases into mixed drinking sets – unlike Greek conventions. After defining Etruscan “drinking sets”, i.e. the recurring combination of vase shapes necessary for a banquet gathering, I will present a series of case studies, chosen from different areas of Etruria during the 7th-6th cent. BC, with a view to inferring the functions of the different Greek and local vases. The evidence will provide the opportunity to consider the influence of the Greek symposium as well as its transformation and adaptation by the Etruscans. The final, chronological, part of my paper addresses the typological and functional development of a selection of Etruscan shapes such as the olla, chalice and kyathos. Their story sheds light on banqueting practices before and after the arrival of Greek symposiotic objects and practices in Etruria.

2. Cécile Jubier-Galinier (Université de Perpignan Via Domitia), 'Shapes, markets and workshops' strategy between specialisation and diversification
Because of Beazley and to simplify we talk about pot, cup, oenochoe or lekythos workshops, but in fact such specialised ergasteria don’t exist that way. Except for some cup potters, potters and painters produce different shapes. The diversification of production is more or less developed, in particular the so called lekythos-painters diversify much more their productions than expected. The distribution maps depend on available data but year after year points are added on maps and the understanding of the pottery market progresses. In this communication, I will go further on the study of the distribution of the Diosphos-Haimon Workshop to follow its variation during two generations or more. Beside the lekythoi of the workshop found in different Greek areas, the compared study of the
distribution of other shapes also produced in this workshop shows the craftsmen's continuing motivation to diversify.

3. Amalia Avramidou (Democritus University of Thrace) - Despina Tsiafakakis (Research and Innovation Centre “Athena”), Attic Kraters and Pelikai from Ancient Thrace

This paper explores the distribution patterns, usage and iconography of two case-specific shapes of Attic painted pottery, the krater and the pelike, within an area expanding from the r. Danube to the Aegean Sea, and from the Black Sea to the r. Strymon. Drawing from the on-going research project Attic Pottery in Ancient Thrace, the krater was chosen as a representative type of large, open pots and the pelike as a characteristic closed, storage-type shape. Kraters are the most frequent large shape found in the area between the sixth and fourth century–cups and lekythoi being the majority, while pelikai appear in noticeably fewer numbers. By considering Ancient Thrace as a single geographic unit rather than an area of compartmentalized study, this investigation aims to recreate the larger picture of Attic imports in the region. Kraters and pelikai are found in coastal and inland sites, in Greek colonies and Thracian tumuli, in settlements, necropoleis and sanctuaries, offering a unique opportunity to examine their diffusion, their function within the local societies and their chronological span. Where applicable, the vases are contextualized and discussed vis-à-vis local traditions but also contribute to a more synthetic approach, considering historical and political realities. Lastly, this study explores which painters and workshops of the Athenian Kerameikos are represented in our sample and juxtaposes these finds to the wider spectrum of Attic exports in the Mediterranean.

4. Dimitris Paleothodoros (University of Thessaly), Attic Red-Figured mugs in the market

Attic red-figured mugs have received relatively little notice in the past. This paper presents a brief overview of the history of the shape, which was invented towards the end of the 6th century in the Athenian Kerameikos, apparently under the influence of the laconian mug that was a highly successful drinking shape in the Peloponnese and the West. Few workshops were involved in the initial production, but soon the shape underwent several modifications, while versions in metal and black-glaze also occurred and became increasingly popular.

If the identification of the shape with the kothion mentioned in ancient sources is correct, the mug was particularly apt for use by travelers, soldiers and people pouring libations. This is confirmed by iconography, as well. Most interestingly, the distribution of red-figured mugs presents a pattern that is unlike any other drinking form in early attic red-figure: most mugs have been found in Greece, South Italy and Sicily, with a large proportion coming from sanctuaries. The funerary destination is also ubiquitous, and it has to be noted that when context is available, mugs appear in tombs of young males. At the end of the fifth century, when the production almost ceases, the few examples produced are giant variants, apparently serving as mixing, rather than drinking vessels. The market orientation is now different, since all of them have been found in Northern Greece and Bulgaria.

5. Barbara Cavallaro, Attic vases in Vassallaggi (Caltanissetta, Italy): special commissions in a sican town

Between sixties and seventies of last century, the archaeologists D. Adamesteanu and P. Orlandini, excavated the southern necropolis of Vassallaggi, near San Cataldo (Caltanissetta, Italy), site of the ancient sican citadel of Motyon, mentioned by Diodorus Siculus since occupied by Ducezio in 451 B.C. and regained by Akragas in 450 B.C. Unfortunately, we don't know the built-up area, still unpublished, so the knowledge of this community comes from classical necropolis that was used throughout the Vth century. B.C. We pay attention to funerary sets consisting of red-figure attic vases, associated with metal elements such as large knives and strigils and, in some cases, indigenous pottery. The inhabitants commissioned the Athenian Kerameikos to have vessel shapes linked to symposium, then sorted from Akragas's emporium. Kraters, oinochoai and pelikai are smaller than the standards. They are decorated with precise figurative scenes, mostly dionysian subjects and scenes of farewell, erotic pursuit or private life, chosen by customers to represent themselves in the afterlife through episodes of their lives. Vascular forms that make up the funeral set, together with knives and strigils, indicate that people was
identified in community values represented by symposium, gymnasium and sacrificial rites. They therefore indicate the total acquisition of the Greek costume at the funerary level (for use of grave-type and kit) and at the social level (for carrying out precise activities).

6. Aaron Rhodes-Schroder (The University of Auckland), Death Driving Deposition: funerary practice as a motivator of Tarquinian selection in the Attic vase trade

This paper presents the results of a quantitative analysis of Attic vases from Tarquinia, based on data collated from the Beazley Archive and the holdings of the Museo Archeologico Nazionale di Tarquinia; the intention was to identify patterns of preference in the changes in shape and technique from the late 6th century to the early 5th century BC. It can be clearly demonstrated that vase-shape was not the sole determining factor for selection by the Tarquinians, but that decorative technique also played a part: the data show preference for the amphora over other vase-shapes, and almost exclusively for black-figure amphorae, whereas other vase-shapes were readily accepted in the red-figure technique when it became available. It would seem that for the Tarquinians, the selection of vases for burials was determined by specific local cultural practices, within which the black-figure amphorae seem to have had particular significance. This has major implications for understanding the decrease in the importation of Attic vases into Tarquinia: rather than being ascribed to the advent of the fifth century crisis (as per the communis opinio), the decline should now perhaps be seen as a response to the change in production in Athens from black-figure to red-figure, of large, high-quality vases - a development which coincides chronologically with the decline in Attic imports into Etruria.

7. Winfred van de Put (Netherlands Institute at Athens), Markets and the survival of shapes: the case of the column-krater

The column-krater is a truly Greek shape with a venerable history, starting somewhere in the seventh century BCE in Corinth but already prefigured in the Mycenaean repertoire. Throughout its existence in the Athenian production it was widely exported. Some shapes, such as the Nikosthenic Amphorae, were made in Athens for a very specific market. It is not surprising to see a short life-span of the Attic variant of such products. The purely Greek shape of the column krater, however, appears to fall out of favour in the mother country, while taking on a new life abroad, with uses not envisaged by the Corinthian inventors or Athenian producers. In the end, the column-krater shared status and fate of ‘export shape’ with types derived from non-Greek examples, to the extent that its survival depended solely on its popularity in Italy. The demise of the shape as an Athenian product may be connected with the overall collapse of the export of Athenian pottery to that region.

8. Vincenzo Baldoni (Università di Bologna), Vase shapes from funerary contexts of Picenum: imports and local production

Numana represents the most significant emporion in the ancient Picenum between VIth and IVth century BC, being one of the crucial centers for commercial exchanges with the Greek world and the Middle-Northern Adriatic areas. A great amount of Attic pottery and other funerary goods were found in the several burials discovered in Numana, although only a few tomb contexts have been already published: in order to bridge this documentation gap, a team from Bologna University has recently started a systematic investigation considering a large sector of the widest necropolis (Quagliotti-Davanzali area). Basing on the considerable amount of available data, this contribution aims to analyze the mechanisms of adoption and circulation of specific vase shapes from Athens, South-Italy and the locally manufactured ones (with particular regard to the so-called Alto-Adriatic pottery), dated from the middle of Vth to the end of IVth century BC. The methodical analysis of Numana funerary sets - to whom the above-mentioned production belongs - gives the opportunity to reflect upon the choices of vase shapes composing funerary sets, to investigate the interaction between imports and local production and, more in general, to examine cultural and production networks.
Panel 5.16 Men, Goods and Ideas Traveling over the sea: Cilicia at the crossroad of Eastern Mediterranean trade network

Organiser: Eugenia Equini Schneider (Sapienza University of Rome)
Saturday | 26 May | 09:00-13:30 | HS VI

Panel abstract
Thanks to its specific geographical position, at the cross-roads of the most important sea and land routes, in a necessary point of transition and interconnection between Syria, Cyprus and Egypt, Cilicia has always played a distinctive role within the context of cultural and commercial exchanges in the mediterranean area. In particular, during its romanization, that gradually took place and was subsequently intensified with the constitution of the province, were of fundamental importance the commercial relations with various areas of the empire and in particular with the Eastern Mediterranean, which were substantially and constantly maintained until the first Byzantine age. This area of Anatolia has recently become in the last years, object of a renewed interest on behalf of Turkish and International universities and research institutions. Aim of the panel will be the assessment of the present knowledge on production exchanges, trade and transport in the Mediterranean, analyzing and discussing new diachronic evidence of the network of Cilicia’s relations and outlining an exhaustive picture of the changes involving the region throughout the centuries in particular as a result of large-scale economic and social processes. The definition of the sea and land-routes that connected the coastal settlements of Cilicia to other regions of the Mediterranean basin will be defined through the integrated use of underwater research, archaeological and geophysical investigation about the harbors’ basins, study of the production facilities, analysis of material culture and numismatic evidence. This will provide a great amount of information about the role played by the region - both as a production center and a market place – within the network of the ancient Mediterranean trade-routes, implementing data concerning Roman and Byzantine port basins and creating standard samples for comparative use by other research programs underway in Cilicia and in eastern and southern Turkey.

Paper abstracts

1. Pascal Arnaud (Université Lyon 2), Non-coastal Cilician cities and their maritime outlets
The preparation of the commented edition of the so-called Stadiasmus Maris Magni on behalf of Brill’s Neue Jacoby vol 5 has focused my attention on striking links between non-coastal cities and the sea. The sources used by the Stadiasmus Maris Magni between Syria and Caria generally go back to the 1st century BC and can sometimes be assigned to the reign of Antiochus IV. They are always older than the Roman conquest. They pay much attention to the relationship between non-coastal cities and the sea, considering these cities as maritime cities. The description of Cilicia, combined with other sources provides us with an interesting set of case-studies for understanding what a maritime city could be, how far from the sea it could be, how it could be linked to the sea and the kind of infrastructure these links relied on, and the kind of boats that make these possible. A higher tonnage and draft, using round ships instead of oared merchant-galleys would prevent boats from sailing upstream and impose transhipment somewhere close to the river-mouth and deeper maritime harbours or ports. As long as medium-sized merchant-galleys used to be the commonest merchantmen within the Mediterranean (roughly until the early 1st cent. BC) cities situated rather far inland and upstream such as Rome or Pella could be considered as maritime cities. This is an opportunity to revisit part of the Cilician hinterland, its complex relationship to the Sea (including piracy) and its evolution.
Many issues regarding historical topography and coastal paleo-morphology do arise, especially – but not only – in the cases of Mallus/ Antioch-on-the-Pyramus/ Magarsus or Holmoi / Seleucia-on-the-Calykadnos.
It appears that navigable rivers and, to lesser extent, lagoons were key links between sea and the interior. It also appears that even when river-borne traffic was possible, terrestrial shortcuts could also exist, like the rock-cut (?) stairs that led from the sea to the road to Seleucia-on-the-Kalykadnos in an poorly sheltered area.

This lecture will eventually address the notion of port as infrastructure and show that important ports could be deprived of the most visible port infrastructure, such as moles, jetties or quays. River mouths, lagoons, sheltered or unsheltered areas, beaches could be sufficient ‘ports’, or interfaces between Sea and land devoted to lading and unloading ships.

2. Hakan Oniz (Selcuk University), Dana Island Shipyard and Underwater Research of the Cilicia Coast-2017

In the east of the Rough Cilicia region on the Mediterranean coast of Turkey, 276 rock-cut slipways were found in 2015 and 2016 on Dana Island which is located 2,300 meters from the shores of the Silifke District of Mersin Province. On the island, there are also a great number of different remains such as work-shops, governmental buildings, houses, watch towers, fortification walls, temple elements, churches and 170 cisterns behind of these slipways. Almost all part of the remains show a great shipyard complex. There are traces which show multiple uses in building remains, located both in the slipways and behind the slipways. The surface materials were dated from Iron Age to 6th Century AD. However some obsidian and stone tools which were found in 2017 also show the possibility of Neolithic and Bronze Age on the island. Among the artefacts found during underwater researches carried out around the island in 2015 were stone anchors, Iron Age stone stocks of wooden anchors, iron anchors dated to the Roman and Eastern Roman periods, and four amphora-loaded shipwrecks which were dated to the Iron Age and after. In this speech, underwater research of Cilicia in 2017 will be transferred shortly to the listeners.

3. Kamil Levent Zoroğlu, A new context of the Late Roman Pottery from Kelenderis in Cilicia

During the excavations in the West Necropolis in we have uncovered a tomb complex dated to the 3rd century AD named K.16 BN TM I. After a catastrophe occurred probably in the second half of the third century AD, building of this tomb complex renewed and added new rooms either inside of the main building or constructed separately by the main building. Inside of fill of these rooms we have unearthed various vases, mainly transport amphora of the LR1A, Cypriot-Red Glazed bowls, depot-vases and local pottery, the latter of which we called “Vases with knobbed-hollow foot”.

In my presentation I will discuss the date and distribution of the each groups of this context in order to propose the relation of Kelenderis with other sites in East Mediterranean Region.

4. Claudia Tempesta - Maria Francesca Pipere - Valentina Cassiani, Under the auspices of Aphrodite Euploia: port infrastructure and urban transformation at Elaiussa Sebaste from the Hellenistic to Byzantine ages

The historical and urbanistic development of Elaiussa Sebaste is strictly connected to the maritime role that it has been played since the time of founding, between the end of 2nd and the beginning of the 1st century B.C. This is clearly showed not only by the position of the city on a rocky promontory flanked by two natural harbours (both now almost totally silted), but also by the silver tetradrachms and bronze coins that the city struked in the Hellenistic period, representing the goddess Aphrodite Euploia and the symbol of aphlaston.

The natural maritime and port vocation of the city found full definition since the Augustan age and even more after Vespasian’s definitive annexation of Cilicia to the Empire, when the economic growth of the city required the building of a network of port facilities, such as warehouse complexes and concrete quays and moles.

These port infrastructures were fully developed about the mid-second century A.D., when the whole city was rebuilt according a monumental layout. The road that bordered the promontory was monumentalised with the building of a curved colonnaded portico, creating a very impressive frame for the northern harbor. Despite of its monumental layout, it was however very exposed to the prevailing ma-
rine currents; as a consequence, since the Byzantine period the northern has gradually been losing its importance, as showed by the placement of the productive structures (such as kilns) along the southern harbour.

5. Annalisa Polosa (Sapienza Università di Roma), Monetization

Coins are not often taken into consideration when speaking about ancient economies, mainly because fully moneyed economies are not widespread in the ancient world. But numismatic data concerning coin production (mints and their organization, output, monetary metals) and coin circulation (hoards, excavation finds) can highlight a better definition of economic activities in a given place and at a given time. The case of Elaiussa Sebaste in Rough Cilicia will be examined, where more than 2000 coins have been unearthed during the excavations, ranging from the middle Hellenistic to the early Byzantine period.

6. Edoardo Radaelli (The University of Southampton & 'Sapienza' - Università di Roma), Cilician amphorae in Rome and Ostia during the Middle Imperial age (2nd–early 3rd centuries AD) and reflections about the consumption of their contents

The recent stratigraphic excavations (carried out from 2007 to 2013 by the ‘Scienze dell'Antichità’ Department of the ‘Sapienza’ - University of Rome) in the building commonly known as the ‘Terme di Elagabalo’ in Rome revealed large quantities of unpublished pottery fragments. In the contexts dated to the Middle Imperial age of this site (2nd–early 3rd centuries AD), the amphorae cover the majority of finds. The data derived from the amphorae found in these contexts in the ‘Terme di Elagabalo’ had been added to those derived from other published excavations carried out in Rome and then compared with the amounts in Ostia. The quantities found in both cities, the commonly accepted chronologies, origins, and volumes of the forms identified led to ponder over the presence of Cilician amphorae which had been imported to Rome and Ostia during that chronological period (in spite of the low quantities). The study also includes another analysis which scrutinised all ancient sources mentioning this same origin and the recent studies about its production facilities in order to identify (when and if possible) the quality of the wine contained in these amphorae. In fact, this study will also involve a consideration about the imports and trade of Cilician wine arriving in both cities, also trying to suggest their hypothetical purchasers with even a reflection about the consumption of this alcoholic beverage using theories derived from social sciences which could be applied to Roman times.

7. Veronica Iacomi, Pottery production in urban landscape and the overregional commerce: LR1 amphorae at Elaiussa and beyond

The discovery of several pottery kilns at Elaiussa has offered a new perspective to the investigation on production and distribution patterns of LR1 amphoras. Despite some aspects of the matter still remain elusive, especially when related to the supplying of primary sources for instance or the detailed organization of the productive system, still the analysis of the excavation results allows to propose an interesting insight on some questions which will be discussed in this speech. In particular, specific reference will be made on:

- Distribution of the kilns and related workshops, when attested, within the urban layout of Elaiussa: the city resulted interested in massive changes during the early Byzantine period (IV – mid-VII cen. AD), which led to the reorganization of urbanized spaces in order to foster LR1 amphoras production;
- Chronology of the kilns/workshops as possibly related to changed consumption needs within the frame of the economy of Byzantium: some hints, in facts, would suggest deep diacronic changes during the considered time-span, whose nature will be taken into account;
- On the light of the previous points, chronological comparison will be made with distribution patterns of LR1 amphorae as emerging from excavation results in major commercial centers of the Mediterranean, in order to better understand the scale of Cilician productions in the frame of the whole Byzantine empire, and beyond.
Panel abstract

Empire Seaborne commerce in the Roman Empire is characterized by an outstanding performance and efficiency. Archaeological remains testify trade routes reaching from Egypt to Britain. Roman traders also stretched out to India and Sri Lanka in order to profit from a lively spice trade. Principally well informed by literally and epigraphic sources, our knowledge about the functioning and structural organization of the seaborne commerce structures admits us to address important players, e.g. the navicularii / naukleroi. On the one hand, Roman legal texts are attesting much information about comestible goods like agricultural products, especially grain used to support the city of Rome. On the other hand, the ancient testimonies miss details about the more practical aspects and the effectiveness of the seaborne commerce in the Roman Empire. According to the anonna Urbis, imperial public commerce was of great importance, but in general trade and shipping probably more or less organized according to the rules of private commerce. The relation between social networks and commerce might have played a dominant role not only regarding the impact of migration but also regarding the tradesmen’s community building over a long period in the Roman provinces and beyond. The high quantity of preserved shipwrecks, cargoes and harbors datable in Roman imperial times strengthen the meaning of archaeology by providing answers to crucial research desiderata, trying to understand the principles of ancient Roman seaborne commerce. One main issue in understanding Roman sea trade would be to define the parameters for sea routes, shipping capacities and cargoes. In order to present new approaches to seaborne commerce in the Roman Empire, the panel mainly contributes to the archaeological records regarding to the reconstruction of ancient ships and their containers and the use of GIS-based data analyses to follow ancient sea routes. In general, the archaeological discussions are dominated by pottery, metal and stone finds. On the other hand important merchandises as grain or textiles are unconsidered due to the preservation conditions. Also the reuse of amphorae that has been discussed during recent years should not be underestimated. Finally, the role of the seaborne commerce for understanding the ancient economy should be discussed in this panel, with special attention to the “new institutional economics”.

Paper abstracts

1. Ronald Bockius (Römisch-Germanisches Zentralmuseum), Cargo capacity & reach of voyage of ancient ships: some thoughts on interrelations of tonnage and shipshape as factors of economic seaborne trade

Research of the 1960ties to 70ies has shown that standardization of hold capacity was unknown to ancient Mediterranean shipbuilding whereas size of freighters and loads respectively had been rated by units of weight (e.g. talenta) or volume (e.g. amphorae, modii). From a fragment of harbor regulations issued on Hellenistic Thasos as well as from Roman measures of subvention or imperial edict it becomes clear that capacity of ancient cargo ships was valuated at categories related to economic aspects by nominating minimum rates: were vessels of minimum 70 to 80 metrical tons burden granted by municipal authorities and by the Roman treasury to be just profitable, modern underwater archaeology provides us with a number of partly well preserved wrecks of ancient freighters whose cargo capacity turned out to be on a distinct lower level.

This paper focusses a series of “small” merchantmen dated to 500 BC to AD 500 which will be discussed as to their shipbuilding concept and their supposed nautical qualities and reach of voyage. They are
estimated as vessels designed predominantly for inshore navigation with riverine ports of destination or such to be reached on shallow waters.

2. Emilia Mataix (University of Southampton), A bird's-eye view: the legal side of Imperial seaborne commerce

This communication intends to study the commercial activities taking place in these sites linked to both the infrastructures and materials associated. This method is labelled as juridical archaeology, and it focuses on archaeological sites where legal activities took place occurred (e.g. contracts, taxation), and it attempts to analyse and explain the causal links between the legal facts reconstructed through the material remains. My work is based on the study of the epigraphy of merchandise (e.g. amphorae, barrels, etc), which reflects the commercial cycle in which the artefact was involved since it was bought (e.g. kilns, workshops) and until it arrived to a destination (e.g. port, market). These inscriptions, which reflect data such as product, or quantity, shape a record and provide essential information about the agreements of sale and transport by sea performed by the parties involved in trade. The model do not just depicts the activity of the ports of the Mediterranean, since when considering other regions of the Roman world, a number of these distribution stages can be identified in the different sources, materials and port structures. Consequently, this approach considers trade from a bird's-eye view, focusing on the people involved in the transactions performed along the shores and understanding them as interacting activities between the private, the imperial and provincial authorities.

3. Thomas Schmidts (Römisch-Germanisches Zentralmuseum Mainz), The inscribed seaborne commerce

Cargoes are an excellent source for the study of the ancient seaborne commerce. Amphorae, pottery of all kind, metal ingots etc. are primary proves of the trade of food, metals and other goods. Nevertheless, until now the great potential of the cargoes for the understanding of ancient economy is not yet exploited satisfactorily. Some obstacles, such as unclear provenances of goods and containers or the possibility of the reuse of amphorae, are causing difficulties for the interpretation. The paper is focused on stamps and graffiti on goods which were parts of the cargo. The inscribed wares deliver more information than uninscribed one. They are suitable to reconstruct transportation routes in detail as well as formation of a cargo. The paper intends to provide an overview of instrumentum domesticum from the sea and to present examples that demonstrate the potential of inscribed wares for the understanding of seaborne commerce.

4. Martina Seifert and Julia Daum (Hamburg University), Commerce and trade: the role of social networks and resources.

After the establishment of the province of Dalmatia by Augustus in AD 9 and the decrease of piracy, many Italic families expanded into the port cities and the hinterland of the eastern Adriatic. Related with local elites, their economic activities contributed significantly to the prosperity of the region. Favourable environmental conditions, established technological know-how and the possibility of logistical connections to seaborne commerce as well as to terrestrial trade routes were just as important as regional and inter-regional political developments and trans-Adriatic family contacts in establishing an 'Adriatic communication area'. The project within the DFG SPP 1630 seeks to analyse and establish the relative importance of these different factors with a focus addressing the role that coastal ports in the east and west Adriatic played in regional and inter-regional trade. The paper presented here will give a special view on the role of allocable Roman familiae as actors in the process of migration and decision-making with a focus on their access to resources in the surrounding areas and to seaborne commerce in the Roman Empire. The project is embedded in current research on network theories and discuss the scientific implication given by studying social networks and resources in archaeology.

5. Joan Rodríguez Segura (Università degli Studi di Padova), From Gades to Aquileia: the maritime trade of foodstuffs from Spain to northern Italy during the High Empire.

The exploitation of the natural resources of the southern area of the Iberian Peninsula is a fact that can be documented from the first millennium BC. Throughout the centuries, these resources have been
exploited and marketed by the different societies that settled in this particular area. With the Roman occupation of the Iberian Peninsula these production sites continued with their habitual activity up to the first century AC when, with the arrival of a new political, social, and economic order, the production of this area increased in a spectacular way as can be seen in the different caetariae and figilinae of the area dated between the first and third centuries AD. This growth in production is linked to the trade, both public and private, of products such as olive oil, wine, and salted fish.

One of the main importing areas of these agricultural commodities was Italy and, more specifically, we will focus our attention on Aquileia as the main port of the Adriatic. The amphoras found in this city and its hinterland, the reuse of these containers in different adjoining cities, and the existence of sea and river shipwrecks, attest to this large-scale trade between Aquileia and the rest of the Empire. As regards to trade between Spain (Gades) and Aquileia, there are still many unresolved questions on the maritime route, the tonnage of the ships, the type of trade (public or private), the role of the different actors involved and, it should be emphasized, the figure of the navicularii maris Hadrriatici, a figure with an important weight in this transaction but not yet properly explored. In this paper, we intend to present new data on the maritime trade route that the city received, and propose new hypotheses on its actors, and to analyse the origin and scope of the Spanish products by studying the amphorae found in the regions X Venetia et Histria and XI Transpadana.

6. Marina Maria Serena Nuovo (Sapienza University of Rome), Ancient landscapes, ports and ships during roman times along the western adriatic coast

During past centuries the organization and management of the western Adriatic coast has been strongly conditioned by its coastal geomorphology. The littoral of this area, especially in the central part, has an alluvial origin and for this reason it is mainly low and sandy. This flat landscape is enlivened only by rare short rocky stretches and by the presence of numerous river and stream mouths perpendicular to the coast. Therefore, since ancient times, man tried to take advantage of the river mouths to solve the inconvenience of an actual lack of natural harbours. A temporary landing place might also be offered by the lagoons, continuously drained and dried out during the last three centuries.

Reconstruction of the ancient landscape is fundamental for archaeological research, in order to figure out where Roman ports and landing places were located in a land described as “harbourless” by the ancient historians and geographers.

Study of Roman shipwrecks found along the coast between Venice and Padua offers the chance to understand what type of ships landed along the western Adriatic coast and their tonnage.

This research tries to combine landscape archaeology, topographical studies and naval archaeology to reconstruct the Roman harbour network along the western Adriatic coast. Moreover, this study tries to focus on western Adriatic seaborne commerce, analyzing what kind of containers and products were exported/imported in this region, especially to-and-from the opposite banks.

7. Pascal Warnking, The Colours of Pompeii

Shipping routes had a major influence on the profitability of ancient Roman maritime trade. Without understanding the specific routes, shipping lanes, sailing times, and environmental conditions, it is not be possible to model Roman trade. Ancient shipping has been the subject of many recent publications; however, the research on sailing times is often incomplete, contains much that is implausible and may result in error. The methodology presented in the panel was developed in order to make this research more precise and reliable. Although the applications of this research have resulted in wide-ranging and surprising conclusions, it is the research approach itself that is the main focus. It facilitates an accurate determination of the most important shipping routes and sailing times by applying the statistical algorithms of modern navigation software to sailing conditions in antiquity. To illustrate the methodology, trade routes for pigments used for the wall paintings in Pompeii are examined.
8. Gloriana Pace (University of Pisa), The ancient Roman shipwrecks of Pisa within the Mediterranean seaborne commerce.

In 1998, during an excavation near San Rossore railway station, in Pisa (Italy), a deposit with at least 30 shipwrecks was unearthed. This archeological area was associated with a watercourse, probably a tributary of the ancient river Auser (modern Serchio), which was linked to one of the regular canals placed within the centuriato grid. After some exceptional floods due to intense rain, the Arno river broke its embankments close to a bend and poured out huge quantities of water and sediments in the area of this canal, sweeping away everything and leaving materials in the hollows of the ground.

The amount and the variety of findings deposited in the archaeological layers is certainly due to the heavy commercial activities which characterised the area of the canal from the Mid-Republic to the Late Antiquity: not only shipwrecks with their cargos, but also numerous findings of luggage and garments, belonging both to passengers and to seamen, were found.

At the same time, the exceptional preservation of the cargos, including amphoras, pottery and organic findings (food remains, leather and wooden objects, wicker baskets) is connected with the hydrogeological characteristics of the river basin.

Aim of this paper is to contribute to the archaeological records regarding to the reconstruction of ancient ships and their goods, to the reuse of amphoras (especially those in which were organic remains) and to the role of the Roman town of Pisa within the Mediterranean seaborne commerce.

9. Michaela Reinfeld (University of Cologne/DAI), The maritime trade network of Lycia in the context of Mediterranean merchant shipping – a bottom-up approach of the ancient economy.

At least since the discovery of the Bronze Age shipwrecks of Cape Gelidonya and Cape Uluburun, the Lycian coast has been recognized as an important interface of the Mediterranean trade routes and has become the focus of scientific interest. Since the Hellenistic period, the Lycian cities were connected by a dense network of ports at both the local level and with the entire Mediterranean world.

Field archaeological research and the results of underwater archaeology show a flourishing trade from the Hellenistic to the Byzantine period. The paper gives an overview on the role of individual port facilities in the Lycian trading network and on trade relations, which can be reconstructed using the underwater archaeological findings. Based on certain parameters, it raises the question whether individual port facilities were particularly predestined for international trade and whether the results of field archaeology reflect the underwater archaeological findings. Modifications in the maritime network, which are accompanied by changes in political, religious or economic factors, will also be discussed. Finally, regional trends, which can be observed on the Lycian coast, are placed in an overall Mediterranean context.

10. Christoph Schäfer, Field trials with Roman vessels on Rhine, Mosel and Danube

Roman maritime trade during the imperial period reached an extremely high volume. The stationing of large military units on the imperial frontiers, particularly in the frontier zones on the Rhine and Danube, provided both markets and considerable economic capital. A large part of traded goods were transported either by way of the Atlantic and the Rhine estuary or by the Mediterranean and the Rhône estuary. From these estuaries, goods were then further transported on the large river ways. This combination of seaborne and fluvial transport was the crucial backbone of the provisioning of these regions.

For fluvial transports, flat-bottomed river barges and scows were used which, their shallow drafts notwithstanding, were able to bear considerable loads. The river highways were safeguarded by military vessels suitable for use also on smaller rivers and streams. Two exceedingly well-preserved archaeological discoveries from the Danube (Oberstimm) and the Rhine (Mainz), both now on display at the Kelten Römer Museum in Manching and the Museum für Antike Schiffahrt (RGZM) in Mainz respectively, allow us to reconstruct two individual vessel types from ca. 100 and 400 C.E. In projects at the University of Hamburg and of Trier, and in close cooperation with Ronald Bockius (who was responsible for the publication of both the Mainz and Oberstimm vessels and also for drawing up the lines plans for the reconstruction) and other partners from different sectors (science, commerce, trades), two reconstructions were built to the original scale. Mechanical engineers from the University of Applied Sciences Trier
and astrophysicists from the University of Hamburg and the Massachusetts Institute of Technology in Cambridge (MA) adapted a suite of measuring instruments for use on reconstructed Roman ships. Thus, for the first time ever, reliable data on the performance and capabilities of such vessels could be collected. This data sheds light on the process of securing trade routes on the Rhine and Danube, as well as their tributary rivers.

A half-scale reconstruction of the Bevaix scow, constructed according to the plans of Beat Arnold and (again) Ronald Bockius, allowed for the first trial of such a vessel in 2015-17. As these craft formed the backbone of Roman river transport, the trials focused on testing different means of propulsion and the efficiency of this type of vessel. In order to accomplish this, further sophisticated measuring instruments were developed, which made it possible to collect data on the vessel's performance under different propulsion (towing, punting, sailing). These new measuring methods, as well as the first results of the trials, will also be presented in this paper.

**Panel 5.18 Trust, Branding and Fakes in the Ancient World**

Organiser: Anja Slawisch (University of Cambridge)

Thursday | 24 May | 14:30-16:30 | HS IX

**Panel abstract:**

Considerable research effort has been devoted by archaeologists to the idea of standardisation, both in terms of manufacturing techniques and by identifying the standard volumes and sizes for containers, such as amphorae. Recent work has also been devoted to mapping these standardised vessels and hence establish the networks by which they travelled. But less work has focussed on how these ‘standard’ vessels functioned from a material perspective in the everyday sphere of interaction. In essence, how was trust between strangers established in the vastly dispersed markets of the ancient Mediterranean? This panel will showcase different forms and concepts of trust, examples of commodity branding in the ancient world and the production of fakes (the inverse of market trust systems) in order to address some underlying dynamics of interaction in ancient economic systems. Contributions are sought from all areas of research on ancient societies (i.e. ancient history, numismatic, material culture studies, literature, provenance studies etc.) that offer a fresh approach to the phenomenon of trust, commodity branding and the appearance of fakes in ancient markets:

- What are the processes or key features lying behind the creation of trust around certain products or commodities?
- What factors promote the introduction of new brands, their maintenance and sustainability?
- How can we characterise the relationship between commodity branding and mass-production?
- How often were brands abandoned and what are the dynamics or lifespans of certain brands?
- To what extent can we detect copies and/or forgeries and how did the market cope with these? Under what of circumstances do they occur?
- Can we define stylistic choices as brand management? Potential themes for discussion include:
  - Enhancement of trust in specific products through the creation and maintenance of branding.
  - Different forms of commodity branding (makers marks, stamps, signatures, coinage, other imagery).
  - Creation of sub-markets or alt-markets, profiting from selling imitations, forgeries and copies of prized and familiar commodities.
Paper abstracts

1. Vasiliki Barlou (Justus-Liebig-Universität Gießen), "What's in a name?". Creating brands and trademarks in ancient Greek sculpture

Artists signing their works by name, stating their geographic provenance, family affiliations or apprenticeship, and sometimes even praising their creations, are a common and well known phenomenon in the world of ancient artistic and artisanal production. Less so are the complex mechanisms and reasons behind these declarations that modern scholarship has only recently started assessing and contextualizing in a more holistic manner (e.g. J. M. Hurwit, Artists and Signatures in Ancient Greece, Cambridge 2015).

Focusing on selected examples of ancient sculpture and epigraphy from Archaic to Hellenistic/early Roman times, this paper aims at analyzing how branding and the formation of trademarks functioned in the sculpture business, how names, typologies and styles may have been perceived by commissioners/buyers and how through this interactive process certain markets were formed and maintained. Even the case of some forgeries shall be addressed and thus the question of the reach and the limits of trust in trademark features in a diachronic perspective.

2. Simone Killen (Université catholique de Louvain), Trust in Tradesmen: How poleis protected their Consumers

When shopping at the farmers’ market or also in the supermarket, we nowadays trust blindly the scales of the tradesmen. Even if the fewest consumers know the measurement and calibration legislation, we confide in the state protecting us as consumers. But how did this bond of trust between the consumer and tradesmen work in the ancient world and which role played the Polis in it?

This question will be pursued in the paper with reference to the archaeological and epigraphical sources of the Classical and Hellenistic times. Especially decrees testify to various aspects of a state protection of trade in Poleis in Greece and Asia Minor: on the one hand, it was established that only official weights were permitted to use in the territory of a city-state, on the other hand, how, where and by whom these official weights and also the standard weights had to be kept. Violations were punished, fake weights were destroyed. Poleis tried to protect their official weights against manipulation and to simplify their control by branding them with reliefs (often parasema, i.e. official symbols), inscriptions and stamps.

First and foremost, these regulations should have served to secure the location of a Polis as an attractive emporium, because satisfied consumers attract more tradesmen who ensure fresh supply and pay taxes to the public fund. But these regulations can also be viewed as an early form of consumer protection guaranteeing legal certainty and generating trust in trading.

3. Anja Slawisch (University of Cambridge), "Amphoras on Amphoras": diachronic perspectives on trade and the use of the amphora image

In 1982 Carolyn G. Koehler presented a number of Corinthian B-type amphoras with stamps showing an icon of an amphora. Koehler speculates that these stamps were simple potters’ marks, presumably designed to manage production in ceramic workshops. Images of single amphoras appear repeatedly on a large variety of amphora types (or on related media) from different places or regions from the 6th/5th century BCE until at least the 3rd century CE. The fact that the earliest examples (from Chios and Samos) actually appear on coins and seals/sealings suggests that this icon may have had an important significance to consumers over a very long time period. In this paper a diachronic approach is sought to explain the occurrence and popularity of this symbol through time and investigate the immanent dynamics of the brands it created and/or represented. Questions that will be addressed include: Are the stylistic choices and their meaning similar through time and space? Are they used for established shapes or to introduce new ones? And, to what role do these images play in the establishment of trust in economic relations over large distances in the ancient world.
4. Kathleen Garland (Cornell University), Stamps of approval: signaling authenticity in Hellenistic packaging

The paper argues that a consideration of the semiotic affordances of Hellenistic amphora stamps can lead to valuable new insights about the nature of economic activity, valuation, and taste-making in the ancient world. From the late fourth- to first-century BCE, Greek exporters assumed a “stamping habit,” presumably for the purposes of bureaucratic accounting; but these stamps also afforded the dissemination of knowledge to far away consumers as agents within a brand economy. Stamps are here seen as a networking technology that affords “a release from proximity” for producers (Knappett 2011, 100). Drawing on theories of object agency (Gell 1998; Latour 2005), relationally constituted regimes of value (Appadurai 1986), and recent applications of Piercean semiotics within archaeology (Preucel 2010), criteria for determining the iconicity and symbolic-value of amphora stamps are identified. Using these criteria, several archaeological assemblages of Aegean stamped amphora handles are analyzed to determine whether we can perceive any diachronic trends in iconicity. The data suggests ancient producers were aware their packaging could signal the origin and quality of its contents, and thus could become an important player in the negotiation between seller and buyer. The paper concludes with a consideration of how amphora stamps can contribute to broader debates about the Hellenistic economy.

Panel 5.19 Roman Transport Systems I: "New insights on the Roman transportation systems. New applications and methodologies for a better understanding of the transportation networks and the movement of commodities"

Organiser: Pau De Soto (Universidade Nova de Lisboa)

Wednesday | 23 May | 14:30-16:30 | HS VI

Panel abstract

The analysis of Roman infrastructures in order to understand the transport systems and the territorial organisation is an indispensable way to know the benefits and shortcomings of the transportation system created in Roman times. It is well known that the Roman Empire built the first big transport network. This overwhelming task included the construction of an enormous road system, and the building of river ports and maritime harbours, all connected and dynamically articulated. Such a huge effort aimed to create an integrated economy covering all the Roman provinces. In the last years, the growth of new digital tools have allowed the scientific community to work and develop their research studies on Roman transportation and commerce from new points of view. The use of new methodologies and approaches to these analyses is offering brand new data that seems to be very useful to obtain better reconstructions of the Roman transport conditions. Between these new approaches we can find the modelling of travel costs and times or the analysis of the road networks morphologies in order to obtain new knowledge about the territorial configuration. The results of such applications provide us with new information to understand the distribution of commodities, product competition and the role of the ancient economies, such as Rome, in the configuration of the historical territories. The ability to see graphically and quantitatively those results which until now they could only be guessed, can open new perspectives and justifications to the speeches made about the Ancient world up to now. At the same time, it is possible to observe how the construction of a complex communication network meant an important element for the integration of new territories to the Roman provincial model. For a better understanding of the morphology of these infrastructures, Network Analyses and other approaches are applied to understand the configuration and performance of the Roman networks in these territories. In this research context, with this panel we want to offer a public space where researchers can share
their experiences with the use of this new methodologies and approaches applied to Roman transport and create a positive debate about their optimal application and generation of results.

**Paper abstracts**

1. Philip Verhagen - Mark Groenhuijzen (Vrije Universiteit Amsterdam), How central are local centres? Testing archaeological hypotheses of the Dutch part of the Roman limes through spatial analysis and network science

The integration of the Dutch Rhine-Meuse delta in the Roman Empire during the first centuries AD is thought to have led to an increased structuring of the settlement pattern and an increased level of interaction between the rural population and the military population that resided in the forts along the Rhine. It has been argued that the Dutch limes zone can be characterised by a dendritic settlement system, particularly for the (re)distribution of goods, wherein most interactions moved up and down this hierarchic system and fairly little ‘horizontal’ interaction took place.

Through the modelling of transport movements using least-cost path analysis, the reconstruction of transport networks and the application of network analysis, this study presents a test of this archaeological hypothesis of a hierarchic settlement structure. The proposed ‘intermediary’ sites in the dendritic system are analysed to see whether or not they actually ‘central’ for their subsidiary areas, and by extension we can see if there are possibly other settlements that may have functioned as intermediary sites, that we did not know about previously. On a more general level, this study hopes to show that by expressing our archaeological ideas into relatively simple testable hypotheses, we can use methods from spatial analysis and network science to further our archaeological understanding in a more quantifiable way.

2. Eivind Heldaas Seland (University of Bergen), Water and communication between Damascus and the Euphrates in the Roman period

Syria was an important province of the Roman Empire, with fertile agricultural lands, major commercial hubs, and an extensive and scarcely populated frontier to the Syrian Desert and beyond that to the Arsacid and later the Sasanian Empires.

Soldiers, traders and travellers moved along and across this frontier, and outposts and settlements in the desert needed supplies.

Although the Syrian Desert receives too little rain for agriculture, it is not hyper-arid. Water can be found in wells and sources or gathered in cisterns, but the availability of water becomes more difficult the further east and south one moves from the 200 mm isohyet theoretically separating desert and cultivated land. In this paper I investigate the relationship between water-sources and known settlements, outpost, and routes of communication on the axis between Damascus and the Euphrates using GIS- and network analysis. The hypothesis is that availability of water can help identify routes between settlements and outposts at a higher resolution than existing itineraries and survey data.

3. Hector Orengo (University of Cambridge) - Alexandra Livarda (University of Nottingham), Networking imports at a continental scale: methodological approaches and research prospects

The combination of spatial network analysis with cultural data-based least cost route modelling and the large-scale distribution of exotic products has resulted in a detailed analysis of the transport economy of Roman Britain (see Livarda & Orengo 2015 and Orengo & Livarda 2016). For the rest of the Roman world, however, the lack of large-scale repositories of archaeological data and the schematic knowledge of ancient routes poses significant challenges to the application of these techniques on a ‘global’ scale.

This paper will address this issue by discussing new analysis methods based on the combination of (1) large-scale probabilistic route modelling for the reconstruction of the ancient transport system, (2) Social Network Analysis, which has the potential to provide important insights about connectivity between trade location, and (3) Spatial Network Analysis, which can analyse transport costs in real space-time and solve complex logistic problems. The use of distributions of imported material of known origin such as exotic food plants, marble, coins and ceramic containers can help modelling ancient commerci-
al routes, trade preferences, commercial contacts, the role of transport in market integration, and can impact more general discussions such as the role of commerce and connectivity on Ancient urban development.

4. Cristina Corsi (University of Cassino and Southern Latium) - Frank Vermeulen, Nodes. New perspectives on road- and river-stations and communication networks in Roman Italy

After more than a decade of stasis, following the publication of important works that dwelled in different ways on the organisation of the Roman transportation system (e.g. Di Paola 1999, Corsi 2000, Kolb 2000), a new season of research has focused on the matter of Roman road-stations. However, in spite of the huge amount of archaeological data that has been collected in the past fifteen years the scientific questionnaire has not been radically renewed. Most frustrating is the fact that the interpretation process has not been able to overcome the impasse caused by the inescapable link to the cursus publicus. Here, we will try to disclose new perspectives on the nodes, the hubs where land- and waterways overlapped, reviewing some of the most interesting case studies in Roman Italy. The new evidence will be confronted with original theoretical frameworks, which challenge the traditional vision of the uneven relationship between overland and sea transport, in order to revitalise a research agenda that bares crucial importance for the study of the Roman economy and connectivity.

Litt.: 

5. Pau De Soto (Universidade Nova de Lisboa), Mercator-e. Quantifying the Roman transportation system in the Iberian Peninsula

The analysis of Roman infrastructures to understand the transport costs and the commercial routes and processes is an indispensable way to know the benefits and shortcomings of the transportation system created in Roman times. Such a huge effort aimed to create an integrated economy covering all the Roman provinces on the Mediterranean Sea and Atlantic Ocean. Within the Mercator-e Project, we are attempting to reconstruct the Roman transport conditions by modelling travel costs and times with the help of GIS and Network Analysis applications. The main geographical focus of this project is the Iberian Peninsula. The results of such applications provide us with new information to understand the distribution of commodities, product competition and problems of stagnation in ancient economies such as that of Ancient Rome. At the same time, it has been possible to observe how the construction of a complex communication network, meant an important element for the integration of new territories to the Roman provincial model. To understand the morphology of these networks, we apply some Social Network Analyses to understand the configuration and performance of the Roman mobility in these territories. The same methodology can be used to analyse other historical periods and therefore to elaborate comparisons of the same territories along the centuries. It allows us to explore the transport network evolution of the Iberian Peninsula from Roman times to the XIXth Century.

Panel 5.20 RomanTransport Systems II: "Rivers and lakes in the Roman transport economy"

Organiser: Koenraad Verboven (Ghent University)
Wednesday | 23 May | 17:00-19:00 | HS VI

Panel abstract

Most modern scholars follow the opinion of ancient authors that, given the right hydrological and geographic conditions, transport by river (and lakes) was many times more efficient, profitable and cheaper
than land transport. Archaeological data showing the transport routes for non-perishable items, such as ceramics and stone cargoes, seem to confirm this idea. The epigraphically documented prestige and influence enjoyed by the Barge-skipper guilds (the nautae) in Narbonensis, Germania Superior, and the southern parts of Lugdunensis further support that picture. And yet the natural efficiency of river and lake transports is far from self-evident. River basins are not naturally connected. Waterfalls, narrow, and rapids obstruct navigation. Levels and flows depend on unpredictable rainfall causing floods and torrents. River banks erode. Sediments change the course of rivers. In the north, rivers and lakes may freeze in winter. In the south, many run dry in summer. Strong currents greatly hamper upstream traffic. Territorial and administrative divisions, as well, pose problems. Differences in regulation, control procedures, and water management practices affect conditions on different stretches of the same river. Tolls and fees burden profitability. Social and political unrest pose threats as barges are vulnerable to attacks by land from brigands, raiders or soldiers. Rivers and lakes, moreover, are useless without a connecting land road network. Without investments in the construction and maintenance of roads the contribution of riverine trade to overland transport networks is doomed to remain limited. Not surprisingly, rivers remained complementary to roads in early modern Europe until 'national' policies improved and regulated navigation. Without tow-paths, canals, portages, locks, connecting roads, ports and warehouses, rivers offer only a marginal contribution to trade. Riverine transport routes are as much man-made as roads are. What does this imply for the supposed efficiency of river and lake transport in the Roman period? In this panel we want to discuss the material and institutional conditions that supported this.

**Paper abstracts**

1. Koenraad Verboven (Ghent University), Rivers and lakes in the Roman transport economy

Most modern scholars follow the opinion of ancient authors that transport by river (and lakes) was more efficient, profitable and cheaper than land transport. Archaeological data showing the transport routes for ceramics and stone cargoes, seem to confirm this idea. The epigraphically documented prestige enjoyed by the Barge-skipper guilds in Narbonensis, Germania Superior, and southern Lugdunensis further support that picture. But the efficiency of river and lake transports is far not evident. Basins are not naturally connected. Without roads the contribution of riverine trade to overland transport networks is doomed to remain limited. Waterfalls, narrow, and rapids obstruct navigation. Levels and flows depend on unpredictable rainfall. River banks erode. Sediments change the course of rivers. Rivers and lakes may freeze in winter or run dry in summer. Currents hamper upstream traffic. Administrative divisions also pose problems related to different regulations, control procedures, and water management practices, tolls and fees. Barges are vulnerable to attacks by land from brigands, raiders or soldiers. Without tow-paths, canals, portages, locks, connecting roads, ports and warehouses, rivers offer only a marginal contribution to trade. Riverine transport routes are as much man-made as roads are. What does this imply for the supposed efficiency of river and lake transport in the Roman period?

2. Allard Mees (RGZM), Rivers and trading hubs

A quarter of a million Roman Samian (Terra Sigillata) stamps are now Open Access available for distribution research analysis at the digital research platform Samian Research of the RGZM (Römisch-Germanisches Zentralmuseum Mainz (http://www.rgzm.de/samian). The fully georeferentiated data collection not only covers the distribution area of Samian made in the Gallo-Germanic and Raetian tradition, but also comprises the complete Mediterranean market of Samian made in the Italian tradition, notably from Arezzo and Pisa. A network of researchers throughout Europe is actively engaged in further enhancing this internet based dataset by online curating existing records and adding new materials. This largest digital online resource on Roman trading goods gives us a unique opportunity to study Roman sea, river and land transport mechanisms. The dominance of river transport in the North-Wes-
tern part of the Roman Empire, already suggested by the authors in antiquity, is clearly reflected in Samian distribution of this area. Least cost network analysis confirms the enormous influence of the river transport cost on the distribution patterns. However, the influence of towns and military installations along the rivers on the river transport system itself is something which has not been studied yet. The network agent based hub functions of these conglomerations can easily be detected and visualised.

3. Tyler Franconi (University of Oxford), The environmental context of riverine trade in the Roman world

Successful riverine trade depended on environmental factors that allowed for the safe transit of goods, people, and information through and across river systems. Rivers were not static entities, and varied greatly in flow characteristics throughout the year; these variations had important influences on riverine navigation in the Roman world. The environmental factors that dictated flow characteristics have been overlooked in scholarship investigating riverine trade, which has typically focused on the goods that were transported rather than the conditions in which they moved. This paper provides an overview of the fluvial shipping season of Western Europe, discussing how precipitation, flow velocity, volumetric discharge, and sediment transport and deposition influenced Roman riverine trade networks. Using a combination of palaeo-environmental data, archaeological evidence, and comparative written evidence from the Medieval and early-modern periods, this paper argues that Roman fluvial transport networks needed to constantly adapt to the changing environmental conditions of their transport routes. Such adaptations necessitated both technological and institutional developments that are visible in the spread of new infrastructural elements such as canals, the adoption of different ship building techniques, and in the development of specialised guilds of shippers responsible for specific rivers.

4. Jean Paul Bravard (University Lumière - Lyon 2), Changing rivers during the Roman period: climate and human action

This paper deals with the conditions of Roman navigation during the Roman period, in the Gaule watersheds and in watersheds of present Europe. Based on the concept of river metamorphosis, which is widely accepted in the Northern hemisphere and in this geographical area since almost 40 years, river landforms are considered as transient structures due to controls exerted by external variables (climate, different types of human actions) and to characteristic adjustments of rivers at certain time and space scales. The general principles, relevant to fluvial geomorphology, will be exposed. Then, the presentation will show convincing examples of river metamorphosis from the Latenian period to the Late Roman period and will document original landforms and river behavior in specific conditions of external control. Thee homogeneity of river responses or adjustments in Europe is now considered as a matter of fact but local variations as well as discrepancy in time sequences may exist. The third objective of this paper is to propose a review of the impacts of river channel changes on the conditions of navigation along the river axis and on the setting of bridges across selected rivers. It will be proposed that the Roman period may have been quite favorable to the economic uses of rivers.

5. Wim De Clercq (Ghent University), All rivers lead to Nehalennia. An archaeo-geological study of the votive stones and their transport routes to the sanctuaries of Colijnsplaat and Domburg

The now submerged Roman sanctuaries of Colijnsplaat and Domburg on the isle of Walcheren on the North Sea coast, have yielded the most extensive collection of votive stones found in Northern Gaul. These bear testimony of the central role the area of the river Scheldt mouth played as a hub for the international trade between the Rhineland, Britain, Northern and Southern Gaul. Sailors, merchants, civil servants and military all dedicated votive stones and statues to the local goddess Nehalennia, next to other deities. So far however, only the epigraphic evidence on the stones had been thoroughly studied. In our paper we will present the results of the archaeo-geological study of the extensive collection of votive stones, pottery and ceramic building material retrieved from the sea floor during the last 40 years. We will assess the chronology of both sites but foremost focus upon the mineralogical study of the votive stones,
revealing the complex network of riverine and land-routes leading from the inland of Germania Inferior and Gallia Belgica, to the sanctuaries.

Panel 5.21 Trade and Cultural Contact in the Iron Age and Archaic Mediterranean

Friday | 25 May | 09:00-13:30 | HS XVI

Paper abstracts

1. Andrea Celestino Montanaro (CNR - Italian National Research Council), Cultural processes and circulation of prestige goods in pre-Roman Apulia. The influences of Orientalizing and the relations with Greeks and Etruscans

The latest studies about the customs of Italic aristocracies in Apulia have added relevant data concerning to the class of personal adornments and symbolic objects, fundamental elements underpinning the Orientalizing period and the phenomenon of the birth of aristocracies between the 8th and 7th cent. BC.

Even more indicative is the bond that unites these aristocracies to those of the Tyrrhenian area, active since the 9th cent. BC. Testimonies of such relationships are the ornaments found in extraordinary burials, some of which they add, to the preciousness of the material, the sophistication of the workmanship and the rare and exotic character (amber, ivory and faience).

Consider the sumptuous parures of Daunian princesses or the funerary assemblages of prince-warriors (Canosa, Cupola, Altamura, Noicattaro, Lavello, Banzi), which are marked not only by several personal adornments (characterized by countless amber beads, ivory and bronze beads, scarabs and faience figurines of Egyptian deities), but also by the presence of metal prestige goods (bronze and silver), true symbolic objects, many of which imported by Southern Etruria (diadems, sceptres, distaffs) or from the East (ribbed bowl), that emphasize the royal status of the deceased with a definite reminder of the aristocracies sung by Homer in his poems. The interest and the reference to the Homeric poems are even higher at the presence of the unusual ritual of horses burial matched to the tombs of Daunian princesses.

2. Francesco Napolitano (MIUR), Traffici etruschi nel Golfo di Napoli tra l'ultimo trentennio del VII e la metà del VI

Come appurato, negli anni tra 630/620 e 550/540, il Golfo di Napoli, sotto il profilo geo-politico, appare a chi provenga o proceda lungo la rotta da e verso l'Etruria, le coste liguri e celtico-iberiche, come una delle due frange meridionali del Tuscorum ius; l'estrema punta settentrionale della Megale Hellas; l'Opikia; esso, in questo lasso temporale, diviene, per i naukleroi e i nau̱tai, un susseguirsi di approdi sicuri e attrezzati. L'area dunque, si consolida, più che mai, come una vera e propria cerniera tra Mediterraneo occidentale e orientale.

La concomitanza di codesti fattori favorisce e determina l'arrivo di differenti mercanzie allotrie in questa fascia costiera; e nel contempo, il loro inserimento o rigetto, da parte del singolo individuo, nel quotidiano, sulla base delle preferenze per le caratteristiche del prodotto, rispetto ad altri locali, o sulla base di valori ideologico-culturali che lo accompagnano. Poche sono le merci frutto di casualità di transito.

Il lavoro proposto, dunque, ricontestualizzando merci legate al mondo etrusco attestate nel Golfo, in rapporto alle classi sociali di destinazione, all'ambito di utilizzo, alle “riproposizioni locali”, ai luoghi di origine e ai percorsi seguiti, evidenzia, tra Orientalizzante recente e Arcaico medio, indizi di un commercio e uno scambio mossi, in quest’area, soprattutto da philía, xenía, eusébeia verso gli dei e predilezione per un gusto etruschizzante.
3. Enrico Giovanelli (University of Milan), Aegyptiaca in Central Tyrrhenian Italy: sea routes, traders and ideas

Even though Aegyptiaca have been sometimes underestimated in the past, nowadays they are considered one of the hallmarks of the relationship between the Etruscan and Italic people and the rest of the Mediterranean at the beginning of the Italian Iron Age. Starting from the most recent studies, this brief synthesis aims to provide an updated synopsis on several aspects linked to these items. In particular it will focus firstly on defining the main areas of production (Egypt, Levant and the Aegean), then on tracing the possible sea-routes and the people involved in the circulation process. The second part of the communication will outline the situation of Etruria, Latium and Campania, where Aegyptian and Aegyptianizing objects are mainly concentrated between the 8th and the 7th century BC, also considering the reception (and the possible re-elaboration) of foreign cultural and religious values and the common and different trends among the indigenous communities.

4. Lorenzo Zamboni (Università di Pavia), Trading in the multicultural emporia of the Po Valley. Crossroads of weight systems and goods

During the second half of the 6th BC, the Po Valley knows the spread of a new urban and commercial phenomenon, with the foundation of many emporia and trace hubs, such as Spina, Marzabotto, S. Polo and Forcello.

Despite a vibrant economy and a complex cultural framework, it seems that coinage was never adopted within this centres. Transactions probably took place through an evolved kind of barter, with a complex system of weighing. Bronze lumps (aes rude) and, in some cases, stamped bronze (aes signatum), were also used, as well as rectangular portions of thin ingots. Their proto-currency use is suggested by their standard weight values, as found in other contemporary trading cities in Northern Italy.

The weights adopted in the sales activities could be of bronze, lead, or more commonly stone. Many stone weights display numeral inscriptions, interpreted as weight units. Recent excavations and studies confirm that a multiple system of weighting standards was in use, especially a light libra of 287 grams, and a heavy one of 358 grams. The latter is widespread in Spina, in Padanian and inland Etruria.

This preliminary study will address:
- why the coinage system was refused in northern Italy until the Hellenistic period;
- what kind of alternative systems were employed, and if their origins are local (i.e. traditional) or imported;
- the role of Spina and the other commercial centres in long term relationships between the Mediterranean civilisations and the Alpine cultures;

5. Paolo Rondini (University of Pavia) - Raffaella Poggiani Keller, Alpine Trades

In the bigger picture of the trades between the Mediterranean world and the transalpine cultural groups, a key role is the one played by northern Italy. In the complex but lively and vivid network of the late VIth cent. BC, it is possible to find the quick and widespread need to connect two different concepts of economy: one based and modulated by the use of coin, and one still firmly pre-monetary, regulated by the use of stone or bronze standards, as weights, ingots.

The Italian Alps are exactly in the middle of this network and they work, and their cultures show, in this very period, an impressive growth both in territorial dissemination of settlements, and in a better exploitation of their natural resources. One of the reasons of this is that through the alpine mountain passes there was a daily traffic of people and goods, which today is difficult to fully understand. Another cause is the natural richness both in metal and natural goods, as well demonstrated by the opening of important mines as the one in Campolungo (BS) and of high mountain villages of miners, as in the case of Dos del Curù, Valle Camonica (BS).

The goals of this speech are to describe the central alpine region in the second half of the VIth cent. BC, as well as to assess the capability of these alpine peoples to deal with these complex long-range trades. As a case of study we'll consider the unpublished settlement of Parre, Val Seriana (BG), one of the most important preroman centres of northern Italy.
6. Martina Čelhar and Igor Borzić (University of Zadar) - Gregory Zaro (University of Maine), Pottery as an indicator of trade dynamics and cultural contacts in the eastern Adriatic during the Iron Age and Roman periods: The case of Nadin-Gradina

Located in the central part of Ravni Kotari (Northern Dalmatia, Croatia), Nadin-Gradina (Nedinum) occupies a vast area of 32.6 ha, while the main stone rampart encloses an area of about 8 ha, making it one of the largest hillfort complexes in ancient Liburnia. Nadin-Gradina was an economic, cultural and administrative center of one of the largest Liburnian territories. By the early first millennium A.D., Nadin-Gradina was transformed into a formal Roman municipium, but it appears to have declined during Late Antiquity. In the later part of the Medieval era, the site regained prominence and was ultimately influenced by Venetian and Ottoman expansion.

The Nadin-Gradina Archaeological Project (NGAP), a multi-year effort currently supported by the Croatian Science Foundation, has recovered abundant pottery from cemetery and settlement areas within the site. Current findings suggest a distinct tendency among Liburnian communities to have imported fine pottery during the Iron Age, and particularly the Late Iron Age, with most artifacts originating from the Adriatic region. This also correlates with an increase in pottery used for transport and storage, confirming Nadin-Gradina’s active participation in broader economic and social events during this period. With the onset of Roman influence, the situation changed with the introduction of goods from the wider Mediterranean region in accordance with more “global” trends.

7. Veit Vaelske (Humboldt-Universität zu Berlin), Experiencing Copper in the Phoenician Cities during Iron Age I/II

Traditionally, the Phoenicians are implicated in metal trade and production especially in regard to copper and copper alloys. This picture, though comprehensive in a global perspective, needs further specification and gets especially blurry when it comes to the Phoenician homeland. What do we know exactly about the provenance and the processing of copper and bronzes in the coastal cities of Phoenicia? The answer to this question so far has to be negative. The project "Early Iron Age Copper Trails in the Mediterranean", started at Humboldt-Universität zu Berlin in cooperation with Deutsches Bergbau-Museum Bochum and the Direction générale des antiquités du Liban, focuses on cataloguing and analyzing provenanced and stratified copper/bronze-findings from the Lebanese coast. The intention is to evaluate common assumptions and to establish a factual basis concerning the industrial and economic complex of the Phoenician cities within their commercial setting in the Mediterranean.

8. Francisco B. Gomes (Faculty of Letters of the University of Lisbon), Trade and Consumption of Mediterranean Perfumes in the Iron Age Iberian Peninsula: An Overview.

The local communities of the Iberian Peninsula consistently consumed a diversified range of Mediterranean imports throughout the Iron Age. These goods played a significant role in their political economy: in fact, they were adopted, adapted and repurposed in the context of local social practices which underpinned evolving discourses of identity, power and status that in turn supported the political hierarchies that developed during this period.

Among these imported goods perfumes seem to have played a significant but often understated role, attested by the presence in the archaeological record of a succession of containers, such as Phoenician ‘oil bottles’, Corinthian and Naucratite aryballoi, glass vessels, Attic lekythoi as well as other Greek vessels, and finally Hellenistic unguentaries.

Despite the persistent absence of any content analysis, all these classes of containers can be interpreted as correlates of a dynamic perfume trade, which involved a series of Mediterranean production centres and acquired different physiognomies in each particular historical and cultural context.

Through an overview of their chronological and geographic distribution, the present contribution aims to establish a framework of reference to analyse the rhythms, the trends and the diachronic evolution of the trade of Mediterranean perfumes in the Iberian Far West, while laying the basis for an analysis of local consumption patterns, with all their social, political and cultural implications.
9. Moritz Kiderlen (Humboldt-Universität zu Berlin) - Michael Bode (1) - Giorgios Mastrotheodoros and Liana Filippaki (2) - Andreas Hauptmann (1) - Yannis Bassiakos and Anno Hein (2) - Noémi S. Müller (Fitch Laboratory, The British School at Athens) - Hans Mommsen (University of Bonn),
Greek copper markets: Modelling the imports from Wadi Arabah, Cyprus, Rio Tinto and elsewhere to Greek central places ca. 1100 -700 BC
(1) Deutsches Bergbau-Museum Bochum
(2) N.C.S.R. „Demokritos”

Our study group consists of about 300 bronze tripod cauldrons of the Geometric type. These objects had a reconstructed weight between ca. 6 kg and 100 kg each and clearly were prestige goods. Consequently, this study group is a good indicator for the copper trade directed to the Greek elites. Most tripod types had legs and handles cast in the lost-wax-technique. If the extant bronze fragments preserve residues of the casting cores or casting moulds, the chemical fingerprint of the clay pastes can be used to distinguish and localize the production sites. Our results of such chemical analyses show that most tripod cauldrons were produced (cast) at central places like Olympia. This is corroborated by finds of workshop debris at some central sanctuaries (Olympia and Akovitika) and at central settlements (Lefkandi).

In this paper we present a list of production-sites of tripod cauldrons and we will try to model for each of these sites which sorts of copper were consumed at which period of time. Our questions are: How did the market shares of small local copper sources develop at each site, and how the marked shares of far away industrial scale producers like Wadi Arabah, Cyprus, Rio Tinto or SE Turkey, and what about recycling? Are there well defined trade routes or even trade zones? What do the results tell about logistics and social organization of trade and about political background?

10. Chiara Tarditi (Università Cattolica, Brescia), Use and function of Greek bronze vessels in indigenous societies

In Greek craftsmanship, bronze vessels take a special position, for the value of the metal, which makes them immediately meaningful and precious: their use restricted to more rich people makes these pieces a clear expression of richness and power. In the Greek world, bronze vessels were early used during aristocratic convivial banquets and symposium, establishing a close relation between objects and their function, and were frequently dedicated as votive offerings in sanctuaries. The spread of these social practices among the indigenous societies, with which Greeks came in contact, is well attested since the Archaic period by imports of Greek bronze vessels: generally coming from funerary contexts of different indigenous areas, from Southern Italy to the Black Sea, they continue to represent wealth, power, and identification with the Greek aristocratic culture and society.

Panel 5.22 The Archaeology of Cross-cultural Trade: Multi-disciplinary approaches to economic and cultural exchange at Naukratis

Organiser: Alexandra Villing (British Museum)
Saturday | 26 May | 09:00-13:00 | HS VII

Panel abstract

Commercial exchange between people of different cultures has long been a topic of scholarly interest, yet like all trade and exchange, its quality, quantity and socio-economic implications are notoriously difficult to grasp in the archaeological record. The aim of this session is to explore and debate the possibilities and limitations of multidisciplinary approaches to the topic, taking as a case study the current reassessment of one of the most pivotal locations of ancient cross-cultural trade: Naukratis. The Nile Delta has long been a contact zone between Egypt and the Mediterranean world, channelling people,
goods and ideas between Europe, Asia and Africa. The trading port of Naukratis, established in the 7th century BC as the earliest Greek settlement on Egyptian soil, was a key hub for such exchange until the 7th century AD. It thus provides an ideal basis for charting long-term patterns of exchange while affording close-up views of individual praxis and experience of interaction. At the same time, Naukratis is exemplary for how present-day knowledge has been shaped – and compromised – by heterogeneous and serendipitous bodies of evidence filtered through selective frameworks of interpretation. It is only recently that a critical reassessment of 19th and 20th century scholarship alongside new archaeological work has begun to reveal a more complex, in depth picture of a pluri-ethnic harbour town, home to diverse international communities, which played role in regional and 'global' networks of trade and exchange for well over a thousand years. Papers in this session will explore different methodologies and perspectives to investigate the port city of Naukratis as a hub and conduit of intercultural trade and as a multi-ethnic community. Their objective is twofold: presenting the results of new research, they will chart the port’s diachronic development and role in wider Mediterranean (Greek, Roman), African (Egypt, Libya?) and Near Eastern (Levantine) networks and examine the agents and processes involved in trade and exchange, from the role of religion to the impact of technological transfer. On a more general level, they aim to provoke discussion about the role of archaeological, geo-archaeological, technological, historiographic and culture-historical approaches in teasing out economic history from the ‘archaeological archive’.

Paper abstracts

1. Alexandra Villing (The British Museum), Greece, Egypt and cross-cultural trade – an introduction

Throughout history, economic exchange has been inseparable from political, cultural, religious and social relations. From the Assyrian trading colonies of the 2nd millennium BC to medieval Gao in sub-Saharan Africa, the 17th century Dutch outpost at Dejima, or the 19th century British treaty port of Shanghai, long-distance commerce has engendered contact and exchange but also conflict and segregation between peoples of different cultural backgrounds. With commercial exchange being founded on institutional frameworks as much as on social networks, international trading ports and trading diasporas have been key agents in these processes. This paper aims to set the scene for a wider discussion of such issues in relation to the topic of Egyptian-Greek economic and cultural exchange, including but not confined to the study of the ancient port of Naukratis. It will give a brief introduction to the history of Egyptian-Greek exchange and to the role of Naukratis against the wider background of scholarly approaches to cross-cultural trade, as well as raise some of the crucial questions to be addressed in subsequent contributions: To what extent can the archaeological exploration of a multi-cultural gateway community provide insights into ancient economic practice? How should we approach the archaeological record, and what are the dangers and pitfalls we need to wary of?


A Greek port city with an Egyptian suburb, or an Egyptian town with a Greek quarter? Classicists’ and Egyptologists’ views of Naukratis can differ fundamentally, shaped by different disciplinary traditions and selective views on a problematic body of archaeological evidence moulded by changing epistemological approaches and their political and economic backgrounds from the late 19th century until today. In the British Museum’s ongoing reassessment of Naukratis, interdisciplinary collaboration and a critical review of fieldwork old and new enables a new perspective on the port’s multi-ethnic populations and their religious and economic activities. Among the key results is the greater recognition of Egyptian agency and of the way that both Greeks and Egyptians shaped the town’s life and history from its foundation.
A deeper understanding of the site and its archaeology also allow us to more fully appreciate the processes behind diverse scholarly constructs of Naukratis – including our own – and to assess their wider impact on the perception of Egyptian-Greek economic and cultural exchange.

3. Astrid Lindenlauf, Economising in an inter-cultural context: practices of repair, re-use and re-utilization of pottery at Naukratis

Clay objects break at different rates but they tend to break eventually. Yet breakage does not necessarily end the use life of a clay object. If a damaged vessel is not considered irreparable, it may be mended and used for the same purpose (re-use) or a different function (re-utilization). Individual potsherds may be considered useful because of their properties, such as their form (to serve as a writing surface or lid), their weight (to serve as a loomweight), or sharpness (to serve as a scraper or knife). Some clay objects may have to be modified to serve their new function, as in the case of stoppers or games pieces. Sherds may also be broken down completely to reclaim the material (material reprocessing) as temper but this practice is difficult to trace archaeologically.

At Naukratis, most repaired and recycled clay objects have been found in rubbish deposits. While the findspots of recycled pots do not necessarily reflect the original location and context of their use, it is possible to reconstruct diverse technological practices of repairing cracks and breaks and of recycling damaged vessels and potsherds. Correlating frequencies of repair and recycling techniques with vase shapes and production centres provides insights into the management of resources and value systems in place at Naukratis, from Archaic to Roman times. It also provides the foundation for better understanding the factors that motivate repair and recycling within a multicultural trading community.

4. Ross Thomas (The British Museum) - Benjamin Pennington (The University of Southampton), Networks of trade and landscapes of connectivity: the port of Naukratis from the 7th century BC to the 7th century AD

Before the founding of Alexandria, Naukratis and its sister port Thonis-Heracleion were Egypt’s main gateways to the Mediterranean. The rediscovery of Thonis-Heracleion, new British Museum excavations at Naukratis and the ongoing interdisciplinary reassessment of earlier fieldwork enable a comprehensive review of trade between Egypt and the Mediterranean world and the role of the riverine networks and port facilities that enabled it.

I will first discuss the cityscape and riverscape of Naukratis based on the latest geophysical, geological and archaeological studies of Naukratis and related sites, which have shed important new light on the navigability of the river, the harbour facilities and sailing technology.

Secondly, an assessment will be given of the scale and nature of trade as evidenced by the large dataset of archaeological remains from the new and old excavations at Naukratis. The limits and biases of the data and the relative merits of different artefact groups will be considered.

Finally, I will discuss the implications of this research for our understanding of Naukratis and of trade relations between Egypt and its Mediterranean and Near Eastern neighbours through the ages. Tracing trade along the Canopic branch from c.620BC to AD650 and considering the impact of short and long term geo-political trends, I will address the question of how pivotal was Naukratis as a hub of trade.

5. Giorgos Bourogiannis (Museums of World Cultures), Cypriots at Naukratis or Cypriots to Naukratis? A brief discussion of material evidence and some writing

Contacts between Egypt and Cyprus in the first millennium BC and their archaeological manifestation are an intriguing subject that has not always been in the centre of scholarly attention. In spite of her strategic position, natural assets and sophisticated socioeconomic structures, Cyprus is often viewed as a mere recipient of Egyptian cultural influence, particularly in the 6th century BC, when the island was under the political control of Egypt. Although the brief period of Egyptian domination left its trace on the island, especially in the art, evidence suggesting a Cypriot activity in Egypt is more difficult to assess.

Looking at sites across Egypt, including the bustling emporion of Naukratis at the Nile Delta, the paper will seek evidence of Cypriot activity and, possibly, presence in the affluent land of the Pharaohs, by examining the archaeological data and written record from selected case studies. The chronological range
of the paper is set between the 9th/8th and the 4th centuries BC. Discussion will consider different groups of material evidence with also due consideration whenever possible of the existing epigraphic record and literary evidence for ancient Cyprus (written exclusively by non-Cypriots). In order to better assess the nature of Cypriot activity in Egypt, comparisons with other areas of the Mediterranean will be made. The paper will focus on issues of pottery production and distribution, trade activity, cultural interaction and its archaeological visibility.

6. Christopher Parmenter (New York University), Biographies of Faience: Naukratis and the Culture of the Commodity

During the 6th cent. BCE, Aegean merchants became increasingly active in Mediterranean borderlands. The entry of new commodities into the Greek world sets in motion a series of cultural transformations as these goods create space for new behaviors and new ideas of the world and its peoples (J. Skinner calls this the population of a ‘cultural imaginaire’). Studies of mass consumption both contemporary (Appadurai, Trentmann) and in the Archaic Mediterranean (Villing, Dietler) demonstrate consumption is central to identity construction. Commodity biography, a genre of historiography from Atlantic history (Mintz), offers a useful analog for how foreign consumers managed interactions with new commodities. The spread of faience Egyptianizing ‘trinkets,’ some made in Naukratis, and some deliberately produced for export, offers an example of how a specific type of product facilitates new behaviors and forms of knowledge among consumers. I will discuss an unpublished deposit of faience from Kourion, Cyprus to show how worshippers displayed and curated faience objects to demonstrate their connectivity in an increasingly ‘globalized’ Mediterranean. A ‘biographical’ approach to faience sheds light on how diverse tastes for single product, sourced from mineral resources in the western Nile delta, sets in motion a wider ‘Egyptianization’ in the 6th cent. The widespread, selective, adoption of this good is background for Greek conceptions of Egypt and its cultures in the Classical Period.

7. Barbara Kowalzig (New York University), Trading Religions at Naukratis

This paper will examine the role of cult in trading relations in the light of the new findings at Naukratis. In particular, it will attempt to understand the ‘pantheon’ of Naukratis as working within a specifically maritime belief system, i.e. catering to the needs, interests, and anxieties of traders, travellers, and seafarers. It will try to pinpoint the workings of Aphrodite in transcultural trading relations by placing Naukratite Aphrodite within her network of cults emerging from the milieu of a maritime merchant elite of the Eastern Mediterranean. I will furthermore look at the role of Hera in long-distance trade, taking into account the insights from a recent monograph devoted to her agency within Greek polytheism (V. Pi-renne-Delforge, G. Pironti, L’Héra de Zeus. Ennemie intime, épouse definitive (Paris, 2016)). A final aspect to be explored is how the community of Greek gods at Naukratis relates to the site’s Egyptian pantheon, notably Amun-Ra, the port’s main Egyptian god, and his possible role as protector of seafarers.

Panel 5.23 Transport Amphorae

Friday | 25 May | 14:30-19:00 | HS IX

Paper abstracts

1. Rebecca Diana Klug (Georg-August-Universitaet Goettingen), Transport Amphorae and the historical space – city – chora – hinterland

One result of the Greek Colonisation was the increasing trade between Greece and the western Mediterranean; the amount of Greek imports is higher. The excavations and surveys show that the Greek vessels also reached non-Greek areas. Foodstuffs, like wine and oil, had been important exchange goods. Amphorae were used as transport vessels for liquid and solid goods. Amphorae are both most common and best preserved transport vessels. The different shapes are significant for their
All attempts to connect the shape to the content would mean reducing the export goods of one city or region to a single kind. The amphorae are therefore a significant object group to study the ancient economy; even if they are not the proper exchange good, but rather the package. South Italy and Sicily create the investigation area. The Greek Colonisation directly influenced both. The Greek settlements enforced exchange and contacts between different cultures, which are visible in the changes to the material culture. The focus of this project is based on the Greek amphorae found in Greek and non-Greek contexts of the 8th-5th century BC and the information they give us about the type of exchange inside the Greek world on the one hand, and between the Greeks and non-Greeks on the other hand. It seems probable that the imported amphorae (including Greek, Punic and Etruscan amphorae) reached the Greek settlements first and were then distributed into the non-Greek areas.

2. Anthi Kaldeli (Department of Antiquities Cyprus), Trade and exchange in the eastern Mediterranean: economic perspectives reflected in the amphorae from Cyprus

The aim of this paper is to provide an insight into the economy of the eastern Mediterranean regions, through the examination of trade and exchange, as reflected in the amphorae from Cyprus. The line of enquiry followed will largely draw on new evidence, based on recent advances in the study of eastern amphorae, not only from Cyprus, but also from neighbouring areas. The identification of new eastern amphora types, including variations and imitations of previously known types, increases our knowledge on production in this part of the empire, but at the same time it adds to the variability characterizing the exchange mechanisms operating in the eastern Mediterranean basin. These new data in conjunction with the strategic position of Cyprus in the eastern Mediterranean, and the application of a theoretical and methodological framework, based on statistical analyses, will shed light in the character of distribution and the associated economic perspectives in the eastern territories, including respective changes and fluctuations. Emphasis will also be put on related institutions, local economies and other non-economic factors that impinged upon the structures reflected in spatial patterns, thus contributing towards elucidating debatable issues concerning the broader character and scale of the Roman economy, within the wider socio-political system.

3. Patrick Monsieur (Ghent University), Rhodian Amphoras in the Italian Adriatic: a State of the Art in Confrontation with Local Amphora Production

The study of Rhodian amphora import in Italy is still underexposed, as well on the Adriatic as on the Tyrrenhenian coasts. In this contribution we want to present a status quaestionis on the Adriatic coast, especially in the light of the new discoveries in the Ager Potentinus (Lower Potenza Valley, Porto Recanati near Ancona) where Rhodian material of the 2nd and 1st century BC– equally bodysers and stamps – was recovered from surveys and excavations. In a second time these Rhodian finds will be confronted with the local Italic late republican productions (Greco-Italic, Lamboglia 2 and Dressel 6A). In a next stade we want to compare this material to the whole of the Italian Adriatic coast. Finally, in a digression on the Rhodian amphora stamps of Potentia and Alba Fucens some chronological issues on the first quarter of the 2nd century BC and around 100 BC will be discussed.

4. Diana Dobreva and Anna Riccato (University of Padova), Aegean trade in adriatic area: new evidences from Aquileia

The aim of the present paper is to analyse trade connections that develop between Aquileia, main commercial hub in northern Adriatic, and the Aegean region, which is one of the most intense area in Mediterranean from an economic point of view. Trade transformations which involved Aquileia and the Aegean were particularly significant because of the size and nature of trade and of its regularity. In order to reconstruct a comprehensive model of these relations a detailed pottery study will be performed. We will make use of case studies from the so-called Domus of Titus Macer to establish in which ways this correlation changes over time and how we can explain some trends. The possibility to examine a big amount and variety of shards, relevant to different pottery classes (as amphorae, fine and cooking wares and lamps) are perfect classic examples of the multiplicity of production centres in the
Aegean. The examined data offered the opportunity to carry out an in-depth analysis of the long-term Aegean imports in Adriatic which developed between Late Republican and Late Antique times. By taking a closer look at the Aegean pottery found in Aquileia, we want to explore imported wares from a quantitative and chronological point of view and discuss distribution patterns of Aegean products in Adriatic. In order to better understand the reasons of this long-term success, some comparison with other regional realities will be performed.

5. Paulina Komar (Jagiellonian University, Krakow), Wine and the Roman economy

The ongoing debate regarding the nature of ancient economy, starting with Finley's criticism of Rostovtzeff's theories, not only lacks a final conclusion, but poses more questions than answers. Recently, scholars have concentrated on looking for evidence that could confirm or reject the existence of economic growth in antiquity (e.g. W. Scheidel, A. Wilson, W. Jongman, E. Lo Cascio, R.Saller), and in the former case attempted to define its character, as well as examining the degree of integration of the Roman 'market' (e.g. W. Scheidel, P. Bang, P. Temin, K. Greene, G. Bransbourg).

Research on the number of amphoras imported to Latium and Campania sheds some light on these issues. First of all, the number of imported containers indicates that considerable economic growth of an extensive character took place in central Tyrrenian Italy between the Late Republican and Early Imperial period. Secondly, analyses of the types of imported products, eastern wines in particular, suggest that this growth might have also been intensive. Finally, the highest numbers of imported containers in Rome come from the areas of the lowest transportation costs. This correlation suggests a certain integration of the Roman imperial market, which moves the image of the ancient economy away from the primitive vision of Finley.

6. Daniel Mateo Corredor (University of Alicante), The trade of Adriatic wine in the southern Iberian Peninsula and its connection with the economic and social transformations in the context of the Roman Civil Wars

This paper analyses the arrival and the uneven distribution of Adriatic wine, transported in Lamboglia 2 amphorae, to the south of the Iberian Peninsula, exploring the economic and social transformations behind this fact. Stratigraphic and quantitative data obtained from different amphorae assemblages leads to the idea that the arrival of Adriatic wine to this area would be focused over the second and the beginning of the third quarter of the 1st century. The start of that period mainly coincides with the fall of Delos and the collapse of the slave trade in the East, to which the commercialization of Late Republican Adriatic wine was related. It is proposed that there might be a relationship between the crisis in the eastern market and the rise of the presence of Lamboglia 2 in specific western areas. Moreover, it is observed that there might be a link between Pompey, the Adriatic wine production and Lamboglia 2 amphorae. It is highlighted the chronological coincidence between the period where the arrival of this type of amphora to the south of the Iberian Peninsula reaches its peak, the presence of Pompey and the development of his network of clients in this territory. In that sense, it is explored the hypothesis that the trade of Adriatic wine that reaches the area of southern Hispania could be related to the economic interests of Pompey and/or his clients.

7. Daniel J. Martín-Arroyo (University of Barcelona), Trade and institution from Alexandria to Rome: The amphorae from Pompeii.

Amphorae from Pompeii can be related to each other from their forms and provenances, their epigraphic features and their specific assemblages or contexts. A quantitative and epigraphic analysis will allow to define certain aspects on the Mediterranean trade and its scope in the Campania region. Concerning this, some hypotheses are posed on the mechanisms of the successful commercialization of the oriental amphorae found in Pompeii. The annonary supply from Alexandria to Puteoli, Rome, and the limes was associated with the exchange of other products. Regional redistribution and navigation stopovers should be considered for the configuration of these secondary cargoes. The tituli picti seem to fit in the configuration of the assemblages along these routes, with the intervention of certain traders with specific roles and relationships, as showed by the epigraphic interconnections of some
Egyptian, Cilician and Cretan amphorae. Private trade would also have benefited from other forms of public administration. Thus, the Cretan amphorae have been associated with the collection of Capuan vectigalia, as well as the Carrot-type amphorae to the imperial properties. In addition to this, the remarkable epigraphic presence of Ti. Ti. Claudii is a possible indicator of imperial intervention through his slaves and freedmen. Finally, these tituli picti will allow a new approach to the personal relationships of commercial agents benefited from the economic dynamics of Roman institutions.

8. Juan Manuel Bermúdez Lorenzo (Universitat de Barcelona), A través de mar y montañas: la epigrafía anfórica en Noricum

La investigación en epigrafía anfórica con una visión provincial comenzó hace algunos años con un interés especial. Esta visión conectada ayuda a comprender la organización del abastecimiento (sobre todo militar). Los hallazgos en Noricum son pocos y la importancia de las ciudades es limitada. No obstante, el papel de la provincia fue determinante en época de las Guerras Marcomanas y la llegada de la Legio II Italica. Por eso el abastecimiento de la Praefectura Annonae debería haber aumentado entonces.

Mi propuesta es ofrecer un status quaestionis sobre la epigrafía anfórica de Noricum y comparar los resultados con las provincias vecinas. Mediante esta comparación se podría debatir sobre las dos rutas de abastecimiento del aceite de oliva proveniente de la Bética y encontrado en Noricum. También se tratarán las necesidades mínimas de este producto en conexión con las unidades militares apostadas en Noricum.

En conjunto, es un objetivo de esta comunicación ofrecer una nueva visión del comercio de la provincia de Noricum a través de la epigrafía y el análisis de la presencia de unidades militares.

9. Pablo Ozcáriz (Universidad Rey Juan Carlos), Los grafitos "ante cocturam" de las ánforas Dressel 20. Sisitematización para la elaboración de un corpus.

En la presente comunicación ofrecemos una propuesta para la elaboración de un corpus de grafitos "ante cocturam" sobre ánforas Dressel 20. Los grafitos en Dressel 20 están realizados sobre la pasta antes de la cocción y cumplen una función relacionada con el proceso de elaboración de la pieza. Desde el grupo Ceipac se llevan publicando los resultados de las excavaciones en el Monte Testaccio, en los que se incluyen ya varios centenares de estos grafitos. En este momento se requiere, por tanto, elaborar un corpus que permita exprimir la información. Para ello necesitaremos establecer con cierta claridad los diferentes tipos existentes y las diferentes funciones que tuvieron según su contenido, localización en la pieza, y cronología. Su elaboración nos ayudará comprender mejor su utilidad y, por tanto, el funcionamiento de uno de los procesos de producción en serie más destacados del Imperio romano.

10. Marta Bajtler (Polish Academy of Sciences), Who in Antiquity sealed amphorae and stamped stoppers? An attempt to understand the process based on examples of finds from Berenike (Egypt) and Risan (Montenegro)

Usage of stoppers was forced by long distance trade. As stopper could have been used almost every kind of material, which could be blocked in the neck of amphorae and sealed by plaster or wet clay. In some cases, the material used for sealing and plugging vessels was characteristic for particular period or region. In Roman Egypt, local wine designated for international trade was closed by different organic and nonorganic plugs, sealed by plaster and sometimes stamped. Seals made from wet clay were popular in local small trade scale and during Hellenistic and Late Roman period. In Central Italy wine produced during last two century of Republic period was sealed in amphorae by natural cork and stamped layer of pouzzolana. In similar period in Adriatic region, wine amphorae were closed by totally different way. The amphora neck was blocked with ceramic stopper produced at potter’s wheel or formed in a mould. Sealing substance was used probably only to seal thin breaks between stopper and inner walls of amphora neck. These kinds of stoppers wear inscriptions and decorations created during production of entire stopper.

Described examples were commerce stamps and usually included personal names. In few cases, we
can find real people involved in long-distance trade at confirmed, e.g. at ostraka. But, did it work the same everywhere? Who made the stamps at stoppers: wine producer, owner of the ship or amphorae producer? These are just a few of many questions, I will try to answer.

Panel 5.24 Greek Coinage

Friday | 25 May | 11:30-13:30 | HS IV

Paper abstracts

1. José Miguel Puebla Morón, The Carthaginian attack to Akragas in 406 BC: Numismatic analysis

Greek coinage, as an official document from the polis which mints it, supposes a medium to spread a message from the population to whom it represents, message which must be understandable for the local population, because of being its main recipient, in addition to the rest of towns where that coinage could arrive for having common elements originating from the Greek imaginary. Accordingly, from this premise I expect to analyse the coinage from the Greek polis of Akragas before the Carthaginian attack in 406 B.C., where, in addition to a considerable increase in the number and volume of its coinage as well as the presence of coins with a high nominal value, both as a symptomatic feature of a war period, it can also be observed the appearance of new iconographic elements in the coinage of Akragas which can be interpreted as the attempt of representation of an iconographic programme where it is expressed the support of the main deities from the local pantheon and supernatural beings from the Greek mythology in Sicily before the imminent attack of the Carthaginian army which would finish with the conquest and the subsequent sack of the polis.

2. Lavinia Sole (University of Palermo), Monete in contesto dall'Acropoli di Gela

Oggetto del presente contributo sono 13 contesti di scavo, comprendenti monete in associazione a materiali archeologici. Ricostruiti a seguito di alcuni studi condotti nei magazzini del Museo Archeologico di Gela (CL), provengono dagli scavi degli anni ’50 e ’60 condotti sull'Acropoli di Gela, antica colonia siceliotta fondata dai Rodio-Cretesi nel 689-688 a. C. L'analisi di questi contesti, databili prevalentemente tra la fine del V e gli inizi del IV sec. a.C., permette di avanzare spunti di riflessione circa la nuova organizzazione e il cambiamento di destinazione funzionale dell'Acropoli all'epoca della distruzione da parte dei Cartaginesi nel 405 a.C., nonché circa l'origine e la natura delle genti che occuparono questo spazio sacro in tale periodo. Verranno pertanto proposte alcune ipotesi interpretative delle notizie delle fonti storiche su Gela in questo arco di tempo, oltre ad essere precisate la cronologia delle fasi di frequentazione dell'acropoli, la datazione e la durata di circolazione delle serie monetali documentate.

3. Antonia Nikolakopoulou (Epigraphic and Numismatic Museum), Burial coins in the Peleponnese as testimonies of monetary relations and coin circulation

Burial coins have always had a symbolic value either because of their connection to the rituals of the transition to Hades, or the respect of the relatives to the deceased or the social status and the religious beliefs of the dead themselves. But apart from their significance as tokens of burial traditions, burial coins are testimonies of the history, the monetary relations and the coin circulation of each region. In this study, coins found in tombs from Corinthia, Achaea, Eleia, Messenia, Laconia, Argolis and Arcadia in the Peloponnese are presented as such.

While in classical times burial rites were very limited, the frequency of burial coins increased in the Hellenistic and post-Hellenistic era. Burial silver and bronze coins were mainly issues of the mints of the Peloponnese rather than of city states beyond this region, where the frequency of findings has been very low. It is striking that one third of the burial coins included in this study come from Sicyon and that they have been found in tombs from nine out of the thirteen areas studied. Therefore, this study attempts to examine the historical conditions of the domination of the Sicyon coins, the monetary rela-
tions and the coin circulation of the cities of the Peloponnese, especially in those with no mints of their own.

4. Vassiliki Stefanaki (Epigraphic and Numismatic Museum) - Nadia Coutsinas, Défense et monnaie en Crète à l’époque hellénistique

Les recherches récentes ont démontré le lien entre frappe monétaire et dépenses publiques (surtout militaires) des royaumes et des cités. On sait que les dépenses militaires concernent surtout la protection et la défense de la cité (construction ou restauration des fortifications et des vaisseaux, armement et équipement de tous ces ouvrages, solde des hommes engagés dans les opérations).

La Crète, réputée pour les guerres incessantes entre ses cités, particulièrement pour des raisons hégémoniques, territoriales et économiques, n’est pas une île fortement monétarisée. Ainsi, même si le métal précieux utilisé pour la frappe du monnayage des cités provenait surtout des activités militaires et piratiques des Crétois, le lien entre guerre et monnaie n’est pas toujours évident, surtout pour une monnaie locale qui ne circulait pas en dehors de l’île. Le problème qui se pose donc est la raison de la frappe monétaire, ainsi que les dépenses envisagées par les cités crétoises.

Les sources écrites et archéologiques attestent l’entreprise de travaux liés à la défense des cités crétoises au cours de la période hellénistique. Toutefois, la datation de ces ouvrages est généralement approximative, ce qui rend difficile et hasardeux le lien entre frappe monétaire et programmes de constructions. Malgré cette difficulté majeure, nous allons tenter de faire un bilan des périodes de convergence ou de divergence entre frappe monétaire et construction des ouvrages défensifs en Crète.

5. Hacer Çoruh (Harran University), The Place of Kyzikos Coins in Antiquity Economics

Kyzikos where on a peninsula in the southern coast of Propontis is known as a major trading and banking center. The tuna fish symbol was used as a permanent symbol on the city's coins. The electron staters of Kyzikos was called the Kyzikenes in antiquity. A Kyzikos electron stater, usually 24 Attic drachmi or 6 tetradrachmi and 1 Persian gold, is equal to the purchasing power. They were perceived as a stable and generally accepted currency. The Persian king made payments to his mercenaries with Kyzikos coins. These coins also played an active role in the international grain trade between the Greek mainland and the Black Sea. We know that Kyzikos coins are hid as dowry because they maintain their validity. Kyzikenes also have an important place in the assets of the rich. This electron staters have a special place in the agreements governing the international rate of exchange. The hoards and inscriptions found on a wide geographical area prove that the Kyzikos coins are an undeniable place in the ancient economies. Athenians and the Persians had never forbidden the production of these coins. Kyzikenes have become one of the three most prevalent coins of the ancient world. In this study will be mentioned on the validity of the Kyzikos coins spread in the geography and their place in the antiquity economics.

Panel 5.25 Roman Coinage

Friday | 25 May | 14:30-19:00 | HS IV

Paper abstracts

1. Renata Cantilena, Federico Carbone and Giacomo Pardini (University of Salerno), Paestum, Velia, Pompeii: monetary policies in Tyrrhenian Campania from 2nd BC to 1st AD.

The research on use and diffusion of bronze coins in Magna Graecia from 2nd BC until 1st century DC concerns the problems on autonomous minting policy in cities located along the Tyrrhenian side of Campania. The documentation considered so far, offers elements of interest for the understanding of economic dynamics at Paestum, Velia and Pompeii. The first two cities represent rare cases of where mint activities are still attested in advanced I BC, producing small bronze coins to serve as subsidiaries of the values issued by the mint of Rome.
The need for small change - useful for daily transactions - appears to be strong, as the practice of fractioning higher bronze nominals to create lower values is widely attested. The case of Pompeii is uncommon as the city has never issued autonomous currency before. In this case, the need of fractional values for the coin circulation in the ager vesuvianus forced the adoption of coins from nearest centres or the striking of local unofficial Campanian issues imitating those already in circulation. This feature is confirmed by recent analysis of coin finds from archaeological contexts, demonstrating the high use of this expedient to deal with a need that should be considered. The analysis of these cities serves as a model for the recognition of economic dynamics on same chronological phases, contextualizing similar reactions even facing with not univocal monetary policies.

2. Barbara Zajac (Institute of Archaeology), Trajan's provincial financial policy in the cities of Bithynia and Pontus

Financial policy in the state during the reign of Trajan was based on the centralization system, such as the period of Domitian rule. The main provincial economy was a focus on the bronze currency struck mostly in the regional cities, but some of them emitted in Rome and distributed for the local needs (e.g. Syria, Cyprus, Cyrenaica, Cappadocia). Silver coins for provinces were struck in Rome, Alexandria, and Antioch. The minting activity in Bithynia and Pontus was conducted by 14 cities which struck bronze coinage. Among the cities were harbors (Byzantium, Heraclea), metropolis (Nicomedia, Heraclea or Amastris), colonies (Apamea and Sinopa) or autonomic cities (Chalcedon). Based on the introduction analysis some similarities could be found, such as denominations or iconography. The similar minting production and relationships are visible between inter alia Heraclea-Tium, and Byzantium-Calchedon. Correspondence of Pliny the Younger gave as some 'reasons' and characteristic of financial policy. C.M. Kraay suggested in his Ph.D. thesis some centralization in this province, but numismatic material then was scanty. Now, in the light of the new material, it's could be tried to rozstrzygnąć this problem. Moreover based on the modern researches some of the Roman imperial coins are visible in provinces material, that have to consider importance this currency in the provincial economy.

3. Zakia Loum (Faculté des Sciences Humaines et Sociales 9 avril Tunis), Le trésor de Sbiba (TUNISIE): reflet d'une circulation monétaire urbaine.

Le trésor de Sbiba, l'antique Sufes (Tunisie), découvert en 1990, est un des dépôts les plus importants, quantitativement, enfouis en Tunisie et qui ont été intégralement restitués. Il se compose de 7140 monnaies dont la fourchette chronologique est comprise entre le règne de Constantin ler et celui de Thrasamund. Les monnaies sont toutes en bronze à l'exception d'un seul exemplaire en argent (1/4 de silique) et dans un piètre état de conservation pour la plupart. Cette investigation préliminaire relative au trésor de Sbiba est A travers l'étude préliminaire de ce trésor et l'inventaire des monnaies de surface issue de la prospection effectuée dans cette zone géographique, ce monnayage permet de préciser l'évolution de ce numéraire tantôt de nécessité tantôt autonome (vandale). Le trésor de Sbiba s'insère dans le premier groupe, constitué des trésors mixtes comprenant des monnaies signées et des monnaies anonymes. Le principal intérêt de cette trouvaille, et il est important de le souligner, est l'absence de monnaies byzantines. Ce qui nous laisse déduire qu'il s'agirait d'une immense réserve de monnaies qui n'aurait plus été alimentée après la reconquête justinienne et ouverture d'une officine byzantine à Carthage. Que s'est-il passé après 533 ? Un retrait massif de numéraire ancien suite à un décri semble peu probable. Car, les bronzes romains, vandales et byzantins n'ont jamais cessé de circuler en parallèle.

4. Hristo Preshlenov (National Institute of Archaeology and Museum - Sofia), City Economy along the Pontus Coast of the Moesia Inferior and Thracia

In Imperium Romanum the Greek cities at the Southwestern Black Sea Coast turned into self-governing municipalities under the control of the Roman administration. Traditionally on the city coins' reverses are portrayed divine protectors of agriculture and commerce. Such a protection was sought also in the surrounding city territories. Next to the agricultural production the hinterland provided also inorganic rough materials. Archaeological researches revealed evidences
about the technical equipment of the regional production. A greater significance for the coastal towns' economy had sea transports. Archaeological remnants reveal the first range importance of the traditional contacts with the East Mediterranean Region. Trade in its different aspects did not exhaust the possibilities for distribution and redistribution of the social product. These were practically accomplished also financially through the direct and indirect taxation, the payments and the endowments, expected from wealthy citizens in the form of liturgy, magistrates' and private payments.

One could distinguish three periods in the activities of the mints of Pontic cities. The first one coincides with the rule of the Antonine emperors. The second period includes the reign of the Severus' Dynasty. Changes in the military-political situation in the 3rd c. AD predetermined the emergence of minting with a military character.

5. Noé Conejo Delgado (Universidad de Sevilla), Monnaie et marchandise: la consommation dans les villæ romaines de la Lusitanie.

Disons d'emblée que la villa romaine, un des éléments économiques de la romanisation, ne peut pas être seulement entendue comme un centre de production. En effet, de nombreuses découvertes archéologiques démontrent une consommation ininterrompue de marchandises de luxe et de demi-luxe. La monnaie est un grand outil pour connaître les changements et les transformations économiques dans une société ancienne. Nous avons sélectionné différents sites archéologiques ruraux situés dans différentes parties de la province romaine de Lusitania. On a trouvé dans tous ces sites une quantité de monnaie significative. Les pièces ont été trouvées soit grâce à une méthodologie archéologique, soit par une découverte isolée. La comparaison entre les deux types de pièces est suffisante pour obtenir une contextualisation chronoculturelle des monnaies trouvées. Dans ce cas la monnaie est analysée d'un point de vue global, c'est-à-dire, Elle est étudiée en même temps que les autres matériaux archéologiques documentés dans ces sites (des céramiques, des verres, des mosaïques, des marbres). Le résultat est: les changements monétaires coïncident avec une consommation très élevée de produits importés. Cet aspect peut aider à approfondir dans la caractérisation des sociétés rurales romaines. Ces groupes avaient des nécessités sociales et matérielles qui ont généré la consommation des marchandises. La monnaie est, par conséquent, un traceur économique très clair pour connaître cette réalité sociale.

6. Johannes Eberhardt (Albert-Ludwigs-Universität Freiburg), History from Italian Cast Coinage

Not stuck but striking: Aes signatum and Aes grave remain peculiar sources for a crucial point in ancient history. Within the monetization of the Roman Republic, heavy metal coinage reveals missing links between archaic continuities, Hellenization and invented local traditions. Numismatists and historians are still not utterly sure about its chronology, development and usage. The second analytic volume of HAEBERLIN's corpus has never been completed. Recent analyses (TERMEER/KEMMERS–MURGAN) demonstrate how fruitful it is to study cast money and to implement new approaches to analyze these objects as well as their complex meanings. The collection HAEBERLIN (coins/textual testimonia) forms part of the Coin Cabinet in Berlin. This material offers a sufficient background to contribute to the vibrant research on Italian cast coinage. The aim of this paper is to ask how research can be built on the achievements of HAEBERLIN and TERMEER, and how further work can provide new insights concerning Italian cast coinage as a monetary as well as artistic form of Italian idiosyncrasy.

7. Katrin Westner and Fleur Kemmers (Johann Wolfgang Goethe Universität Frankfurt) - Sabine Klein (Deutsches Bergbau-Museum), Geochemical characterisation of aes coinage from the Western Mediterranean, 5th to 2nd centuries BCE

The minting of coinage requires metal(s). In the case of aes coinage, these are copper and potentially tin and, increasingly from the 3rd century BCE on, lead. These metals are concentrated in ore deposits, which are scattered throughout the Mediterranean and beyond. Consequently, not every civilisation had access to raw material sources on its own territory. This imbalance was partially compensated with trading networks. Other sources of metals generally are booty, war indemnities, tributes and taxes. The composition and Pb isotope signature of aes coins therefore provide insight into the access (i.e. exploitation and distribution) of copper and lead, respectively, in the Mediterranean and, on a bigger scale, are thought to reflect the political situation at a given period.

We investigated a total number of 70 bronze coins dating between the 5th and 2nd centuries BCE. Fresh and unaltered sample material has been obtained by drilling. The metal chips have been dissolved and measured by SC-ICP-MS and MC-ICP-MS for their major, minor and trace element composition and Pb isotope signatures, respectively. Our study focuses on the mints of Rome and Syracuse with the two cities each representing a different cultural affiliation. With our results, we aim to address the following questions: Are the composition and Pb isotope signatures responding to political changes? Are there differences concerning the access of raw materials between Rome and Syracuse?

8. George Azzopardi (Nil), Common concerns, assimilated cults: an assimilation of Tanit with Ceres in early Roman Melite

This paper seeks to explore a possible religious assimilation process taking place in the 2nd century BC on the central Mediterranean island of Malta.

The cult of the Carthaginian Tanit enjoyed popularity on the island of Malta already before the latter was taken over by the Romans in c.218 BC. But two successive coin issues of Melite's early Roman occupation might indicate an assimilation of the Carthaginian Tanit with the Roman Ceres both of whom shared similar concerns and attributes. This assimilation process involved an interchangeable image changing divine representation following a change in the accompanying symbol from one coin issue to the next.

This move may have reflected an attempt by the people of Melite to negotiate their identity in view of the new political reality, now that they were under Roman rule. It may have also been a 'political' move to manoeuvre political allegiances after Rome had defeated and destroyed Carthage at the end of the Third Punic War. At the same time, from the religious point of view, the people of Melite still secured the heavenly favours they needed.

9. Steven Hijmans (University of Alberta), Art and Economy: Images on Roman Coins

The study of ancient art is losing favour and is now almost an afterthought in many programs. At this conference, it is relegated to the fringe. Growing consensus that ancient art was highly communicative may change this, for though we still lack the easy ability to “read” ancient art as autonomous “texts”, we are increasingly aware of how different that was in antiquity. Art, both durable and ephemeral, had major agency in creating and maintaining the shared environment, the “Mediterranean koine”, so to say, that formed the basso continuo to the ever-varying fugues weaving the discourses - religious, economic, political - of the day.

In the Roman Empire, coins played a major role in the visual instantiation of both that koine and those discourses. Integrated analyses show how they were positioned at intersects of economy and ideology in ways that we may not expect but cannot ignore. Yet studies concerned with the monetary aspects of Roman coins rarely take their imagery into account, while visual analyses often ignore all economic aspects.

Two case studies - one drawn from the mint of Alexandria under Nero, the other from the imperial coinage of Aurelian - illustrate the deficiencies of such one-sided approaches. In both cases, understanding the economic and social impact of the coins requires equal attention for their denomination.
and imagery alike. These case studies illustrate the necessity of integrated analysis of Roman images in whatever context they occur.
Session 6: Consumption: Daily and luxury consumption, conspicuous consumption, waste, recycling, diet

Panel 6.1 Culinary Traditions in an Entangled World: Continuities, innovations and hybridizations in Mediterranean culinary practices (8th – 5th centuries BC)

Organiser: Ana Delgado Hervás and Meritxell Ferrer Martín
(Universitat Pompeu Fabra)
Saturday | 26 May | 09:00-13:30 | HS IV

Panel abstract

Material cultures and daily practices play a central role in the invention and (re)production of identities, politics and economics in the context of historical experiences of migration and displacement. Following this premise, the aim of this session is to analyze daily practices and materialities, especially those related to food –the way of cooking and food preparation as well as its consumption–, in the construction, manipulation and negotiation of social identities, power relations and economies of production and exchange in different Mediterranean colonial contexts. Through different study-cases this session wants to explore the continuities, innovations and/or hybridizations experimented by several Mediterranean communities between 8th and 4th centuries BC, relating them with the economic, political and social dynamics occurred in their specific contexts, the construction of new foodscapes as well as their local and global networks.

Paper abstracts

1. Meritxell Ferrer Martín and Ana Delgado Hervás (Universitat Pompeu Fabra) - Marta Santos (Museu d'Arqueologia de Catalunya-Empúries), Foodscapes and culinary traditions: continuities, innovations and hybridizations in the culinary practices of Emporion’s Neapolis, northeast Catalonia (6th-4th centuries BC)

Between 8th and 4th centuries BC, new foodscapes emerged in western Mediterranean. The available foods, the ways of producing or obtaining them, the technologies, installations and tools used to process, prepare and cook them, the consumption modes, their appearance and taste, as well as their social and cultural meanings were transformed in these Mediterranean settings. In the configuration of these transformations were also significant the multiples experiences of migration, displacement, connectivity and trade that characterized the Mediterranean Sea during this period. These experiences entailed the mobility of foods and ingredients, tablewares and consumption practices, but also recipes, cooking sets and implements and culinary practices that got new meanings in different local contexts.

The aim of this paper is to explore the dynamics experimented by foodways and food habits in Emporion between 6th and 4th centuries BC. In particular, we want to focus on continuities, innovations, transformations and hybridities produced in relation to the ingredients engaged in the elaboration of foods, the installations, tools and wares used to cook and the culinary practices and traditions. Through this study we want to place value on the role of cooking sets, culinary practices and cooking practices employed in the daily life by the emporitai, in the transformation of the consumption practices and in the articulation of global and local economies in this Mediterranean enclave.

2. Birgit Öhlinger (Universität Innsbruck), The communal meal as "social technique" in a changing world of Archaic Sicily

Within the archaic Mediterranean Sea as mega-space of transcultural interactions Sicily was one of the most important hubs due to its central position. With the new foundations of Phoenician and Greek
settlements along the coasts from the 8th century BC on, the hinterland of the island was transformed more and more into a zone of intercultural encounters with specific meeting places, where the ‘global’ interchanged with the ‘local’ and vice versa. At these places rituals as social technique play an integral part as collective representations constructing personal, social and cultural identities and affiliations. At the centre of these practices was the communal meal, where social identities were negotiated and transformed. It was one of the oldest and most frequent celebrated feasts of Bronze and Iron Age Sicily, archaeologically attested through hearth places and ritual deposits containing animal bones, ash and ceramics for the preparation and consumption of food and drinks. Because of its century old tradition a diachronic analysis of the communal meal and its related activities – like food preparation – offers the opportunity to study the formation, transformation and innovation of this culinary practice within a changing world, where the local communities were challenged to strike a balance between new influences form outside and a continuance of a local feeling of belonging and this on various social levels and in different social situations.

3. Ana María Niveau-de-Villedary (University of Cadiz, Spain), Daily consumption and ritual commensality: social contact settings at the beginning of the Phoenician presence in central and western Mediterranean (9th-8th centuries BC)

Following the topic of this panel, the main aim of this communication is to delve into some of the processes and mechanisms through which the cultural and social identities of two societies in contact – in particular, the Phoenician and the local– were modified and transformed. This study will be done through the analysis of one activity carried out by everyone, such as the ingest of food, but strongly structured both, social and culturally.

Recent discoveries in western and central Mediterranean have allowed to enlarge almost a century the chronology of this phenomenon, as well as have provided new domestic and ritual contexts where feeding practices were carried out. The analysis of these new data allow to highlight the continuities and modifications of consumption and commensality practices in these earlier colonial spaces as well as their social implications. But also, the comparison of these earlier colonial settings allow to evidence the different patterns and rhythms experienced by each of them.

4. Eva Miguel Gascón (University of Barcelona) - David Asensio i Vilaró - David García i Rubert - Rafel Jornet Niella - Samuel Sardà Seuma, Introduction of wine consumption in the Northeastern Iberian Peninsula communities at the Early Iron Age: adaptation, changes and innovations in the local hand-made pottery assemblages

The Phoenician presence in the Northeastern Iberian Peninsula, its associated exchange network and the interaction with indigenous communities has been a key theme in the study of Protohistory since the 1970s. The recognition of the intense activities of these pioneer traders acted as a timely counter balance to the traditional explanation of Greek colonisation in development of the Iberian Culture.

Inside the archaeological record, Phoenician amphorae have been extensively studied through different approaches and techniques. This studies have overshadowed the local hand-made pottery, leaving their consideration as a secondary concern to explain the impact of Phoenician products in these communities.

Taking into account that archaeometrical analysis (focused on provenance studies) performed to the Phoenician amphorae founded at this area, detected some regional differences, it was thought to be interesting to propose an integrated study of the entire assemblages.

This paper presents the study of several hand-made pottery contexts from the Ilercavonia and Cossetania regions in order to compare how the communities of these two different areas adapted or change their vessels and eating habits to consume the new products introduced as a consequence of the Phoenician commerce. It is possible to detect any significant changes? Are there any regional differences?
5. Francesca Spatafora (Polo di Palermo per i Parchi e i Musei Archeologici), Alimentary habits and cooking of foods in protohistorical and archaic Sicily

The unitary cultural facies that characterizes Sicily since the Middle Bronze Age offers the possibility to recognize common alimentary habits to the various communities, obviously depending of the settlements location, variedly displaced along the shores or in the most inside areas of the island.

An useful contribution to understand the diet and the way in which food is consumed, is given by the analysis of the tools used for obtaining food and of the containers for cooking: in some cases, they show an extraordinary continuity of use for several centuries. In others, their morphology evolves, adapting themselves to changing cooking or to the introduction of new foods, especially when there is the presence of foreigners permanently settled on the island.

Since the 7th century BC, in fact, the established presence of the Greeks and the Phoenicians allows to recognize, also through the material culture connected to the everyday life of the local community, offers a very significant cross-section for understanding the processes of resistance or, in contrast, of negotiation and interaction in an area of Sicily that is characterized by continuous and deep relationships between different groups by origin, education and culture.


The settlement of La Monédière, established on the Hérault river, approximately 6 km from the sea shore, is located in the heart of an area that clearly shows, from the beginning of the 6th century BC, the implantation of Greek merchants and craftsmen, well before the foundation of the massalian colony in Agde (Agathé) (ca. 425/400 BC).

The early development of pottery activity in link with the production of grey-monochrome ware and wheel-thrown cooking ware, is indicative of the range of these contacts, synonym of a close and rapid interaction between the colonial and the indigenous world. La Monédière was occupied without interruption between the beginning of the 6th and the end of the 5th century BC and appears as a basically indigenous site, all the while being highly inserted in Mediterranean exchange networks, to the point that an emporic function is clearly considered, implying the hypothesis of the recurring presence of allochthonous individuals or groups.

The intrinsic characteristics of this site, as well as the nature of the material culture and the consumption practices associated with it, reveal complex and sometimes contradictory processes of conservatism and innovation. Confrontation of the study’s results, on one side animal and vegetal resources, and on the other, the ceramic repertoire, raises the question of the archaeological readability of acculturation and borrowing mechanisms, as well as the characterisation of potentially mixt contexts.

7. Ariadna Nieto-Espinet (CSIC- IMF) - Angela Trentacoste (University of Oxford) - Sergio Jiménez-Manchón (UMR 5140-Archéologie des sociétés méditerranéennes, CNRS) - Silvia Albizuri (Universitat de Barcelona) - Eric Gailledrat and Alexandre Beylier (UMR 5140-Archéologie des sociétés méditerranéennes, CNRS) - Gabriel de Prado (Museu d'Arqueologia de Catalunya-Ullastret) - Rosa Plana (Universitat de Montpellier) - Ferran Codina (Museu d'Arqueologia de Catalunya-Ullastret) - Marta Santos, Joaquim Tremoleta and Pere Castanyer (Museu d'Arqueologia de Catalunya-Empúries) - Silvia Valenzuela Lamas (CSIC- IMF), Cooking Greek and eating Greek? Multisite comparison of culinary practices the Western Mediterranean in Iron Age based on zooarchaeological remains

This study presents a synthesis of zooarchaeological studies in view to characterise different culinary traditions in the Western Mediterranean during the Iron Age, most notably Iberian, Greek and Etruscan. The study is based on the species eaten and butchery patterns as well as cooking techniques (roasted vs. boiled bones). The zooarchaeological data will be contextualised with the shape and size of the cooking pots in view to characterise different culinary traditions and to elucidate what was cooked and how, as well as points in common and differences between the three areas studied (Empordà, Agde and Po Valley).
8. Anne Sieverling (Technische Universität Darmstadt), Nutrition habits in early Akarnania

As nowadays, food in antiquities was not only indispensable to life, but also highly significant for various ecological, economical and sociocultural matters. The aim of this paper is to discuss the paleodiet of the early historical times in Akarnania. By using an interdisciplinary methodological approach, comprising the interpretation of the pottery along with the animal bones and pollen from Stratos, the hinterland Stratiké and a sanctuary the nutrition habits are examined.

The vessel properties capacity, stability, accessibility and transportability provide evidence for the functional classes of pottery, e.g. consuming, processing, cooking, transporting. The distribution as well as the composition of functional classes reflects general consumption habits, including the preparation of food with and without heat, and storage. Changes of vessel forms or even whole functional classes show, inter alia, modification in the nutrition of a specific timespan. Furthermore, the analysis of the various contexts offers the rare opportunity for comparing a specific nutrition patterns in the settlement and the sanctuary of the Stratiké. The contextual differences are also reflected in the archeozoological material which indicates a specific way of food preparation and consumption in the sacred context due to sacrificial rituals. The interpretation of the palynological analysis in this region highlights the economic and ecologic impact on the environment and the cultivation of plants.

9. Paola Cavaliere, L'alimentazione nella Sardegna punica: il caso di Olbia

Scavi di emergenza sul sito di Olbia hanno messo in luce, tra i vari periodi storici, anche la fase punica della città, datata tra la fondazione cartaginese (seconda metà IV s. a.C.) e la conquista romana (237 a.C.). La collocazione geografica del sito, con la sua proiezione marina e il ricco entroterra retrostante, rimanda a un'economia basata sullo sfruttamento delle risorse locali. Lo stanziamento cartaginese sfrutta, adatta e sviluppa, in base alle esigenze dei colonizzatori, il precedente sistema di sussistenza delle comunità indigene locali, la cui presenza sembra archeologicamente documentabile in città.

Si presentano qui dati archeologici preliminari da contesti di abitato relativi all'alimentazione. Lo stretto rapporto con lo sfruttamento delle risorse marittime è documentato dal rinvenimento di resti ittici. Frequente è il rinvenimento di ossa di animali selvatici e addomesticati. L'analisi dei materiali ceramici fa ipotizzare alcune abitudini alimentari praticate nella città, dalla preparazione, alla consumazione, alla conservazione del cibo. Tipologie ceramiche e caratteristiche di impasti e cottura attestano (oltre a numerose importazioni) anche produzioni locali di vasellame che indicano che in questo centro si cucinava secondo le abitudini puniche (con forme da cucina anche derivate dal mondo greco nel V-IV sec. a.C.) e secondo quelle di tradizione indigena (con forme ascendenti anche al Bronzo finale).

10. Sara Giardino, Foreign pottery shapes in the Phoenician ceramic repertoire of the Central and Western Mediterranean

In this paper, I examine the presence in colonial contexts of the central-western Mediterranean area of ceramic shapes not typical of the Phoenician tradition. Observing some particularly significant case studies, in which, for example, the adaptation of Greek shapes for drinking use, as well as the use of vessels clearly of indigenous derivation occurs, a dual connection of the ceramics in use can be identified: on one hand, Phoenician ceramics are influenced by the Greek cultural sphere, on the other hand, they are receptive towards the production of indigenous community. Through the study of the evolution of the Phoenician expansion in the West, it is possible to reconstruct the meaning of the presence of these vessels. They represent the result of the (re)construction and redefinition of cultural identities within multicultural communities. By their very nature, Phoenician settlements are contexts in which identity constructions were particularly dynamic: the cultural contacts between colonial and local communities and the integration of indigenous elements in colonial milieus are of supreme importance in complex processes of identity configuration. Furthermore, in the specific context of ceramic production, hybridisation processes indicate not only the introduction of innovative functional aspects in the pro-
duction of the indigenous societies, but they may also reflect some influence of indigenous procedure on the manufacture and use of vases in the Phoenician colonies.

Panel 6.2 The Eternal Message of Marble: Prestige, symbolism and spolia in the Western Roman provinces

Organiser: Virginia García-Entero (Universidad Nacional de Educación a Distancia, Spain)
Diana Gorostidi Pi (Rovira i Virgili University, Spain)
Anna Gutiérrez Garcia-M. (IRAMAT-CRP2A, France)
Olivia Rodríguez (University of Seville, Spain)

Saturday | 26 May | 09:00-13:30 | HS XIV

Panel abstract

Marble was a noble material most used in Antiquity. Since late-Republican times, the use of all sorts of marbles (used here in the large sense of “decorative stones” or marmora) became fashionable in Rome and, in particular since the Imperial Age, it was specially sought of to be used in architecture and the plastic arts. Yet besides its technical advantages, its use also hide economical, ideological or even political associations which strongly defined their demand and use throughout the Roman era and shaped the European conception of this material for evermore. With the closure of the quarries and the reduction of more global markets due to the decline of the Roman Empire, recycling Roman artefacts became a key part of the economic processes related to material procurement for architecture as well as the artistic production. But it is also well known that spolia also carried out a powerful meaning as symbolic relics from the past. Therefore, studies on relocation and trade, retouch and imitation of stone artefacts, predominantly in precious local or exotic marmora, configure a network of multidisciplinary research, from archaeometry to fine arts and philological studies. The Iberian Peninsula's case shows that, next to the imperial marbles, marmora from the Western Provinces such as the Hispanic Almadén de la Plata (Baetica/Lusitania), Estremoz (Lusitania), Santa Tecla (Tarracconensis), or even those apparently out of the primary trade routes -Saint-Béat (Gallia), O Incio and Espejón (Tarracconensis)- played an important role on the autorepresentation of Roman provincial elites as well as the Early Medieval kingdoms. Therefore, local stone spolia, not only fine art manufactures but also architectural building components, could be understood as an icon or status-symbol, in any case as illustrative picture of public assessment. This is a very promising field of research that is currently been approached by several Spanish interdisciplinary teams, whose results will be presented by the speakers in a wider context of the Western Provinces. Thus, this panel aims to be a meeting point for a wide range of cases studies from current research projects, covering archaeological, epigraphic, art historian and historical perspectives to discuss and advance on our understanding of cultural, social and ideological implications of the use and reuse of marble artefacts.

Paper abstracts

1. Diana Gorostidi Pi (Institut Català d’Arqueologia Clàssica), Stone for an epigraphic landscape: shaping honorary iconography in Tarraco

Tarraco marmor is one of the most widespread stone used for monuments in the ancient capital of Hispania Tarracones from 1 Cent AD onwards. Its exploitation is directly linked with the huge urban development under Flavians on the upper-city related to the concilium provinciae Hispaniae Citerioris district, where the so called forum provinciae, the templum Divi Augusti and the circus are settled. A thorough and systematic epigraphic landscape was planned for these places of public magnificence, in which the founding of an honorific gallery of statues for the provincial priests was key. The pedestals
were made in the bright and beauty local limestone, always with the same measurements, in a specific shape with similar formula and palaeography. This kind of pedestal was soon identified with the production of public honorary monuments erected by the concilium Provinciae and its massive production allowed a broad dissemination by customers from other cities around the conventus Tarraconensis, but even in other quite distant towns in the neighbouring Caesaraugustanus and Carthaginensis. In this paper, we are dealing with the development of this local and specific officina lapidaria for imperial purposes and the propagation and imitation of the explicit Tarraco’s pedestal as a symbol of prestige for the honorific monuments in Flavian municipalities.

2. Hernán González Bordas (Université Bordeaux Montaigne), Cuantificar el prestigio: hacia una sistematización de las categorías de prestigio en las inscripciones latinas

En el marco del proyecto liderado por Anna Gutiérrez García-M Graver dans le marbre ROMAE, que combina el estudio epigráfico, arqueológico y arqueométrico, y cuyo objetivo principal es determinar el origen de los objetos maroméos cuyo uso y ostentación implican un cierto grado de prestigio, se ha procedido a estudiar una serie de corpora de inscripciones marmóreas de Francia y España. Con el objetivo de establecer el grado de prestigio de cada inscripción, desde una perspectiva textual y formal, por oposición a la del material lapídeo, se ha creado una ficha modelo en la que se vacían los datos de cada una de las inscripciones de estos corpora. Estas fichas contienen categorías que cubren:

1) El tamaño y el tipo de soporte
2) la calidad del acabado del monumento epigráfico así como la calidad de la incisión y la decoración de la misma.
3) el espacio de exposición de la inscripción y su función
4) la clase social (o política) de los dedicantes
5) la adscripción religiosa de los dedicantes y si hay una función votiva

El problema radica en la dificultad de cuantificar unas características que son por definición cualitativas. Gran cantidad de estos datos se presenta de forma diferente en cada inscripción ya sea en el monumento en sí como en el texto. En nuestra intervención presentaremos los casos de inscripciones u objetos que por sus características han sido más difíciles de adaptar a tal ficha y por qué razones nos hemos decantado por una u otra opción.

3. Virginia García-Entero (Universidad Nacional de Educación a Distancia), Espejón Limestone and Conglomerate. The marmor of Clunia at the service of the Hispanic-Roman elite

Espejón limestone and conglomerate is the main ornamental stone in the Iberia Peninsular inland in Roman Times. This marmor was highly valued due to its macroscopic appearance and lithological characteristics. As such, it was widely employed in Hispania from Augustan era on, in the framework of new public ornamental programs of cities immersed in marbling processes as well as to meet the needs of an Hispano-Roman elite that, from very early, emulates the ways ofself-representation of imperial power, among which the massive use of marmora for epigraphic and decorative purposes had a prominent role. The employ of Espejón's limestone and conglomerate remained in full use throughout the Late Roman period, as part of interior decoration of key rural complexes such as Carranque (Toledo) and La Olmeda (Palencia), but also in visigothic and medieval times as shown by the reuse of this marmor in Carranque or San Miguel de Escalada (León).

4. Oliva Rodríguez Gutiérrez (University of Seville), The prestige of marmor in the architecture of Roman Baetica: local stones vs. imported marbles

Specially in the last two decades a deep research about construction materials in Roman Baetica has been done. Among them marbles and other ornamental stones have been of special interest to the scholars because of their use as support of significant archaeological items in architecture, sculpture and epigraphy. They usually content chronological, functional of contextual information that allow the historians to design an always more complete panorama of the use of marble and its development in Roman provinces.

The more classical archaeological research has been completed in the last years with the fundamental
aid of the archaeometrical analysis. They offer new precious information about many different aspects as components, mechanical features or physicochemical properties and have been applied not only on the archaeological artefacts but also on samples from quarries. The exchange of this information about materials in origin and destination points has let us recognize relevant Baetic marble varieties used in Roman times, mixed in cities and buildings with the most valuable Mediterranean stones. A reflexion about the selective use of both groups –local and imported- and even this terminology and consideration of the different varieties documented in Roman Baetica is now convinience.

5. Vilma Ruppiene (Julius-Maximilians Universität Würzburg), Marmora in the late antique imperial palace in roman Treveres: Import from the mediterranean provinces and supplement from the regional sources

Numerous relicts of wall and floor incrustations were discovered in the area of the so called Constantini-Basilica – the prestigious reception hall of the late antique imperial palace in Trier. They bear witness to the splendid decoration of the hall with sophisticated geometric and figurative patterns performed in stone.

The aim of this study was to gain knowledge about the former luxurious interior design of the hall. Further, to pinpoint the provenance of marmora discovered in the Constantini-Basilica in order to illustrate the whole spectrum of stones used for decorative purposes. The precise knowledge of stone types was firstly to reveal how far the trade with Mediterranean marmora was developed in Roman Treveres of the 4th century AD. Secondly, to demonstrate the diversity of regional stones used for decorative purposes and to verify their importance and the extent of use.

To pinpoint the provenance of the stones petrographic and geochemical analyses were applied. The investigation revealed that both Mediterranean and regional marmora were used in the imperial hall in large extent, though, regional rock types being more abundant. Around 20 types were imported from various sources in Greece and Greek islands, from Turkey, Egypt, Tunisia, Italy and France. The higher proportion (ca. 2/3) of the used stones originates from various regional sources: black, grey and red limestones from Belgium, marble and diorite from Odenwald and diabase from Trier.

6. Mariella Cipriani (University of Rome 'Tor Vergata”), "Mythologische Prachtreliefs”: decorative elements in luxury Roman housing

The production of “Mythologische Prachtreliefs”, large mythological marble reliefs, starts in the early Empire. This is a class of valuable and collectible materials, intended to decorate the walls of important state rooms, like the oeci, in luxurious suburban villae of the Roman aristocracy. The marble reliefs were placed in the middle zone of the wall, in a way that allowed the viewer to enjoy mythological narratives and attested the status-symbol of the owner. The preciousness of marble, as a raw material, is undoubtedly an expression of wealth and social status. However, it may not have been the only reason to justify the choice of material. Indeed in antiquity the preference of precious materials, such as marble, in reliefs of mythological content, could have been more due to their durable nature, in order to immortalize the message of the subjects represented and to emphasize their importance. It could be assumed that the use of marble would have contributed to the actualization of the Greek myths semantic, stressing the symbolic significance of characters, scenes and allusions to the contemporaneity, making the content message perpetually valid. An example of this is the well-known relief with the Sleeping Endymion of the Capitoline Museum in Rome, found on the Aventine, where it was reused as a decorative element in the Traian Decius Baths.

7. Simon Barker (Norwegian Institute in Rome), Roman sculptural recycling in the Western Provinces

Throughout the course of late antiquity, particularly from the 3rd century AD onwards, cities and local communities all over the Mediterranean increasingly turned to material produced in earlier times for new buildings and sculptural monuments. The re-use of materials was not something new; however, recycling became a defining feature of late antiquity, so different in scale and intensity that it had become something specific to the period. Charting the rise and evolution of re-use provides an invaluable
insight into the broader transformations that helped to define late antique cityscapes. To-date, however, analysis of recycling as a Late Antique phenomenon has been uneven and important questions about regional differences and empire-wide trends remain: do patterns of recycling in the Western Provinces match those elsewhere in the empire? Were objects put to consistent re-use across time and/or region? These questions can only be answered by considering the practice of recycling in different regions of the empire, marking out wider trends and motives, so that we can understand how recycling developed in different parts of the Empire and over time. This paper will examine various types of sculptural re-use (sarcophagi, statues, portraits) during late antiquity, in order to begin to provide an understanding of recycling practices in the Western Empire during this period.

8. Anna Gutiérrez Garcia-M. (IRAMAT-CRP2A, Université Bordeaux Montaigne) - Silvia González Soutelo (University of Vigo), Producing, recycling and reusing Roman marble objects in Gallaecia (NW of Spain)

Within the framework of a multidisciplinary study aiming to understand the use of marble in the northwest of Roman Spain, a relatively large number of marble objects (sculpture, architectural elements and revetments) have been located in the current territory of Galicia. Most of them are currently in several museums, other institutions or reemployed in later buildings (especially churches), thus making it difficult to grasp their original context of use. Moreover, the stylistic study of these objects is at times controversial as retouches or re-carvings (often linked with its use in Early Christian contexts) of Roman and late-Roman elements seem to have been in order during the centuries following the fall of the Western Roman Empire. Nevertheless, their presence is noteworthy since Galicia is a mostly granitic territory and, therefore, the vast majority of stone objects and architectural elements were made from granite.

In this paper, we aim to address the reasons behind the choice of marble as raw material both for the production or the import of certain Roman and late-Roman productions, since recent archaeometrical analysis showed that both local and exotic marbles flowed into Roman Galicia, as well as of the subsequent reuse of these materials in the early medieval period. We will, therefore, explore the economic, logistic and symbolic aspects of their use while taking also into account, in the case of the spolia, the context in which they were salvaged and recycled.

9. Antonio Peña Jurado (Universitat Autònoma de Barcelona), The use of spolia in the islamic architecture of Córdoba: the testimony of the Great Mosque

After the conquest of the city in 711, the Muslims reused pre-existing buildings of the late Antiquity: the visigothic governor’s palace became the center of power and the bishop’s complex was transformed into a mosque. The coming to power of Abd al-Rahman I in the middle of the 8th century generated a great change in architecture. New buildings reused architectural elements from the pre-Islamic era and, among them the Great Mosque stands out. The oratory was built at the end of the 8th Cent. and in its enlargement at the mid-9th. Its columns and the impost blocks practically all were taken from constructions of roman and late antique times. The monumentality achieved by the city in both periods and the fast construction of the oratory suggest that the bulk of the reused material came from the own Córdoba. However, at least a number of pieces integrated into the 9th century enlargement were brought from Merida. In spite of the apparent “disorder”, a detailed analysis suggests that spolia were distributed according to parity and symmetry criteria, typical of the late antique architecture. The most important elements were the shafts, distributed according to their color. With the Caliphate at the beginning of the 10th Cent, in the new enlargements of the Mosque spolia didn’t were used anymore, but a new architectural language based on architectonic elements carved out ex profeso. The state demanded new forms of expression, turned into elements of political legitimation.
Panel 6.3 Textiles and Fashion in Antiquity

Organiser: Mary Harlow (University of Leicester)
Thursday | 24 May | 09:00-16:30 | HS V

Panel abstract
This panel will bring together a range of scholars and material which stress the points that in the ancient world, textiles and dress form key factors of cultural identity, and that textile production was one of the major consumers of raw materials and labour time. The various papers discuss the functionality of textiles whether as dress or soft furnishings or highly utilitarian items such as sails, and the various messages embedded in or projected by them.

Textile and dress studies engage with a wide range of primary material and a broad scope of methodologies. They tend to be about much more than the immediate subject, dealing with aspects of identity, of economics, of cultural interactions and indeed, of understanding of the cosmos. The papers offered here elucidate ways in which the study of textiles and dress can enhance both our understanding and engagement with the ancient world.

Paper abstracts

1. Mary Harlow (University of Leicester), Spinning: the invisible profession
The Roman wardrobe required miles and miles and miles of spun thread (perhaps up to 40 kilometres to make an imperial toga) but spinning is a craft that is rarely commemorated in Roman inscriptions or literature. When spinners are commemorated they are almost invariably lower class/slave women, a factor which only adds to its invisibility in terms of profession. This paper will argue that studies of archaeological textiles suggest that the production of miles of standardised thread in a particular diameter suggest highly skilled craftswomen who, if not defined as a profession, were required to work in a professional manner in terms of rates of production and quality control.

2. Francesco Meo (University of Salento), Textile production in Lucania in the Hellenistic Period. Some Case Studies

The research conducted during the last years on textiles and textile production in Southern Italy is giving meaningful results regarding the knowledge of ancient cloths and their production system. This paper will focus on textile production in a specific area of the South of Italy, Lucania, through the study of some contexts.

The first of them is the so-called ‘Casa dei Pithoi’ of Serra di Vaglio, a 4th century BC aristocratic house. About 100 loom weights have been discovered in a row along a wall of this dwelling together with traces of the burnt loom. The loom weights have been investigated with the methods of investigation developed by the Centre for Textile Research of the University of Copenhagen which allow us to recognise the quality of the warp by analysing the relationship between the weight and thickness of the possible set of weights.

The results will be compared with those of the Square Building of the Heraion near the mouth of the Sele river where about 300 loom weights have been discovered and studied applying the same methods and where the presence of some looms for the production on several qualities of cloth has been hypothesized.

A second step will be the comparison of the previous results with a piece of cloth found mineralised in a 4th century BC Lucanian burial of Paestum and recently published. The combination of the results from these contexts will give us a first picture of textile production in Lucania during the Hellenistic period.
3. Judit Pásztókai-Szeőke - Ivan Radman-Livaja (Archaeological Museum of Zagreb) - Ottó Sosztarits and Andrea Csappáros (Iseum Savariense), Refurbishing Pannonian identities. Interpreting the archaeological evidence of a Roman workshop

As human skin covering the body from outside is seen as the physical boundary of the individual as a biological and psychological entity, gestures, formation-modification of the corporeal body and clothing together can be interpreted as its social skin. This constitutes a malleable surface, which is not only shaped by personal preferences, social consent and expectations, but communicates personal and social identities as well. Both the type of dress and how it is treated are important parts of such a cultural medium.

The archaeological excavations of a workshop in the southern suburb of ancient Savaria yielded an abundant corpus of textile tools and inscribed commercial lead tags. Tools, most of which have no local indigenous predecessors, but their parallels origin back to Italy, are a very useful source for the textile technologies applied locally by the workers. The tags were used as labels for valuable garments entrusted by clients to the care of this workshop for refurbishing them.

The archaeological finds from this workshop and similar inscribed lead tags (more than 1200 has been known by now) from other sites of Pannonia not just allow us to study the local wardrobes (which seem to be different from the iconographically attested picture), and help to trace the cultural biography of different garments in this region (e.g. the Roman dress icon, the toga), but also the local practice for treating clothes in the local Pannonian culture.

4. Marie-Louise Nosch (University of Copenhagen) - Stella Spantidaki (Université Paris-Sorbonne) - Peder Flemestad (Lund University), Where are the sails? An interdisciplinary search for the textiles of the Athenian fleet

The Athenian fleet is one of the most iconic endeavors of the Greek city state, a symbol of democracy, naval supremacy, organizational skills and technological skill. Thanks to the Athenian navy, Athens gained power over the seas and on this ground, founded an empire. The Athenian fleet's glory is primarily known for the period from 480 to 322 BCE.

But where are the sails? This question is addressed to both the ancient Greek sources and to modern scholarship on the Athenian fleet. Many studies focus of construction technology and function of the wooden parts of a trireme. Although the sails were not the main source of energy for the propulsion of a war ship, they remain a vital part of the equipment. They are recorded in detail in the naval inscriptions. They start around 400 BCE and give an overview of transactions, agents and equipment. Following a decree in the year of 358 BCE, these inventories and annual accounts become very precise, detailed and extensive. Archaeology of the harbor installations in these years is expanding, especially thanks to the ZEA Harbour project, and data from experimental archaeology and ship reconstructions provides new information, which will allow us to quantify resources and the use of sail cloth.

Ship archaeologists have mainly explored the hulls, masts and oars, and textile archaeologists focus on textiles for clothing and domestic use. This presentation will thus bridge a gap in scholarship on the textiles of war ships. In order to understand the extent of sail production and use, we will include results from experimental sailing and experimental weaving. We will explore sail technology, the organization of sail making and maintenance of sails, as well as the administration and storage facilities that were put in place for the war ships' sails and rigging. Here, we will focus entirely on ships in the Athenian fleet.

5. Ali Drine (INP Tunisie), Témoignages archéologiques et historiques sur les teintureries et les couleurs antiques dans la Petite Syrte

Témoignages archéologiques et historiques sur les teintureries et les couleurs antiques dans la Petite Syrte

Les recherches que nous effectuons dans la Petite Syrte ont permis la découverte des témoignages archéologiques sur les teintureries antiques. Ceux-ci proviennent des sites de Meninx dans l'île de Jerba et d'El Mdeina l'antique Zouchis au sud du Lac El Biben. Parmi ces témoignages citons des cuves util-
isées dans les préparations de la teinturerie, des amoncellements des murex pilés dont les glandes ser-
vaient à l'obtention de la pourpre... La teinturerie à base de pourpre en Tripolitaine est confirmée par
PLINE l’ANCIEN, la NOTITIA DIGNITATUM, le géographe STRABON...Les teintureries antiques étaient aus-
si d'origine végétale. Un document découvert à Meninx confirme l'utilisation de la garance pour obtenir
une belle teinture de couleur rouge rosée.

Nous signalons aussi la présence d'autres couleurs : l'ocre rouge, le vert, le jaune et le vert. De boules
bleues découvertes dans les horrea de Meninx seraient identifiées au fameux lomentum ou au
cæruleum vestorianum qui se rapporte au bleu égyptien. Confectionné à partir de matières premières
peu coûteuses, ce bleu nécessite un savoir-faire certain, ce qui explique d'ailleurs sa cherté : Une livre
de vestorianum se vend en moyenne 11 deniers soit 45 fois le prix d'une livre d'huile, 175 fois le prix
d'une poterie simple... (J.-P. Morel, 1984, p.99).

6. Lena Larsson Lovén (University of Gothenburg), Textiles in Roman daily life

Textiles were multifunctional in Roman society and various types of textiles were used by everyone on a
daily basis. In Roman culture, the clothed body was the social norm and clothes were used in everyday
life by people of all ages: men, women and children. Clothes played an important role as identity mark-
ers of an individual that would visually communicate aspects of the age, gender and social status of the
weaver. In addition to clothes, a variety of other textiles were used in daily life. Items such as bedcovers,
blankets, cushions, and curtains were common in Roman private houses where they were used for
both practical and decorative purposes. Like clothes, textiles in interior decoration could work as mark-
ers of status but up to date and in spite of the attention on historical textiles we have witnessed during
the last almost twenty years, textiles in Roman interior decoration have drawn only scant scholarly at-
tention. This contribution will focus on the use of clothes and other textiles and how they were used in
daily life and how they could function as markers of status.

7. Rocio Manuela Cuadra Rubio and Jordi Pérez González (Universitat de Barcelona), Mobiliario
textil en la casa romana. La comodidad perdida

El presente estudio representa la síntesis de una reflexion a cerca de la casa romana. La casa romana
es entendida como un contenedor de la que se estudia su arquitectura, su decoración, su evolución y
en algunas ocasiones también su contenido. Las investigaciones sobre la casa romana han sido siem-
pre enfocadas en función a los hallazgos que nos hablan de la vida cotidiana de una sociedad. Sin em-
bargo, existe una serie de objetos que hoy no encontramos pero que existían en el día a día de la vida
de un ciudadano romano y de los que se han realizado hasta el momento pocos estudios. Hablamos
del mobiliario téxtil, es decir, aquel grupo de objetos como cojines, cortinas, manteles, etc. que creaban
el confort en la casa y contribuían, como hoy, al descanso o a las tareas del hogar de una familia. El
estudio del mobiliario téxtil se basara en gran parte en la iconografía y a partir de ésta, lograr entender
cómo era y cuál era su presencia en la casa romana. Una vez realizada una primera aproximación al
mundo de las telas como parte indispensable del mundo privado de las casas romanas, estudiaremos
cuales fueron los diversos tipos y cualidades de las telas utilizadas en el mobiliario romano, de donde
procedieron y cuales fueron las rutas de acceso utilizadas por los comerciantes textiles. Para ello será
indispensable conocer quienes estuvieron detrás del comercio de las mejores lanas, linos, sedas y púr-
puras representados en las figuras de los lanarii, sericarii o purpurarii.

8. Anna den Hollander (University College Roosevelt/Utrecht University), Gendered Economics
and Dedications: an Analysis of the Brauron Clothing Catalogues

This study aims to investigate women’s economic contributions to the oikos through the garments that
they produced, as reflected in their dedications from Brauron. The Brauron clothing catalogues provide
the names of the dedicants and the nature of the garments, indicating that the textiles were donated
and possibly made by women. Arguably, the economic value of the garments lies in the time and labour
spent producing them, as well as in purchased resources like raw materials. The material requirements
for the production of the garments will be compared with the list of ancient professions and their
wages in Loomis (1998). This will be complemented with a grounded analysis of various literary
sources, including Aristophanean comedy, focusing on the presented definition of female economic activity in general and women's textile production in particular. By deriving the grounded categories to define these aspects from the sources themselves, grounded theory contributes to less a biased, more reflexive hypothesis regarding women's craft activity in ancient Athens. Existing gaps in the record of the clothing catalogues are tentatively filled through a semantic analysis like the one applied by Cleland (2005). The paper will argue that the wealth embedded in the garments exceeds the value one would expect based on literary sources, which describe a very limited female economic contribution to the oikos.

9. Audrey Gouy (Université de Pau et des Pays de l’Adour), The Performative Clothing in Pre-roman Italy. Ritual Function of Etruscan Dress among Mediterranean Interactions and Cultural Identity (6th-5th cent. B. C.)

The representations of ritual performances found in Tyrrhenian Etruria and dated from the 6th and 5th centuries B.C. permit to define a complete repertoire of Etruscan clothes for this period. The studies of Larissa Bonfante distinguished the clothes inspired from the Mediterranean area and those properly Etruscan. I will propose an innovative functional and anthropological study in order to stress a cultural definition of Etruscan dress and to focus on its importance as a ritual device. (1) How can we determine the clothes had a ritual function? And what was it? My PhD thesis on Etruscan dance has highlighted that specific clothes were employed for rituals, and that they were used according to the moments and the functions of the rituals. This brings me to consider them as performative tools. I will study in particular the reliefs from Chiusi and the tomb paintings from Tarquinia. (2) Consequently, it questions the actors’ status in rituals. It is possible to draw differences of clothing between performers and thus their different functions during rituals. The clothes will be understood as propitiatory ritual devices. (3) Finally, I will study the differences of use and clothing between imported textiles from the Mediterranean area and those Etruscan. It seems the ritual function of clothes is defined by their geographical origin, their colours and motives. It possibly created a ritual trade. This point will deal with aspects of identity and cultural interactions.

10. Torill Christine Lindstrøm (University of Bergen), Fashion or Function? Costume and Colour in the Great Fresco in Villa of the Mysteries, Pompeii

The Great Fresco of the Villa of the Mysteries (Villa dei Mistéri) in Pompeii has been given numerous interpretations. The interpretations have been mainly connected to data from the behaviour of the persons in the Fresco, the fresco’s total composition, and the Fresco’s visual references to Dionysiac mythology and rites, including divinations and initiations. However, the Fresco seems to contain data that are still poorly explored. This paper focus on possible semiotic elements in connection to textiles and clothes in the Fresco. I will demonstrate that certain colours and colour-combinations can be found in the persons’ costumes and other textiles. A statistical chi-square analysis revealed that the colour combinations are not arbitrary, but carefully chosen. I suggest that it is possible that particular symbolic colours and dress-codes may be hinted at, or even spelled out in the Fresco. As fixed dress-codes and colour-symbolism often have characteristic functions in religious societies and rites, these findings may have relevance for the interpretation of the Fresco. In this paper I relate the dress-codes in the Fresco to other information about Dionysiac congregations (thiasoi).

11. Monika Muszyńska (University of Warsaw), How deep is your love, Hadrian?

Two famous portrait busts of Hadrian – the Ny Carlsberg Glyptotek piece and the one form Museo Archeologico Nazionale in Naples – show the emperor dressed in a cloak draped over his naked body. The question as to what the emperor was actually wearing: Roman paludamentum or Greek chlamys has been asked repeatedly, but no conclusive answer was offered. Both types of garments can be similarly draped, both are held in place by a brooch. Comparative material is scarce, although this type of costume seems to have been used more frequently for depictions of young boys and youths. If one takes into consideration evidence offered by ancient writers concerning appearances in the
chlamys, such a choice of costume for public display should be considered an act of bravery, a sign of deep philhellenism, even true love. But was this really the case? Was Hadrian audacious and innovative in his choice of costumes? The problem will be investigated basing on an extensive analysis of the typology of portrait busts – the result of several years of research on this fascinating subject.

12. Marta Zuchowska (University of Warsaw) - Robert Zukowski (Polish Academy of Sciences), Exotic fabrics in Palmyrene clothing

Among fabrics found in Palmyra, pieces of over 500 diverse textiles were documented, including local but also imported products, such as Indian wild silk and Chinese mulberry silk. In the same time, archaeological research brought to light numerous iconographic representations, mostly funerary sculpture but also some wall paintings. The abundance of both – iconographic and archaeological material give us a unique opportunity, allowing for a multi-aspect analysis of clothing and fabrics worn by Palmyreans. One of the most intriguing issues, concerning Palmyrene dress is the use of imported material – yarn and fabrics produced in India and China. Were they used and worn in Palmyra, or constituted only valuable trading goods? Were they popular decoration of local dress, or valuable enough to be worn only by the richest? Were their style and ornaments attractive enough to influence the local production, or they were considered bizarre and thus never imitated? Basing on analysis of fabrics found in Palmyra and their iconographic representations we will survey this topic and try to answer the main questions concerning the use of exotic fabrics in Palmyra.

13. Amy Wale (University of Leicester), Sartorial Expressions: North African Mosaics

As a combination of art and architectural decoration, the rich corpus of North African mosaics provide colourful and striking representations of the Late Antique world through various artistic, iconographic and figurative repertoire. These mosaics, however, have not yet been comprehensively investigated for their sartorial value. Artistic renderings of dress offer nuanced insight into Roman dress systems and attitudes to dress. Clothing was an important form of identity communication through processes of identity construction, negotiation, and expression. While this was manifested in the practice of dressing, visual depictions of clothing also evidence aspects of dress rhetoric: acceptable forms of attire for particular contexts, changing attitudes towards certain items of apparel, or purposeful representations of sartorial deviation. Mosaicists were bounded by the conventions of their medium and the conventions of ‘visual’ clothing. Both dictated how clothing and dress systems were represented. Mosaics were an important arena for sartorial expression. Understanding and interrogating mosaics as such can provide significant insights into the daily practice of dressing and ways in which clothing, and the clothed body, could be imagined and portrayed.

Panel 6.4 Making Value and the Value of Making: Theory and practice in craft production

Organiser: Helle Hochscheid (University College Roosevelt/Utrecht University)
Ben Russell (Edinburgh University)
Thursday | 24 May | 09:00-13:30 | HS IX

Panel abstract

This panel investigates the relation between production processes and value attribution in ancient crafts. In the process of making things, it is the craftsperson who shapes functionality and value of artefacts. She/he is, however, never a lone force but depends on networks of suppliers, fellow craftspeople, consumers, wider audiences, the material conditions for the application of craft, and more ephemeral considerations like aesthetics or religious value. Ancient economic history, especially from an archaeological perspective, tends to focus, with good reason, on the objects produced by craftspeople, on form and style, and on distribution. Typological approaches, necessary for sorting and analyzing large bodies...
of material evidence, have also prioritized the form of finished artefacts and, when they have been applied to part-worked objects, have tended to concentrate on identifying discrete stages in production processes. The maker, as an individual, responding to their own needs as well as those of their customers, is often absent from this picture. In recent sociological and anthropological studies, the role of makers as individuals trained in a particular way, responding to their materials, and operating in a wider network of production, has been more obviously stressed. Key recent works include Tim Ingold’s Making: Anthropology, Archaeology, Art and Architecture (2013), Richard Sennett’s The Craftsman (2008), David Miller’s edited volume Materiality (2005) and even more specialized studies written by practicing craftspeople, like Peter Korn’s Why We Make Things & Why It Matters (2013). This panel will bring together scholars interested in making and the role of the maker to discuss what new anthropological and sociological approaches might add to our understanding of ancient craft production and valuation. Among the topics explored in the panel are: - Interaction between craftspeople and the users of their products - Economic value in relation to other types of value attribution - The role of different participants in the chaine opératoire, and indeed the validity of this term - Training of craftspeople and its impact on production - The concept of materiality and its meaning to how craft products are used and valued The aim is to cover multiple periods and media, with papers on Aegean, Greek and Roman material, sculpture, mosaics and other forms of craft production.

**Paper abstracts**

1. Tatiana Ivleva (Newcastle University), Making Romano-British glass bangles: Inside the craftsperson mind

The appearance of glass bangles in Britain is dated to the mid-first century AD, starting with the Roman conquest of the Isles. Prior to the Roman invasion, Britain had no history of glass bracelets production, albeit on the Continent the glass bangles were in circulation already for two and half centuries. The close inspection of ca 400 fragments from Roman Britain has shown that these bangles had been produced in the similar manner as the La Tène D1 Continental types. What guided the glass workers in Roman Britain to start making the glass bangles according to the century-old technique: process of self-discovery, consumer pressure, knowledge transfer, learning by doing after watching? There is evidence to suggest that craftspeople made bangles through the process of self-discovery influenced by the local consumer pressure, while others profited from the direct knowledge transfer and apprenticeship. The experimental work in making the replicas of the Romano-British glass bangles done by the experienced, highly creative glass artisan supervised by the author gave possibility to glimpse into the craftsperson mind. The artisan made numerous attempts as to the reproduction; yet, the seemingly easy technique in theory was difficult to replicate in practice. The failure to replicate, however, has provided compelling insights into the process of making a glass artefact.

2. Maria Coto-Sarmiento and Simon Carrignon (BSC-Barcelona Supercomputing Center) - Xavier Rubio-Campillo (University of Edinburgh) - José Remesal Rodríguez (Universitat de Barcelona), An Agent Based Model to detect variations in the transmission of potters from Baetica province

The goal of this study is to analyse the transmission of technical skills among potters within Roman Empire. Specifically, our case of study has been focused on the production processes based on Baetica province (currently Andalusia) from 1st to 3rd century AD. Variability of material culture allows to observe different production patterns that can explain how social learning evolves. Unfortunately, it is extremely difficult to identify some evidence of social learning strategies in the archaeological record. In Archaeology, this process has been analysed by the study of the production of handmade pottery. In our case, we want to know if the modes of transmission could be similar with a more standardized production as Roman Age.

In particular, we analyse a set of measures among different amphorae shapes from different workshops to quantify the differences on the production pattern. Specifically we want to identify if there are differences in the transmission of learning processes depending on the spatial distance. For this rea-
son, we propose here an Agent Based Model that allows to compare different processes of transmission (vertical vs horizontal). In this model, we implement a mechanism of pottery production with different social learning processes under different evolutionary scenarios. In particular, the aim of this study is quantifying which one of these transmission mechanism might explain the results obtained in our dataset.

3. Ben Russell (University of Edinburgh), Stone Carvers and their Working Processes: Problematizing the Chaîne Opératoire

The chaîne opératoire emphasizes dynamic process, focusing on the stages of working and their sequence in the creation of an object. Where conventional studies of artefacts tend to view them as finished products, studies of the chaîne opératoire consider issues such as raw material sourcing, production, transport, use, even re-use and discard. While the chaîne opératoire approach has demonstrated the utility of exploring craft production as part of this broader context of activities, critics of the methodology underpinning this approach argue that production is rarely as simple as the chaîne opératoire implies. Variability, circularity, and trial and error are realities of making; the idea of sequence is not necessarily problematic but the fixity and linearity of this sequence are. The maker rarely exists in isolation and the changing demands of the customer or client will also impact on the planning of the production process. The aim of this paper is to consider the applicability of the chaîne opératoire to the specific field of Roman sculptural studies. It will be argued that while particular sequences of actions can be seen in certain instances it would be wrong to reconstruct a standard approach to sculptural production based on single examples; each project was unique and, while broad trends can be noted, so can a wide variety of individual approaches to this craft.

4. Natacha Massar (Royal Museums of Art and History), How many craftsmen to prepare an army?

Although many people have written about the economic aspects of Greek warfare in Antiquity, few have commented on the crafts and craftsmen involved. An exceptional source gives us some insight into this aspect of war preparation. From 399 to 397 BCE, Dionysius I of Syracuse built up a navy and a land army in order to fight the Carthaginians. In Book XIV 41-43, Diodorus Siculus gives an extensive account of these preparations. This description will be my starting point to examine the materials, activities and, especially, skills necessary to achieve the tyrant’s goal. These range from finding a source of wood to provide raw material for the carpenters to the building of ship sheds to protect the vessels when not at sea. But Diodorus also mentions how so many craftsmen were lured to Syracuse, what some of Dionysius’ requirements were and how, as their patron, he encouraged and motivated the people working for him. Other sources can help fill in the picture, especially concerning the navy as well as developments in the Hellenistic period. Taken together, they provide an unexpected image of the chains of production, the variety of skills, and the great numbers of craftsmen involved, as well as the competition between states and individuals to hire the most skilled. Among the questions addressed will be the requirements of the patrons, the status of the workmen, their mobility, possible teamwork as well as rivalries.

5. Ann Brysbaert (Leiden University), Crafting as making, thinking and being (together)

In the prehistoric east Mediterranean, hierarchical societies developed technological systems and production processes for both quotidian and prestige and luxury items. This paper addresses questions about how artisans reacted to and interacted with specific production demands linked to elites’ identity formation and reconfirmation practices, while they were perhaps also forming their own identities through crafting. Crafting or making is connecting and performing: materials to each other, people to each other, people to materials, materials to people. Crafting is both technical and social and creates distinction. Someone who is very skilled through life-long practicing develops differently than someone who does not. Socio-technical distinctions are thus logical consequences of making and are linked to value attributions at
various levels. Value ascription may differ according to social groups and may be both inclusive and exclusive. How can we identify such socio-technical processes and practices, and their consequences, how can we define the role(s) that craftspeople played in the socio-political and economic contexts of elite-based societies, and are these always as clear-cut as usually portrayed? Processes of value ascription to crafting in Aegean BA contexts are compared to contemporary craft contexts in order to understand whether such values and value ascriptions are universal or context-specific.

6. Helle Hochscheid (University College Roosevelt/Utrecht University), Owning the stones: materiality, ownership and classical Greek sculpture

This paper looks at the value of classical Greek sculpture through the lens of the anthropological concepts of ownership and materiality. Claims to ownership come about in different ways through people's relations to objects, for instance, through sale, gift-giving or inheritance. Labour is seen as a key cause of ownership: 'work transforms material things into property' (Hodder 2012, 24).

But the relation between making and owning is not straightforward. For instance, the value of raw marble in ancient Greece is obscure. Sculptors sold the value of the labour that they added to the stone; but during carving, did they own the object? After sale, the relation between sculptors and their works was not severed. Completed works were invaluable as points of reference for ancient craftsmen's careers. Similarly, dedicators of votive sculpture ceded possession to sanctuaries, but their continuous self-proclamation through image and text is the locus of the monuments' value, extending far beyond their formal ownership. In gravestones, ownership and identity are even more entangled: stelai could claim ancestral burial plots and familial property.

This paper explores the shifts in value of classical Greek sculpted monuments at different stages of their creation and existence. It examines the ways in which participants in this process could be formed by the monuments they owned, and argues that the value of sculpture lay with this shaping of identity rather than with economic worth.

7. Heide Frielinghaus (JGU Mainz), Assessment of Value Attribution. The evidence of votive offerings

While some kinds of value attribution were connected with post-production aspects, others touch on post-production as well as on production aspects, and some – like those concerning material, ornamentation or craftsmanship – were definitely related to production processes. The last-named relationship held true, too, when the/a value attribution in question happened not until after the actual production – and, therefore, without the attributing person's/persons' involvement in the actual production process – or when the value(s) attributed to a certain object changed in the course of time or usage. Based on the assumption that votive offerings were given to the gods because they were thought to be of (some kind of) value, it will be asked in how far production-related values may have played a part in choosing them. Drawing on concepts like that of ‘object biographies’ a selected part of the material evidence in the sanctuary of Olympia will be evaluated with regard to the question, if some of the aspects named hereafter were of particular/no importance in the objects' selection: material (focus on unfinished metal objects, objects of simplified form, use of/feigned precious metal), ornamentation (focus on occurrence/extent/quality in contrast to similar objects in different contexts), flawlessness (focus on objects with barely visible/obvious/crude repairs) and craftsmanship.

8. Gert van Wijngaarden (University of Amsterdam), Time and Place in Distance Value. The case of cylinder seals in Bronze Age Greece

Exotic items circulate widely in many non- or proto-monetary economies. Objects imported from far-away and artefacts made locally or nearby, but imitating foreign styles and techniques, are exchanged as commodities or in the form of gifts. Exotic objects often acquire value because they convey notions of a luxury lifestyle and they refer to a wider world of connections beyond the realm of daily life. The ways in which exotic items are used may vary according to the cultural context in which they circulate and, in many cases, are different from the functionality intended by craftspeople who made such objects in the area of origin. This raises the question regarding the materiality of exotic items: what role
did the materials, techniques, artistic style and quality play in the way these objects acquire value in a new context.

This question will be explored by addressing the Near-Eastern or Near eastern-style cylinder seals that have been found in the Bronze Age Aegean. The Levant and Mesopotamia had a long tradition of sealing with cylinders and there are many seals in the region – and in many museums all over the world. Cylinder seals can be made from different materials and many contain a highly specific iconography. The Aegean did not have a similar tradition of sealing by cylinder. Instead stamp seals were used. Nevertheless, a small number of cylinder seals have been found in Minoan and Mycenaean contexts. Most appear to have been imported from Cyprus or the Near East, but some may have been regionally made. By investigating the contexts in which these Aegean cylinders have been found, I will explore the way they acquired their exotic value.

9. Caroline Cheung (University of California, Berkeley), Precious Pots: Making and Repairing Dolia

Dolia defy generalizations about pottery. Considered a class of pottery yet often manufactured alongside bricks and tiles in workshops that supplied building industries, dolia were large storage containers for agricultural commodities that were also considered architectural features. Despite their widespread use in the Mediterranean, little work has been done on their production. This paper discusses findings based on over 400 dolia and dolium fragments from three sites in west-central Italy: Cosa, Pompeii, and Ostia. As craftspersons gained a deeper understanding of material properties for producing dolia, they developed more sophisticated techniques and materials for production-phase repairs; dolium repairs shifted from traditional pottery mending techniques added during the vessel's use-life to architectural joinery techniques applied during the production-phase. Dolium mending techniques were not static or fixed; instead, they reveal developments in skills, knowledge transfer, and industries, as well as different workforces. The life histories of dolia, including their production, (re)use, repairs (both during the production-phase and use-life), and discard, illuminate the value of these containers; the relationship between making and repairing; the different craftspersons and their knowledge in forming and/or mending these vessels; possible interactions between dolium makers, users, and repairers; and how knowledge developed in order to manufacture these costly vessels.

10. William Wootton (King's College London), The value of surfaces: the experience of making and the making of experience

This paper examines the value invested in surfaces. It brings together research on the economics of production with recent work on the dynamics of experience to consider the interplay between the expectations and intentions of the consumer and the expertise and insights of the maker. Case studies from the Roman world, focused on interior decoration such as mosaics, will present some of the variability in terms of their materiality and character while also making the case for the experiential quality of the investment.

Panel 6.5 Material Records, Consumption and Local Habits in a Proto-global Antiquity

Organiser: Erich Kistler (Universität Innsbruck)
Friday | 25 May | 17:00-19:00 | HS VIII

Panel abstract

Material culture shapes the lives of people, mediates between them and their environment, habitualises behavioural and perceptual patterns – it thus gives substance to cognitive processes. It follows that objects are not passive, timeless containers of specific cultures or of times gone by, but alongside their everyday practical functions things are also conveyors of values and identity whose significances gen-
erally also change when the user’s environment is altered. Consumption behaviour in relation to such objects, in ordinary as well as extra-ordinary events, therefore points to significant forms of materialisation in the cultural horizons of human coexistence. It is precisely this that should be revealed in the Antiquity strata of the Mediterranean area, for the latter to make it possible to draw conclusions about the regimes of behaviour applying at a given time and place that prefigure consumption habits; in this way they afford insights into the situational discourses of values and power in the antique Mediterranean as a proto-global entangled world. Thus, assemblages of archaeological findings can be analysed as materialised interfaces of consumption behaviour at which the local circumstances of coexistence intersect with ‘global’ influences.

**Paper abstracts**

1. **Erich Kistler (Institute for Archaeologies), Consumption habits and and ceramic fingerprints on the Archaic Monte Iato (6th/5th cent. B.C.)**

Michael B. Schiffer developed the premise that ritually deposited find ensembles in particular are always structured according to specific "underlying rules or grammars of cultural order". William Walker was finally able to demonstrate that otherwise closed contexts of finds, even if they could not at first sight be identified as ritual deposits, might nonetheless also be material evidence of patterns of historical behaviour. From such a point of view, all deposits became "evidence of sequences of events through which human actors positioned materials in relation to each other". Based on these perceptions of the processes of formation and transformation of archaeological findings as effects of specific human behaviour, all those sherds that are of little to no importance concerning typological or form aesthetical reasons, obtain scientific significance. By analysing the way these sherds are fragmented, chosen and brought together within one assemblage in one stratum, habitual patterns can be revealed. To filter out those patterns we developed on Monte Iato (Western Sicily) the concept of the ceramic fingerprint.

2. **Matthias Hoernes (Universität Innsbruck), No Need to Tighten the Belt: ‘Valuing’ Metal Objects in Reused Tombs in Pre-Roman Apulia**

Metalwork, weapons and adornments are often regarded as reflecting status and prestige and serve as a toehold for measuring value and funerary wealth. Until recently ‘value’ in burial archaeology has been gauged predominantly in terms of material and materiality, the distant provenience of an artefact or the raw material, its scarcity in other assemblages, or the sheer abundance of objects deposited in one grave. Complementing these analyses, that conceptualize value mainly through an economic perspective, recent approaches have addressed the ‘biography’, ‘use-life’ or ‘itinerary’ of objects, shifting the focus onto how objects are valued, devalued or revalued in social practices they are embedded in. In my paper I attempt to apply these concepts to reused graves in fifth- and fourth-century Apulia to discuss how metal objects – vessels, fibulae, belts, knives, and weapons – were acted on and engaged with in the course of time. Some objects hint at a prolonged itinerary prior to being deposited in the tomb, but most essentially they underwent several post-depositional stages and practices in which they were manipulated, re-arranged, re-associated with the ‘old’ dead, reused for a newly deceased, or retrieved. Though the diversity of local practices undermines generalizations, the trajectories of metal objects in tombs that are far from being static, closed contexts but multi-stage features may add to a more nuanced understanding of ‘grave goods’ and the dynamics of value.

3. **Lisa Peloschek (University of Copenhagen), A shared material culture: Rhodes and the Eastern Mediterranean in the Hellenistic and Roman periods**

A Hellenistic and Early Imperial period ceramic assemblage deposited in a building complex in the necropolis of ancient Rhodes exemplifies how local communities responded to external influences prevailing in the Eastern Mediterranean. Due to its excellent strategic position along trade routes and its proximity to the Western coast of Asia Minor, the island of Rhodes was subjected to numerous cultural encounters.
The presentation aims to explore the strategies of ceramic consumption at the so-called “Pa- 
pachristodoulou-Karika” plot, now being investigated as part of “The Rhodes Centennial Project”. In 
particular, the spectrum of imported fine wares originating from Pergamon, Ephesos and Knidos will be 
discussed, contributing to a better understanding of the distribution patterns of these ceramic proto-
types. Simultaneously, potential local-regional reproductions - respective derivatives of these diagnostic 
shapes - will be morphologically and technologically analysed. Supplementary natural-scientific data, 
obtained by petrographic and geochemical analyses, enables us to detect the compositional variabili-
ties of the ceramics and to trace their region of production with certainty. 
Besides gaining insights into the meaning and value of pottery exchange in a supra-regional perspec-
tive, the study focuses on human-environment interactions and associated cultural processes on the 
island of Rhodes, thus documenting the interplay of local and foreign traditions.

4. Julia Martin (Freie Universität Berlin), Clay-made environment. Some aspects of bricks as an 
element of material culture

The adaptation of the new building material red bricks into the material culture of several cities in 
western Asia Minor, mainly in the 1st and 2nd centuries A.D., shows in some aspects similarities to 
adaptation processes known from pottery: Instead of being directly imported from Rome, fired bricks 
were probably produced locally in Asia Minor, imitating their metro-politan antetype and being, on 
the other hand, altered in order to fit local requirements. Even though this phenomenon can be observed 
in a number of cities along the western coast of Asia Minor, neither the size of the bricks nor their use 
were consistent within the province of Asia. In more commonplace private and funeral architecture, as 
well as in more exceptional public buildings, fired bricks, occasionally along with tiles, were ›consumed‹ 
as one building material together with stones. Bricks were often used in newly introduced building 
types, such as bathgymnasia, or in altered structural forms, as for example in the remodelled stage 
buildings in theatres. In this paper I want to discuss to which degree fired Roman bricks in western Asia 
Minor can be understood as a facet of local material culture. Thereby, I want to shed light on the ques-
tion if, and if so, to what extent fired bricks were introduced as a building material in order to answer 
some needs created by an altered concept of a city’s architectural furnishing.

Panel 6.6 Assemblages of Transport Amphoras: From chronology to economics and society

Organiser: Mark Lawall (University of Manitoba)

Friday | 25 May | 09:00-13:30 | HS IX

Panel abstract

There is a long and important history of research centering on ceramic chronologies that gives a star-
ning role to closed deposits. Carl Schuchhardt’s 1895 publication of a mid 2nd century BC deposit on 
the citadel of Pergamon provided a fixed point for Rhodian amphora stamps. His interests were not 
limited to chronology; he also considered the intensity of Rhodian-Pergamene commerce and the rea-
sons for stamping amphoras in the first place. Such interpretive steps, however, tend to be overshad-
owed by matters of chronology and typology. This session follows a current trend in Classical Archaeol-
yogy towards greater interest in contexts, both for chronology and for socio-economic interpretations. 
Sculpture is studied not only for its style and iconography but also as objects in collections. Fine- and 
plain-ware pottery can reveal changing habits of dining and food preparation. Such contextual studies 
when brought to bear on transport amphoras can inform our understanding of trade and exchange, 
the economics of cult, household economies, and the intersections between these three sectors. Our 
understanding of commercial assemblages from shipwrecks or agora spaces might seem sufficiently 
fulfilled by defining contributors to a cargo or sources of imports. And yet, the markings on the jars, 
states of preservation, the chronological span and geographical diversity of the various types present,
all help to characterize market practices. Comparisons of deposits on an inter- and intraregional basis can help define commercial practices across the Greco-Roman world. Sanctuaries also provide amphora deposits. At times, jars are explicitly marked as cult property, but often they seem more anonymous and generally related to feasting. Such remains can shed light on selectivity of consumption for specific social settings. Different cults, too, show differing intensities of amphora use. Household assemblages shed light on individual consumer behaviour. In rare instances of short occupation or sudden abandonment, the debris in and around a dwelling might be attributed to a narrow period of decision making about use of amphoras. More often, the debris might be linked only to a broader ‘neighbourhood’ over some decades. Amphora debris in or near households provides evidence for various economic matters including storage needs, diversity of types in comparison with commercial sites, and the domestic use of amphora marking.

**Paper abstracts**

1. Alexandra von Miller (MLU Halle Wittenberg), Amphorae at Taxiarchis Hill, Didyma: Economy and Cult of an Archaic Sanctuary in the Light of its Assemblage of Transport Jars

The hereby proposed paper aims at discussing the economic dimension and ritual use of the amphorae found at Taxiarchis hill, Didyma.

The majority of amphorae forms part of the diverse group of local plain and banded wares. The range of mainly Milesian amphora types shows the sanctuary as almost completely relying on the local/regional distribution and supply of goods. The sheer amount of vessels, contrary to the record e.g. at Assos, underlines the high demand for groceries, and hence gives evidence of an intense frequency of people engaged in ritual celebrations on the site, including feasting and dining.

Apart from being used for transport into the sanctuary, the amphorae, given the lack of other large storage vessels, might also have served for storage. The smaller dimensioned table-amphorae are part of the local set of plain-and-banded tableware, instead.

Few is the evidence of specific cult-related vessels, and ritual use of jars. Unlike the evidence at the sanctuary of Aphrodite on Zeytintepe hill at Miletos or at the Heraion on Samos, where graffiti and dipinti appear quite often, only one amphora shard from Taxiarchis hill seems to have carried an inscription. Of special interest are, however, the three amphora bases with central perforations, which hint at a secondary use of these jars, probably in the context of libation rituals.

2. Antonio Saez Romero (University of Seville), Greek wine and Punic fish? The amphorae from a specialized tavern of the Classical period at Corinth

The so-called Punic Amphora Building at Corinth (dating mid-5th century BC) is one of the most prominent archaeological milestones of the development of the production, trade and consumption of salted fish in Classical Antiquity in the Eastern Mediterranean. The abundant fishbone remains found together with Punic transport amphorae were interpreted as the evidence of a remarkable commercial connection established between the Punic West and the Greek world as early as the 5th century BC based on the eastern demand of tuna tárichos. The information provided by Greek literary sources of the 5th c. BC support the arrival of the western fish products to Corinth, Athens and other key sites, and the continuation of the exchange until at least the last decades of the century. Mr. Williams’ first publication of the archaeological assemblage at Corinth (1977-1979) underlined the commercial role of the building, and the presence of massive quantities of Greek and Punic amphorae and the exceptionally preserved ichthyologic remains found in the pavement layers of the courtyard. A recent review of both the amphorae and the faunal material provides a more precise view of fish species and shape/size (of the tuna chunks) and also of the typological features of the Greek and Punic transport vessels found in the building. The paper will focus on this issue, providing an overview of the types and the chronological framework and as well an updated interpretation of the function of the building.
3. Yiftah Shalev (Israel Antiquities Authority) - Ayelet Gilboa (University of Haifa) - Gunnar Lehmann (Ben-Gurion University), Aegean Amphorae in the Southern-Levant during Persian Period: A synthesis of distribution patterns

The Persian period in the Levant witnessed one of the most significant cultural, economic and political transformations the region underwent in early antiquity. Amid these changes, it's involvement with the Mediterranean maritime trade flourished dramatically, reaching previously unattested intensity. This paper is the first fruit of an extensive research program, the aim of which was to reexamine the distribution of transport amphorae prevalent in the Levant during the 5th-4th centuries B.C. and reassess their significance for charting cross-Mediterranean contacts.

Greek amphorae turned up in every Persian period South-Levantine coastal site: large towns and small villages, in domestic, commercial and military contexts. The most common types are the South-East Aegean and Ionian (Chios, Samos and Milethos) as well as some North-Aegean (mainly from Mandes or Thasos). Other types as Lesbian or Corinthian, that forms most common types at Aegean and western Mediterranean sites, are totally absent. Most amphorae probably reached the Levant on ships sailing from the East Aegean via the southern coast of Cyprus were similar variation of amphorae was noted. The very same route was used also to distribute Attic pottery. In Egypt on the other hand, the distribution of East Greek amphorae is different than in the Levant and in Cyprus, meaning that Egypt was connected to the East Aegean via another network.

4. Stella Demesticha (University of Cyprus), The Mazotos Shipwreck Cargo, 4th Century BC

Seaborne trade was the backbone of the economy in the eastern Mediterranean and the Aegean throughout antiquity. Written sources list a plethora of goods that were exchanged via sea routes, whereas the archaeological record from land sites has provided plenty of material evidence on these goods. There is little doubt, however, that shipwrecks represent a special kind of archaeological site, one that provides unique, direct evidence of trade mechanisms and the ancient economy.

The Mazotos Shipwreck, Cyprus, dated to the middle of 4th century BC, is one of the best-preserved wreck-sites currently under excavation in the Mediterranean. The ship carried a nearly homogeneous cargo of Chian wine amphorae, complemented by at least one type of secondary cargo comprised of jugs. Although the excavation is still in progress, over 120 Chian amphorae already recovered from different parts of the cargo have provided a statistically adequate number of vessels for quantitative and spatial analysis of the assemblage: the sizes and capacity of the amphorae, their location in the cargo and the percentages of the different subtypes. The first results of this study are presented in this paper, thus shedding new light on the role of standardization in seaborne trade mechanisms during the Classical period.

5. Konstantinos Filis (Hellenic Ministry of Culture & Sports. Ephorate of Antiquities of Achaia), Transport amphoras from domestic and workshops facilities as indicators for economic changes in the societies of NW Peloponnese from late 6th to 2nd century BC

Aigion, Rypai, Elike, Voura, Aigai, cities of the Achaeian Dodecapolis and metropoleis of major colonies in Magna Graecia, such as Sybaris, Croton, Kaulonia, Metaponto, Poseidonia developed along the coastal zone of NW Peloponnese. Their participation in the colonization led to the development of commercial activity and the exchange of goods from the end of the 8th century BC. Between Trapeza and Diakopto a new coastal settlement dating from the late 6th to the 3rd century BC was discovered, with a commercial character as evidenced based on the existence of port facilities. The intensity of regional and interregional commerce is obvious by the presence of transport amphorae from the late Archaic, Classical and Hellenistic periods from 'Greek' and 'non-Greek' workshops, which provides evidence for various economic matters. Amphorae material from neighboring Aigion, the most important city in the region, is also considered; a strong activity of local workshops especially from the late Hellenistic period is attested here. The local amphoras resemble the products of the nearby workshops of Corinth, but also the Brindisian amphoras. The amphora production in Aigion reveals the existence of agricultural surplus and the growth of a vibrant network of trade routes that flourished after the destruction of
Corinth in 146 BC. The amphoras assemblage can inform us among other for the changing economic practices in NW Peloponnese from the Late Archaic to the late Hellenistic Period.

6. Gerald Finkielsztejn (Israel Antiquities Authority), Assemblages of Amphoras in the Hellenistic Southern Levant: from chronology to economics (and History)

During the Hellenistic period, the Southern Levant imported amphoras from Rhodes, Knidos, Kos, Chios, Ephesos and the Western Coast of Asia Minor, Thasos, Brindisi and the Adriatic Coast, Sicilia, Campania, Latium, Tripolitania and North Africa, and Egypt. The destinations were ports (Ascalon, Jaffa, Ake-Ptolemais), major cities (Marisa, Gezer, Jerusalem, Scythopolis, Samaria, Philoteria) and settlements with specific functions (Tel Emeq, Tel Keisan, Mazor, Khirbet El Eika, Tel Anafa, Tel Kedesh). Quantities vary from over a thousand, several hundred, to fifty.

Six 2nd c. BCE sites of different sizes and types produced amphoras assemblages.

Marisa: 2 storerooms in houses, holding 47 amphoras, from 12 provenances, including 19 stamped (t. a. q. 108/7 BCE); Jerusalem: military camp refuse, ca. 20 amphoras, 3 provenances, most stamped (132 BCE); Scythopolis: 3 storerooms in houses, 25 amphoras, 3 provenances, 23 stamped (t. a. q. 108/7 BCE); Mazor: redistribution center, 4 storerooms, 183 amphoras, 9 provenances, 13 stamped (t. a. q. 145/4 BCE); El-Eika: estate storeroom, 8+ amphoras, 4 provenances, 5 stamped (t. a. q. 145/4 BCE); Tel Kedesh: administrative building, 8 amphoras, all stamped (t. a. q. 145/4 BCE).

These contexts provide us with information on:
- Intensity and origins of trade of amphora-held products,
- Organization of the trade,
- Differences in supply (upper class vs. military),
- Chronological data for local and Historical events, supplementing or correcting literature.

7. Stella Skaltsa (University of Copenhagen), The stamped amphora handles from the so-called ‘temenos of Helios’ in Rhodes: context, chronology and function

This paper aims to offer a preliminary overview of the amphora handles from a public building in the ancient city of Rhodes. Located at the eastern foot of the Acropolis along one of the main arteries of the ancient city this building is commonly known as the ‘temenos of Helios’ or the ‘clubhouse of the priests of Helios’. This identification is based on the presence of six statues of priests of Helios among a greater number of honorific statues. Not only can this identification be contested but new research on the archaeological finds from the complex, undertaken by the ‘Rhodes Centennial Project’ together with the Archaeological Service for the Dodecanese with a view to publish the material, can illuminate aspects of the function of the building. In particular, the site has yielded ca. 376 stamped amphora handles. This is an unprecedented and substantial assemblage from the city of Rhodes. The contextualization of the material helps to clarify the chronology of the building, but most importantly prompts us to raise questions about the social setting of this assemblage and how it can better inform our understanding of the use of this civic space.

8. Horacio Gonzalez Cesteros (Austrian Academy of Sciences) - Hannah Liedl, Ephesus in the Julio-Claudian period. New evidences of consume, cult and exchanges from the Terrace House 2

Knowledge of pottery contexts in household levels in Hellenistic and Roman Ephesus has developed enormously since excavations in the so-called Terrace Houses. In 2004 a small excavation in Terrace House 2 was carried out. In the course of this excavation a large pit was uncovered in Residence unit 5. This closed context stands out due to its rich spectrum of well-preserved finds.

This pit is important concerning two essential aspects. It is the chronological approach to the architectural and functional changes that took place in the Terrace House 2 in the Julio-Claudian period, and the interpretation of this area’s function.

The pottery assemblage contributes to determine the exact moment of use. On the other hand, the central location of the pit and the materials used to fill it give us important clues for its understanding. In this sense, the amphorae finds form a capital contribution.

In this presentation we aim to display the amphorae material, including some almost complete pieces
from a great range of geographical areas used for the transport of different commodities. Special attention will be paid to the epigraphic remains and the chronological contribution of the different types. At last we present an interpretation including other pottery remains for a better understanding of the functional character of the archaeological context, one of the most precise of Julio-Claudian Ephesus

9. Anna Nagy - György Szakmány (Eötvös Loránd Tudományegyetem), Amphorae from Brigetio (Pannonia): Archaeology and Archaeometry

During the 1st-4th centuries AD Brigetio (modern-day Szőny) was a significant Roman town in the province of Pannonia. Legio I Adiutrix, one of the four legions in the province was stationed here. West of the legionary camp and the canabae was the civil settlement where ca. 100 amphora fragments have been unearthed. Some of them were found in closed contexts (e.g. in a cellar with a collapsed wooden ceiling).

The aim of this research was to analyse the amphorae using both archaeological methods and petrography in order to get a more precise knowledge of the commercial connections of Brigetio, exploit their historical aspects and study the population's diet and Romanization. In course of the petrographic analyses the geology of the suggested source areas and previous archaeometric studies were taken into consideration.

Wine arrived from different regions of the Aegean in Rhodian, Dressel 2-4 and Kapitän 2 amphorae. Olive oil was imported from the Istrian peninsula in Dressel 6B amphorae, from the Aegean in Dressel 24 amphorae and from the Guadalquivir valley in Dressel 20 amphorae. Fish sauces were also consumed: Hispanic Dressel 7-11 vessels and one Knossos 26-27 amphora attest to this fact. The latter probably arrived based on an individual order. Italian olives in Schörgendorfer 558 amphorae and probably levantine figs and dates stored in Carrot amphorae were also demanded. The majority of the inhabitants of Brigetio considered these goods exotic and didn’t change their diet.

Panel 6.7 Classical Food and Diet under the Microscope

Organiser: Evi Margaritis and Efthymia Nikita
(The Cyprus Institute, Science and Technology for Archaeology Research Center)
Anita Radini (University of York)
Wednesday | 23 May | 09:00-13:30 | HS XVI

Panel abstract

Diet, with its multiple social and economic determinants, constitutes a key research arena in archaeological studies. Dietary patterns in the Classical world have been extensively explored as a window on ancient cuisine, agricultural and animal management practices, and social structure, among others. The primary means adopted in such studies have been written sources, artistic evidence, material culture and, to a lesser extent, bioarchaeological data (archaeobotanical, zooarchaeological and human skeletal evidence). Recent advances in microanalytical techniques have demonstrated the high potential of microscopic and biomolecular evidence in elucidating dietary aspects which remain elusive on a macroscopic scale. It is the purpose of this session to elucidate the chaîne opératoire from food production to consumption using different lines of evidence. In this direction, we are interested in papers that aim at reconstructing agricultural practices, dietary choices, food processing and food consumption in different geographical areas of the Classical world, by means of archaeobotanical remains, phytoliths, and starches, dental calculus microdebris of dietary origin, dental microwear analysis, residue analysis from pottery and other material cultural remains, or any other microscopic dietary evidence. Equal emphasis will be placed on contributions with a primary methodological direction, presenting novel approaches in microscopic dietary reconstruction, and to contributions with a stronger biocultural character, which emphasize the integration of the resulting data in their broader economic and societal context. Papers
focusing on interdisciplinary approaches to diet and the ancient economy, emphasizing the added value of an interdisciplinary approach, will be very welcome. We are also open to experimental approaches aimed at implementing our understanding of the archaeological record related to diet.

**Paper abstracts**


Prior to the inception of urbanisation in the Aegean on Crete after 2200BC, its antecedents may be recognised at a number of sites where a constellation of conspicuous elements makes them stand out strongly from their contemporaries. In recent years the most interesting of these sites is found on the small island of Keros in the Cyclades. In the period 2750-2300BC a number of factors combine in a unique foreshadowing of the processes of urbanisation. This paper aims to define and measure changes in agriculture, patterns of consumption and landscape exploitation related to increased centralisation. Using macrobotanical and microbotanical remains (seeds, phytoliths, charcoal, starch) as well as lipid analysis as proxies, this paper will combine all the available information related to crops and crop processing, secondary products, land use strategies, storage and consumption activities on site, and the places where agricultural practices took place. Undamaged by later occupation layers, we can examine the rise and demise of a third-millennium proto-urban centre, which stands out among its peers as one of the largest and most complex sites within a now well-defined site hierarchy. The outcome of this paper will be the interpretation of a rich and comprehensive set of data and results producing a unique insight into the questions of intensification and diversification in farming, diet, food preparation and consumption along with pastoral activities in the mid-third millennium.

2. Örni Akeret and Sabine Deschler-Erb (University of Basel) - Sophie Helas (University of Bonn), *The diet at Gabii (Latium) in the Early Iron Age*.

During the excavations at the fortifications of the ancient Latin city of Gabii (2010-2014), animal bones were systematically collected and sediment samples were taken for archaeobotanical analysis. In three field campaigns, the samples were processed and the bioarchaeological remains sorted and identified. The most important crops consumed at this protourban site were barley and emmer wheat, and pulses (mainly broad bean and bitter vetch) played an important role. Other food plants included fig, stone pine, olive or grape. The most commonly eaten meat was beef, followed by mutton/goat meat, while pork was relatively rare. The collection of wild plants and hunting (deer, wild boar and tortoise) and fishing played a minor role.

While the archaeobotanical results are in good agreement with other contemporary sites of Rome and its surroundings, the comparatively low importance of domestic pigs represents a significant difference. It remains to be explored if this discrepancy can be explained by social or economic reasons.

3. C. Margaret Scarry (University of North Carolina at Chapel Hill) - Margaret Mook (Iowa State University) - Donald Haggis (University of North Carolina at Chapel Hill), *Agricultural Wealth, Food Storage, and Commensal Politics at Azoria an Archaic City on Crete*.

Azoria (630-480 BC) is a small urban center on the island of Crete. Ten seasons of large-scale excavations have shed light on the formation, organization and operation of this Archaic city. At its heart is a massive civic complex with shrines, assembly halls, public dining rooms with associated kitchens and storerooms, a large free-standing storehouse, and an olive press. Surrounding the civic complex are “townhouses” of important families: here too storage, preparation and consumption of foods were prominently displayed. The layout and contents of these public and residential buildings manifest the importance of food storage and display in urban politics. This paper draws on ceramic, architectural, and archaeobotanical evidence to discuss the mobilization and storage of agricultural products—particularly from vineyards and orchards. We argue that people, that city authorities or some other supra-household group administered the mobilization, storage and distribution of a range of foods (such as
grain, pulses, olives, wine, oil, and almond) for display and consumption in symposia and larger banqueting events.

4. Aleksandra Mistireki (Universität Zürich) - Florinda Notarstefano (Università del Salento) - Christoph Reusser (Universität Zürich), Dietary habits and economy in the etruscan settlement of Spina (Comacchio-Ferrara)

The presentation will propose the reconstruction of dietary habits in the etruscan settlement of Spina through the application of chemical analyses of organic residues on pottery vessels. In the framework of a project carried out by the University of Zurich, in collaboration with University of Salento, a large number of ceramic containers retrieved during recent excavations was sampled and submitted to residue analyses by gas chromatography-mass spectrometry (GC-MS), with the aim to identify the foodstuffs processed in the vessels. The containers are datable from the second half of the IVth century B.C. and they belong to different pottery classes: cooking wares, transport amphorae, tablewares, storage containers.

The results indicate that most cooking vessels were used to process animal fats or vegetables, while fish consumption did not play a significant role in the diet, considering that only few samples contained marine fats. Tablewares were primarily used for meat consumption. Transport amphorae contained wine, while other vessels were used for pitch production, with the purpose of coating the amphorae, but probably also to protect the wooden housing structures.

The results of residue analyses were integrated with botanical and archaeozoological studies, contributing to the reconstruction of dietary habits linked with animal breeding, agricultural and environmental resources and to better define economic and productive activities, such as wine production and trade.

5. Anna Elena Reuter (Römisch-Germanisches Zentralmuseum/Institut für Ur- und Frühgeschichte der CAU Kiel), Opening a Treasury for Archaeobotanical Analysis. The Analysis of the Plant Remains from the 6th Century Granary of the City Carin Grad (Serbia)

Since 2013 archaeobotanical analysis is practiced on different structures and areas in the early byzantine city Carin Grad. Up to now a wide dataset on more than 200,000 plant remains yielded important knowledge on dietary patterns and agricultural practices. In the 2017 campaign of the newly established project “Zwischen staatlicher Fürsorge und privater Vorsorge – Eine interdisziplinäre Studie zur Versorgungssicherung im 6. Jahrhundert anhand des Getreidespeichers von Carin Grad” systematic sampling for archaeobotanical analysis and soil science were firstly conducted in a 6th century horreum in the Balkans. The horreum was erected during the first phase of the city in the early 6th century and destroyed in a conflagration already on the end of the 6th century. A secondary use is shown by modest structures from the early 7th century short before the abandonment of the city around 615 AD. The layers were sampled systematically to show diachronic developments as well as activity zones in the different parts of the building. All in all 182 samples were taken for archaeobotanical analysis, which showed already during flotation a high concentration of different plant remains – including different types of cereals, pulses, grape pips as well as cereal weeds. The ongoing research will yield important information to expand the knowledge on the development of food processing, consumption and storage in unstable times of war and conflicts in the early byzantine Balkans.

6. Cindy Ventura Abade and Lucy Lawrence (University of Sheffield) - Victoria Sabetai (Academy of Athens) - Efthymia Nikita (The Cyprus Institute), Dental Microwear As Evidence of Human Diet In the Classical World: A Pilot Study

This paper explores the extent to which dental microwear features, most notably scratches and pits on dental occlusal surfaces, can provide useful information regarding the diet of past populations. Even though dental microwear has been used extensively in zooarchaeology and palaeoanthropology to deduce dietary patterns, it has received limited attention in bioarchaeological contexts. Using human skeletal material from the Archaic to Roman era cemetery at Acraiphnion, Boeotia, central Greece, we examine correlations between dental microwear, dental macrowear and dental disease patterns in order to assess whether microwear features can provide information that complements other lines of
evidence regarding past dietary activities. Sexual dimorphism is also taken into consideration given potential differences in the alimentary patterns of males and females. Different cusps were examined separately to determine which one provides more consistent results in cases of extreme dental wear, where traditional approaches cannot be employed. Our research advances the current scientific methods used to identify microwear traces in human dental remains and enhances the ability of microwear identification to the point that it can support further discoveries to determine human diet and its implications.

7. Anita Radini (University of York), Eat your greens: New approaches to vegetable food and spices in classical antiquity

Plants play an important role in diet and nutrition, but also in cuisine. While evidence of staple food such as cereal and legumes is widely present in the archaeological record, other lines of evidence such as leafy greens and flavours are rarer. Leafy greens have important nutritional values and spices can be connected to social status and trades. Increasing the visibility of such lines of evidence is therefore an important goal of Archaeobotanical methods and practice. This paper approaches plant remains with limited archaeological visibility entombed in calculus and in residues of pottery, elucidating how new techniques can give visibility to such lines of evidence and how they can improve our understanding of how leafy greens and flavourings have complemented staple foods to create cuisine in the classical world.

8. Anastasios Zisis (Laboratory of Physical Anthropology, Democritus University of Thrace) - Sandra Lösch (Institute of Forensic Medicine, University of Bern) - Christina Papageorgopoulou (Laboratory of Physical Anthropology, Democritus University of Thrace), Ancient Greek colonies in Thrace: health and diet reconstruction of the first settlers

Colonisation of the Mediterranean and the Black Sea by waves of Greek colonists during the first millennium BC changed dramatically the ancient world, imposing major influences on the society, economy, and demography. The process triggered a sequence of multi-level fundamental interactions between populations, the outcome of which remained tangible over the course of several centuries. The paper presents a work in progress on the bioarchaeology of Greek colonisation with emphasis on the coastal area of Greek Thrace.

In this presentation, we bring forward original stable isotope results ($\delta^{13}C$, $\delta^{15}N$, $\delta^{34}S$) in conjunction with skeletal macroscopic and microscopic observations from Greek colonial settings in Thrace (i.e. Zone, Dikaia, and Lissos). By dietary reconstruction, we are going to assess the differentiation in diet both between individuals and geographical areas. Moreover, we are planning to discuss the historical significance projected by differences in food intake. Isotopic signatures portray an aspect of the proto-settling period as well as the subsequent development of the colonies through the timeframe of three centuries (8th-5th centuries BC). These signatures should reflect social, cultural and economic images within a spatiotemporal frame from Thrace, which, together with living conditions and palaeopathological reconstructions allow us to draw conclusions considering a geographical area highly influenced by Greek colonisation, but little studied thus far.

9. Evi Margaritis (The Cyprus Institute), Foodways in Classical Greece: Agricultural practices, diet and the domestic at Olynthos

Classical archaeology has been widely criticized for its focus on public monuments and burial sites, leaving the analysis of domestic space largely unexplored. This situation is now changing with the new excavation project at Olynthos, which uses inter and multidisciplinary approaches to interpret the urban centre of the Classical period and its chora. This paper will use archaeobotanical, phytolith and other material culture data as proxies in order to document activities of farming, food processing, production and consumption at Olynthos. The macro, starches and geochemistry evidence from Olynthos will be an invaluable addition to the very limited data deriving from the Classical period thus far not only from Macedonia but the whole of Greece, and will not only demonstrate essential interpretative techniques in the study of archaeological contexts, but it will also emphasize that in the absence of such work,
knowledge of significant aspects of daily life would have been permanently lost. This paper will focus on the range of cultivated and wild plants used in the site, detect any variation in the species and dietary choices between the different buildings and to identify crop-processing procedures and husbandry regimes. The paper will also discuss the form and intensity of labour, and the risks involved in agricultural production undertaken at Olynthos and whether the production of agricultural products aimed to self-sufficiency or was market oriented.

Panel 6.8 Recycling and Reuse of Sculpture in Roman and Late Antique Times

Organiser: Caterina Parigi (University of Cologne)
Friday | 25 May | 14:30-19:00 | HS I

Panel abstract
Recycling and reuse of sculpture was a common practice in the ancient world, which took a variety of forms in different periods and places. The research on this topic underwent a strong increase in the last years in which the phenomenon of reusing sculpture was analysed from different points of view.

The panel stresses two main aspects in relation with this practice: on one hand sculptures and their parts were reused as building material. One example is the case of Athens, where several funerary reliefs and parts of statues were already reused in the classical period for the construction not only of buildings but also of fortification walls. On the other hand, sculptures could be reused maintaining their original function or as works of art. In the first case it happens in the original context through a new dedication of the statue, the practice of reinscribing the monument or of remaking parts of the sculpture – normally the portraits. In the second case the statues were placed in a new context, that often implies an alteration of the objects in function and meaning. This is the case in Ostia, where a lot of funerary material was reused to redecorate private domus and public buildings in late antiquity. The practice of recycling and reusing sculptures implies a number of consequences concerning socio-economic aspects. The economical factor plays an important role in recycling and is an integral part of this concept, which is why it always has to take discussing the chosen case studies into account.

The panel focuses on the roman and late antique periods and on the Mediterranean area. Through analysis and comparison of different case studies of recycling and reusing sculptures in several contexts the panel aims to highlight common features and local singularities of this practice with particular attention to the socio-economical aspects.

Paper abstracts
1. Christiane Vorster (University of Bonn), Economy or added value – the reuse of statues in Late Antiquity

There were certainly many good reasons for the increased reuse of ancient statues in Late Antiquity. Primarily, we think in terms of economy as the scarcity of material and the deterioration of the transportation infrastructure throughout the Mediterranean became an ever growing difficulty regarding the purchase of new sculptures.

Yet, apart from these economic reasons, there may have been some socio-cultural reasons as well that prompted the reuse of sculpture in Late Antiquity.

Throughout the Roman Imperial Period ancient statues were highly esteemed in the décor of private and public spaces. While the senatorial residences in and outside Rome were repeatedly expanded and rebuild over the centuries, the statues, which were passed down for generations, were preserved and
diligently reinstalled in these new surroundings. Many sculptures show traces of continuous presenta-
tion over the centuries, as is evident not only in the deterioration of their surfaces but especially in the
numerous visible repairs and restoration.
In Late Antiquity a special regard for ancient statues in public spaces as well as in private villas is docu-
mented in literary sources and monuments. Selected examples aptly illustrate that the reuse of statues
in late antique portraits was by no means induced by economic reasons only. In fact, there is abundant
evidence that the recirculation of intentionally selected antiques was quite suitable for heightening the
effect and the distinction of honorary statues.

2. Caterina Parigi (Universität zu Köln), Recycling of sculptures as building material: the case of
Athens
Il riutilizzo di sculture o parti di esse come materiale da costruzione è un fenomeno comune nel mondo
antico, che si ripete in luoghi e periodi diversi.
Ad Atene, questa pratica trova particolare applicazione. Già in età classica, infatti, le mura della città
vengono costruite con una grande quantità di materiale scultoreo riutilizzato. Nel periodo romano e
tardo-antico ugualmente sono diversi i casi di riuso di sculture come materiale edilizio non solo per la
costruzione o il restauro della cinta muraria, ma anche per la realizzazione di edifici.
Il contributo si sofferma in particolare sull'analisi di una serie di teste, appartenenti a rilievi funerari e
con buona probabilità provenienti dalla necropoli del Ceramico, riusate, forse in due periodi diversi, per
restaurare la cinta muraria nel settore occidentale della città. Attraverso questo e altri esempi – come le
sculture (e le iscrizioni) provenienti dal muro di recinzione della piazza del Nuovo Bouleuterion nell'ago-
ra e quelle reimpiegate nelle mura post-erulse nella zona orientale della città - il contributo cercherà di
mostrare le caratteristiche di questa fenomeno nell'arco di tempo oggetto di studio. Infine, verranno
presi in considerazione aspetti legati al significato della pratica, al suo valore, soprattutto dal un punto
di vista economico, ma anche religioso e culturale, e alla connessione con eventi, che potrebbero stare
alla base di questo fenomeno.

3. Ralf Krumeich (University of Bonn), Recalling the Past and Saving Money? Some Observations
on the Reuse of Statue Bases and Sculptures on the Athenian Acropolis of the Late Hellenistic
and Roman Imperial Periods
The reuse of pre-existing statue bases and the reinscription of Greek sculptures as honorific statues
especially of Romans is well documented on the Athenian Acropolis from the 1st century BC on. Until
recently, particularly the economical advantages of this recycling have been underlined. But new rese-
arch during the last few years has made clear some more and quite unexpected aspects of this prac-
tice: It aimed not merely at avoiding the expenses of producing new statues and bases, but also at ho-
nouring prominent Romans with Greek monuments of the Classical and Hellenistic periods. These rein-
scribed statues were significant in terms of their iconography and quality (many of them still show the
original signatures of Greek sculptors). Moreover, some reuses involved a great deal of modification of
sculptures or groups of statues as well as scaffolding. By this, even the reuse of already existing sculp-
tures contributed to flourishing Athenian workshops.
This paper focuses on the various facets of the reuse of pre-existing bases (including huge pillar mo-
ments) and the reinscription of Greek sculptures as honorific statues of Romans on the Athenian
Acropolis in the late Hellenistic and Roman imperial periods as well as on the economical, political and
social aspects associated with this practice.

4. Panayiotis Panayides, The reuse of sculptures in public bath buildings in Late Antiquity
Public bathing establishments retained their importance as urban settings for the display of sculpture
throughout the Roman and Late Roman periods. Bath complexes, largely neutral in cultic terms, not
only received frequent and generous renovations and redecorations, but also continued displaying my-
thological sculptures well in Christian times.
In the late antique period, when the production of new sculpture dwindled, it was not an uncommon
practice to remove statues from disused buildings and redisplay them in new contexts, either by retai-
ning their original form or altering it intentionally. Although a frequent phenomenon, the translocation and redeployment of statues in late antique cities was less frequently documented epigraphically. The practice may, nevertheless, be discerned by assessing statuary assemblages against various variables. During redecorations, a selection process may have presumably been in play while, the redisplay of old statues from buildings of a different function in bath complexes may also suggest that the statues too acquired a different function and meaning. This paper will probe into these issues and present preliminary results of ongoing research on the reuse of statues in late antique public bathing establishments, through the analysis of selected occurrences of the phenomenon across the Mediterranean.

5. Simon Barker (Norwegian Institute in Rome), Beyond re-worked portraits: other forms of re-use and re-carving in Roman sculpture

The pervasiveness of re-carving in the Roman world ensured its place as one of the essential skills in the stone carver's repertoire. To-date studies on re-carving have tended to focus on the re-working of portraits into new likenesses, particularly imperial male portraits as a result of what has become known by the modern name of damnatio memoriae. Although portrait heads provide some of the most compelling evidence for re-carving, Romans re-used sculpted material for a variety of purposes and new objects could cross entire boundaries of sculptural categories. Therefore, in order to assess sculptural production, especially in private contexts, a wider consideration must be given to such pieces. This paper will examine a selection of re-carved stone sculptures (portraits, statues, sarcophagi, reliefs, sculpted architectural blocks) that were transformed into new objects through the practice of re-carving. The corpus investigated is drawn from across the empire during the first five centuries AD. It will explore the forms and varieties of sculptural re-carving, while considering aspects such as the sources of stone for re-carving projects and the sculpting techniques employed in recycling and adapting existing works to new objects. Overall, it will present new information about the supply and the organisation of sculptural production through re-carving and recycling of earlier sculpted stone objects.

6. Claudia García Villaba (Universidad de Zaragoza), Images without power. The practice of recycling and reusing Roman imperial sculpture in the North-East of Hispania. Case studies from the 1st to the 2nd century

In Roman times the practice of reusing and recycling sculpture was common. Indeed, first examples appeared at the late IIIrd century B.C. during Roman expansion through the Mediterranean. Although, it was not until the 1st century A.D. when Roman statuary monuments became available for reusing. On the other hand, activities connected with reusing have been conventionally linked to Late Antiquity, rise of Christianity and demystification of Roman objects and places. Indeed, scholars who have studied those practices have focused their attention specially on that period. However, reused or recycling sculpture was not just linked with the decline of classical cities. That practice has been a constant feature in the History of the Roman Empire and also in Hispania, where several examples from the 1st and II nd centuries can be observed and analysed.

The aim of this paper is to stress that reusing and recycling practices were complex processes. I want to prove with archaeological evidences from the North-East of Hispania that those practices and urban crisis did not always went together. Incentives for recycling and reusing sculpture were varied and different. Political changes were one of them. In this way we can point out the Domitian portrait from Turiaso, transformed into Augustus, after his damnatio memoriae. In other cases there were economical reasons. For example in Bilbilis where some statuary monuments were reused because there was no good quality stone in the area.

7. Carlos Márquez (Universidad de Córdoba), Una escultura de Calígula sedente procedente de la provincia Baetica

Durante las excavaciones de la curia de la colonia Ituci Virtus Iulia (Torreparedones, Baena, provincia de Córdoba) apareció un grupo formado por tres esculturas sedentes de tamaño mayor que el natural que representan a divus Augustus, diva Augusta y la tercera representó, con toda probabilidad, en principio al emperador Calígula pero su retrato fue reelaborado posteriormente como divus Claudius;
esta última pieza está hecha en mármoles regionales, de dos metros de alta y representa al emperador Gaius sedente, togado y calzado con mullei. Análisis sobre el color parecen demostrar que esta pieza vestía el traje triunfal y la túnica palmata.

El interés de la pieza radica no sólo en representar la figura completa del emperador Calígula, cuya imagen fue en general destruida tras su muerte a pesar de no haber sufrido la damnatio memoriae, sino que además, fue elaborada en dimensiones y características semejantes a la estatua de divus Augustus Pater; dado que contamos con una cronología segura para su realización (los años del principado de Calígula), interesa destacar que su disposición coincide con la imagen de la moneda RIC I2, Gaius/Calígula 56 con la leyenda CONSENSU SENAT ET EQ ORDIN PQR.

Objetivo principal de nuestra investigación será establecer las razones de su presencia en el foro de esta colonia justo al lado de la figura entronizada de divus Augustus Pater.

8. Cristina Murer (Freie Universität Berlin), Recycling roman funerary sculpture in Italy and the West

Plundering and re-use of funerary sculpture is a phenomenon that is widely attested in the Greek and Roman world. Aside from written sources, there are several archaeological contexts that show to what extent the sculptural décor of tombs became a target of plundering in times of greater social political changes. This is especially true for the Late Roman Empire: from the 3rd to the 6th century, marble funerary sculpture (i. e. sarcophagus lids, funerary altars, epitaphs, reliefs and statues) was re-used invisibly but in many cases also visibly within new settings and in altered functions. This implies that plundering must have been a far more frequent occurrence than in previous periods. By discussing several public and private buildings from Italy and the Western Provinces, the paper assesses how far funerary sculpture became an integral part of the late antique décor of Roman houses, villas, churches and public buildings. It furthermore discusses literary and legal sources that concern the actors and agencies behind the social practice of tomb plundering and the common re-use of funerary sculpture in the Later Roman Empire.

9. Roberta Ruotolo (Pontificio Istituto di Archeologia Cristiana), Il fenomeno del reimpiego come pratica edilizia. Un caso di studio dalle aree centrali di Ostia

In età tardo antica Roma e Ostia sono interessate da un forte mutamento del paesaggio in cui i precedenti assetti urbanistici appaiono trasformati dall'impianto di nuovi edifici e dall'occupazione di spazi pubblici e strade non più in uso. In questo periodo l'arredo marmoreo continua a svolgere una funzione di autorappresentazione e adeguamento nei confronti della tradizione architettonica imperiale. Ma da dove provengono i marmi impiegati nei cantieri edilizi? Da un lato, essi sono il risultato del commercio di manufatti architettonici con le province, dall'altro, sono espressione del reimpiego di marmi da edifici più antichi o dalle loro destinazioni originarie.

Ad Ostia, in particolare, si assiste ad un'espansione del fenomeno del reimpiego da far ipotizzare che sia diventato già in età imperiale una pratica consueta nelle attività edilizie. Numerose sono le testimonianze provenienti dal riutilizzo di piedistalli intitolati a personaggi della vita locale attestate dall'ultimo terzo del III secolo d.C. In particolare, l'importanza del riuso dei marmi è evidente nella precocità con la quale ad Ostia sono dimostrati fenomeni di reimpiego di manufatti marmorei come materiale edilizio. Emblematici sono il riutilizzo come elemento di cornice nel Capitolium augusteo dell'iscrizione in tavernetino del duoviro Cornelius e di basi di statue dedicate dai collegi a membri dell'amministrazione statale per una muratura di sostegno del teatro tra la fine del IV e l'inizio del V secolo d.C.

10. Eva Christof (Karl-Franzens-Universität Graz), Late antique statue bases made from former Roman grave monuments, the surprising life cycle of Roman stone artefacts

According to a well-known phenomenon, a very high percentage of late antique statue bases as supports of portrait statues were not made from freshly quarried marble or lime stone, but from already available, reused older material. Late antique statue bases are primarily investigated epigraphically for the content of their inscriptions, but their forms and ornaments are usually neglected. In some cases an attentive view can figure out, that they were originally grave monuments. This study will present
some examples from Italy and discuss the social, legal and financial conditions, which allow that former grave monuments from a necropolis could assume a completely new function in the middle of the city, as bases for statues, which especially in the case of portrait statues were considered one of the highest honours attributed by society to an individual.
Session 7: Economy of Cult: Investment, religious and ritual consumption, economics of death

Panel 7.1 Religious Investment and Ritual Consumption in Peloponnesian Sanctuaries

Organiser: Stefan Feuser (Christian-Albrechts-Universität zu Kiel)
Saturday | 26 May | 09:00-13:30 | HS XV

Panel abstract

The sacred landscape of the Peloponnese is formed by a distinct mixture of Pan-Hellenic sanctuaries, urban sanctuaries and smaller extra-urban and rural cultic places. Since Archaic times these sanctuaries must have formed an important part of the Peloponnesian economy, however, their economic significance was largely overlooked in modern scholarships so far. Thus, the panel aims at bringing together leading experts on Peloponnesian sanctuaries to take a fresh look on their economic role from Archaic to Hellenistic times by looking at (1) religious investments as well as (2) ritual consumption.

(1) The investment in the religious infrastructure was manifold with the construction, extension and embellishment of temples, altars and sacred precincts. Furthermore, buildings closely related to the cultic activities such as treasuries, banquet buildings, theaters and infrastructure facilities like water supply were also erected. Key questions concerning these buildings could be: What was the driving force behind the investment in religious architecture and cultic infrastructure (e.g. competition among sanctuaries/cities/rulers, changes in cult practices, destruction through war/earthquake/fire/decay)? What might have been the economic rules and logics behind these investments? (2) The ritual consumption was one of the most important parts of ancient cults: it comprised the offering of votives (statues, statuettes, reliefs, vessels, etc. all of different material) and of sacrifices (animals, vine, food, flowers, etc.) as well as the performance of processions (clothing, ephemeral constructions, etc.). Possible questions might be: Concerning their material/ideational value and quantity, what different kind of commodities were offered? Is it possible to estimate the importance for and impact on the urban, local and regional economy of the ritual consumption? Were there production sites of these commodities adjacent to the sanctuaries, in the surroundings or were they imported? And: What did it mean for the ancient economy that an offering or a sacrifice was detracted from the economic circle by consigning it to a goddess or a god?

Paper abstracts

1. Oliver Pilz (Johannes Gutenberg-Universität Mainz), The Economy of Votive Practice: Olympia and Kombothekra in the Geometric and Archaic Perio

Ancient dedicatory practice continues to be primarily interpreted as a symbolic means of communication in a religious context and has rarely been analyzed as an economic phenomenon. Yet, many dedications in sanctuaries throughout the Greek and Roman world were of considerable material value. Moreover, a substantial part of the objects deposited in sanctuaries are commodities produced for the sole purpose of dedication.

The sanctuary of Zeus at Olympia and the nearby cult place of Artemis Limnatis at Kombothekra rank among the best known Peloponnesian sanctuaries in terms of the publication of the votive material from the Geometric and Archaic periods. Olympia and Kombothekra are therefore well suited for investigating the dedicatory patterns in these sanctuaries during the periods in question. Drawing on this data, the paper not only explores the economic dimension of dedicatory practice in a pre-monetary society, but also aims to embed the ritual consumption of commodities in a social context.
2. Raimon Graells (Römisch-Germanisches Zentralmuseum), A diachronic research on the votive offerings in the sanctuary of Olympia (From the 10th to the 5th century BC)

The paper presents the first results of a DFG-project between the Römisch-Germanisches Zentralmuseum in Mainz and the Athens Department of the German Archaeological Institute. It analyses the diachronic development of the largely metal votive offerings in the Zeus sanctuary of Olympia from the Protogeometric to the Classical period (10th-5th century B.C.), using consistently archaeological and statistical methods. The archaeological data used considers the already published Metal votive offerings discovered in Olympia. The final purpose is to provide a substantial contribution to the history of the pan-Hellenic cult place in the first half of the 1st millennium B.C.

3. Stephanie Kimmey (University of Missouri, Columbia) – Kim Shelton (University of California, Berkeley), Well Deposits and Changes in Ritual Consumption at the Panhellenic Sanctuary of Nemea

Nemea is known as the site of the panhellenic Sanctuary to Zeus and yet can also be considered a rural location of cult activity due to its placement within the Nemea Valley, removed from large polis centers. The Nemea Valley was well watered and perhaps was a factor in the location of the sanctuary. The custodians of the site not only manipulated the Nemea River but also took advantage of the natural resource by building aqueducts and a series of wells across the sanctuary. These wells, while providing water for a variety of functions, are also a set of relatively closed archaeological contexts that provide evidence for the ritual activities occurring during the festivals and games.

A close examination of the artifacts deposited in the wells reveals changes in ritual consumption at Nemea from the Archaic/Classical to the Late Classical and Early Hellenistic periods. The preponderance of regionally-sourced drinking vessels is an Archaic period trend, while a resurgence of activity in the later 4th century BCE corresponds with new building projects and more diverse sources of the commodities used at the site. The well assemblages and associated facilities attest to a small ceramic production center within the sanctuary along with the importation of goods by the panhellenic visitors.

These wells are important loci for different activities that correspond with the surrounding architecture and provide a different way to trace ritual consumption within the eastern Peloponnese.

4. James Lloyd (University of Reading), Producing the Spartan Lead Votives

The Spartan lead votives represent one the largest productions of Greek votive offerings: over 100,000 from the sanctuary of Artemis Orthia, and around 6,000 from the Menelaion, in addition to smaller numbers from other Spartan sanctuaries and locations outside Laconia.

Since Wace 1929 there have been few studies on the production of the lead votives and what their production might reveal about Archaic Spartan economics and religion. Boss 2000 is a major exception, also of importance is Gill & Vickers 2001, who argued, based on Pb isotope analysis of 12 votives, that the source of the lead used to produce the votives was the Laurion silver field.

This paper presents new Pb isotope analysis of 19 Spartan lead figurines in the Ure Museum of Greek Archaeology, concluding that East Lakonia is a potential source for the lead too. The paper also hypothesises, drawing on evidence from new XRF analysis of 59 lead votives, and comparative examples, that the figurines were produced on a small, frequent scale and produced either within or nearby the sanctuary of Artemis Orthia and the Menelaion.

Finally, I will suggest initial calculations as to the cost of producing such a large quantity of figurines. The lead figurines, as tempting as it is, should not be seen as symbols for an austere sixth century Spartan culture, but as evidence for wider Spartan individuality and of relatively complex economic mechanisms.

5. Maria Spathi (Institut of Messenian Archaeological Studies), Small votive offerings from the Sanctuaries of ancient Messene and their value in terms of religious, political and economic significance

The city of ancient Messene in the southwest Peloponnese, founded in 369 BC by the Thebans, was one of the largest and more distinguished cities in Greece with a high level of social and economic status.
The aim of this paper will be to highlight the parameters that appear to influence the production and consumption of votive offerings in the various sanctuaries of the city of Messene, whilst taking into consideration local distinctive peculiarities that form aspects of private and public religious life. The political circumstances and pursuits, played an important role in the formation of the votive spectrum, and an example of this might be the promotion of the national identity and ethnicity. Aside from the religious and political reasons that prompted the dedication of specific types of votives in the Messenian sanctuaries, it is important to discuss the possible economical reasons for the preference. This discussion might be able to help answer the following questions: Does the dedication of specific types of offerings also reflect a practice imposed by economic reasons? Does the restricted economy of the sanctuaries have an impact on the dedicatory praxis or even a wider one in the economy of the city? Do different variety offerings, not only the small and less valuable but also the more expensive, affect the economy of the “sacred and if so, in what way?

6. Dimitrios Ath. Kousoulas, Heraion of Argos in comparison to the Temple of Apollo in Bassae
In the classical Period, several temples are erected in the Peloponnese either replacing earlier buildings, which were destroyed, or honouring new deities, such as the Asklepieion in Epidaurus. Among them, two temples stand out for their artistic value and the certain references to the Attic art: the Heraion in Argos, which was destroyed due to fire in 426/5 BC, and the temple of Apollo Epikourios. These monuments are significant, because they occupied famous artist of the period. Earlier studies have shed light on the costs required for these buildings and the number of craftsmen that were necessary. Aim of this paper is to compare the statistical and economic data available for these monuments, based on archaeological, literary and other sources, with comparison to contemporary Attic buildings.

7. András Patay-Horváth (ELTE, Budapest), Temple building in Archaic and Classical Arkadia
Surprisingly many temples were built in Archaic and Classical Arkadia and some of these buildings were at the same time substantial monuments. In addition to their elaborate architecture, they were often erected at strangely remote places, or were orientated differently from the usual Greek temples. Some special cases (such as Bassae and Tegea) apart, there is practically no written evidence about the identity and the underlying motivations of the temple-builders and the historical circumstances of a temple-building project can only be reconstructed tentatively, mainly based on the actual remains and their findplace. The current historical interpretation assumes that the buildings expressed the identity of the local communities which commissioned these temples mainly in order to demonstrate their independence from the menacing power of Lacedaemon. Based on practical considerations and comparable cases across the Greek world, my paper challenges this view and tries to offer an alternative interpretation. It is argued that most of these temples were connected with some kind of social mobility and/or migration.

8. Stylianos Katakis (National and Kapodistrian University of Athens), Wiederverwendete Statuen auf der Skene des Theaters von Epidaurus
geläufig, dass ältere Statuen, Statuenbasen und auch Architekturteile in späterer Zeit aus finanziellen Gründen an anderer Stelle wiederverwendet wurden.

9. Katia Perna (University of Catania), Greek artefacts and ritual consumption in the indigenous sanctuary of Polizzello (Sicily)

The site of Polizzello lies at the center of Sicily, near the modern village of Mussomeli. During the eighth century B.C., a sanctuary arose there, which housed round buildings, surrounded by a temenos wall that marked the sacred area.

From the mid of the seventh through the mid of the next century, a large amount of Greek artefacts (Corinthian and black painted ware, personal ornaments in bronze, amber, bone, ivory and silver and bronze and iron weapons) were dedicated in the sanctuary.

The offering of these objects (all pertinent to the types offered in the main Archaic Greek sanctuaries) testifies a profound change in ritual actions and goods consumption, but also presupposes the establishment of new economic and political relationships.

This change can be understood in the wider context of the expansion of the Greek colonies in central-western Sicily; the presence of colonists in this area, in fact, led to the creation of a complex interaction network and enacted processes of religious syncretism.

This paper aims to analyze Greek artifacts from an economic point of view, as trade goods, but also paying attention to the role that they played in the activation of social strategies - especially during religious performances - and cultural and political transformations.

Panel 7.2 The Economy of Death: New research on collective burial spaces in Rome from the Late Republican to Late Roman period

Organiser: Thomas Fröhlich and Norbert Zimmermann
(Deutsches Archäologisches Institut, Rome)

Friday | 25 May | 09:00-13:30 | HS XV

Panel abstract

The panel aims to discuss economic aspects of Roman funerary architecture designed for extensive numbers of burials - such as columbaria, large hypogea, and catacombs - as well as questions about theirs owners and users. We would like to discuss to what extent economics played a leading role in the invention, the development and the use of large communal burial monuments in Rome; and additionally, how these buildings fulfilled the religious and social needs of their recipients. Some spaces were originally prepared for family groups or various kinds of associations, which in following generations could be still occupied by the same group or could change hands; often traces of related funeral art and inscriptions are preserved. New studies in Roman funerary monuments have documented interesting evidence for the dynamic process of preparation and use of burial space. Particularly in larger constructions for many more burials than a single family, the aspect of economy in ownership and use is a promising avenue for research. Who planned the project? How and why was a certain place chosen and a specific architectural concept applied? How and where in the original project did the owner and their families situate their own burials, and where and in which manner of distribution or acquisition were further tombs sold or given to others? How were various spaces or decorative schemes differentiated, and how consistent was the anticipated use with the actual use? Can we find explanations for the changes? Was there a standardization of workmanship in building techniques and decoration to respond to economic necessities? Why did certain spaces remain out of use? How was a burial space used by the following generations? Do we have evidence of burials grouped into new collectives, or of smaller groups and factions of formerly unified groupings? How is this attested by architecture and artistic evidence, and how do these relate to the epigraphic sources? These questions are especially
pressing because over the last decades a series of general studies on Roman burials and burial customs have emerged, but necessarily based on older documentation. Fresh and more detailed analysis of single monuments provide new and different insights and interpretations. We propose reexamining Roman funerary customs, art, architecture and epigraphy through an economic lens.

**Paper abstracts**

1. **Dorian Borbonus, Economic strategies in the collective tombs of Imperial Rome**

The columbarium tombs of Augustan Rome feature capacities of over 500 burials and readily illustrate the notion of collective burial as a rational economic response. The prevailing historical interpretation of columbarium tombs consequently reads them against the population increase in the city and the resulting need to maximize burial capacity. But the economic dimension of these collective tombs goes beyond their capacity and indications of economic strategies can be traced throughout their entire life-cycle: the planning needed to match the projected occupancy of the monument with the realities of a building site; financing probably required aristocratic backing but there is also evidence for crowdsourcing strategies; the large-scale construction projects were facilitated by an extremely standardized layout; once in existence, the collective tomb was a valuable resource that was painstakingly administered by governing bodies; and, finally, individuals used various strategies to acquire and secure burial real estate. Economic strategies thus permeated many aspects of collective burial, probably because the practice posed substantial logistical challenges that required innovative and efficient responses.

2. **Thomas Fröhlich (Deutsches Archäologisches Institut) - Silke Haps (Technische Universität Dortmund), Große Gemeinschaftsgräber im frühkaiserzeitlichen Rom: Wirtschaftliche und soziale Aspekte ihrer Erbauung, Ausstattung und Nutzung**


3. **Clarissa Blume-Jung, Identität und Grab. Zur Individualisierung von Bestattungen in Familienmausoleen und Mehrfamilien-Columbarien in Rom im 1. und 2. Jh. n. Chr.**

4. Barbara Borg (University of Exeter), *Peter and Paul ad catacumbas: a pozzolana mine reconsidered*

The burial sites of the apostles Peter and Paul are among the most controversial topics in scholarship on early Christianity. Their cult site on the via Appia, set into and above a former pozzolana mine, is still seen by many as a temporary refuge for their relics during times of persecution, while a growing number of scholars has resorted to the assumption that there were rival traditions related to the Appia site on the one hand, and those on the via Ostiense and the Vatican on the other. I shall reconsider the evidence for the apostles’ burial, and the history of their cult on the via Appia, in the light of both the site’s development from quarry to basilica, and its wider context between the second and third milestone of the consular road.

5. Michela Stefani (Università degli Studi Roma Tre), *The large collective burial monuments of the Scipio’s Tomb in Rome.*

The Tomb of the Scipios, one of the most well-known monuments of ancient Rome, is located on the Appian way, outside Porta Capena. This site includes not only the famous hypogeum of the Scipios, but also other Republican tombs, two columbaria, a big foundation in tuff, a roman house, an hypogeum with a small catacomb, and another building erected above the Tomb of the Scipios. All of those monuments are been studied in depth for my Ph.D.

The aim of this paper is the analysis of the large burial buildings located in this site, such as the columbaria and the hypogeum with the small conjunct catacomb, and a reflection on the economic and ritual aspects that those monuments presume. The columbaria, dated back to the I century AD, are two burial underground chambers in brickwork. The largest one could hold at least 480 urns, the second one is preserved only for a small portion of the N and S wall. Both of the structures has an elegant parietal decoration, attributable to the III pompeian style. The hypogeum is a unique funerary building, dated back to the IV century AD, which has an unusual "L" shape and is characterized by the presence of a small catacomb consisting of two short galleries with burial recesses on walls. Therefore, the archaeological and decorative analysis of these funerary structures will allow to make a reflection about some questions of this session, such as the economic class of owners and the funeral ritual that this kind of monuments presumes.

6. Norbert Zimmermann (DAI), *Beobachtungen zu wirtschaftlichen Aspekten der römischen Katakomben: Grundbesitz, Graberwerb, Grabnutzung und Grabausstattung im Spiegel archäologischer Quellen*


7. Antonio Enrico Felle (Università degli Studi di Bari "Aldo Moro"), *The ‘written death’ in collective funerary settlements. Some case studies*

In order to reach the goals of the panel “New research on collective burial spaces in Rome from late republic to late Roman time” the paper aims to consider the use of the epigraphs in collective burial areas.

The paper will expose the results of the analysis conducted about two funerary collective settlements in the suburb of Rome suburb: first of all the Christian catacomb of Domitilla along the via Ardeatina, and, if it will possible, the columbarium III of Vigna Codini at the first mile of the via Appia.

The idea is to consider the use of epigraphic medium from both a quantitative and qualitative point of view. How much are the “inscribed tombs” in these areas?; how were they realized? The “collective” or
"community" trait of these burial areas did or did not influence the choice of materials, techniques, writings, languages, formulas used in the inscriptions? Did still exist professional stone-cutters in service for the users of Christian catacombs, or not?

In fact, all these elements are valuable aspects in order to define the different or homogeneous social and economic level of the users of these funerary settlements.

8. Agnese Pergola (Pontificio Istituto di Archeologia Cristiana), Un cimitero comunitario per l'aristocrazia romana. Il peculiare caso della catacomba dei Ss. Marco Marcelliano e Damaso

La catacomba dei Ss. Marco, Marcelliano, che si colloca all'interno del vasto comprensorio suburbano racchiuso tra le vie Appia e Ardeatina, nacque agli inizi del IV secolo, quando nelle catacombe romane si scavavano le regioni più tarde, ed ebbe il suo massimo sviluppo a cavallo tra IV e V secolo. In questo contributo si intende partire dall'analisi topografica del cimitero in rapporto alle testimonianze epigrafiche e iconografiche per tentare di comprendere quali fattori economico-sociali abbiano portato, non tanto alla sua creazione, quanto al suo sviluppo e continuità. Sebbene si collochi in un'epoca ormai avanzata rispetto alla vita delle catacombe romane il cimitero continua a vivere e ad accogliere sepolture monumentali non meno imponenti dei mausolei del sopratterra. Si cercherà quindi di delineare quelle che furono le motivazioni che spinsero alcuni rappresentanti dell'aristocrazia romana (ma non solo) a scegliere questo luogo di sepoltura che continua a privilegiare la dimensione comunitaria a dispetto dell'esclusività; quali scelte economiche furono alla base delle differenti forme architettoniche e decorative; a chi appartenevano e come furono effettivamente sfruttati gli spazi che, in alcuni casi – come nel "cubicolo delle colonne" – videro una fase di riuso, ingrandimento e abbandono. Si tenterà in fine di comprendere se lo sviluppo del cimitero è legato ad un progetto unitario e chi ne furono i promotori.

9. Roberta Ruotolo, Il porto di Roma: caratteri di continuità e di discontinuità con i cimiteri dell'Urbe. Il riutilizzo degli spazi funerari di età classica come modello economico o fenomeno di parasitismo architettonico?

Panel 7.3 Boundaries Archaeology: Economy, sacred Places, cultural Influences in the Ionian Adriatic areas

Organiser: Enrico Giorgi and Giuseppe Lepore (Bologna University)
Wednesday | 23 May | 17:00-19:00 | HS X

Panel abstract
The aim of this panel is the analysis of the institutional, economical and cultural development in the Ionian and Adriatic borderlands. This process derives from the contacts between middle Adriatic regions and Northern Epirus on one hand and the culturally hegemonic centres on the other. This meeting generated mutual influences and cultural osmosis in various ways and times, linked to different historical and geographical contexts, but often with similar results. Recent archaeological researches allow us to assume that sacred places are privileged contexts to analyze these phenomena: in fact, they are gathering places and cultural mediation centres involved in economical and political interests. Sanctuaries are also strictly connected to urban genesis, to territories occupation dynamics and to relations between town and country. The papers move from specific study cases and archaeological researches still in progress but aim to offer a general overview. These researches are possible thanks to the collaboration between Bologna University, Department of History and Cultures (DiSCi) and several Institutions such as British School at Rome, Università Orientale at Naples, Soprintendenza Archeologia Belle Arti Paesaggio of the Marche region, Tirana Archaeological Institute and Ecole des Hautes Etudes en Sciences Sociales (Paris).

Paper abstracts
1. Francesco Belfiori and Sara Morsiani (University of Bologna), “Romanization”, Economy and Rituals in Medio-Adriatic Cult Places
The paper focuses on materials from some sanctuaries of the Picena area between III and I sec. B.C. The aim of the paper is to investigate their role in economic and cultural transformations during this period. The so-called Etruscan-Lazio-Campanian ex-votos, architectonic terracottas as well as pottery from these contexts show the role of these sanctuaries as centers of production and import of specific classes of materials with exclusive sacred destination. In some cases, the production of these objects takes place in loco, such as in the sanctuary of Monte Rinaldo. Here materials suggest the spread of cultural models through the displacement of people from the Tyrrhenian area into the middle Adriatic region, together with the colonization of the territory. In other cases, as in the federal center of Asculum, early indirect contacts with Etruscan-Lazio culture are attested by the presence of objects imported and then reinterpreted according to local ritual practices.

2. Enrico Giorgi and Francesco Belfiori (University of Bologna) - Filippo Demma (MIBACT) - Stephen Kay (British School at Rome), Monterinaldo: A Roman Sanctuary in the middle of Picenum
The Sanctuary of Monterinaldo (III-I BC) is one of the most representative and less known monuments in the Mid-Adriatic area. It rises in the heart of the Picenum along the border between the territory of the civitas foederata of Asculum and that of the Latin Colony of Firmum Picenum. It was discovered in the last century and then partially reconstructed. The Sanctuary was originated in 3rd cent. B. C., in a site frequented from the Iron Age. In the 2nd cent. B.C. it was rebuilt with a Tuscan temple in the center of a square open to the Valle dell’Aso, according to architectural features comparable to those of the sanctuaries such as Gabi in the Latium. In 2016 research finally resumed, thanks to a project involving the Archaeological Superintendence for
Marche Region, the University of Bologna and the British School at Rome. The first Campaign focused on the analysis of archival documentation and on a new topographical and geophysical survey. In summer 2017, the first Excavation Campaign finally took place. Now we know that the Sanctuary was dedicated to Juppiter, with others secondaries deities. The excavation also provided important information for architectural reconstruction and its chronology.

The main research concerns the understanding of the role of the Sanctuary during the Roman colonizaton of Picenum, in organization of the rural population, in administration of Aso valley, where there was not an urban center (as in adjacent valleys), and in its economic development.


The fearsome reputation of Adriatic navigation has probably fostered in ancient times the particular interweaving between sea routes and places of worship, which is found throughout the Adriatic coast. My paper will focus on some aspects of maritime cults, consecrated to heroes, such as Diomedes, and to some Olympic divinities, such as Zeus and Aphrodite, in the middle and lower Adriatic, between the 6th and the 2nd centuries BC. The communication will highlight some rituals and practices (votive offerings, inscribed dedications, libations) which have some similarities despite the different contexts. It will be thus possible to highlight the particular link with some significant points of the maritime landscape, such as islands (Palagruza, Tremiti Islands), caves (Grotta Porcinara, Grotta dell'Acqua), promontories (Mount Gargano), which mark the main routes of the Adriatic navigation. Within these paths and cults, a particular attention will be paid to the role of the oracle of Dodona, which has so far not been considered for the development of the Ionian-Adriatic trade, and seems on the contrary to have had a great reputation for commercial mobility, directed in particular towards the Corinthian Gulf, the sites of the Ionian-Adriatic region (Epidamnos) and Southern Italy (Taranto, Syracuse), between the 6th and 4th centuries B.C.

4. Anna Gamberini (University of Bologna) - Lorenzo Mancini - Nadia Aleotti (University of Pavia), Sacred places, territorial economy, and cultural identity in northern Epirus (Chaonia)

The only sacred place in Chaonia whose material, spatial, and cultic features are sufficiently known is the Sanctuary of Asklepios in Butrint. However, only its middle-to-late Hellenistic and Roman stages have been extensively investigated, focusing on the role of the Asklepieion as a political and self-identity point of reference for the koinon of the Prasaiboi first, and then on the modifications of the complex from the foundation of the Augustan colony onwards. The origins of the cult and the earliest stages of the sanctuary, instead, are much more uncertain. Their traditional dating to the late 4th or early 3rd century BC relied mostly on the alleged chronology of the ceramics found by L. M. Ugolini, in 1929, in a votive deposit. A reassessment of these materials, now lost but published in detail by the Italian archaeologist, is still lacking. The aim of the paper, therefore, is to investigate the origin and the development of the Asklepieion in the light of material culture, comparing Butrint's case with that from other northern Epirote sites, and in particular with Phoinike, capital of the Hellenistic koinon. The relevance of this topic, indeed, oversteps the boundaries of Butrint, providing an insight on the self-formation processes of Chaonian tribes from the emancipation of Butrint from Corcyra in the late Classical period, to the relations of the region with the Western shore of the Ionian Sea, until the intervention of Rome in the first half of the 2nd century BC.

5. Atalanti Betsiou (University of Ioannina), Marcus Antonius and the negotiatores of Dyrrachium

The commercial classes of the negotiatores and mercatores developed a wide range of activity in different parts of the Greek world, according to their interests. In the correspondence of Cicero to his friends we are well informed of the presence of active entrepreneurs in Narona (Marcus Bolanus), Buthrotum (T. Pomponius Atticus) and Dyrrachium (C. Flavius). The most energetic stands out the case of T. Pomponius Atticus, who tried unsuccessfully to forestall the deductio colonia of Buthrotum with the support of his friend, M. Tullius Cicero. The same process was engaged for the cases of Dyrrachium and
Byllis after Julius Caesar’s victory over Gnaeus Pompeius in Pharsalus (48 BC.). Nevertheless, the assassination of the dictator in the curia of Rome (44 BC.) postponed these plans on the Greek calends. The study of the bronze coinage of Dyrrachium unfolds the political stance of its citizens during the struggle for ultimate power between Marcus Antonius and Gaius Octavius in the last decade until the naval battle of Actium. The inscriptions of Greek alphabet on this coinage prove also, that the city hasn’t become a roman colony yet. The aim of this presentation is twofold: a) to underline the Greek character of the city, and b) the involvement of the commercial class in politics after the battle of Philippi (42 BC).

Panel 7.4 Financial Resources and Management in the Sanctuaries in Greece (FiReMa)

Organiser: Annalisa Lo Monaco (Sapienza, Università di Roma)
Wednesday | 23 May | 09:00-16:30 | HS X

Panel abstract
Ancient sources attest for Greece a careful distinction between sacred and public finances. Even if there were certainly separate funds, the reality was far more complicated. The boundary line between sacred finances and city resources was not always easy to recognize. Indeed, spending was huge: sanctuaries needed large economic resources to finance the erection or restoration of buildings, daily or monthly liturgical expenses (victims to be sacrificed, firewood, cleaning of buildings and statues, decorations), and the organization of agonistic festivals. The liquidity inflows mainly derived from taxes and the collection of fines and bequests, as well as from sacred lands, which could be rented, cultivated, or given to pasture. A great resource was also the accumulation of votive offerings in precious material, kept in temples or in special locked buildings. It was a real reserve hoarding, which was withdrawable also for non-religious purposes (normally to refinance wars). Inside the shrines also real banking transactions took place, such as safekeeping of restricted deposits, collective or even individual loans with subsidized rate, minting of coins, currency exchange. Finally, the extraordinary inflow of pilgrims involved the creation of real market areas within the sanctuaries. The administrative management was very varied and complex: it could be operated directly by the priests, by the advisory bodies of the respective poleis, by specific sacred assemblies or even by private citizens.

Conducted by a multi-disciplinary team and combining all kinds of sources (literary, archaeological, epigraphic and numismatic), FiReMa is conceived as a double-panel: the first is dedicated to the financial capacities in the sanctuaries of Greece; the second is focused on financial and administrative management pursued in the holy places by several agents. Both the sections span from the 5th c. BC to the Imperial period.

Paper abstracts
1. John Davies (University of Liverpool), 'Economics' and 'the economics of cult': can a marriage be arranged?

For many years now, some economic historians of Classical Antiquity have been invoking modern economic theory, especially New Institutional Economics (summary in Groenewegen et al. 2010), in order to replace the simplistic Finley-Polanyi-style picture by more complex and realistic models. This paper will attempt to illustrate the possibilities. It will begin by sketching some recent work on the Greek world in this direction (Bresson, Lewis, Ober), and current views on the economics of religion (McCleary ed. 2011), It will then cite an analysis of the medieval Catholic Church as an economic firm (Ekelund et al. 1996) as an example of the applicability to pre-modern cult of modern analytic concepts. It will then present some of my own published and forthcoming work in a similar direction, including studies of
temple states, of the economic roles of temples and sanctuaries within a polis framework (stability; response to implicit markets: capital accumulation and lending: etc). It will then commend the general utility of the theory of the firm as an interpretative framework, individual sanctuaries mostly being U-form organisations but poleis themselves largely M-form as managers, controllers, and investors. It will then use the Eleusis cult as a case-study, and will conclude by looking further afield, to Egypt, Babylonia, Judah, and Anatolia, where the economic roles of temples and sanctuaries were plainly paramount and would respond to a similar theoretical approach.

2. Peter Londey (Australian National University), Financing temple building at Delphoi in the 6th century BC

We know, comparatively speaking, quite a lot about the financing of and expenditure on the temple of Apollo built at Delphoi in the mid-4th century BC, thanks to the surviving sequence of building inscriptions (CID 2). By comparison, beyond a small number of historical references (starting with Hdt. 2.180 and 5.62), we know very little about the financing of the grand construction works carried out in the 6th century, which included a radical remodelling of the temple terrace. The Delphic Amphiktyony was no doubt involved in all this, but some recent assumptions about the interpretation of the archaeological evidence at Delphoi are vitiated by continued reliance on the fictitious First Sacred War as an explanatory tool (see recently Scott 2010: 52–60; Londey (2015); for a summary of the limited historical evidence, see Sanchez 2001: 84–91). The 6th century works are an excellent example where archaeological, epigraphic and historical evidence must be used together to explain how a small albeit famous sanctuary, situated in a remote area of central Greece, could undertake a major building program in the late Archaic period.

Sanchez, P. (2001), L’Amphictionie des Pyles et de Delphes (Stuttgart, Franz Steiner)
Scott, M. (2010), Delphi and Olympia: the spatial politics of panhellenism in the archaic and classical periods (Cambridge, CUP)

3. Rita Sassu (Sapienza, Università di Roma), The treasures of Athena: Hoarding processes in the sanctuaries of Athens and Argos

Studies concerning the Greek polis have not hitherto properly considered the role played by sacred areas in public economy, particularly in the establishment of a financial deposit of collective resources during the Archaic and Classical age. Epigraphic, literary and archaeological evidence indicates that, before Hellenism, a series of hoarding processes were taking place in the poliadic sanctuary. In this regard, Athens and Argos turn out to be an exemplary case studies. Athenian Acropolis’ edifices were progressively built and spatially organized to meet the polis’ religious needs but also to address the necessity to create a financial collective deposit, established through a hoarding process requiring a complex and highly structured management system. The Acropolis acted as the place where public resources were preserved and controlled through a dedicated staff of officials since the Orientalizing age; from the Archaic age, a dedicated temple was built to preserve sacred resources, that were composed by both civil and religious revenues and could be spent on both the sanctuary’s and the polis’ expenses, especially in emergency situations such as wars. A similar situation can be observed in Argos, where the concentration of public assets within Athena’s poliadic sanctuary is documented since first half of the VI century B.C. Also in this context, the hoarded resources could be managed and used directly by the polis, which is lastly the co-owner of the goddess’ funds.

4. Spencer Pope (McMaster University) - Peter Schultz (North Dakota State University), The Management and Location of Public Treasures in Athens in the Fifth Century BC

Despite the existence of numerous decrees on civic monies, many mysteries remain regarding the management and location of the Athens’ public funds. The Treasury of Athena is associated with a space known as the “Opisthodomos,” but the designation is unclear and might refer to two discrete locations on the Acropolis. The completion of the Parthenon provided a new locus for the
goods belonging to Athena. Annual inventories of public and sacred property reveal that the interior of the building was filled with a wide range of objects ranging from the extremely valuable (gold crowns) to the dubious (rotten arrows). Conspicuously missing from the inventory accounts, however, are the coins that constitute the vast majority of the city's wealth. Ancient sources describe up to 10,000 Talents held in the treasury. While no inscriptions refer to the location of the city's coined wealth, it has long been known that temples were used as banks. The principal spaces of the Parthenon were already utilized for display and for the storage of goods. However, its design includes a third served space: a staircase built into the Parthenon's eastern cella wall. Like the famous staircases in several Sicilian temples of the Archaic and Classical periods, this staircase led to the temple's attic. Safe, accessible, easily controlled, and sanctified by the goddess's own power, this large, neglected space may have played a more central role in the Parthenon's form and function than previously thought.

5. Valentina Mussa (Paris Sorbonne, Paris IV), Economical officials and management of attic sanctuaries in classical Athens

In Athens, during the classical period, a high level of administrative complexity and institutional articulation characterized the religious administration. A policy of gradual centralization in the management of the fortunes of the Attic sanctuaries became manifest, from the last third of the 5th century BC, when the polis multiplied the boards of its sacred officers and a new treasure was created, under the supervision of the treasurers of the Other Gods, in order to keep on the Acropolis the cash wealth of many Attic sanctuaries.

The collaboration between the boards of treasurers on the Acropolis and the capillary network of the various local administrators made the system function and last until the beginning of the Hellenistic period. But to what extent was it truly rational and coherent? At an institutional level, it had existed a certain fragmentation and overlap between various fields of competence. Moreover, Attic sanctuaries had different statuses which made it difficult to adopt a single administrative model. Finally, we must not forget the weight of demes and private associations in the administration of certain shrines, which enjoyed a shared management between the city and its components.

The interpretation of evidences from a selection of urban and extra-urban sanctuaries will allow us to reflect on the diversity of the administrative methods adopted by the polis in order to administer the sacred finances in the most efficient and autonomous way possible.

6. Manuela Mari (University of Cassino and Southern Latium), Sacred goods and local conflicts in Hellenistic Macedonia

The paper aims at analyzing the dynamics of conflicts between civic authorities and sanctuaries which were in various ways connected with the administration of sacred goods in Hellenistic Macedonia. The analysis of some well known inscriptions testifying the interventions of the Antigonid kings in this field (from within and outside Macedonia proper) will suggest further reflections on the following topics: 1. the exact legal nature of the documents; 2. the nature itself of the king' interventions (is he acting in his capacity of 'High priest' of the state?); 3. the limits of the cities' autonomy in exploiting the economic resources of sanctuaries lying in their territories; 4. the relevant economic role of at least two Macedonian sanctuaries (that of Herakles Kynagidas in Beroea and that of Serapis in Thessalonike).

7. Elisabetta Interdonato (Université Charles de Gaulle Lille 3), Fundraising systems and management of the revenues in sacred spaces: The case of the Asklepieion of Kos

The sanctuary of Asklepios in Kos, investigated by R.Herzog in the early twentieth century and subject of some Italian research and restoration in the 1930s, is one of the most clearly laid out sacred complexes in Greece and Asia Minor. After its discovery and early explorations, however, the vicissitudes of history led to the dispersal of some finds and, most significantly, the abandonment of analytical studies of a large part of these finds.

The deep research lead by the author on the entire documentation of the sanctuary has permitted to bring to light many aspects of the Asklepieion, that were so far ignored, such as the fundraising sys-
tems and the management of the revenues, that are the focus of this work. It has been possible, through an analytic study of the rich epigraphic collection, to understand the economy of this sanctuary. In fact, on one hand, several sources of revenues have been identified: collection of fines, sale of priesthood, entrance and sacrifice fees, sacred lands and animals, private donations, loans and safekeeping deposit. On the other, it has been possible to comprehend how these revenues were administered: the epigraphic evidence seems to reveal the existence of two different thesauri and of an articulate banking system.

8. Véronique Chankowski (Université Lyon 2), Sanctuaries and banking activities: Changes from the Hellenistic world to Roman influences

A lot of Greek sanctuaries made use of their financial resources by providing credit to a diverse clientele. This was a way to make prosper the cash of the sacred chest but it also contributed to engage the cities in specific financial networks. After a presentation of several forms of credit in sanctuaries, the paper will analyze the reception of this Greek conception of the public and sacred finances by the Roman power, through several epigraphical sources.

9. Francesco Camia (Sapienza Università di Roma), The economic side of Greek festivals: some examples from Roman Greece

Festivals were among the most expensive events in the religious life of the Greek poleis, and represented a substantial item in the city budget due to the involved spending (sacrifices and other rituals, athletic and theatrical infrastructure for the agones, prizes for victors, remuneration of attendants and artists). Generally speaking, the financing of festivals was secured by a combination of public funding and private munificence. In my presentation, I am going to consider the epigraphic evidence in order to highlight the specific ways by which the poleis coped with the funding of festivals. My analysis will be focused on the cities of mainland Greece during the Late Hellenistic and Imperial periods.

10. Stefano Caneva (Université de Liège), Hellenistic cultic foundations for the dead: Civic, royal, individual, and groups’ initiatives in interaction

The paper explores the interaction between different kinds of social agents in the funding and management of cult foundations for the dead in the late-classical and Hellenistic period. Textual and archaeological dossiers will be discussed in order to 1) investigate the occupation of sacred space in existing sanctuaries and other public spaces as well as the creation of new sacred places, specifically meant to host ritual practice for dead individuals or groups; 2) provide a comparative analysis of the patterns of establishment, funding and management of cult foundations pertaining to civic, royal, individual or groups’ initiatives; 3) explore the forms of interaction between various agents involved, e.g. between civic and private initiative in funding and management. When possible, these considerations will also be integrated with an evaluation of the religious status attributed to the honoured persons, with particular attention to the semantic fields of heroization and deification. Thus an attempt will be made at tracking down possible general trends of religious administration beyond local particularities, and at schematizing these configurations in a model taking into account four factors: the social status of ritual agents and recipients; the religious status acknowledged to cult recipients; the methods of funding and management; the degree of monumentalization and social impact of the cult foundations.

11. Sven Schipporeit (Universität Wien), Frauen und die Finanzierung griechischer Heiligtümer

Chr. einerseits die Rolle griechischer Bürgerinnen für den finanziellen Haushalt der Heiligtümer weiblicher Gottheiten als Stifterinnen, Kultfunktionärinnen und -teilnehmerinnen beleuchtet werden. Zum anderen widmet er sich der Frage, wie der Betrieb dieser oftmals bescheidenen Heiligtümer, deren Kulte wie im Falle der Demeter Thesmophoros aber durchaus von hohem religiösem Stellenwert für den Bestand und das Wohl einer Polis war, aufrecht erhalten werden konnte.

12. Annalisa Lo Monaco (Sapienza, Università di Roma), I mercati degli dei. Agorai e vendita al dettaglio nei santuari in Grecia

L'afflusso di pellegrini e visitatori in occasione delle feste determina la nascita di vere e proprie agorai ai margini delle aree sacre, spesso nei paraggi delle vie di accesso. In tali circostanze, si potevano vendere cibi destinati al consumo immediato (orzo, grano e cereali, frutta) e altri beni, secondo una regolamentazione precisa che vietava la contraffazione dei prodotti e tentava di salvaguardare la genuinità. Solo raramente citate dalle fonti letterarie, le agorai sono però noti sia epigraficamente (Delfi, Olimpia, Andania) sia, più di rado, archeologicamente (Olimpia). Il presente intervento si propone una rassegna completa della documentazione a disposizione, fornendo una casistica dei beni in vendita ed esaminando la regolamentazione giuridica delle operazioni inerenti il loro commercio.

13. Stavros Vlizos (Ionian University), Metal workshops, production and the sanctuary infrastructure: The case of the Spartan Amyklaion

The most notorious, according to Polybios, sanctuary in Lakonia that of Apollon Amyklaios has been located on the hill of Hagia Kyriaki around 5 km south of Sparta. This study deals with the discovery of traces of workshops inside the sanctuary, unknown until present, associated with the metal findings from geometric to archaic times. The aim of the presentation is to discuss new evidence and interpretations using an economic approach. Many fragments of bronze and iron, together with much broken pottery, were recovered in several dumped deposits near the Temple. Bits of metal, which would be found where casting of bronzes had taken place are valuable sources of information about metal manufacturing techniques and the tools used in the process. From their presence so near to the temple we infer the existence of foundry working in the temenos. There is substantial evidence that a bronze foundry existed on the site. On the basis of these indications of industrial activity, one could reasonably conclude that at least some, though certainly not all, of the metals objects found at the site were made and finished there. The sanctuary is not to be taken as an isolated phenomenon, but put into relation with the surrounding world and life of its city and region. Such edifices were seen as embellishment, closely linked to the community and polis. Therefore, questions of Land use, industry, technology and artistic production will be discussed in this paper.
factured and commissioned) it and in some cases also how it was made. This focus on the production process and the makers corresponds with the visual markers that display the materiality of the monument (different treatments of surfaces, colouring etc.). The participation of different craftsmen is also visible in the splendour of various types of decoration (painting / carving / sculpting).

The beholder is directly confronted with the production process of the grave monument while she/he should commemorate the deceased. But why? The paper discusses the manmade status of the monument that refers to the monument’s history and gives legitimation for permanent commemoration of the deceased. Economic expense and skilled craftsmanship are conditions for the monument's ambition and were therefore communicated to the beholder.

2. Andrea Celestino Montanaro (CNR - Italian National Research Council), Funerary painting and architecture in Daunia between IV and III century AC. Models and cultural influences

Some recent discoveries have allowed to be opened a new meaningful chapter in the study of painting and funerary architecture of preroman Apulia. To the scarce canosinan testimonies, already known for long time, others are flanked that have allowed to expand the geographical and cultural context. In addition, the field of the subjects represented has also been enlarged, proposing a broader case of themes and achievements that are comparable in both Greek and Campanian painting. Such attestations, in addition to Canosa, refer to settlements located north of the Ofanto River, namely Salapia, Arpi and Tiati.

The funerary painting begins in the Daunian world in the first decades of the 4th century BC and refers almost exclusively to funerary structures of emerging social classes. Indeed, at this stage, the use of chamber tombs, constructed (Arpi, Salapia, Tiati), or excavated in the natural counter (Canosa), with the use of decorative, pictorial and sculptural elements spreads. Their adoption was ornamental, but functional to a more complex language that, at least in the design and the original construction, the whole architecture tended to express. The set of the tomb and the deposed objects, and the figurative sphere to these often associated, was functional not only to the commemoration of the religious beliefs of the deceased, but also (including the development of the reference model) to the affirmation of the role played in the community from the family group of the dead.

3. Giovanna Pietra and Sebastiana Mele (Soprintendenza Archeologica Cagliari), Non omnis moriar. Strategie di sopravvivenza alla morte nella necropoli romana di Karalis sul colle di Tuviyeddu

Between the 1st and 2nd century AD in Rome there are significant ideological changes in the funeral sphere in regard to the ways in which individuals choose to represent themselves and their world of values within the community of belonging. The outcomes of this process are evident in the adoption of specific architectural and monumental solutions – together with specific images and texts - and in the composition of the public to which the messages of figurative apparatus are intended. Belong to this chronological and cultural context some of the funerary monuments of Cagliari, including the well-known sepulchres of Attilia Pomptilla and Rubellio, that were recently restored. making it possible to increase our knowledge of the ways - rituals, architectural models, artistic languages and Epigraphic texts - to preserve the memory of the people whom they were built for.

4. Ana Ruiz-Osuna (Universidad de Córdoba), De sua pecunia. The socio-economic landscape of the funerary world in Hispania

The phenomenon of funerary monumentalization appears in Rome during the 3rd Century BC, but it will not be until the end of the republican stage when it will acquire large scale. Therefore, those belonging to an adequate social sector and had enough economic resources ordered to build, for them and their families, monumental tombs positioned in a distinguished topographical position. But, how much could a funerary monument cost? Or, in the other words, how much would a Roman be willing to pay for it?

According to historical and ephigraphic sources, the price of a tomb could fluctuate between some hundreds of sesterces (the equivalent to a small niche in a columbarium in Rome) and a million; before
adding, in many cases, the extra cost of the terrain, the funeral, commemorative rites or regular offerings. Given the scarcity of available direct sources informing about the costs, and the difficulty to compare them with archaeological reality, only very few researchers have approached these historic-economical matters. Some pioneer scholars must be highlighted, such as R. Duncan Jones (1962; 1974); and N. Purcell (1987). Given these precedents, and assuming as our basis all those essential aspects for the understanding of the socioeconomic environment of this period and its reflection within the funerary world, we present the preliminary results on the topographic distribution and economic and statistic study of the funerary space in Hispania.

5. Tatiana Ivleva (Newcastle University), The Power of Hands: Decoding Non-verbal Knowledge Transfer on the Roman Provincial Tombstones

In Roman provincial funerary art one can encounter a variety of bodily movements and gestures, showing the interactive nature of these acts: the deceased were depicted with a staged gesture proclaiming a certain meaning to viewers, which added emotional color to the written words of an inscription. The present paper presents the analysis of gestures of hands on ca 500 funerary tombstones found in the Roman provinces of Noricum and Pannonia and dated to the late first-third centuries AD. It decodes hidden meanings behind particular gestures used within the non-verbal medium of stone monuments and proposes that various gestures on tombstones were applied as a form of narration to project messages to the audience. It, thus, challenges the complementary role of hand gestures depicted and exposes their power and impact as meaningful signifiers. The contemporary scholarship often sees these gestures on Norican and Pannonian tombstones as being signs of Roman citizenship, intellectual superiority, or social status and often accredits them with being attention-getting. The present paper suggests, in contrast, that some gestures may not have been Roman in nature but a consequence of previously-established un-Roman gestures, appropriated into the local set of values and norms.

Panel 7.6 The Economy of Palmyrene Burial and Death

Organiser: Rubina Raja (Aarhus University)

Wednesday | 23 May | 17:00-19:00 | HS VIII

Panel abstract

The aim of this session is to discuss the economy of death and burial in Palmyra and show the wide range of representations and production economy processes in Palmyrene funerary contexts. Funerary towers, hypogea and temple tombs were significant markers in the landscape and large necropolis stretched around the ancient city. An impressive high amount of portraits has been produced between AD 50 and AD 273, when Palmyra was sacked by the troops of the Roman emperor Aurelian. Many examinations of the identity of Palmyra's inhabitants, the history and archaeology of the city have been undertaken. Different influences from Greek and Roman cultural spheres can be detected. Simultaneously, influences from the Parthian realm are very profound in the Palmyrene visual culture. Such influences from a broad range of cultures came together in the local portrait tradition of Palmyra. The portraits show a wide range of variety in style. Whereas investigations on individualization and the importance of representing status and family relations have been pursued, the theme of economy in the funerary sphere has been under researched. Therefore, the topic of this session will focus on the organization of economy of death and the processes involved in this economy. This might enable us to understand the means of representation and answer questions about large-scale production and individualization: Did the carvers create an image that suited the wishes of the costumer or was the costumer restricted to buy a portrait off-the-shelf with little influence on facial features and the chosen attribut-
es? We do know that the local limestone was used in the production of portraits, but where did the knowledge of carving come from? By examining the portraits and asking questions about identity and individuality, we are able to obtain more knowledge on the requirements and the functioning of the Palmyrene market. This will lead us to a better understanding of the economy of the death and the cult around death in Roman period Palmyra. The speakers are connected to the Palmyra Portrait Project, which is funded by The Carlsberg Foundation. The project has compiled the most complete corpus of Palmyrene funerary sculpture in a specially designed database. The database now consists of more than 3000 portraits. The Palmyrene material is the largest corpus of portrait sculpture of the Roman world outside of Rome itself.

**Paper abstracts**

1. Rubina Raja (Aarhus University), Production processes: The relationship between tomb architecture and the funerary portraiture

   Through a study of the relatively few in-situ contexts (a bit more than 100), which remain in the graves in Palmyra, this paper will address issues of the relationship between tomb architecture, decoration and the installations of the funerary portraiture in the graves. It is clear that there from the introduction of the earliest tomb type in which portraits were put up, namely the tower tomb, was a relationship between grave type and commemoration type (the portrait). Architectural shape and commemoration form went hand in hand. While the in-situ contexts, in terms of how the portraits might have related to each other within the graves, have been dealt with elsewhere (Krag and Raja forthcoming), it has not been addressed in which ways we might begin to trace production processes and chains from architecture, over decoration of the graves and the installation of the funerary portraits and/or sarcophagi. Until now it is not clear in which ways, if at all, these steps of planning and production might have related to each other. Did the commissioner of a grave already have a decorational scheme in mind when ordering a grave monument? And how did the various elements of the decorational schemes including the funerary portraits relate to each other? May we begin to disentangle the relationship between workshops, which would have been involved in the various steps of the process, by studying the in-situ contexts in detail?

2. Julia Steding (Aarhus University), Tracing production processes in the Palmyrene funerary sculpture

   When studying the surface of the Palmyrene loculus reliefs in detail, either more or less obvious traces of tools can be detected. The parallel grooves of the tooth chisel, single and multiple drill holes, abrasion of a rasp or the carving traces of the flat chisel – all these marks can be seen on the portraits and during the three centuries, the production techniques seem to change and adapt to the styles that came into use. Some of these changes will be discussed in two case studies, outlining the tooth chisel and the rasp, how the traces of these two tools look like on the Palmyrene portraiture and which chronology we can be built upon them. The question why the production techniques changed will be discussed all along. This includes a breakdown of production processes, which are essential when studying the making of reliefs or other carved stone products. Of course, every carver had an individual way of working but general processes can help to understand the sequence of tools and why they have been used or not used. The conscious choice of tools and also of the state to which a portrait was carved can add valid information to the stylistic analyses that have been done in the last centuries and years.

3. Olympia Bobou - Christian Svejgaard Lunde Jørgensen (Aarhus University), Foreshortening or sculpture trait? Placement of loculi reliefs inside Palmyrene tombs

   Often in Palmyrene funerary reliefs the head appears large in relation to the body, while the arms appear smaller. This phenomenon has been described as foreshortening. We would like to investigate the reasons behind the use of foreshortening, and the connection between foreshortening and the production economy of Palmyrene funerary reliefs.

   One way of investigating if the phenomenon influences the production procedure is to examine whe-
ther foreshortening was used in other reliefs, i.e. votives. Another is to examine the location of reliefs inside the tombs. Unlike contemporary painting, where foreshortening functions as a means of giving the illusion of an object receding further into the background, our hypothesis is that foreshortening functioned as a way of accentuating parts of the figure in funerary art. By comparing funerary with votive reliefs we can test if it was a salient feature of funerary sculpture. If so, then it can be understood as having an active influence on the production process, and formed a specific choice. The next question is whether this was a choice of the sculptors, and formed part of their sculptural repertoire, or if it was prompted by the patrons, i.e. people buying and setting up the reliefs in the tombs. By examining the location of the reliefs, it may be possible to examine if foreshortening was used for the sake of creating visual impact, something that could imply that the reliefs were commissioned for specific locations inside the tomb. In order to test the hypothesis, we will be conduct a case study.

Panel 7.7 Can the City Afford that God?

Organiser: Anna-Katharina Rieger (University of Erfurt)
Johanna Stöger (Leiden University)

Thursday | 24 May | 09:00-13:30 | HS X

Panel abstract

The session seeks to explore the Roman city through the economic dynamics created by the mutual constitution of urban and religious space. Religion has always had a strong physical presence in the ancient city through objects, images, sounds, smells, dress, and above all through buildings and spaces designated to cultic practice and the gathering of people. The Roman city was characterised by the plurality of religious groups and practices, all negotiating, squatting, appropriating and repurposing urban space. One could even claim that the processes of diversification, along the entire spectrum of applied religion (for the civitas, for the emperor, or by individuals), gradually transformed the Roman city into a microcosm of socio-religious interaction with marked economic implications. This transformation might have reworked existing notions of solidarity and connectivity within a city, as well as modifying socio-economic structures for competition and organisation. Moreover, the religious landscape constantly was in dialogue with the physical urban infrastructure. In turn, this plurality of voices was influenced by social and above all economic forces. Of particular interest are points of intersection between the urban infrastructure, the city’s economic life, and religious and/or cultic establishments (e.g. sanctuaries, temple areas, shrines, and temporarily dedicated spaces). These include processions, briefly appropriating public space and the wider urban territory, as well as burial places and funerary practices as hubs for integrating the economic functions of the suburbium. We also seek to shed light on the interactions between residents, religious bodies and civic governance, either conflicting or reconciling in their negotiations. Cities, as places of interactions on various levels, allow for the merging of religious, social and economic practices. In this wider context various topics can be discussed: How do sanctuaries and temples function in the competitive environment of a city? How can religious groups negotiate the urban spaces? How do scholae of collegia reflect economic interests within the urban web? When are civic spaces the stages for religious activities, and who invested in them? How can religious and economic infrastructure be related to or manifested in urban space? How do cities affect religious changes or vice versa; how are these changes related to the economic ups and downs of cities?
Paper abstracts

1. Marlis Arnhold (University of Bonn), Religion in the urbs: Defining the special case of Imperial Rome beyond the political centre

The contribution analyses cults and sanctuaries in the city of Rome during the Imperial period beyond the major monuments of the political centre with the Forum Romanum, the Imperial Fora, the Capitoline Hill, and the Campus Martius. So far, mithraea and some other cult-sites, such as the so-called Sanctuary of the Syrian Gods or the Fountain of Anna Perenna received attention in scholarship as individual monuments or under the notion of specific cults. Their integration into urban religion, however, has hardly been discussed. Furthermore, one must ask which other cults were present in the city of Rome which after all provided an extraordinary density and composition of population that in some way or the other was reflected in a multitude of cults. The worship of the gods of Jews and Christians spring to mind but only form two examples out of more that certainly existed and played a role in urban life. How visible, how perceivable were these in the city? Which role did these cults play in urban life and communication (i.e. representation, creation of social identities)? How did various cults work together? How are cults, trade, economic production and, at times also, politics intertwined in sense of functional spaces? Thus changing the perspective on urban religion, not only an eye is cast on the urbs beyond its well-known political monuments but also the question is raised anew, what makes Rome special as a city? Or do we find the same patterns of urban space as elsewhere?

2. Dorothea Rohde (Universität Bielefeld), Sacred, public or private? Financing the cult of Isis whithin the Roman city

Isis was among the most popular deities of Hellenistic-Roman times. Her cult was attractive because she was deemed omnipotent, queen of the gods, ruler of the sea, the goddess with many names; she promised wealth in this world and salvation in the afterlife. Her cult belongs to the so-called mystery cults and was characterized by an unusual emotional relationship between goddess and devotee. Her main festival opened the seafaring season and therefore was highly important for long-distant traders and for harbor towns in general. Additionally, the emperors showed special interest in the goddess. The cult of Isis, thus, offered a platform for interactions between individual worshipers, cult-associations, city-community, and emperors that had significant religious, economic, and social consequences. To gain new insights into the intermingling of these different levels, an economic perspective is chosen: How was the cult of Isis with its temples, rituals, and priests financed? Which religious, social, and political implications did arise? Taking the temple at Pompeii as a starting point, the epigraphical and archeological evidence of Imperial Italy will be examined in order to provide a better understanding of the Roman city as a place were social, economic, religious, political, and agents interact.

3. Anne Kleineberg (Christian-Albrechts-Universität zu Kiel, CAU), The Forum Boarium and Hortorum in Rome – Their religious, social and economic significance until the early imperial time

Since early times the two Fora had been important market places and economic transfer points nearby the Tiber port and connected to the transregional road system. Although the emergence of cult places and their interrelation to commercial activities has been pointed out in general, previous investigations concerning the two Fora often dealt with their mercantile function, single monuments or focused on cultic activities and festivals only. Focussing on the republican and early imperial era the casestudy will take these different aspects into account and analyse systematically how religious and economic practices interact on various levels, even if important earlier developments must be considered too. The different cult places for Hercules will be of particular interest as traders not only vowed the decuma of their profits to him, but could have been the dedicators of a new temple too. Moreover the Forum Boarium is connected to several public festivals and cultic activities as the annual sacrifice at the Ara Maxima Herculis, followed by a common sacrificial banquet. In addition the triumphal procession crossed both Fora in later times. Due to the erection of temples and porticos from middle republican time on, the market place of the Forum
Holitorium increasingly shrunk and had been transformed to a magnificent road framing the triumphal route step by step.

4. Charlotte Potts (University of Oxford), Fora as Urban Sanctuaries: Continuities in Form and Function

A connection between temples and communal spaces was a long-lasting tenet of Roman urbanism. In Rome itself, examples including the Temple of Mater Matuta in the archaic Forum Boarium, the Temple of Saturn in the republican Forum Romanum, and the Temple of Mars Ultor in the imperial Forum of Augustus show that a close relationship between cult buildings and places of assembly existed in a variety of periods, political systems, and physical settings. The temple and portico arrangement of early imperial fora closely resembles the architecture of republican sanctuaries, and plans of central areas in settlements including Minturnae, Tarragona, and Leptis Magna in the imperial period represent the extent to which this pairing was replicated even beyond Italy. Although fora and sanctuaries are usually regarded as distinct architectural complexes, this analysis will show that they shared many formal and functional elements over the period that stretches from their emergence in the sixth century BC to their proliferation in the first century AD. A series of case studies will demonstrate that cult structures were a consistent feature of open spaces concerned with displays of status and power, and that consequently an association between communal spaces and cult buildings can be viewed less as a product of Roman ideology than part of an older, broader Italic phenomenon that was gradually subsumed by its dominant culture.


Aim of this paper is to present the different ways in which various agents of a city (political actors, priesthood, collegia, immigrants and inhabitants) claimed urban space through religious practices. The focus will be set on ephemeral religious events, such as processions and festivals, which are considered as urban marketing strategies (von Borries). On the one hand these marketing strategies were used by political leaders to legitimize their power, when for example curule aedils organised chariot races in the circus. However, on the other hand they were also used by religious entrepreneurs to compete with other cults and to attract new adherents. Processions, for example, offered the Mater Magna priests the only possibility to annually perform their pivotal ecstatic dance in public visibility. As religious activities beyond sacra publica were not financed by the city administration, the urban marketing strategies were vital for any practitioner living on religion by organising worship of a specific deity. The paper will also take individual strategies of claiming urban space into account, such as single devotees of Isis, which propagated the cult in the neighbourhoods (Seneca).

I will approach the topic by a comparative study of Mater Magna and Isis cult in imperial Rome based on archaeological and literary evidence. The focus will be on urban topography, architecture, visual culture (coins, reliefs) and literary sources.

6. Kristine Iara (American Academy in Rome), Appropriating space in urbs and suburbium

The proposed paper, part of a larger research project on Rome's pagan sacral topography, deals with the relationship between urbs and suburbium as regards religion and religious life in Rome, presupposing that, in terms of the traditional Roman religion, urbs and suburbium were interdependent and complementary parts of Rome's sacral topography, constituting one coherent area of ritual activity. The paper's chronological focus is on Late Antiquity, a period of manifold and profound transformations, affecting both Rome's physical appearance and the civic and religious life of its inhabitants. In the face of these transformations, a core issue is whether the statement of the interdependence and complementarity of urbs and suburbium proves valid for the late antique period as well. The question of the interrelations of inner and outer city-space on a religious level must be addressed from a larger angle of view, as the impact of a relatively new religious group, the Christians, must be taken into account. The paper addresses, first, how the coexistence of these religious groups affected the space. Can we observe any shifts or changes in its perception, conception and use? Can we observe a competing ap-
propriation of space? Or, rather, shared spaces, appropriated temporarily and rendered sacred when required? Secondly, the paper inquires on religious activities and continuous investments, now subject to changing economic conditions, in these interrelated areas, urbs and suburbium.

7. Maura Medri (Università di Roma Tre), The long life of an extra-urban sanctuary: the Bona Dea sanctuary in Ostia (Regio V, X, 2)

One of the oldest sanctuaries in Ostia was dedicated to the goddess Bona Dea, and the sanctuary located in Regio V, X, 2 is one of two known temples to the goddess in the city. Excavation here yielded three dedicatory inscriptions offered by three female worshippers and donors, named Octavia, Valeria Hetera, and Terentia. While these inscriptions date between the 1st century B.C. and the 1st century A.D., the sanctuary itself existed much earlier than this and continued into the Late Antique period, when the city changed irreversibly and the sanctuary was destroyed. The recently edited study on the adjacent Terme del Nuotatore (Baths of the Swimmer, Reg. V, X, 3) has offered the opportunity for a new analysis of the sanctuary’s nine building phases. This fresh reading of the sanctuary’s long life offers an opportunity to re-analyze its relationship both with its neighboring buildings and with the wider city’s socio-economic development, through its diverse time periods.

8. Iskander Renato Gregoire Echnaton Sonnemans (Leiden University), The Mithras-scape: a case-study from Ostia Antica

Within the plethora of Roman cultic practice the Mithras cult took an exceptional role. In contrast to almost all other cults, cultic activities, and their associated material expressions, were focused internally. All cultic space was private and only accessible to initiates. This was a conscious strategy that appears to have helped popularize the cult. This does however not mean that the Mithraic cult places (mithraea) should be seen as isolated nuclei that functioned independently from their larger urban and social contexts. In this paper the relationship between Mithraic cult and its urban (socio-economic) context is explored through a number of case-studies from Ostia. The nature of this site offers us interesting lines of enquiry to examine this concurrence of social, economic and cultic demands on Roman society. By looking at the way Mithraic Cult sites interacted with their built environments, combined with the material contents of the cult places themselves, a better understanding of the cult’s larger socio-economic impact can be achieved. Contrary to the cult’s inward focus and its display of privacy, its socio-economic implications carried much further within the groups adhering to Mithras. It can be suggested that mithraea formed spaces of interaction and stages for self-promotion in various ways that extended beyond the confined cultic space.

9. Winfried Held (Philipps-Universität Marburg), Zur Deutung und Finanzierung der ‚Roten Halle‘ in Pergamon

errichtete kolossale Heiligtum, ebenso wie die kolossalen Neokorietempel Hadrians etwa in Kyzikos oder Ephesos, wohl maßgeblich auch vom Kaiser finanziert worden sein.

10. Aynur-Michèle-Sara Karatas, Cults, money, and prestige: Cultic offices as means of prestige for leading families in Asia Minor

Several inscriptions from the Greek East dating to the Hellenistic and Roman periods reveal that the cultic officials financed festivals and banquets. Cultic officials were members of leading and wealthy families who held the most significant cultic and public offices in their cities.

My paper aims to classify the inscriptions from Asia Minor through a structured approach. The inscriptions demonstrate that the leading families in Asia Minor did not favour all cults. The question arises why some cults were more favoured than others. The expenses for cults changed over time. The Roman rule did not only change the political features of Greek poleis, but also the religious landscape. Some cults were favoured by Roman rulers. This also changed the expenses for certain cults and the immense sum of money given to the sanctuaries. One of my objectives is to analyse the sum of money given by leading families to certain sanctuaries and how this money was used during the Hellenistic and Roman periods. My research and analysis is focused on the epigraphic and archaeological material.

Panel 7.8 Consumption of Local and Imported Goods in Palaestina in Roman and Byzantine Times

Organiser: Jon Seligman and Itamar Taxel
(Israel Antiquities Authority)

Wednesday | 23 May | 17:00-19:00 | HS XII

Panel abstract

The proposed panel, designated for the session on Consumption, focuses on the province of Palaestina in Roman and Byzantine times (first to seventh centuries CE). It presents several case studies, which reflect the consumption of locally-produced and/or imported goods by a variety of populations living in rural, urban or other settings. Three of the panel's papers will demonstrate the consumption and production of foodstuffs and agricultural goods by local and foreign communities in a specific region or site during times of relative peace (Seligman; Ashkenazi and Aviam) or political turbulence (Stiebel). The three other papers will discuss the consumption and use – including reuse and recycling – of various architectural media, be they building materials or stone objects, decorative elements or liturgical furnishing. The latter cases will be examined within the context of a specific period or consecutive periods in a given site (Gendelman and Gersht) or region (Habas), or from a cross-regional perspective (Taxel). Altogether, the suggested panel provides an opportunity to publicly discuss various aspects of consumption, some are unique to Roman-Byzantine Palaestina while others are familiar from other regions but have not yet been systematically studied locally.

Paper abstracts

1. Jon Seligman (Israel Antiquities Authority), Production and Consumption in the Hinterland of Jerusalem in the Byzantine Period

Like any city, in any period, a symbiotic relationship existed between Jerusalem and its hinterland. Byzantine Jerusalem was a prosperous city, public investment leading to population growth, stimulating demand for agricultural goods and in turn to more pilgrims, who would spend their money in the city. Jerusalem was characterised by a huge religious sector servicing the many cultic institutions of the city and this required an efficient surplus agricultural sector to feed so many non-productive people. The lecture will concentrate on strategies of agricultural production as they are expressed archaeologi-
cally, with specific attention paid to olive oil production, capacity and consumption. Given this data, an attempt will be made to judge the nutritional and subsistence capabilities of the hinterland of Jerusalem in order to assess if autarkic sustenance for the population of the region was feasible. Furthermore, given the lack of an integrated settlement infrastructure in the environs of Jerusalem in the Roman period, attention will be given to the development of the agricultural coenobium as a system that could guarantee a food supply for the large urban population that evolved in Jerusalem during the Byzantine period.

2. Jacob Ashkenazi and Mordechai Aviam (Kinneret College on the Sea of Galilee), The Contribution of Monks and monasteries to Rural Economy in Late antiquity: The Galilean Test Case

Monasticism is known to have introduced a significant role in late antique Christianity. Studying monasticism through the lens of hagiography alone can distort the understanding of the overall picture of monastic life in the Christian orient. Archaeological surveys and excavations in the Levant in recent years, and in Galilee in particular suggest that monasticism played a prime key role in the economic prosperity of the 5th-6th centuries of the Levant. Rural monasteries were located inside the village or within a short walking distance from it and most of them contained industrial facilities whose production exceeded the needs of the local monastic community. The rural economy of late antique Galilee was mainly based on olive oil and viticulture. It would seem that the monasteries, in addition to their given and obvious spiritual and surely religious functions, also served as part of the region's economic and industrial infrastructure, thus creating and substantiating complex and lasting connections between them and the villages that surround them. By emphasizing on the monastic production of olive oil and viticulture we will suggest a new outlook on rural economy in the Galilee in Late antiquity.

3. Guy Stiebel (Tel Aviv University), The Taste Case of Masada. From Noble Cuisine to the Diet of Refugees

Whether the famous saying that the way to one's heart is through their stomach is correct or false, it is nonetheless evident that one of the most efficient ways to learn about the economy and social aspects of a given society is via the examination of its diet. The excellent preservation conditions at the site of Masada, Israel offer an ideal opportunity to unveil both the royal diet of King Herod the Great (37–4 BC) as well as that of the rebel community which sought asylum at the site during the First Jewish Revolt against the Romans (AD 66–73). In addition to a rich assemblage of ostraca and tituli picti, the renewed excavations at the site, that commenced in March 2017, has harnessed microarchaeological methods which shed much new light on this issue. The paper aims to provide an intimate insight into the pantry of King Herod the Great that not only reflects the costly taste of the king but also reveal the network of his connections and political ties that drew way beyond the boundaries of his kingdom. In addition, new results regarding the flora that was cultivated in his gardens/plantations will be presented. Lastly, a glimpse into the “poor people's food” or the way the rebels’ community coped with the food insecurity during the revolt will be discussed.

4. Lihi Habas (The Hebrew University of Jerusalem), Imported Marble and Local Production of Liturgical Furniture in the Negev: A Case Study

Hundreds of liturgical furniture and vessels made of marble or local limestone or Bituminous Schist, complete and broken, have been found in the churches of the Holy Land (Provincia Palaestina Prima, Secunda, Tertia and Provincia Arabia). The liturgical furniture included chancel screen, an ambo, altar table (sacra mensa), ciborium and reliquary. The marble elements were standard products created in the imperial workshops in Proconnesus Island in the Sea of Marmara. These were exported by marine transport during the reign of Justinian to the entire Byzantine world. This lecture will focus in the Negev region which belonged to Provincia Palaestina Tertia. In this desert and semi-desert area, villages and towns developed along the trade routes that crossed the desert from the east to the ports of the Mediterranean already under The Nabataean Kingdom and Roman period. But in the Byzantine Period there has been a significant increase in the population, the cities grew, many churches were built, agricultural activity expanded, mainly wine production and the area benefit-
ed economically from the movement the journeys of pilgrimage from the Holy Land to Egypt and Sinai. The lecture will focus on the liturgical furniture made of imported marble which found in the Negev, its impact on local production alongside unique local creation.

5. Rivka Gersht (Tel Aviv University and Oranim College of Education) - Peter Gendelman (Israel Antiquity Authority), Architectural Decoration in Roman and Late Antique Caesarea Maritima: Production, Importation and Reuse

The excavations at Caesarea Maritima, the capital of the province Judaea, later Syria Palaestina and Palaestina Prima, provided a huge amount of evidence for local production of architectural decoration out of raw and recycled materials. The two workshops excavated in the 1990s — one for producing floor mosaics, the other for producing wall sectile panels — provide valuable data regarding the working process and methods of production. Tool marks offer evidence for employing of almost all known tools and methods of production including water powered multi-blade sawing machines. The vast majority of the architectural decoration was made of imported stones including marbles, limestones and sandstones in a variety of colors, of granite, of porphyry and of conglomerates. Recycling and reuse of architectural members became common practices in Late Antique Caesarea. Excellent examples for these practices are the Semi-Public Complex located within insula W2S3 at Caesarea and the Bathhouse at Khirbet Jābir in the vicinity of Caesarea, wherein all survived architectural decoration was made of Roman columns, bases and cornices, which were likely brought to the site from the city of Caesarea. The paper will present the mentioned evidence and more.

6. Itamar Taxel (Israel Antiquities Authority), Reuse and Recycling of Architectural Elements and Stone Objects in the Countryside of Late Antique Palestine

Much scholarly attention has been given to the subject of reuse and recycling older architectural elements (spolia) in Late Antiquity (fourth to seventh/eighth centuries) across the Mediterranean, especially within the context of urban or otherwise monumental architecture. This includes also a handful of studies on urban and a few rural public structures in late antique Palestine. However, the potential of the rich archaeological data related to the countryside of late antique Palestine to shed much new light on the phenomenon of spolia reuse and recycling remained largely unexploited. A review of the published and some unpublished excavations of rural sites across the country points to two main types of spolia utilization: 1) architectural elements which were reused for a designation similar to their original one; 2) architectural elements and other stone objects (such as sarcophagi and millstones) which were reused for a designation different from their original one. The latter category includes also the practice of recycling, in which a given item has totally lost its original identity while becoming a raw material in the construction of a new element/structure. This lecture will discuss these practices, which contribute not only to the study of building techniques and materials in late antique rural Palestine, but also to the understanding of contemporaneous world-views, mentalities and economic choices.
Session 8: The Role of the City in the Ancient Economy: Urban infrastructure, relations between town and country

Panel 8.1 The Storage in Urban Economy: Rome and its ports

Organiser: Evelyne Bukowiecki (École française de Rome) and Milena Mimmo (Aix Marseille Université)

Thursday | 24 May | 14:30-16:30 | HS VI

Panel abstract

In recent years, many studies have been devoted to the warehouses of the ancient world, but only recently have the close links between storage facilities and urban economy begun to be reconstructed. In each city, the warehouses have played a central role in urban supply dynamics, capable of receiving and storing goods for relatively long periods. Control of the widespread distribution of goods, both incoming and outgoing, was based on a complex network of storage infrastructure. The city of Rome is of course the most emblematic case of this challenge of supplying the urban economy. With more than 1.000.000 inhabitants, the Urbs had to ensure the supply in adequate quantities and the proper preservation of all those goods necessary for the functioning of a metropolis: from essential foodstuffs such as the frumentum, oil, legumes, wine and salt; the most precious and delicate goods such as textiles, papyrus and spices; but also other basic raw materials such as fodder for animals, firewood and building materials. The goods came long distances, along the Mediterranean trade route, but also from more local areas, along the Tiber River, its tributaries, and also via the road network. Some of the merchandise actually represented provincial taxes being paid in kind. Several sources report that all these goods, and many others, were contained in the warehouses of Rome after having transited in the warehouses of its ports, in particular Ostia and Portus. They arrived in the city under the control of the State or by free market, in order to satisfy the needs of the population on the one hand and to meet the market needs on the other. The extent and the strategic distribution of storage areas, the high architectural specialization and the monumental size of the warehouses, the planning of the port system between sea and river, as well as the amount and variety of the goods moved, the cooperation between State and private and the economic interests brought into play, makes of Rome a unique case study in the history of urban supply. In the light of new research and the latest reflections on Roman warehouses, we can trace the entire chain of supply of goods toward the Urbs, but also better appreciate the efficiency and articulation of the infrastructures needed to do it.

Paper abstracts

1. Milena Mimmo (Aix Marseille Université, CNRS-Centre Camille Jullian – LabexMed), Rome. The urban warehouses and the storage topography

I magazzini urbani della città di Roma offrono un punto di vista privilegiato sulla questione dell’approvvigionamento in merce di una delle metropoli più grandi del mondo antico. Una recente ricerca ne individua circa 200 all’interno del perimetro urbano e permette di chiarire vari aspetti sul loro funzionamento nei vari periodi. La distribuzione topografica degli edifici sottolinea una netta distinzione funzionale tra il contesto urbano interno e quello fluviale. Sebbene, infatti, quasi tutte le Regiones fossero dotate di magazzini, quelle comprensive di riva fluviale furono attrezzate per funzionare come veri centri di stoccaggio, ognuna con una propria peculiarità. Con un’efficace organizzazione delle rive (banchine, magazzini, discariche), la fascia fluviale si configurò come “diaframma” per le merci sbarcate e momentaneamente stoccate, prima della loro entrata in città. In questo articolato sistema, ciascun settore rivierasco era
destinato alla ricezione di specifici tipi di merci, provenienti dai porti marittimi o da quelli fluviali a monte della città.

Estremamente interessante risulta dunque seguire i percorsi delle merci, sia nel contesto urbano interno che in quello fluviale, analizzando le interconnessioni tra magazzini e altri tipi di edifici: da quelli dedicati alla vendita, ai grandi edifici pubblici; dagli edifici residenziali a quelli per le distribuzioni assistenziali.

2. Evelyne Bukowiecki (École française de Rome), The storage architecture in maritime ports of Rome (Ostia and Portus)

L'architettura dello stoccaggio a Roma e nei suoi porti, sia marittimi che fluviali, è stata l'oggetto di varie recentissime indagini archeologiche. I risultati finora raccolti permettono di definire con sempre più precisione le specificità di quest'architettura utilitaria, sia a livello delle caratteristiche tecniche delle singole celle che nella pianificazione dei importanti cantieri che hanno permesso di assicurare alla capitale dell'Impero un approvvigionamento delle merci regolare ed efficiente.

Attraverso una curata presentazione dei dati nuovi, per alcuni ancora inediti, l'intervento proporrà di paragonare due casi emblematici recentemente indagati: i Grandi Horrea di Ostia e i cosiddetti Magazzini Traianei di Portus. Saranno evocati in particolare i dati raccolti sull'organizzazione dei due cantieri, sulle soluzioni tecniche scelte per la conservazione delle derrate come l'uso dei pavimenti sopraelevati e le proporzioni specifiche delle celle, sulla manutenzione dei magazzini e la gestione dell'acqua necessaria all'igiene dei locali e infine, sulle capacità di stoccaggio e sulla circolazione delle merci e del personale all'interno e all'esterno di questi due importanti elementi dell'articolata rete di rifornimento dell'Urbs.

3. Andrea Guaglianone (Università di Venezia "Ca' Foscari"), The Grain Circulation System within the Urbe: Contextualising the frumentationes in the Urban Texture of the Regio IX

In this paper I will try to examine how the monthly distributions of free grain to the urban citizens of Rome worked, trying to contextualise the service within the urban texture.

Starting from the already well-known problem of the two porticus Minuciae (the vetus one and the frumentaria one), I will try to investigate the original aspect of the buildings where they took place from the Republican to the Imperial era, by means of a new comparative approach involving the archival data (from 1884 to 1941) and the nowadays archaeological evidences. In this regard, reasoning about the connection between these buildings and the urban evolution of the part of the Regio IX where they were, it could allow to reconstruct the relationship between the distribution's operations and the infrastructures of the area. Therefore, the aim of this paper is to try to explain how the distances between the place of distribution and the storehouses known were covered by streets and passages in a problematic system that had to allow the contemporary presence of the crowd of the plebs frumentaria, the staff of the service and the users of the neighbouring buildings. At last, thanks to a bottom-up perspective of the matter we will be able to understand the relationships and the links between the Minuciae and the other important buildings of the area, like the Circus Flaminius, bringing new light above the question of the connection between the distributions, the ludi and the triumphal processions.

4. Alessia Contino (Soprintendenza Archeologia, Belle Arti e Paesaggio di Roma), Rome and urban wastes: a problem of storage, elimination and reuse

Sistemi di stoccaggio, riuso e eliminazione dei rifiuti sono ampiamente documentati nelle città antiche e hanno costituito una questione rilevante anche a Roma, una tra le città più popolose del Mediterraneo. La gestione dei rifiuti urbani doveva assicurarne lo smaltimento e garantire l'igiene pubblica con un sistema misto di eliminazione e reimpiego. In particolare i rudera, frammenti ceramici e edili, venivano reimpiegati nei materiali da costruzione, trasformandosi così da problema a risorsa cittadina, mentre una parte dei residui organici veniva impiegata nell'agricoltura, nei combustibili e nelle manifatture. La possibilità di poter confrontare alcuni contesti romani (Mercato Testaccio, Monte Testaccio, Via Sacchi) permette di individuare discariche con differenti funzioni e tipologie costruttive: discariche «non selezionate», destinate genericamente allo smaltimento dei rifiuti, costituite da materiali vari (ceramici,

Oltre a definire il sistema di gestione dei rifiuti, lo studio dei materiali provenienti dalle discariche risulta inoltre particolarmente interessante per la ricostruzione della circolazione e del consumo delle merci nelle città.

5. Giulia Boetto (CNRS), Loading and unloading: sailing up the Tiber to Rome

This paper will focus on research questions on the loading and unloading of ancient wooden vessels: the sailing maritime ships that arrived carrying different cargoes in the maritime harbours of Ostia and Portus, as well as the smaller ships, called naves caudicariae, towed up to Rome through the Tiber river. All these vessels, characterized by different structural elements, shapes and sizes, were the principal food suppliers of Rome.

If the way of arranging within the sailing maritime vessels the ceramic containers (mainly amphorae) used to transport liquid foodstuffs (wine and oil) is well known for Antiquity due to the underwater excavations of a large number of ancient shipwrecks found in the Mediterranean, the question of loading and unloading one of the most important food supplies, the cereals, is subject to discussion. This paper will attempt to propose new hypotheses about this important research question, based mainly on the study of parallels from the analysis of post-medieval, as well as modern textual and iconographic sources.

The paper will also discuss the relationship between harbour structures, quays and warehouses, food supplies and ships though two case-studies: the Grandi Horrea at Ostia and the so-called Magazzini di Traiano at Portus.

Panel 8.2 Agrigento: Archaeology of an ancient city. Urban form, sacred and civil spaces, productions, territory.

Organiser: Luigi Caliò and Giuseppe Lepore (Università di Bologna)

Thursday | 24 May | 09:00-13:30 | HS XI

Panel abstract

Every ancient town with its own buildings, its executive and production structures constitutes a model for common living, being an administrative and operational point of reference for a wide portion of the territory.

The most recent researches carried out and coordinated by the Parco in the site of Agrigento, in cooperation with a number of Universities, are defining a more concrete profile for Akragas/Agrigentum, as a unitary and integrated system eligible, on a large scale, for community needs management: from public spaces to private ones, from facilities to cult places, from necropoleis to production sites, from the exploitation of the chora to the handing of the port areas - all the most important political and economic functions correspond to the urban system. Particularly, the plan of the city is newly interpreted, along with the profile of sacred and civic areas, the inhabited and the production places and ways, from archaic period to Late Antiquity; economical organization is shed a new light, as it is investigated according to archaeological evidence, no more only through literary sources or the magnificent architecture of the Valley temples.
1. Oscar Belvedere and Aurelio Burgio (University of Palermo), Il territorio di Agrigento

The aim of this paper is to present the methodological approach and results derived by different projects focused on archaeological survey. The first one is an intrasite survey, and it regards the city of ancient Agrigento and its surroundings. The others regard the territory near Agrigento, both in the East, where the University of Palermo has carrying out the “Cignana project”, and in the West, where the study of ancient landscapes is conducted by a series of thesis; it needs to highlight that all these researches use the same methodological approach.

The Agrigento project is articulated in several phases: first of all the realization of a GIS platform, using the software ArcGIS Desktop (8.3), in which we inserted several layers, particularly the marks detectable by remote sensing. The second step was the fieldwork, carried out in the 2008-2010; the realization of excavations and the study of potteries and other remains from the fieldwork are the later steps. The fieldwork was carried out using intensive and systematic approach, noting density and distribution of archaeological remains (potteries, structures and architectural fragments), collecting selected wares, significant from cultural and chronological points of view. These data allowed us to made thematic maps as “visibility map”, “archaeological map”, and “field density map” (tipically referred to density of pottery in a square meter), and finally a “chronological map” that could be a starting point for next researches. The preliminary results regard both the urban and the sub-urban areas. The excavation in the urban area of Agrigento close to Poggio Meta/San Marco (NW of the public area of Poggio di S. Nicola) is part of this project; it was integrated with tomography and georadar, and with finalized orthophotos made by drone. In the fields outside the ancient city, the survey documents several kinds of sites, some still unknown, like farms and crafts areas.

The other projects analyze some well defined contexts, around the roman villa of Cignana, and in areas close to the Mediterranean coast (particularly between the modern villages of Siculiana and Montallegro). The archaeological data attests that many large sites (farms, villages and maybe any villa) were inhabited in these territories during the Late Roman period. Finally, this is strictly connected with the results of some landing places excavated by the Soprintendenza of Agrigento West of city, and it contributes to highlight the economic interrelations between the ancient city and its surroundings.

2. Natascha Sojc (Universität Augsburg), Das extraurbane Heiligtum in der Contrada Santa Anna


3. Elisa Chiara Portale and Monica De Cesare (Università di Palermo), Lo spazio sacro presso la cosiddetta Porta Aurea: infrastrutturazione e contesto socio-economico

A seguito delle ricerche in corso da parte dell’Università degli studi di Palermo, si propone una nuova lettura d’insieme dell’area sacra situata sul margine meridionale della città di Akragas, finora percepita sostanzialmente attraverso i templi monumentali più noti (Olympieion e cosiddetto Tempio di Ercole) ma in realtà frutto di una complessa sequela di interventi di infrastrutturazione e riconfigurazione
monumental, legati all’evoluzione socio-politica e alla crescita economico-materiale della città dal suo sorgere alla conquista romana.

After the ongoing research work of the University of Palermo, we'll give a general overview of the sacred area in the Southernmost part of the town of Akragas. This area has been perceived till now mainly through the well-known monumental temple of Zeus Olympios and “Hercules”. It is indeed the result of several building activities aimed at giving facilities and at enhancing monumentality, related to socio-political transformations and economic and material growth of the city, from the beginning to the Roman conquest.

4. Luigi Maria Caliò (Università di Catania), Gli spazi pubblici di Agrigento ellenistica dalla progettazione al cantiere

La definizione di una nuova pianta della città di Agrigento ha portato una nuova visione della forma urbana e all’individuazione dell’agorà della città. Si tratta di un enorme impianto quadrangolare nel quale si affacciano edifici politici e sacri e le grandi abitazioni degli isolati ellenistici. L’importante salto di quota che si trova nella zona meridionale di questo spazio ha permesso l’individuazione di una cava teatrale che i recenti scavi, condotti dal Parco della Valle dei Templi e dall’Università di Catania, hanno parzialmente messo in luce.

Ne emerge un complesso ellenistico, databile nelle prime fasi nell’ambito del III secolo a.C. che costituisce in nucleo della città ellenistica romana. L’insieme monumentale costituisce uno dei più antichi esempi di piazze con teatro che caratterizzano i grandi spazi delle città occidentali tra il III secolo a.C. e la romanizzazione.

The definition of a new plant of the city of Agrigento offers a new vision of the urban form and allowed the identification of the agora of the city. It is a wide quadrangular space, along its edges the most important political and sacred buildings and the large houses of Hellenistic blocks were built. The steep slope located in the southern part of this space has allowed the discovery of a theater cave that the recent excavations, conducted by the Park of Valley of the Temples and the University of Catania, partially highlighted.

More generally, a Hellenistic complex emerges, dating back to the early stages of the 3rd century BC, which is the nucleus of the Hellenistic and Roman city. The monumental setting is one of the oldest examples of squares with theater that characterize the great spaces of western cities between the 3rd century BC. and romanization.

5. Valentina Caminneci (Parco Archeologico e Paesaggistico della Valle dei Templi) - Maria Concetta Parello (Parco Archeologico e Paesaggistico della Valle dei Templi di Agrigento), L'impianto termale dell'Insula IV del Quartiere Ellenistico-romano

Le nuove ricerche condotte nel Quartiere Ellenistico Romano, vasto settore di abitato dell’antica Agrigentum, indagato negli anni Cinquanta del secolo scorso, hanno messo in luce i resti di un edificio termale subito ad Est delle tre insulaescavate, nell’area presumibilmente occupata dall’insula IV. Si tratta del settore riscaldato di un piccolo complesso, del quale si conservano in fondazione due ambienti, di cui uno absidato con l’ipocausto e le suspensurae. Allo stato attuale si può ipotizzare che l’edificio termale fosse di pertinenza e a servizio del quartiere abitativo. Le strutture, abbandonate dopo il periodo tardoantico, sono state spoliate e sconvolte in età altomedievale, quando nell’area si impiantarono officine artigianali. Obiettivi della ricercafutura sono il completamentodello scavo del monumentoin tutta la sua estensione e la definizionedella cronologia delle fasi costruttive e di abbandono.

6. Sergio Aiosa, Paolo Barresi and Mariangela Liuzzo (Università Kore di Enna), For a socio-economical reading of the living contexts: insula I in the Hellenistic and Roman District of Agrigento

According to the latest researches recently organized by Regional Archaeological Park of Agrigento, whose aim was the definition of the ancient town of Akragas / Agrigento as an integrated unitary system, we paid a new attention to the forms of living, particularly in the area of the so-called “Quartiere Ellenistico Romano” (Hellenistic and Roman District). This area was excavated in the ’50s and ’60s of the last century, but the publication by Ernesto De Miro was edited only in 2009, making it possible to know
more about it. In this paper, we want to focus on the insula I of this District, dominated by two large houses, I A/B and I E/F, that overlook the public area of the agorà with a high difference in height. The House I A/B derives from the union of two independent housing units, in order to give to the new house a larger extension, one of the largest of the whole Quarter, and to improve its luxury devices, on the model of the most famous Pompeian houses with double atrium and peristylium adiectum. Since the new plan of the house shows a nearness to the Italic models, together with a deep transformation of the previous reception rooms, whose articulation was typical of the Hellenistic peristyle house, we assume an Italic origin of the house's owner; perhaps he was one of the many negotiatores attested by the literary sources, who reached Sicily to take care of his interests, probably related to the commerce of sulfur, rather than a member of the local elite who adopted the way of life Roman conquerors to the point of transforming the plan of his own house.

The largest surface within the three insulae of this District characterizes the house I E/F, or “house of the gazelle”: for this reason, and for its high-quality decoration as well, both in wall painting and opus sectile, we can focus its role as a place of representation and expression of its owners’ wealth. This role can have already begun in late hellenistic age, but the house must have reached its higher level in Roman imperial age: also in this house, the finding of tegulae sulphuris can be connected to the sulfur diffusion. For this study we realized a campaign of integrated detection, with 3D laser scanning and GPS technologies, with the aim of supporting an unitary and multiscale reading of the insula I, analyzed in relationship with the urban asset of the District and in its specific morphological and architectural components, both material and decorative.

7. Michele Scalici (Università di Bologna), Production sites in Agrigento: the kilns outside Gate 5

From August 2017, the University of Bologna and the Valley of the Temples Park of Agrigento carry out a research aimed to identification and study all the production sites within the perimeter of the ancient city and in its district.

In this communication I am going to present one of the most significant contexts has been identified: it is a production site immediately outside the urban walls, comprising at least two large kilns. The topics related to the function and location of this area will be discussed in relation to the other production sites in Agrigento.

8. Marina Albertocchi, Produzione e circolazione delle ceramiche comuni ad Agrigento. Lettura di un modello economico

The communication focuses on Roman and Late Roman (3rd-6th centuries AD) plain pottery found at Agrigentum: common ware is in fact a significant tool to gain indications both on food practices of a social group as well as on the level of technical skills achieved by craftsmen.

Recent publications of the excavations carried out in the town allow an up-to-date review of the spread of plain pottery at Agrigentum in 3rd-6th centuries AD. The reconstruction of a framework with defined boundaries is further facilitated by recent studies on population and on communication roads: it is therefore possible to suggest a close link between material findings, settlements and long and short-range commercial relationships.

The survey can focus first and foremost on the spread of specific pottery shapes, trying to compare their presence into urban and non-urban contexts. The possibility of using specimens from well stratified contexts (in particular from the ongoing excavations in the area of the so-called Hellenistic-Roman sanctuary), allows us to define the chronological sphere of diffusion of certain well-documented types, in order to partecipate to a reconstruction of the economic activities that had taken place in the urban area at a time of great transformation. A special focus will be on the recognition of the local production chain and the relationships with imports from the North African area, already known, as well as with the eastern Mediterranean centers.
9. Maria Concetta Parello and Maria Serena Rizzo (Parco Archeologico e Paesaggistico della Valle dei Templi di Agrigento), Parco Archeologico e Paesaggistico della Valle dei Templi di Agrigento

Le recenti ricerche nell'area centrale della città antica di Akragas/Agrigentum, comprendente l'agorà/foro e il distretto residenziale, hanno restituito numerose tracce riferibili alle produzioni urbane di età romana e tardo-antica. Insieme ad un riesame delle evidenze messe in luce da scavi e ricerche più antiche, i nuovi dati contribuiscono a delineare l'immagine di una città in cui, al consumo dei prodotti del ricco entroterra agricolo e minerario, si affiancavano numerose attività di trasformazione e produzione. Particolarmente importanti, per l'età tardo antica, sono gli indicatori di produzioni individuati con lo scavo dell'immondezzaio che, a partire dalla fine del IV sec. d. C., ricopre il complesso piazza/tempio del cosiddetto santuario ellenistico-romano, parte della grande area pubblica di età romana. La ricca documentazione riferibile ad attività artigianali, cui si affiancavano abbondanti e diversificate importazioni, suggerisce l'immagine di una città, che, pur degradata e profondamente trasformata nelle sue strutture urbane, doveva conservare una certa vitalità economica e complessità sociale.

10. Enrico Giorgi, Giuseppe Lepore, Vincenzo Baldoni and Michele Scalici (Università di Bologna), Vivere e produrre: l'insula III del Quartiere ellenistico-romano (Live and produce: Insula III of the Hellenistic-Roman Quarter)

The so-called Hellenistic-Roman Quarter of Agrigento is the main residential side in the city, discovered by the archaeological excavations, carried out from the nineteenth century until today. Since 2016 the University of Bologna and the institution Parco Valle dei Templi have conducted a research intending to outline an image - as detailed as possible - of one of the settlement blocks less focused by the scholars' attention until now: the Third Insula.

Basing on 4D documentation, three-dimensional topographical reliefs, geophysical surveys, the archive research of past archaeological excavations along with the study of findings, it is possible to delineate a detailed image of the residential and commercial structures of the block, of the people who lived and worked there, of the economic, social and productive texture of this part of the ancient city, populated from the 6th century BC to the 8th century AD.

Panel 8.3 Shops, Workshops and Urban Economic History in the Roman World

Organiser: Miko Flohr (University of Leiden) and Nicolas Monteix (Université de Rouen)

Friday | 25 May | 09:00-13:30 | HS XII

Panel abstract

The material remains of Roman urban shops and workshops long played a marginal role in classical archaeology, but in recent years, they have enjoyed a marked increase of scholarly attention. Influenced by debates about the nature of ancient urban economies, scholars began to study the archaeological evidence for urban retail and manufacturing with an unprecedented vigour from the late 1990s onwards, and increasingly began to experiment with novel ways of interpreting it. Still, opinions diverge as to the actual interpretative power of archaeologically identifiable shops and workshops: their real contribution to our understanding of the history of Roman urban economies is a matter of debate. On the one hand, scholars have increasingly expressed pessimism about the possibilities to use archaeological remains as a starting point for quantifying output in absolute terms, and about the extent to which shops and workshops were oriented towards local or supra-local markets; on the other hand, they have increasingly begun to assess aspects of shop- and workshop design in relation to investment strategies and profitability, and to explore the economic history of urban commercial landscapes. At this point, a critical challenge ahead lies in counter-balancing the fragmentation of discourse: while good evidence comes from all directions, and in a variety of forms, and while the available categories of evidence are
being studied in a variety of places, archaeologists have difficulty in connecting the threads, and – more than those studying crafts and retail on the basis of epigraphy and literary texts – suffer to develop a comparative perspective over larger geographical areas. Hence, it is time to put this interpretative integration explicitly on the agenda. This session will bring together scholars who have studied this evidence from a variety of angles and in a variety of places in the Roman Mediterranean. It will discuss the ways in which recent developments in the study of urban shops and workshops have (and have not) challenged our conceptualization of urban economic history in the Roman world, and it will explore possible avenues to further deepen our understanding of the changing nature of Roman urban commerce, and to bridge spatial and chronological distances between local sets of evidence.

Paper abstracts

1. Steven Ellis (University of Cincinnati), Salve Lucrum?: Questioning the economic (ir)rationality of Roman retail landscapes

That tabernae once dominated the busiest street-fronts of most Roman cities is a fact long known. And though their frequency was often overlooked for much of the 20th century, and their value to urban studies largely ignored, in more recent years we have witnessed a rising interest in Roman retail outlets. These days the common explanation for both their presence and placement in the Roman city is pinned on profit. Naturally the motivation for financial gains from urban investment makes immediate sense to us: we see the lure of reditus, after all, pressed into mosaics (SALVE LUCRUM; CIL X 874), with the economic rationality of commercial construction (and abandonment) tied to the ebbs and flows of the broader urban economy.

Rational and real though this singular motivation will have been, it is at once an over-simplification and, more problematically still, a rendering of the urban economy that limits our understanding about both the place of tabernae in the Roman socio-economy and the fuller range of motivations to invest in them. The aim of this paper is to explore the plurality of social and economic agencies - rational or otherwise - behind retail investment across multiple Roman cities and over time. It is about who opened tabernae, as well as where, when, and why. An ultimate objective is to complicate what we know of Roman tabernae, which is an aim that might better integrate the topic with the richer and (seemingly) more sophisticated studies of Roman urbanization.

2. Miko Flohr (University of Leiden), Commerce and architecture in the late Hellenistic world: the emergence of the taberna row

One of the more radical developments in the commercial history of Roman cities is the emergence, in the second century BC, of the taberna as a defining factor in urban space. While the taberna had a history before this period, it is the second century BC that saw the emergence of new models and practices: the taberna not only began to be built everywhere, it also began to be built in a much greater variety of architectural contexts.

One key innovation of the second century BC is the ‘taberna row’, a commercial building that simply consisted of a sequence of tabernae and, occasionally, a porticus. This paper starts from the idea that the emergence and spread of this building type present an important new chapter in the history of cities in the Roman world. Analyzing the contexts in which this new building type emerged and flourished, it will argue that the taberna row initially had a relatively limited spread, but that its appearance nonetheless signals a rapid increase in the commercialization of urban economies, and in the commodification of commercial facilities.

3. Rhodora Vennarucci (University of Arkansas), Shop Design as Marketing Strategy in The Shops of Roman Ostia

After a transformative shift toward fixed-point retailing occurred in the mid-Republic, civic improvements initiated by Augustus unified shop fronts with the streets, producing more harmonized streetscapes in towns around Italy. Although still viewed by marketing historians as a modern innovation of retail, “shopping streets” – streets characterized by a high frequency of shops and the presence of archi-
tectural installations, such as porticoes, arcades, and sidewalks - dominated the commercial landscape of Ostia by the 2nd/3rd c CE. Contributing to recent work on Roman urbanism, this paper employs an interdisciplinary approach, integrating retail change theory and consumer culture theory, to investigate the evolution of the shopping street in the harbor town of Ostia and its impact on consumer behavior. As the shopping street became embedded within the urban image, the activity of shopping became part of the urban experience, encouraging a shift from functional buying to shopping as a cultural activity imbued with a sense of enjoyment and/or social significance. Evidence from Ostia suggests that shopkeepers, as urban placemakers, may have actively contributed to these developments through the management of their shops and street environments (raising the level of the street, installing benches, shop décor), indicating that the architecture of a shopping street, as a social artifact of the shared experiences of its local inhabitants, has excellent potential for providing a more nuanced understanding of Roman urban culture from below.

4. Adeline Hoffelinck (Ghent University), New light on the commercial landscape of Roman cities: towards an archaeological research agenda

When studying the urban economy of the Roman world and in particular the Italian peninsula one always refers to the well-known sites of Pompeii, Ostia and Herculaneum, where the extensive material remains of shops and workshops provide us with a glimpse of their bustling economic life. While the study of these cities was and still remains essential in investigating the Roman economy and urbanization, many other sites have been neglected and need to be brought into current debates. This mainly concerns cities whose remains are currently not visible to the modern eye because they simply were not preserved in an extraordinary way and have not been the subject of long term excavations. That these lost towns can be mapped and visually reconstructed by means of non-invasive full coverage surveys has been proven during many recent projects in the Roman Mediterranean world. Within my talk I would like to propose an agenda for future research in which the integration of non-destructive methods for the study of urban commercial space gets the upper hand. These methods have the potential to bring many other Roman sites into the debate, making way for a comparative approach of cities over broader geographical areas than central Tyrrhenian Italy. By empowering the methodological approach and expanding the geographical focus substantial information can be gained on the relationship between the economic environment and a wide range of urbanization processes.

5. Jeroen Poblome (University of Leuven) - Dorien Slotman- Fran Strootbants - Johan Claeys - Sam Cleymans, Work/Shop till you drop. Collated evidence from South-Western Asia Minor on (work)shops and associated people, between Hellenistic times and late antiquity

This paper aims at collecting the available evidence on the infrastructure of workshops and shops in urbanizing, urban or de-urbanizing communities in South-Western Asia Minor, between middle Hellenistic times and the end of poleis, as we know them. Apart from the physical, oftentimes archaeological evidence, the paper will further look into epigraphical or otherwise historical evidence, related to these places, the people involved in producing or retailing goods, and the practices and institutions regulating these aspects of ancient society. This evidence will be considered against wider backgrounds, such as general shifting opportunity costs in the productive landscape, levels of monetisation of these provincial communities, living conditions of the workforce, aspects of their quality of life and communal practices associated with these breadwinners.

6. Elizabeth Murphy (University of Bonn), Spatial Developments in Urban Industry from Roman Imperial to Late Antique Periods in the Eastern Mediterranean

Ancient cities, with their wide range of services as well as their dense and diverse populations, relied on some degree of planning to organize space. In considering economic spaces as reflections of social negotiations among urban communities, changes to the scale of investment in and location of economic space offers insight into shifting cultural perceptions of commercial and productive activities within the cityscape. This paper investigates economic topographies of cities from the Roman Imperial period through Late Antiquity in order to investigate changing industrial spaces. By comparing workshop units
within and between cities in the eastern Mediterranean, patterns in the scale, character, and status of manufacturing segments of urban society from the 1st c. BC to the 7th c. AD are discerned. The results of this study, on the one hand, highlight general trends in the changing use of urban space—e.g., the movement of industry into city centers and public buildings in Late Antiquity, the phasing of industries taking over public buildings, and the changing distribution patterns of different types of industry. It likewise, highlights variability across the region that more likely reflects local decision-making in urban transformation.

7. Helmut Schwaiger and Jasmin Scheifinger (Österreichisches Archäologisches Institut) - Katharina Sahm - Sabine Ladstätter (Österreichisches Archäologisches Institut), A Late Antique City Quarter in Ephesos: Social Differentiation and Functional Heterogeneity

Classical archaeological urban research informs the idea of a functional spatial division via the creation of city quarters. Private residential districts as well as areas of workshops and commercial activity are confronted with public space. A completely different picture is presented by the Late Antique city quarter in Ephesos, which in recent years has been extensively excavated and whose time of origin is dated to the early 5th century AD. Workshops and tabernae not only are immediately adjacent to prestigious domestic buildings, but are also structurally interwoven with them. In addition, no coherent house type can be deduced; instead, the houses are units that are conceived of in a completely varying manner, and differ from each other in their size, sequence and disposition of rooms, and equipment. Permanent installations bear witness to wine and oil production as well as the storing and further processing of agricultural products. Trading and industrial activities are demonstrable in streetside shops. An appraisal of the archaeozoological material resulted in evidence for the processing of meat and seafood. Furthermore, extensive mapping of objects allows zones of activity to be defined in the individual households.

The picture obtained from the excavations is characterised by heterogeneity and social differentiation, often at a distance of only a few metres. In a virtual reconstruction a partial excavation should be confronted with the extensive one, and the diverse results should be critically discussed, above all with regard to the relationship between private and public space.

Panel 8.4 The Economics of Urbanism in the Roman East

Organiser: Rinse Willet (Leiden University)

Wednesday | 23 May | 17:00-19:00 | HS XIV

Panel abstract

The urban geography of the Roman Empire has a long historiography, with scholars like A.H.M. Jones already making an excellent monograph of the cities of the Eastern Roman Empire in the 1930’s. Yet these studies focused primarily on the history of cities and they saw the ancient town as an isolated historical phenomenon or at best as an index of the spread of Hellenism or Romanitas. Unlike these studies, "An Empire of 2000 cities" adopts a different approach to the study of Roman urbanism. The current project is an attempt to take a step further and place the town in its socio-economic context, collecting the most up-to-date archaeological evidence and using statistics to approach the urban phenomenon in the Roman East. The data used, however, is often disparate and complex and many uncertainties surround the theme of urbanism. To achieve a more balanced treatment in the various regions that constitute the Roman East, we will base our discussion on the most basic parameters of urbanism: the number of towns per province, their spatial distribution and size under the High Empire. The panel will consist of four presentations that will focus on particular regions or provinces of the Roman East. The first issue to be analysed is our solution to the fundamental difficulty of deciding what a town is in the first place, in order to arrive at a simple definition that will encompass all the different regions in
the study. Subsequently we shall show that much can be inferred from the variations in the number of
towns per province or region, their geographic foci and the variations in size. Equally intriguing ques-
tions emerge when we attempt to interpret the distribution of the urban settlement in terms of the
character of the regional economies and the distribution of wealth. What was the share of the structur-
al factors of landscape, climate and infrastructure and the continuity or discontinuity of pre-Roman ur-
banism? In order not to get lost in the particularities of the Roman East, the panel intends to lift the re-
results out of regional isolation for cross-regional comparison, allowing for an in-depth discussion of the
nature and economy of ancient cities in general. We invite at least one distinguished scholar of Roman
urbanism who has studied a different part of the Roman Empire to comment on the pattern of urban
settlement and its implications in the socio-economic sphere from a comparative perspective.

Paper abstracts

1. Rinse Willet (Leiden University), The nature of ‘the town’ in the Roman East and the case of
Anatolia
Although many words have been committed to paper concerning cities during the Roman Empire, their
definition often remains unclear. Relatively few volumes have been written on the city in the eastern
half of the Mediterranean, which often emphasize the civic status of settlements. An archaeological ap-
praisal of the city in the East as a whole is therefore needed, which allows for a synthesis to place the
town in its wider socio-economic context.
This paper introduces the work of four specialists working in the ERC funded “An Empire of 2000 cities”
project of Leiden University. An overview of their joined work is provided to show the general patterns
of urbanism in the Balkan, Greece, Anatolia and the Levant during the Roman Imperial period. The den-
sity of settlement and urbanization in these regions is quite diverse, from which, already, many implica-
tions for the socio-economic workings of cities can be inferred.
From this overview, a more detailed account from my own research on Roman Anatolia is provided. The
regional diversity is elaborated, focusing particularly on the economic implications heavily settled and
more empty regions. The socio-economic success of cities is the result of a multitude of factors, such as
historical path-dependency, agricultural potential, connectivity and institutional context. The product of
these and other factors results in a complex pattern of urbanism in Anatolia during the Roman Imperial
period.

2. Michalis Karambinis, Urban Networks in Early Roman Greece
This paper presents the results of my research into the urban systems of Roman Greece and Roman
Cyprus, which is being undertaken in the context of the ERC Advanced Project “An empire of 2000 cities:
urban networks and economic integration in the Roman Empire” (Leiden University). The chronological
focus of the paper is the Roman imperial period (1st – 3rd century AD). It has to be noted, however, that
attention will be paid to the transition from the urban configuration of the late Classical and early Hel-
lenistic periods to the Roman pattern. The obvious reason for this is that a diachronic perspective must
be considered an essential element in identifying and interpreting the profound changes in the urban
networks of Greece that took place under Roman domination.
Based primarily on archaeological sources, this paper demonstrates that the poleis in Roman Greece
were not only fewer but also smaller than in Classical-Hellenistic times, indicating a less urbanised
landscape of Roman Greece. Although the Roman conquest resulted in a drastic reconfiguration of the
urban systems of various sub-regions, this paper shows that Greece as a whole maintained the modu-
lar urban system which it had inherited from the Classical and early-Hellenistic periods. Its cities con-
tinued to be sustained by basic foodstuffs produced in their territories, and production was mostly for
local consumption.
3. Damjan Donev (Institute for Archaeological Research, Macedonia), Aspects of Roman urbanism in the Hellenistic Balkans

The very first word that comes to one's mind when looking at the basic parameters of the urban geography in the study area is modularity. This is inscribed in the physical geography of the Balkan Peninsula, comprising sequences of discrete micro-regional units, separated by high mountains. Although there is some kernel of truth in this description of the regional urban geography, it is far from encapsulating the regional specifics and it entirely ignores the dynamic aspects of the urban system.

The principle goal of this study is to demonstrate the differential developments in the urban system of the Hellenistic parts of the Balkan Peninsula. We will begin by presenting the evidence for the urban map in the area in the period preceding the Roman conquest and the geneses of the newly-founded settlements. The area in question is quite diverse and it doesn't comprise an integrated territorial entity, so much emphasis will be placed on the regional developments. We will then present the evidence for the size of the settlements in the period of the High Empire. These data will then be juxtaposed with the regional road-networks and above all, the evidence for Roman colonization in the area, whether in the guise of colonies or municipia or large communities of Roman citizens. We will demonstrate that quite often, though not universally, urban growth coincided with the strategic importance of the towns' locations and the presence of a strong community of Roman citizens.

4. Paul Kloeg, Roman settlement patterns in the Near East

Cities have always stood in the centre of attention in historical studies, just as much as cities themselves have always been focal points of many spheres of human activity, ranging from the social, economic and demographic to the cultural and religious. Naturally, even purely from a demographic sense, a focus on the urban will lose sight of the larger part of human past, and even with today's highly urbanised societies, globally this would still miss almost half the world population. Nonetheless, for a student of the past, they tend to leave brighter, more visible afterimages of past worlds, where much of the extra-urban realities have faded away.

This paper discusses some of the results of a phd-project on the urban network of the Roman Near East, an area where the urban past has been shining longer and brighter than in many other parts of the Roman Empire. Here, past cities ranging from Ebla and Ugarit to Ashdod and Jericho paved the way for the vast urban centres of Roman Syria, often built on the same sites as their forebears, and covered themselves by cities of later times.

Two of the themes treated in the project will be discussed: the spatial patterns of the Roman cities in the Levant, and the interplay between cities and natural, environmental limitations, looking in both cases for the reach of human agency and imperial strength within the bounds of nature and the shadows of the past.

5. Tønnes Bekker-Nielsen (University of Southern Denmark), Roman urbanism in the Pontic frontier zone

Following the defeat of Mithradates VI Eupator, the victorious Roman general, Pompey the great, was faced with the problem of creating a viable and economically self-sustaining structure of civic self-government. This he attempted to solve by establishing a string of cities on the polis model along an east-west highway from Nikopolis on the Armenian border to Pompeiopolis in central Paphlagonia. Pompey's work was soon undone by Mark Antony, but a century later. The Pontic cities were re-integrated into the Imperium Romanum. The subsequent and diverse life histories of Pompey's cities throw light upon the dynamics of urbanisation in the north-western Anatolian frontier zone and the inherent contradictions between politico-administrative objectives on the one hand and economic realities on the other.
Panel 8.5 The Economics of Urbanism in the Roman West

Organiser: Matthew Hobson (Leiden University)

Wednesday | 23 May | 14:30-16:30 | HS XIV

Panel abstract

To what extent were towns integral to the economic functioning of the Roman empire? How did the structures of Roman imperialism affect the processes of urbanisation and municipalisation within the Roman provinces? Can the distribution patterns of large-, medium- and small-sized towns across the western empire help us to identify the major factors determining their food supply and growth? Emphasis in the debate over the role of the town in the ancient economy has recently shifted from Max Weber and Moses Finley’s ideal types to the use of urbanisation rates as proxies for economic performance. This panel intends to use a vast set of newly available data collected by researchers as part of the long-running Empire of 2000 Cities Project, hosted by the University of Leiden, to explore these questions at a broader scale of analysis than ever before. Geographically it will encompass the majority of the Latin west; the Greek-speaking regions, whose urban sites developed within the polis system, are intended to be the focus of a sister panel, which we hope will also be hosted by the 2018 ICCA. Thanks to the flexible web- and GIS-linked database produced by the Leiden Cities project, which it is hoped will eventually be free to access online, patterns in the size, monumentality and status of urban sites across a vast geographical area can now be observed. A number of regional specialists from within the project will be invited to respond to a discussion paper, outlining these broader patterns, to be circulated 6 months in advance of the conference (i.e. by October 2017). Individual speakers will be asked to comment upon how their provinces fit into or differ from the broader regional developments of the western empire and upon the significance of this for the overall functioning of the Roman economic system.

Paper abstracts

1. Frida Pellegrino, Models of settlement hierarchy: an evaluation of regional case-studies in selected areas of the North-Western provinces

A settlement hierarchy implies that settlements are organized in a “pyramidal” fashion according to their size, range of services, goods, and functions. However, the shape of the relationship between settlements can vary. For example, a settlement hierarchy can be characterized by a single, large city lying at its top and numerous small settlements at its bottom, with almost no intermediate urban settlements. It may, on the other hand, comprise a mix of large, middle and small settlements. This paper will discuss the settlement hierarchy of selected areas of the North-Western provinces of the Roman Empire at a time when this area was at its peak (2nd c. AD). Given how settlement systems are likely to be subjected to path dependence, reference to their evolution from the Iron Age will be made. Specifically, the main questions that will be tackled will be: what can the shape of a regional settlement hierarchy tell us about the economy, politics, and socio-cultural development of its region? What effect do the Roman conquest and the integration of these regions within the Roman Empire have in their settlement patterns? Why in some regions does it appear that changes have occurred slowly, allowing their settlement hierarchy to be able to adjust accordingly without major disruptions, while in others cases settlement systems have not survived the economic and political cycles that created them? Why do some settlement systems appear to be more resilient and others more fragile? In order to answer these questions, theories within the fields of economics and geography that engaged with the geometry of the hierarchical distribution of cities (e.g. central place theory, locational analysis, rank-size analysis, and urban primacy) will be considered.
2. Karolien Pazmany (University of Leiden), Between mountains and frontiers. The roman urban settlement system in the northern Alpine region

The presented work is based upon results of a doctoral research which was part of the overarching project ‘An Empire of 2000 cities: urban networks and economic integration in the Roman Empire’ (University of Leiden). How many cities existed in the Roman Empire? This was the starting question of the project, embracing further desires to investigate the processes of urban development over the whole empire, the relations between urban centers and the socio-economic implications.

The intention of this presentation is to give a brief overview of the urban settlement system in the northern Alpine region, including the Roman provinces of Germania Superior, Raetia and Noricum. It concerns a territory described by the classical author Strabo as depressing and unfruitful. The reconstruction of that settlement system will rely on a number of different aspects. These will include processes such as that of municipalisation and monumentalisation. The presence of the army and its influence on town developments will also be considered as a factor. Possible explanations for similarities or differences between the urban developments in the three provinces will be suggested. Hopefully, by looking for answers to fairly simple questions like ‘Which places performed urban functions?’, ‘What did Roman towns look like?’ and ‘How were Roman towns constructed?’, a better understanding of the urban dynamics in the northern Alpine region will be reached.

3. Pieter Houten (Universiteit Leiden), Urban Pattern on the Iberian Peninsula in the High Empire

The great cities of the Roman Empire, Rome, Carthage and Antioch have drawn the attention for decades, leading to an idea of the standard Roman city in the eyes of the general public. Within the academic field the idea of a standard city has been successfully challenged and the realization has set that the Roman city was in general small and often less magnificent than these large cities. Nonetheless, the Roman city is still often taken to be the centre of the civitas, within the simple model of an urbs and territorium. When looking closely at the urban pattern of the Iberian Peninsula we observe within this sub-region a plethora of different centres for the civitates.

This paper will discuss the range of the different centres of the civitates on the Iberian Peninsula. As such, the development of the large centres, such as Tarraco, Carthago Nova and Gades will be taken into account, as well as the development of smaller, strongly monumentalized centres such as Munigua and Segobriga. In addition, we will turn to an often neglected form of ‘urbanization’: the civitates and even municipia that lacked a clear urban centre.

The range of urban settlements and their development will be further understood by regarding the spatial patterns. By taking the geographical and historical template of the Iberian Peninsula into account we can better understand the different forms of urbanism found on the Iberian Peninsula.

4. Matthew Hobson (University of Leicester), The Settlement Hierarchy of Roman North Africa

Using new advances in technology related to spatial databases and geographical information systems, this paper looks at the distribution patterns relating to the size, monumentality, juridical status and administrative structure of over a thousand of the larger settlements that existed in the African provinces during the Roman period. This region is often marveled at for the great density of towns that it possessed. This is especially so for the northern part of the province of Africa Proconsularis, now modern day Tunisia, in which numerous impressively well-preserved examples of urban monumental architecture survive. In the case of the African provinces we also have an extremely rich corpus of inscriptions, revealing much about past municipal institutions. Few previous attempts have been made, however, to really understand the settlement hierarchy of this vast area, or to divide the numerous towns that existed into different types and to quantify them.

Much of the data collected for these towns and villages has been available for several decades. The ability to bring all these various categories of data together in one place, however, and to compare them in maps and figures across such a vast area, is new. Using GIS layers derived from earth-observation satellites, the obvious factors constraining and enabling the development of urban sites, such as
rainfall, temperature, ruggedness of the landscape etc. can be brought into sharper focus. This also helps one to begin to separate out what was unique in the achievement of the Roman period, from what came before and what followed afterward.

Panel 8.6 Judaea/Palaestina and Arabia: Cities and hinterland in Roman and Byzantine times

Organiser: Achim Lichtenberger (Universität Münster)
Oren Tal (Tel Aviv University)
Zeev Weiss (Hebrew University of Jerusalem)

Wednesday | 23 May | 09:00-16:30 | HS XII

Panel abstract

The proposed session dedicated to urban infrastructure aims to explore the relationships between the city and its periphery. It will focus on some southern Levantine major and secondary administrative centers of Judaea/Palaestina and Arabia under Roman and Byzantine rule (1st to the 7th century CE). Papers read in the session will present several test-cases in which the information on the periphery of a center is well-documented via excavations, surveys and other means of documentations (i.e. LIDAR, aerial photography and so forth), while others will address a wide range of issues connected with the Graeco-Roman city and its hinterland, among which networking and communication, city lands, citizenship and the definition of a city, etc. Road networks, dependent villages and estates, aqueducts and dams, rivers, streams and seafronts, necropoleis, industrial quarters and facilities, agricultural terrains and towers, dumps and fortifications will be considered as some of the means for defining the urban infrastructure not only in an economical perspective but also in a political and social perception. Given the scarcity of studies addressing this issue in a southern Levantine milieu, we intend to produce a collective study on the subject steaming from the papers and discussions of our intended session.

Paper abstracts

1. Shlomit Weksler-Bdolah (Israel Antiquities Authority), Aelia Capitolina - The Roman Colony and its Periphery

Very few remains of the Roman period are known in the close periphery of Aelia Capitolina, including military posts, Roman villas, pottery workshops and tombs. Interestingly, most of the sites are located along the Imperial roads which led to the city. The sparse settlement in the periphery of Aelia Capitolina is very different from the crowded settlement that characterized the periphery of Jerusalem before the year 70. This change is probably related to the abandonment of the Herodian settlements, the expulsion of the Jewish population and the confiscation of Jewish lands by the Romans following the Bar Kokhba Revolt ("Fifty of their most important outposts and nine hundred and eighty-five of their most famous villages were razed to the ground... Thus nearly the whole of Judaea was made desolate..." (Cassius Dio, Roman History, LXIX, 14). However, the meager settlement of the hinterland of Aelia Capitolina probably reflects the size of the Roman city, which was based, among other things, on the supply of products from the periphery. In the lecture –the nature of the city and its hinterland shall be discussed in light of archaeological finds.

2. Boaz Zissu (Bar Ilan University, Israel) - Eitan Klein, The Hinterland of Beth Guvrin-Eleutheropolis: Pagans, Jews and Christians during the Late Antiquity

During the Second Temple Period, and continuing through the Bar Kokhba Revolt, Judea was densely populated by Jewish farmers. After the failure of the revolt and elimination of the Jewish residents, the
Roman authorities had the opportunity to remake the province and its people as they saw fit. They established four new cities based on the standard Hellenistic-Roman principles and assigned them jurisdiction over the adjacent rural districts. As part of this system, in 199–200 CE the emperor Septimius Severus granted the town of Beth Guvrin the status of a polis and it was renamed “Lucia Septimia Severa Eleutheropolis.” The city, located at a major road junction in the southern Judean Foothills, was allotted the largest territory of any polis in Judea, stretching from Ein Gedi in the east to the southern Hebron Hills on the south, the Coastal Plain in the west, and as far as the Elah Valley on the north.

A study of Roman-Byzantine era archaeological finds, from both in the city itself and in various locations in its rural hinterland, and an examination of relevant historical sources revealed that the population was a mixture of Pagans, Jews, and Christians. In the lecture and following paper we will sketch out the settlement limits of each group by examining its typical material culture, consider whether these boundaries resulted from advance planning by the authorities, and study the mutual relations among these three groups during the Late Antiquity.

3. Zeev Weiss (The Hebrew University of Jerusalem), Sepphoris: The City and Its Hinterland (Khôra) in Roman Times

In the heart of the Lower Galilee, 5 km west of Nazareth, lie the remains of Sepphoris, capital of the Galilee for long periods in antiquity. As one of the major cities in the Galilee, it played an important role in reconstructing Jewish life after the destruction of the Second Temple in Jerusalem, yet remained unscathed by both the First and Second Revolts against Rome. Economically it had become a well-established city due to the fertile soil in the nearby valleys and the active trade with its immediate surroundings and distant markets. On the eve of the Great Revolt against Rome, in 66 CE, Sepphoris stretched across the hill and its slopes, having a rural appearance and lacking most of the typical Roman-style public buildings. Only years later, after the suppression of the Great Revolt, and probably owing to the city's pro-Roman stance, was it transformed into a prominent Roman polis boasting monumental buildings.

Various excavations and surveys were conducted in Roman Sepphoris and its immediate surroundings. After a short presentation of the major finds inside the city, the paper will focus on the elements known to date in the city's khôra—roads, farmhouses, burial places, agricultural installations, and quarries—and will explore Sepphoris's urban infrastructure and the relationship between the city and its hinterland.

4. Peter Gendelman (Israel Antiquity Authority) - Uzi ‘Ad, Caesarea Maritima View from Outside: The Periphery of the Roman and Byzantine Metropolis.

The territory of Caesarea, the metropolis of the province Judaea, later Syria Palaestina and Palaestina Prima, had a large agricultural hinterland including the fertile Sharon Planes and the hill country of Western Samaria and South Carmel. The paper offers a view on the different activities which were taken place in the outskirts of Caesarea in about a radius of 10 km. from the city-walls. The immediate area around the city was extensively occupied by cemeteries of family burials—mausolea and caves/hypogea. In addition the area was used for accumulating and recycling the city's garbage. Several upper class suburban palaces and villas provided their owners and guests with the pleasures which the country side could offer within sight of Caesarea. All unoccupied areas in this range were used for agriculture; this is evinced from the various agricultural installations such as vineyards and granaries. Extensive network of aqueducts crossed the outskirts of Caesarea and supplied the inhabitants with fresh water. A unique feature is the large artificial lake constructed north of Caesarea in Late Antiquity to supply water to the city by means of Low Level Aqueduct. This lake also supplied water for operating water mills which supplied the Caesareans with fresh milled flour daily. Last but not least important are the quarries of local sandstone kurkar, the main building material used by the Caesareans.
5. Oren Tal (Tel Aviv University), Apollonia-Arsuf/Sozousa: Its Immediate Hinterland and Periphery in Byzantine Times

Apollonia-Arsuf is located in the northwestern part of the modern city of Herzliya (Israel) on a kurkar (fossilized dune sandstone) ridge overlooking the Mediterranean. Since 1977, 25 seasons of excavations have been conducted at the site. In 1996 and in 2012 and 2013 considerable salvage works have extended the excavations far beyond the inhabited settlement and focused on the Byzantine-period (5th-7th centuries CE) settlement’s immediate hinterland, where an agricultural and industrial hinterland of the mother-site Apollonia (then named Sozousa) was unearthed. While the architectural remains in this area—winepresses, field towers, tombs and other installations—are few, they still offer an important test-case on the site infra-structure and the relationship between the town and its hinterland. Immediate lands were used for growing crops; while some installations were functional (guarding, storing, burying, disposing, and so forth) others were engaged in the production of secondary products (wine, flour, etc.); large refuse pits were utilized for the disposal of waste (organic and inorganic) from the settlement and their content served as fertilizer to enrich the soil in the nearby fields. Ongoing salvage excavation at the site periphery attesting to the size and the location of its necropolis and hamlets. Both type of evidence offer additional aspects on the site mode of functionality in Byzantine times.

6. Achim Lichtenberger (Westfälsiche Wilhelms-Universität) - Rubina Raja (Aarhus University), Gerasa: The City and the wadi

The paper examines the relationship between the city of Gerasa/Jerash and its hinterland during the Roman to Early Islamic periods. The Roman city of Gerasa defines itself very much through the river, the Chrysorrhoas (Wadi Jerash), at which it is situated. The river is integrated into the name of the city, the river deity is depicted on Roman coins and the topography of the river even structures civic associations. Therefore we discuss the evidence for how the city relates to the river and how the city manages the resources of the river. New data is assembled regarding the land management in the wadi and on the geological perspectives about how the wadi can be investigated in a joint archaeological-geological effort, to trace long-term development in this river environment and the relations between humans and river.

7. Gabriel Mazor (Israel Antiquities Authority), Nysa-Scythopolis capital of Palaestina Secunda and its Cultural, Religious and Ethnic Hinterland

Around the turn of the century (386–409 CE) a revised administrative tripartite division, conducted by Theodosius II, promoted Nysa-Scythopolis to the status capital of Provincia Palaestina Secunda. During the fifth century the polis, now an important administrative and economic center, flourished and its civic center was architecturally renovated and culturally reshaped. And yet Nysa-Scythopolis of the Byzantine era preserved its second century Roman imperial baroque architectural trend and its deeply rooted Hellenic culture. The geopolitical change of the region from a Roman province to the venerated Holy land, a remarkable peaceful era and the administrative division resulted, during the fifth to sixth centuries, in urban prosperity and immense increase in population both in urban entities and hinterland of the Decapolis.

The flourishing capital of Provincia Palaestina Secunda had a dynamic and heterogenic population composed of diverse ethnic and religious communities. Consisting of a diminishing in number pagan devotees, newly converted Christian, a constantly rising number of devoted members of the church and significantly large and influential communities of Jews and Samaritan that ethnic complexity of the polis and its cwra created a unique social arena.

Nysa-Scythopolis was a Christian monastic center. Churches revealed within the city were all part of flourishing monasteries, while its cwra was dotted with numerous monasteries. A considerable number of its bishops were appointed monks, while venerated leaders of the Judean monastic movement, as attested to by Cyril of Scythopolis, their main hagiographer, were involved in civil and religious affairs of a city that was rather deeply involved in the complex Christian dogma struggles.

The hinterland of Nysa-Scythopolis reflects its complex ethnic and religious heterogeneity as faithful mirror reflection of its central polis. It is prosperous and rich, it is Hellenic in nature and divers in its
clearly separated religious communities. While most of the monasteries were established in the northern and western parts of its area, the Samaritan and mainly numerous Jewish settlements occupied its southern and eastern parts. Each of the events of the Samaritan revolt of 529 CE successfully retained a peaceful coexistence in the polis and its hinterland.

8. Michael Eisenberg and Mechal Osband (University of Haifa), Antiochia Hippos and Its Territorium during the Roman Period

Antiochia Hippos (Sussita) of the Decapolis was the only urban settlement in the central and southern Golan during the Roman period. New research now aims to better understand the phenomena beyond the city walls – the settlement and regional relationships in its territory. Over the past four years the University of Haifa team has initiated excavations along the city's saddle ridge, outside its walls. The excavations have revealed surprising finds concerning urban expansion during the Roman period and the remains of a Roman-period sanctuary. The sanctuary stretches 170 m. along the western side of the saddle ridge. So far, the remains of a propylaeum, public bathhouse and a theatre were found, dated to the second century CE. A Roman mausoleum built within the necropolis east of the saddle ridge has been almost fully excavated and nearby, a series of burial towers were identified along the main road. Recent surveys east of Mount Sussita and in its proximity have identified new sites, necropoleis and springs, all previously unknown. The Hippos region is a prime candidate for a case study elucidating the urbs-territorium-oppidum/vicus relationships. This new research (Eisenberg and Osband) is aimed at better understanding the territory borders, determining the extent of the key role that Hippos played in the region and studying the socio-economic and ethnic relationships in the region.

9. Claudia Bührig (DAI), Gadara and its hinterland

Research in recent years at Gadara was characterised by clarifying the development of the Decapolis city. By observing the cityscape, the attention was directed towards the settlement history and to finding new insights into the transformation process of the ancient city Gadara and especially its surroundings hinterland. The paper is dealing with the history of settlement and usage of Gadara's surroundings from Roman to Byzantine Times. The initial aim is to investigate the surrounding landscape of the ancient city of Gadara, and to identify technical and agricultural installations or settlement structures but also the reconstruction of climate and agriculture. At the same time, research is increasingly directed towards the surrounding region with the 'Umm Qays Hinterland-Survey', more concretely on investigating the interrelation between the city and the hinterland as well as between settlement and climate development from the Stone Age until today. The research in the hinterland of the Decapolis city Gadara addresses and emphasizes essential questions that pertain to the generation and utilization of urban space and its natural and historical-political conditions. Thereby, particular attention is directed towards the spatial relations of sanctuary and settlement and natural space.

10. Christian Schöne and Michael Heinzelmann (Universität zu Köln) - Tali Erickson-Gini (Israel Antiquities Authority) - Diana Wozniok (Universität zu Köln), Elusa (Haluza) – Urban Development and Economy of a City in the Desert

Elusa (Haluza) was the only proper city in the Negev region and formed its administrative and economic center. Founded as a stop-over on the Nabatean incense route it developed during the 1st/2nd c. CE into an actual city despite its difficult environmental conditions. It flourished especially from the 4th to 6th cent. CE and was abandoned after the Umayyad period. Since 2015 Elusa has been investigated by the Archaeological Institute of the University of Cologne and the Israel Antiquities Authority by a multidisciplinary team. Meanwhile a complete geophysical survey of the city has been executed, complemented by an archaeological survey, and a digital terrain model, allowing the reconstruction of wide
areas of the city's layout. Additionally, various stratigraphical sondages have delivered new information both on the long-term development of the city, as well as on newly identified buildings (churches, tower houses, a huge peristyle building, a complex sewer system etc.). Finally, the systematic analysis of finds, especially the faunal remains and the pottery, allows interesting insights into the city's economy. This paper is summarizing the results of the project and is further focusing on the question of Elusa's economic role and development in the context of the Negev settlements.


The Nabataean capital of Petra (Jordan) has been extensively researched archaeologically and numerous excavations have revealed important insights into Petra's cityscape.

In contrast, although various survey expeditions have been carried out in Petra's surroundings documenting an impressive number of rural archaeological sites that date from the Iron Age to the Byzantine and Early Islamic Periods, Petra's hinterland remains comparatively under-researched.

Although aspects of rural settlement and land use in the Petra region from the Nabataean-Roman to the Early Islamic Periods have recently been discussed, an overall, in-depth archaeological and historical contextualization of the various archaeological sites in the Petra area is yet missing.

Therefore, this paper presents the author's doctoral research results which aimed at reassessing overall, military and non-military, strategies of spatial organization in the Petraean hinterland in Nabataean-Roman times. By adopting a landscape archaeological approach, it is attempted to investigate political, administrative, socio-economic as well as military aspects of Petra's surroundings. Specifically, this paper focusses on discussing the available archaeological evidence for rural settlements, subsistence strategies, the communication infrastructure as well as the military disposition and possible religious structures – thus providing a cultural landscape characterization of the Petraean hinterland in Nabataean-Roman times.

12. Nicolò Pini (University of Bonn), Semi-urban or semi-rural settlements: a new definition of urban centres required?

The third century in the Eastern provinces of the Roman Empire saw the beginning of an astonishing development of settlements, which reached its peak in the Byzantine period in the V-VI century. This phenomenon involved not only the larger urban centres in the region – the former poleis organised according to more or less strict Hellenistic models, like in the Decapolis. It saw also, if not especially, an unseen development of the rural hinterland of these cities, more and more intensively settled by villages and other kind of settlements, which definition is nonetheless problematic and intriguing.

This kind of settlements underwent a diversified process: on the one side, some former villages developed into cities, being also officially recognised as such but not changing considerably their spatial organisation – like in the case of Esbus/Tall Hisban near Madaba (Jordan); on the other side, there is also the formation of renewed large settlements – referred to as towns in many scientific publications, like Umm el-Jimal in northern Jordan – that if potentially showing urban features, doesn't appear as official cities or poleis.

The present paper aims to investigate this semi-urban or semi-rural dimension, focusing especially on the social triggers that might help explaining not only the phenomena mentioned above, but also some similarities in the spatial organisation visible also in the former poleis in the Late Antique periods.

13. Joseph Patrich (Hebrew University in Jerusalem), The City and its Territory – The Case of Caesarea Maritima

The ultimate goal of this project is to develop a digital application that will present each ancient city in the context of its rural territorium and will enable to get, on screen, tables and maps in GIS (Geographical Information System) technology, permitting to present geographical information as well as archaeological and historical data as superimposed cartographical layers. The objective is to present a synthesis between the archaeological finds and the soil and geo-physical features of the said territorium, in order to evaluate the potential agricultural yield of the region. The agricultural produce will be translat-
ed into calories, and given the amount of calories necessary for the livelihood of a human being, an estimated size of population living in the said territory can be evaluated. The first step in this direction is to mark the rural hinterland of a city, analyze its geomorphology, its soils and the archaeological features such as villages, farmsteads, dispersed agricultural installations, water sources, aqueducts, roads systems, military posts etc. The possible implementation of this approach on the rural hinterland of Caesarea Maritima and its territorium in the Hellenistic, Roman and Byzantine periods will be examined.

Panel 8.7 From Splendidissima Ciuitas to Oppidum Labens: Financial problems and material ruin in Roman provincial cities at the end of the High-Empire

Organiser: Javier Andreu Pintado (Universidad de Navarra)

Wednesday | 23 May | 09:00-16:30 | HS XI

Panel abstract:

Between the Late Republic and the Flavian era Rome created an Empire of cities. Using that model Rome entrusted the local elite with the responsibility of managing their communities in an unprecedented approach. The result was the articulation of the Latin West as a network of cities as "parua simulacra" of Rome. The engagement of the local elites, their munificence, together with the financial autonomy of each center produced some of the most important changes in this model of urban life. So, in order to study the city as an economic centre it is necessary to take into account the epigraphic and archaeological evidence, to describe the city in its financial and institutional contexts and to explore whether or not the Roman Empire was successful and the idea of city durable. On the basis of some decrees from the Flavian era, the comments of Pliny the Younger on the financial problems of many cities and, finally, different notices in the Historia Augusta reporting the existence of oppida labentia –"cities in decline"– at the end of the 2nd century AD, we seek to discuss the following question: was the municipal system, at least in the Latin West, a useful and sustainable model of managing local autonomy? Was it a durable system? Were new cities more fragile than others in terms of financial sustainability? What were the causes for the lack of strength of many urban centres from the 2nd century AD onwards? Scholars working in different provinces of the Roman Empire have attested diverse signs of financial difficulties in many privileged urban centres from at least the reign of Marcus Aurelius. This evidence shows abandonment of public buildings –forums and water supply systems–, lack of private munificence initiatives promoting buildings, depreciation of sculptural programs –recycled or reused–, decline in the epigraphic habit and depopulation of complete clusters of cities. Such processes transformed in many ways the layout of the classical model of city and show us that, most likely, many of those formerly thriving communities expanded beyond their capacity and could not cope already at the end of the Antonine period with the troubles preceding the 3rd century crisis. The main goal of this panel is to discuss what were the conditions in which Roman cities began to lose their former economic power, reversing from the ideal of the "splendidissima" ciuitas to that of the "oppidum labens".

Paper abstracts

1. Laurent Brassous (University of La Rochelle), Resources of wealth in the cities of the Roman Spain: approaching to the change of urban model

Various of epigraphic and, above all, archaeological signs seem to indicate a loss of vitality in the Hispanic cities between the second and fourth centuries AD. In several cities, the degradation of urban centers, and more specifically public spaces, seems to indicate a lack of resources, or a lack of interest in the maintenance of public monuments. At the same time, archeology allows to see the development of craft workshops installed in the very heart of the old public spaces. More than a sign of crisis, this phenomenon seems to be better the testimony of a reconversion and even a change of the urban po-
pulations. It could testify to a transformation of the nature of the city and the adoption by the inhabi-
tants of the model of the city of production to survive.

2. Claudia Garía Villaba (Universidad de Zaragoza), The decline of imperial propaganda. The end of the classical city and its honorary statuary programs

In Roman times architecture and statuary programs went together. They were considered essential parts of a classical Roman city. There was no Roman city without its public buildings and no public build-
ing without sculpture programs. In this way the decline in the epigraphic habit and the recycling or re-
use of sculpture and Roman portraits were ordinarily linked by scholars to the ‘urban crisis’ happened
in the IIIrd century.

Although, in the recent years archaeological evidences have shown portraits, sculpture and epigraphy
discovered in recycling or reused archaeological contexts dated in the late IIInd century, at least in the Latin West. Also, classical sources reported, in some occasions, the decline and the financial problems many Roman cities were going through at the end of the IIInd century. Does this means that the first steps of the ‘urban crisis’ had started even before? Was recycled or re-used sculpture a main evidence of that process?

From my point of view scholars have not focus enough attention to these evidences. They have only studied the sculpture pieces but not why they were useless and therefore re-used. It has been proved that motivations for recycling and re-use varied from one city to another. In this way it is important to study some cases in the Mediterranean area where the decline of the classical city and the recycling or re-use of honorary statuary programs were related.

3. Aitor Blanco (Universidad de Navarra), Imperial Responses to urban Crisis in the Roman Em-
pire: A Conceptual Approach

In 77 and 79 AD, the communities of Sabora and Munigua received imperial letters from Vespasian and Titus, respectively. These recent Flavian municipia had experienced di-
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difficulties and decided to petition the Roman emperors for effective solutions beyond the jurisdiction of the provincial governor. Both inscriptions shed almost unique light on to the impact of the new juridical status granted by the Flavi-
ans to Hispania. Organised urban centres multiplied on the Iberian Peninsula on an unprecedented scale and these two cities show some of the negative side effects of the process.

Unfortunately, such direct testimonies in the western provinces are rather exceptional. For the Greek East, by contrast, the habit of inscribing imperial letters and provincial edicts is better attested. Likewi-
se, the insightful testimony of Pliny when he was governor of Bithynia under Trajan is available to us.

The aim of this paper is to study this evidence collectively and determine whether there were common procedures in responding to local urban difficulties during the high imperial period. The language and measures communicated by the emperors and their representatives will be analysed, as well as the strategies of diplomacy and appeal available to the provincial population. This approach therefore seeks to show how the Roman administration conceptualised the challenges of its Empire of cities.

4. David Espinosa-Espinosa (University of Santiago de Compostela), From "splendidissimae urbes" to "infirmae ciuitates". On the crisis of the Roman city model during the High Empire in the Western provinces and its legal-administrative and institutional factors

The crisis of the Roman city model at the end of the High Empire in the Western provinces has an un-
deniable material dimension, which has been thoroughly studied from an archaeological point of view in order to understand its manifestations and extent. Less attention, however, has been given to the legal-administrative and institutional aspects of this historic process, whose origin would be the result of a chain of economic, political and environmental causes. These events would have decreased the sources of funding and wealth of the local elites and, therefore, the urban monumentalization and ma-
agement practices would have been neglected. Aligned with that approach, this proposal aims to pro-
vide a reflection on the role of the legal-administrative and institutional factors in the crisis of the Ro-
man city model. To this end, aspects such as the spread of "Latium minus", the introduction of "Latium m.aius", and the promulgation of Caracalla's "Constitutio Antoniniana" in A.D. 212, are considered. Also,
different signs of institutional weakness such as the loss of autonomy and the assistance or intervention of the Imperial power in the management of the "ciuitates" are analysed. Both groups of factors may be at the root of a structural crisis of the Roman municipal system, which would have transformed "splendidissimae urbes" into "infirmae ciuitates".

5. Pilar Diarte-Blasco (Universidad de Alcalá), The end of the process: a changing urban model in Hispania – from classical to late antique

Traditional historiography has characterized Late Antiquity as a period in which many urban sites failed and disappeared. From our contemporary perspective in a modern western world of substantial cities, it is difficult to comprehend how an urban site could disappear completely in the landscape, taking with it its multiple activities and numerous inhabitants. However, in recent decades, this view of the historical period between the Roman Empire and the consolidation of the medieval states has been much revised and it has been accepted that only a small group of cities completely vanished during these turbulent centuries. The majority, however, did persist without sizeable upheaval, although each saw change in physiognomy across this period.

The loss in use and primary role of Roman (classical) urban public buildings and spaces and their later reuse with diverse functions are two of the essential characteristics of the transformations that cities underwent in Late Antiquity. This paper will offer a more nuanced view of this transitional process, taking into focus a specific territory, namely late and post-Roman Spain – Hispania – where these transformations were fundamental to the genesis of the new urban reality of Late Antiquity. A particular aim is to explore what archaeology can tell us of the fate and redesigning of towns in this crucial timespan and to question how the mutations in the urban fabric marked the start of what we might term 'medieval urban characteristics'.

6. María Ruiz del Arbol Moro (Instituto de Historia, CSIC) - Penélope González Sampériz (Instituto Pirenaico de Ecología, CISC), Not islands in the landscape. Environmental and territorial transformations linked to the material ruin of provincial cities: the case study of Los Bañales

The analysis of the transformations and changes of the Hispanic cities from the end of the 2nd century AD raises interesting questions about the processes of change of the Mediterranean landscapes during the High Empire and their connection with the emergence of new forms of social organization. Our intervention aims, first of all, to assess the extent to which the action of man in the physical environment and the degradation of the environment are relevant aspects to understand the decline of Hispanic provincial cities; second, to analyze the character of the man / environment relations during this period. To do so, we will make a general review of the state of the art in Hispania and, in particular, of the paleo-environmental and population data available for the region of Alto Aragón and, specifically, the municipality of Los Bañales (Uncastillo, Zaragoza). Our intention is to contrast the various data sets from an interdisciplinary perspective (combining the points of view of geography, history and archeology) in order to assess aspects such as the effects of the intensification of agricultural production in the territory, density of settlement, expansion of the population to previously unoccupied areas, etc. In short, to assess the extent of the imposition of Roman interests on a regional scale and their diachronic impact on the environment.

7. Diego Romero Vera (Université Bordeaux Montaigne), Murallas, calles y cloacas. Indicadores del vigor urbano en la ciudad hispanorromana de época antonina

El análisis de los elementos de infraestructura urbana supone un excelente indicador para calibrar la vitalidad de las ciudades antiguas. Los fenómenos de incuria y abandono de murallas, calles y redes de saneamiento se engloban dentro de las transformaciones propias de época tardía. Dichas alteraciones se han venido situando tradicionalmente en Hispania a partir del siglo III, pero su génesis arranca ya, como pretendemos demostrar, en la segunda centuria. Eso sí, ello no afecta entonces de forma generalizada a todas las urbes, sino solo a una minoría que comparte inequívocos signos de involución urbana.

En este sentido, no son pocos los cambios que afectan a la infraestructura urbana durante el siglo II.
Uno de ellos es el papel secundario que juegan las murallas en este momento. Su progresiva irrelevancia defensiva determinó que, en algunos casos, la propia muralla o bien sus anexos fueran amortizados. En el ámbito del viario urbano, el fenómeno más frecuente fue la reparación de las calles y la limpieza de cloacas, actuaciones que deben englobarse dentro de la línea de mantenimiento y reparación que afecta a la mayoría de los elementos de topografía urbana en este siglo. Otro fenómeno que ha concitado nuestra atención es la ocupación de vías y pórticos por parte de construcciones privadas. Esta apropiación del espacio público se relaciona con la falta de suelo edificable y, asimismo, con la permisividad de las autoridades.

8. Felix Teichner, The Municipium Flavium Mirobrigense – an example of the false start of urbanisation in Roman Lusitania?

The Roman city of Mirobriga, which developed from a celtiberian oppidum during the 1st century AD, embraced public facilities such as circus, baths and a forum. The present investigations concentrate on domestic architecture (domus), which were recently discovered through non-invasive geophysical survey. The following careful excavation of the houses provide us for the first time with the possibility to reconstruct the construction history of private architecture and its evolution in the small urban centres of southern Lusitania, between the Flavin period and the second half of the 3rd century A.D. when the city structures collapsed.

9. Pepita Padros and Clara Forn (Museu de Badalona) - Jacinto Sanchez, The Urban Transformations in the Roman Town of Baetulo from the Flavian Period

The roman town of Baetulo (Hispania Tarraconensis) is located beneath present-day Badalona, 10 km north of Barcelona. Baetulo was founded ex novo around 80 B.C. as part of a programme led by Rome at the end of the 2nd century B.C. and beginning of the 1st century B.C. to be one of the key elements of the new territorial distribution in Laietania. Baetulo has a clear Roman filiation not only in its town planning but also in its documented public and private buildings in which it shows a clear and total italian influence. With regard to its legal category, Pliny refers to it as an oppidum civium romanorum, that is, a fortified urban settlement with an established presence of Roman citizens.

From the end of the first century AD and the first half of the second century AD, archaeology documents in Baetulo a process of change that led to major transformations in public and private use spaces. This fact did not mean abandoning the area, but a transformation of the functional use of these spaces, which may have to be related to the granting of the Ius Latii. The vitality of Baetulo during the second and third centuries is proved by the existence of archaeological contexts and epigraphic elements that document the evolution and transformation of urban life. This fact contrasts with the possible contraction of the city, or the lack of political power in the early third century AD, which translates into the use of public spaces as a place to dispose of domestic waste.

10. Tamara Peñalver (Universitat de València), Lucentum: the decline of the city through its domestic architecture

Domestic spaces in the Roman world are microcosms, they reflect the transformations and changes that take place on a large scale in society, so they are valuable tools for analyzing the phenomenon of cities classified as "shooting stars." The various phases of a house, from its construction, reforms and abandonment (sudden or premeditated), are symptomatic of the state of the cities to which they belong.

Our aim with this communication is to analyze this phenomenon of the oppida labentia through a concrete case study, the domestic spaces from the municipium of Lucentum. Its domus show through its construction techniques, its decorations and its material culture, a total symbiosis with the evolution of the city.

In the second hand, we will try to deduce the flows of the population once the city declined. In our case, the decadence of Lucentum (at the end of the second century AD) occurs at the same time that a relative splendor of Ilici and of the Portus Ilicitanus, where has been found one of the most luxurious late-
antique domus in the Valencian territory.

Regarding the villas, two phenomena occurred, while those suburban villas suffered the same fate as Lucentum, disappearing in the s. III AD (Calle Rómulo and Remo, Casa Ferrer, Balsa del Castillo); Other surrounding villas flourished (Algorós, Xauxelles, Els Banyets de la Reina), becoming centers of political and social life, between the 3rd and 4th centuries AD.

11. Inmaculada Delage González (Universidad de Navarra), Roman common ware and the issue of transition, crisis and discontinuity in urban building programs at the end of 2nd century AD and the beginning of 3rd century AD, the case of Los Bañales (Uncastillo, Zaragoza, Spain)

In addition to work by J. Galiay in the 1940s and A. Beltrán Martínez in the 1970s, nine excavation campaigns have been led by the current research project at the Roman city of Los Bañales. The site has become a paradigmatic case study for the difficulties that confronted many Hispanic-Roman cities in the late II century and early III century A.D. Different evidence for these difficulties has been recently analysed at Los Bañales and includes reused forum spaces, disuse of the hydraulic system and the collapse of the baths. The objective of this paper is to incorporate an analysis of the private buildings, in particular material from the area in front of the baths known as the “domestic-handcraft space”. This area was used during the II century A.D. in what was probably an earlier public building. This paper presents a detailed study of the everyday pottery, which includes table, cooking and storage wares.

With this analysis, we intend to outline elements of change and alteration identified in common ceramics, which until recent times have received little attention by investigators, and to make visible the small-scale changes in the behaviour and customs of inhabitants of this city that had a major impact in the habitational zones.

12. Luis Romero Novella (Universidad de Navarra), El foro romano de Los Bañales (Uncastillo, Zaragoza): Construcción, reformas y amortización de un forum del conuentus Caesaraugustanus

La ciudad romana de Los Bañales presenta un conjunto forense construido, como máximo, en época augustea temprana, según se deduce de la presencia en el mismo de un ciclo escultórico dedicado a los nietos e hijos adoptivos de Augusto: Cayo y Lucio César. Posee una de las plazas forenses más pequeñas de Hispania, a la que se abren una porticus duplex en los lados norte y este, dos scholae y la curia en la zona este y la basílica jurídica hacia el oeste. El conjunto sufrió varias reformas, una vinculable a la promoción de la ciudad a municipium en época de Vespasiano. El recinto fue tempranamente amortizado, entre finales del s. II - principios del s. III d.C., según se deduce del material cerámico recuperado en las fases de amortización del criptopórtico este y la zona de tabernae sur. Este fenómeno es observado en otros foros hispanos, algunos de ellos en su ámbito geográfico más próximo. Se analizarán en detalle los procesos de amortización de los programas escultóricos, decorativos y epigráficos del mismo. Asimismo, se estudiarán las técnicas de adaptación de los antiguos espacios públicos del foro para fines distintos a los originales, para lo cual se dan procesos de compartimentación para adecuarlas a estos nuevos usos, en las que se reutilizan sillas e incluso decoración arquitectónica.

13. Alessandro Alessio Rucco - Claudio Negrelli - Fabio Bracci - Renata Curina, Claterna (Bologna, Italy): crisis and transformation of a municipium between II and III century A.D.

The ancient town of Claterna lies in the countryside, along the via Aemilia, about 15 km east of Bologna. Several archaeological campaigns have investigated the surface of the settlement helping us to detect the general plan of the town. Two domus were intensively excavated, while the public area is still under preliminary investigation.

Even if partial, the available data is sufficient to show the close bond between the case of Claterna and the general issue of the decline of towns around the II-III century A.D.

Born as a conciliabulum along the via Aemilia, between Bononia and Forum Cornelii, at the crossing with a road coming from the Apennines, Claterna is recorded as a municipium from the 1st half of the I century B.C. It is our opinion that after the floruit of the augustan age, the town underwent a severe crisis between the late II and the beginning of the III century A.D. The aim of our paper is to discuss this hypothesis starting from the presentation of a stratigraphic context.
The latest excavations in the so called Domus of the Blacksmith let us discover that a 50 cm thick extensive layer of ruins sealed the I-II century floors. The time-span between these ruins and the immediately later interfaces was about a century. Only in the V century, in fact, the domus was recovered, but the characteristics of the new occupation suggest that the surrounding settlement might had already lost its role as municipium and turned to its original condition of itinerary place.

14. Mario Gutiérrez-Rodríguez (Universidad de Granada), Site formation processes and urban transformations during Late Antiquity from a high-resolution geoarchaeological perspective: Sedimentary contexts of Vrbes Baeticae

Understanding urban transformation processes in public spaces is a key-challenge to recognize the scope of the transformations of the Early Empire Roman cities towards Late Antiquity. In this sense, public areas experienced a great variety of transformation processes entailing the genesis of complex stratigraphy of anthropogenic and natural deposits. In this paper we use archaeological soil micromorphology, physico-chemical analyses and geochemistry to investigate site formation processes and non-traditional forms of occupation not visible in the macroscopic archaeological record. This methodology allows the distinction of several anthropogenic activities as recycling, housing and reflooring practices, middening of organic residues, animal penning, or expoliation and progressive decay of constructions among others. Further, sedimentary components inform about the changing geomorphological dynamics of the surrounding landscape of the Roman cities, and also about the interaction of residual occupation forms and sedimentation once public architecture experienced abandonment processes. Thus, the complex superposition of site formation processes seen at Roman cities of provincia Baetica underlines the role of Geoarchaeology for the identification of behavioral signatures and its relevance in deciphering urban transformation in public spaces during Late Antiquity. To illustrate this, we will present different case-studies as Munigua, Baelo Claudia, Hispalis and Torreparedones.

Panel 8.8 The Numidian Country and its Commercial and Economic Opening on the Mediterranean Basin and its Southern Prolongation

Organiser: Khaoula Bennour (Faculty of Human and Social Science of Tunis)

Wednesday | 23 May | 09:00-11:00 | HS XIV

Panel abstract

Our study focuses on the commercial networks linking the Numidia country to the Mediterranean world and to the nomadic, semi-nomadic and sedentary tribes of the Saharan and sub-Saharan regions. Numidia has inherited a network covering the whole of the Mediterranean basin, connecting the port areas to the interior of the Numidian lands and even to the sub-Saharan regions. Indeed, the evolution of urban structures in Numidia was accompanied by a significant economic boom that seems to be increasing in the 2nd century BC. Especially with the decline of Carthage. It is the Numidian monarchy that benefits greatly, it develops the networks of trade with the regions of the Mediterranean basin which was in the Punic movement, especially after the control of the main commercial ports of the regions of the Syrtes and the Sahel. Thus, Numidian kingdoms were inserted into the commercial networks of the Phoenician-Punic world, Greek and Roman. These networks can be direct or via Carthage. Numerous questions relate to the nature of agricultural or artisanal production and to the modalities of trade and the organization of markets in urban and rural areas in a Numidia country. However, the interest of the Numidian power in international trade does not undermine the importance of interregional trade and pre-Saharan or Saharan caravan trade. Trade networks have played an important role in forging links and socio-economic exchanges linking the Mediterranean to sub-Saharan areas. The “tariff of Zarai”, although it goes back to Roman times, informs us about the presence of several circuits of exchange of pastoral, nomadic and semi-nomadic products of the numido-Mauritanian region. Given
the geographical position that contributed to the isolation of the North African world with its southern natural prolongation, this did not prevent the Libyco-Numidian, Carthaginian, Greek and especially Roman populations from building bridges and contacts with the various tribes Nomadic, semi-nomadic and sedentary peoples of the Saharan and sub-Saharan regions, such as the Muslims, the Garamantes, the Gules and the Ethiopians, who certainly contributed in one way or another to the shaping of Libyco-Numidian culture.

Paper abstracts

1. Estefanía Alba Benito Lázaro (Universidad Complutense de Madrid), ¿"Carros garamantes"? Relaciones económicas entre las poblaciones locales norteafricanas en el contexto de la confederación númida

El reino númida, configurado, según afirma la historiografía moderna, a partir de la unión de tribus llevada a cabo por Masinisa (que pasó de ser "rex Massyliorum" a "rex Numidarum"), se considera la potencia norteafricana más importante que confrontaron los pueblos foráneos (primero, cartagineses y griegos y, más tarde, romanos) que llegaron a instalarse en el área geográfica del actual Magreb. Etnográficamente, se trataría, pues, de una entidad de la máxima jerarquía, que, en su momento de apogeo, debía aglutinar, o al menos controlar, por lazos de hegemonía, un número significativo de organizaciones tribales menores, lo que hace que esta confederación sea una de las más interesantes para el estudio de la etnicidad en el norte de África. En esta presentación, se tratará de valorar cómo fueron los contactos interregionales entre estas tribus o grupos que constituían o se encontraban en la órbita númida. Se analizará especialmente el caso de los garamantes, protagonistas de un cierto comercio bidireccional entre su territorio y la costa, pero sin dejar de lado las actividades económicas, menos conocidas, que también debieron llevar a cabo el resto de pueblos del entorno, mediante las rutas caravanas larga tradición que, en su máxima prolongación, llegarían a conectar con el África subsahariana, posibilitando el viaje de productos, personas, animales e ideas entre los diversos "mundos" que entraban continuamente en contacto en este escenario fronterizo sin igual.

2. Slimani Souad (Université Constantine 2), Transhumance ways and economic issues in southern Numidia Example of Hodna

The Hodna is an area of transhumance and nomadism since ancient times, with many of these tracks and paths used until the 19th century. Through the corridors of Hodna and Aurès, the transhumants moved seasonally towards the regions of the Tell and reversed direction in the winter towards the Ziban and the Sahara. In this paper, we will identify these tracks, consider the management of this activity (control of the passages, tariffs and taxes), establish the products being marketed and the implications of this economic activity. We also will offer new insights into the passages through the Hodna, by interpreting the archaeological evidence revealed by our field surveys.


The drying out of the Sahara Desert in the 3rd millennium BCE led to the increased mobility and migration of the pastoral communities of the ancient Maghreb, resulting in a greater degree of contact between a diverse range of peoples. This period also saw a shift in burial practices with a rise in the use of megalithic tombs, arguably due to an increase in social stratification and hierarchies. The location of these tombs has often centred on the increase in competition for natural resources required to sustain pastoral communities, which in turn led to more pronounced territoriality in which tombs were used to demarcate boundaries. While this argument certainly has merit, a further possibility could link some of these tombs to the subsequent rise in trans-Saharan trade and periodic markets, a practice associated with the economy of pastoral communities including those of Roman North Africa. This current paper, through the analysis of case studies, will delve further into the ritual and symbolic purpose of tombs in the ancient Maghreb and assess whether they played a role in the location and economy of periodic markets, from the Late Pastoral period into the Roman era. While this certainly does not imply that all

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tombs and necropoleis were linked to such a function, it does offer possible further insight into the location of megalithic tombs and ritual spaces and their potential role in the economy of the ancient Maghreb.

4. Hanane Kherbouche (Universite Constantie 2), La verrerie préromaine en Numidie: Echange commercial et échange de savoirs faire

The necropolis of Coudiat Aty in Constantine - the ancient CIRTA - and the tombs of Tiddis - CASTELLUM TIDDITANORUM-, have delivered an abundant furniture in glass. The forms present in this collection strongly illustrate a commercial exchange of this material or else an exchange of know-how; although the typological approach of the pieces of this furniture releases models probably made in local or regional workshops.

In this paper we will try to trace the ways of trade related to the craft of glass, so we have Carthage as the first home of the glass industry in North Africa; in order to schematize the evolution of the economy of production and exchange between the cities of Numidia and the other provinces of the Mediterranean basin during the pre-Roman period and during the Roman Empire.

5. Khaoula Bennour (Faculty of Human and Social Science of Tunis), The numidian country and its commercial and economic opening on the Mediterranean basin and its southern prolongation

Our study focuses on the commercial networks linking the Numidia country to the Mediterranean world and to the nomadic, semi-nomadic and sedentary tribes of the Saharan and sub-Saharan regions. Numidia has inherited a network covering the whole of the Mediterranean basin, connecting the port areas to the interior of the Numidian lands and even to the sub-Saharan regions. Indeed, the evolution of urban structures in Numidia was accompanied by a significant economic boom that seems to be increasing in the 2nd century BC. Especially with the decline of Carthage. It is the Numidian monarchy that benefits greatly, it develops the networks of trade with the regions of the Mediterranean basin which was in the Punic movement, especially after the control of the main commercial ports of the regions of the Syrtes and the Sahel. Thus, Numidian kingdoms were inserted into the commercial networks of the Phoenician-Punic world, Greek and Roman. These networks can be direct or via Carthage. Numerous questions relate to the nature of agricultural or artisanal production and to the modalities of trade and the organization of markets in urban and rural areas in a Numidia country. However, the interest of the Numidian power in international trade does not undermine the importance of interregional trade and pre-Saharan or Saharan caravan trade. Trade networks have played an important role in forging links and socio-economic exchanges linking the Mediterranean to sub-Saharan areas. The "tariff of Zarai", although it goes back to Roman times, informs us about the presence of several circuits of exchange of pastoral, nomadic and semi-nomadic products of the numido-Mauritanian region. Given the geographical position that contributed to the isolation of the North African world with its southern natural prolongation, this did not prevent the Libyco-Numidian, Carthaginian, Greek and especially Roman populations from building bridges and contacts with the various tribes Nomadic, semi-nomadic and sedentary peoples of the Saharan and sub-Saharan regions, such as the Muslims, the Garamantes, the Gules and the Ethiopians, who certainly contributed in one way or another to the shaping of Libyco-numidian culture.
Panel 8.9 Town-country Relations in the Northern Parts of Germania inferior from an Economic Perspective

Organiser: Marion Brüggler and Julia Obladen-Kauder (LVR-Amt für Bodendenkmalpflege im Rheinland) Harry Van Enckevort (Gemeente Nijmegen, Bureau Archeologie en Monumenten)

Friday | 25 May | 11:30-13:30 | HS XIII

Panel abstract

Germania inferior is in some aspects an interesting candidate for investigating town-country relationships. While its southern part borders on the distribution area of celtic oppida, its northern parts had no Iron Age tradition of larger settlement agglomerations. Nonetheless, in the Roman period towns – even one Colonia – were founded here: The Colonia Ulpia Traiana (Xanten) and the municipia of Ulpia Noviomagus (Nijmegen) and Forum Hadriani/Municipium Aelium Cananefatum (Voorburg). Another important economic agent is the Roman military with its numerous forts along the Lower German Limes. This massive and new agglomeration of people that were not primarily involved in food production must have posed a challenge to the supply of provisions. This panel focuses on the northern parts of Germania inferior and aims to discuss the economic interaction between the named towns as well as the other larger settlement agglomerations (military forts and vici) with their respective hinterland. What supply strategies for the towns can be made out? Are there differences between the civitates? Do they differ from those in the southern parts of Germania inferior and other northwestern provinces? And if so, in what way and what are the reasons for it? Also, methodological questions need to be addressed: Can we, with our data at hand, answer these questions? Else, what other methods can be applied to gain a deeper insight into this aspect of Roman economy? The Speakers of this session are set.

Paper abstracts

1. Christoph Eger (LVR-RömerMuseum), Colonia Ulpia Traiana: the economy of a garrison and border town at the Lower Germanic limes

The foundation of Castra Vetera and the deployment of two legions a few years BC is the starting point of large scale economic activities in the region of what is today the city of Xanten. Grain, oil and meat in large quantities were needed to feed the troops. But the legionaries needed also cloths, leather, ceramics, metal objects and other things more. And they had money to pay for it. Soon, a civilian settlement grew up nearby the legionary fortress where specialists organised the production, trade and transport of a large variety of goods. In AD 100, this settlement was changed into Colonia Ulpia Traiana where also a lot of veterans lived. However, the economic preconditions were not the best at this place: the grounds in the surroundings of CUT are sandy and not very fertile, quarries, mines and big forests with oaks are missing. A lot of requested goods had to be transported by floats and boats on the Rhine river rather than by carriages overland. Hence, the river harbour might have played a central role in the life of the city. Archaeological evidence shows that a large variety of handicrafts was present in the city. But obviously none of them played a supraregional role. CUT have never become as important as Cologne in Roman times. Was CUT finally a failed city?

2. Marion Brüggler and Renate Gerlach (LVR-Amt für Bodendenkmalpflege im Rheinland) - Tanja Zerl and Jutta Meurers-Balke (University of Cologne) - Michael Herchenbach, The hinterland of the Colonia Ulpia Traiana (Xanten): Supply basis for the town?

The territory of the Colonia Ulpia Traiana (CUT) comprised the civitates of the Cugerni in the north and of the Baetasii in the south. Their landscapes were very different: While the civitas of the Baetasii lay in the loess-belt with its high quality soils, the civitas of the Cugerni was situated in a landscape made up of loamy and sandy soils with small scale changes of soil quality. High quality soils also occur, but not in...
as large areas. In this presentation, we concentrate on the northern part of the territory of the CUT, i.e. its immediate hinterland.

The archaeological record here is still sparse. Only in the last decade farms were excavated and only a handful is known so far. Settlement layouts, material culture and archaeobotanical data can be evaluated, but no zooarchaeological data is available due to lack of preservation. Therefore we have tried to apply a theoretical model by van Dinter, Kooistra et al. created for the Rhine Delta. According to it, the farmers should have been able to create a surplus in cereal to supply the town. However, farming and food consumption obviously continued in Iron Age traditions in these vernacular farmsteads, so whether a surplus had actually been created is questionable. Still, some kind of economic interaction must have taken place, as the occurrence of Roman made pottery shows. We would like to discuss how we can get a better understanding of the economic interactions between the CUT and its hinterland with the available data.

3. Harry van Enckevort (Gemeente Nijmegen), Ulpia Noviomagus and the villas in the civitas Batavorum

The data on the use of building materials such as grauwacke and stamped tiles show that, at the beginning of the 2nd century, the army was involved in the construction of both public buildings in Nijmegen and villas and temples in the Batavian countryside. The construction of these buildings seems rather to have been intended to help expand the economic, infrastructural and administrative structure of the civitas Batavorum on the Roman model. In combination with other archaeological data this suggests an important social-economic transformation of the civitas during a period of almost less than a generation, between approximately 85 and 122 A.D. The reorganisation from a military district on the Lower Rhine into the province of Germania inferior, the grant of municipal status and the imperial name to the town, the construction of villas and temples, as well as the substitution of hand-made and regionally made wheel-thrown pottery by imported pottery, are important signs of this development. Other signs are changes in the economy in the countryside. This illustrates how the social and economic development of the Batavian community could be bound up with the Roman army and the career of Trajan. It is striking that this process started about 100 years after the arrival of the Romans in the Dutch river area, and six decades after the Rhine was established as the northwestern frontier of the Empire.

4. Laura Kooistra (BIAX Consult) - Maaike Groot, Supplying the Lower German Limes with food

With the creation of the Roman province of Germania inferior in the first century AD the rural inhabitants of the Lower Rhine Delta would have changed their farming practice from a subsistence strategy to surplus farming. In this part of the province a dozen small forts and the towns Ulpia Noviomagus (Nijmegen) and Forum Hadriani/Municipium Aelium Cananefatium (Voorburg) were located. The aim of this presentation is to prove the hypothesis that the farmers supplied the forts and the towns. In the last few decades, a large number of agrarian settlements in the Lower Rhine Delta were investigated. The data analysis included botanical and zoological assemblages concerned with crops and livestock, respectively. These data prove that the farmers in this area produced a certain surplus of plant and animal food.

The data sets collected from forts/vici and the named towns suggest that food produced by the local farmers would have been used by people in forts/vici and in towns. The way in which the food was distributed between farmers, citizens and soldiers needs some more attention to be fully understood. The archaeological research also generated data which made clear that the towns and forts were supplied by food from outside Germania inferior.

To give ‘food’ for discussion a flow diagram of the possible supply networks is presented in which gaps of knowledge occur. Suggestions will be given for other methods that can be applied to gain a deeper insight into this aspect of the Roman economy.
Panel 8.10 The Aesthetics of Urban Production and Trade

Organiser: Annette Haug (Universität Kiel) and Johannes Lipps (Universität Tübingen)
Friday | 25 May | 09:00-13:30 | HS XIV

Panel abstract

The relevance of economy in ancient society found its visual expression in the effort that was put into the layout and design of 'economic spaces': spaces of production and trade. They were not conceived purely with functionality in mind, and were often enhanced with elaborate programmes of decoration and precious materials. Within urban landscapes, these buildings were sometimes even positioned to take advantage of different visual perspectives, such as a view from the sea or a river. At the same time, economic spaces could also engage the other senses: most were characterised by specific sounds and odours that contributed to the general aesthetic 'design.' Above all, however, it was the people acting in those places who created particular commercial atmospheres. Thus, design and agency were intrinsically related. On the one hand, the needs, behaviour and expectations of commercial agents shaped economic spaces. On the other hand, the (architectural) design and décor of the spaces induced specific forms of agency and perception. In recent years, a renewed emphasis on the economy has offered important insight into ancient material culture. But the aesthetics of urban spaces of production and trade has rarely been the subject of research. This panel therefore wants to outline this phenomenon for different chronological horizons with regard to the following questions: - How are economic spaces staged within urban settings? How does their design refer to (or differ from) the surrounding urban landscape? - Which strategies are chosen to aestheticise economic buildings? Are there specific forms of 'economic' design/décor? - What might have been the purpose of decorating these buildings? - In what way do people and architecture affect each other in economic contexts? - How are economic spaces perceived? - Do written or visual sources reflect on the aesthetic qualities of economic buildings? - In which historical (temporal and chronological) situations do economic spaces become aesthetically prominent within urbanscapes? The questions will be addressed for all 'ancient' contexts, from the Minoan period to Late Antiquity. Systematic approaches to the topic are welcome, as are case studies on specific contexts, literary or historical reflexions.

Paper abstracts

1. Annette Haug (Christian-Albrechts-Universität zu Kiel) - Johannes Lipps (Eberhard Karls Universität Tübingen), Introduction

The introduction aims at an historical contextualization of the research questions that the panel will ask. On the one hand, it traces the history of aesthetic theory from Alexander Gottlieb Baumgarten to Gernot Böhme with a special focus on the aesthetic perception of spaces. On the other hand, it outlines prominent research traditions of economic theory with regard to questions of consumption. On a theoretical level, these two traditions have rarely been brought together, though in praxis it is well known that aesthetics and economy are merging. This can be seen in modern warehouses, but it also now appears within the field of Classical Archaeology. A brief history of research, however, will show that a systematic discussion of this subject is still lacking.

2. Mantha Zarmakoupi (University of Birmingham), The aesthetics of branding in late Hellenistic Delos

This paper will analyse the architectural and visual strategies that merchants of late Hellenistic Delos employed in order to promote their economic interests and fashion their corporate identity. Delos was at the centre of the emerging Roman Empire's trade network with the Greek East, after the
Roman senate granted the statute of ateleia (freedom from taxes) to the island in 167 BCE. The result of this economic development was an unprecedented population increase due to new settlers and, by consequence, a rapid urbanization attested by the formation of new neighbourhoods and harbour facilities and the redevelopment of existing urban and harbour areas of the island. On the one hand, merchants transformed the urban fabric and waterfront façade of Delos by creating prominent commercial hubs within the city and developing extensive harbour infrastructures around the island and, on the other, they employed domestic cults alongside merchant associations as a means of fashioning their corporate identity and promoting their economic interests.

By tackling the ways in which the economic spaces of the emporion of Delos shaped the city's urban form as well as the ways in which diverse groups of merchants articulated their commercial aspirations in both public and private spheres, this paper will address the aesthetics of branding in late Hellenistic Delos.

3. Armando Cristilli (University of Rome 'Tor Vergata), Aesthetics as approval of urban trade? The porch and its variations on the main façade of the Roman macellum.

This essay focus up the role played by the porch on the main façade of the Roman macellum in the urban layout of host cities. Starting with previous studies about this subject and using some interesting case studies (e.g. macellum of Gerasa in Jordan and Cirene in Libya), it highlights how this aesthetic was basic it to emergence of the foodstuff markets in the culture of the community of buyers: in fact, these units indicated the presence of relative buildings, claiming for themselves autonomy in the total urban approval. But this kind of porch, in turn, respond to the aesthetic exigencies of the local context too, so it offers us a variety of artistic and architectural solutions dependent on the cultural and urban background of the host city. It is the element that allowed a commercial space with a precise functionality and elaborate decoration and architecture program to be approved by citizens in the relationship between the urban space system and the space of fruition.

4. Taylor Lauritsen (Christian-Albrechts-Universität zu Kiel, CAU), Wall Decoration in Roman Commercial Space

Excavations in Pompeii, Herculaneum and other well-preserved urban contexts have shown that Roman cities were awash with painted decoration. Art situated in the domestic sphere has received the bulk of scholarly attention over the years, but public wall paintings represent an equally compelling corpus of material with which to work. In the street, wall decoration was positioned at the centre of a dialectical relationship between the artist/patron and the consumer. The diversity of images (and graffiti) applied to the façades of Roman buildings reflect the range of messages that were occurring between individuals. Naturally, context played a central role in structuring these 'conversations.' The public relations aims of an elite householder, the owner of a fullonica and a shopkeeper were different, and were reflected in their respective choices of décor. Although recent studies have emphasised the economic importance of commercial facilities, and, at the same time, interest in 'sub-elite' art, public graffiti and façade architecture has grown, wall decoration in and around shops remains a comparatively neglected topic. While individual structures have been subject to thorough decorative analyses, no comprehensive examination of commercial decoration has been produced. This paper takes preliminary steps in that direction by exploring some common images and ornamental designs found on the walls of Pompeian tabernae.

5. Pia Kastenmeier (Kunsthistorisches Institut in Florenz), Rural Pompeii: vineyards, leisure, gladiators and Priapos

Spätestens seit Anfang des 1. Jhs. v. Chr. ist das Hinterland Pompejis von einem dichten Netz kleiner und mittelgroßer Gutshöfe überzogen. In der Hauptsache wurde hier Wein angebaut und an Ort und Stelle weiterverarbeitet. Für diesen Produktionszweig haben sich offensichtlich auch viele Immobilienbesitzer innerhalb der Stadt entschieden. Im Bereich um das Amphitheater wurden zahlreiche große Weingärten freigelegt. An die eigentlichen Rebpbflanzungen sind architektonische Strukturen und Ausstattungselemente angeschlossen, die darauf schließen lassen, dass auf diesen Grundstücken nicht

6. Simona Perna, Architecture, décor and aesthetics of a statio negotiatorum from the early Imperial period at Murecine (Campania)

At modern Murecine (about 600 m south of ancient Pompeii) rescue excavations uncovered a public building complex unparalleled within its urbanscape. Built in the Julio-Claudian period at the hub of an intense production and distribution network, it enjoyed two stunning visual perspectives: the Sarno river mouth with its luxurious flora and the bay of Naples. Rooms decorated with marble and superb IV-Style frescoes opening on a porticus triplex would have stimulated visitors’ sensorial perceptions while the large garden with water fountains, myrtle bushes and fish-ponds contributed to the general aesthetic design. Evidence points at a “5-star” hospitium or statio negotiatorum that catering for a high-ranking clientele (commercial agents?) must have represented an ideal stage for business-orientated social interaction. From at least AD 62 the building belonged to the Sulpicii, wealthy bankers and traders from Puteoli. It also emerged that in AD 79 the site was undergoing major construction and renovation work especially in the bath complex area, as the discovery of dozens of rare Greco scritto marble slabs waiting to be set in place suggested. This paper will use the evidence from Murecine to offer insight into dynamics, strategies and purposes behind the “aesthetisation” of a Roman public economic building through an analysis of its architecture and interior décor. The ultimate objective would be to re-evoke Murecine’s aesthetic prominence and meaning within its urbanscape.

7. Michael Feige (Christian-Albrechts-Universität zu Kiel, CAU), Productive Installations of Roman Villas as Scenery for the Luxurious Living and the Representation of the Urban Elite

The cultivation and processing of wine and olives, besides the growing of grain, were the two main sectors of profit-oriented agriculture in Roman Italy. Both branches of production left their mark on the remains of roman rural buildings on the Apennine peninsula in the form of wine and oil presses and storage facilities.

In addition to the remains of these market-oriented facilities the archaeological sites of Roman villas contain a series of agricultural production plants which, in regard to their composition and furnishing, clearly go beyond the usual characteristics of this kind of installations. Through the use of valuable building materials and room types usually associated with elevated residential architecture the facilities are upgraded from the normal functional frame of agriculture and put together as prestigious ensembles. The paper examines the extent to which these installations, aside from their superior equipment, differ further from the normal economic facilities. In this context, two possible interpretations are discussed:

1. The plants were still associated with real productive processes and have to be understood as a proud representation of a successful entrepreneur.
2. The seemingly productive installations were turned into pure scenery in the staging of a romantic agricultural image for the otium of the Roman upper class.

8. Wolfgang Filser (Humboldt-Universität zu Berlin), Emulation als Leitmotiv. Conspicuous consumption in der Casa della Fontana Piccola

Das Atriumhaus ist benannt nach dem kleinen, mosaikverzierten Brunnen im Garten. Bekannt sind die großen Landschaftsbilder, die die umlaufenden Wände der Westseite des Scheinperistyls schmücken.

9. Jessica Bartz (Humboldt-Universität zu Berlin), Trading between judicial, political, religious and social requirements. The economic history of the Roman Forum

Public spaces did not function as static areas, but as dynamically changed, heterogeneously animated and multisensory experienced spaces. At the Roman Forum markets, speeches and elections, courts and assemblies, rituals, processions, triumphs and gladiatorial contests can be located. This led on the one hand to a heavy functional concurrence, on the other hand all these temporary events required flexible constructions, which organized and structured the space and supported the specific function. Therefore, the aesthetic perception of the Roman Forum continuously differed, complicated by the current changing needs depending on the political structure of the society. Depending on the quantity and quality of one specific function, the appearance of the appropriate required architectures varied from a temporal small structure over huge (semi-)ephemeral constructions to permanent monumental buildings.

The paper will focus on the economic history of the Roman Forum, in which or close by trading and commercial structures primarily belonged to the visual experience, but were always competed by the divergent functions. The economic functions were partly displaced to other areas, regularised to precious objects or transferred to the inner parts of monumental buildings. The ancient sources do not tell us about pragmatic reasons but they mention the annoying by-products, like dirt and smell, which did not have been appropriate for the aesthetic perception of this outstanding urban space.

Panel 8.11 Cities, Micro-regions and Economy in an Interdisciplinary Perspective. Three case studies from Hellenistic-Roman Asia Minor

Organiser: Daniel Knitter (Universität Kiel) Bernhard Ludwig, Ulrich Mania and Felix Pirson (Deutsches Archäologisches Institut Istanbul)

Saturday | 26 May | 09:00-13:30 | HS XI

Panel abstract

Economic relations between ancient cities and the rural hinterland have for a long time been described in terms of a hierarchic dichotomy of "town" and "country". Against this background, the double-panel applied for seeks to understand the economy of ancient cities as a system of interdependencies in the context of micro-regions. This includes economic relations amongst urban communities and with the rural hinterland. A central role here is played by the ecological dimension, namely the human–environment relationship and its impact on the landscape and urban development. The interplay of specific
topographic situations with the individual physiognomies of ancient cities and their economies will be discussed with reference to Ephesos, Pergamon and Sagalassos. These three sites are particularly relevant to the topic under discussion. Ephesos was a seaport throughout antiquity; Pergamon, though situated inland, had access to the sea via its harbours, while Sagalassos significantly lay in the interior in the Taurus mountains. While the mentioned differences offer highly promising conditions for scientific enquiry, comparability in fact extends over several levels: differing in status in Hellenistic times, all three cities experienced a massive expansion in the Roman imperial period, a circumstance that needs to be analysed in the context of their respective micro-regions. At all three sites a wealth of archaeological and geoscience data is available. On the other hand the three sites are anchored in different research traditions, which presents an opportunity to re-evaluate the role of the economy in interdisciplinary archaeological urban research projects.

So that comparative discussion of the selected sites can be conducted as productively as possible, the double-panel is divided into three sections – (1) Resources: needs, supply and infrastructure, (2) Production, distribution and consumption, (3) Economy and urban physiognomies. In each section contributions will be presented on all three cities. The ancient history perspective on the interplay of settlement structure, urban development and the economy in Hellenistic-Roman Asia Minor will be augmented by a paper on the emergence and abandonment of urban settlements.

Frank Vermeulen (Ghent University), an internationally recognised specialist in the archaeology and geo-archaeology of ancient Mediterranean landscapes and Roman rural and urban settlement history, has been invited as a discussant in order to extend the focus beyond Anatolia and to establish a connection with the discussion of these phenomena in the western Mediterranean region.

Paper abstracts

1. Alexander Sokolicek and Horacio Gonzalez Cesteros (Austrian Academy of Sciences), Ephesos: Not enough grain, but too much wine? A diachronic perspective on demand and supply of Ephesos with basic foodstuff

For the most time of its existence, Ephesos had a key role as local and global distributor of various goods, both raw and processed. Whereas Ephesos' economic importance is evident, the question of its dependence on and its interaction with other economic systems has not yet been studied. Politically and economically, Ephesus is closely linked with almost any region in the Mediterranean and the Black Sea areas. This paper discusses the relationship of import and export of foodstuff of an ancient metropolis, whose population has exceeded self-sustainable food supply at least since late Hellenistic times. Due to its size and geopolitical importance, Ephesos is a perfect case study of the functioning of ancient economy and food demand/supply.


The transition from the Hellenistic to the Roman Imperial Period is characterized by a phase of significantly increased urbanization. Within the city, this is mirrored by an extension of the city's build space, while many settlements and farms in the Kaikos river valley may have been abandoned. This development raises various questions in terms of resource availability, transport, production, and exchange. The socio-economic configuration of the entire Pergamenian Micro-region must have been changed considerably and new modes of organization were necessary in order to supply the city itself and to link its reduced complementary, supplying hinterland.

In this study we use quantitative models to investigate the potential distribution and supply system of key resources, i.e. stone, wood, and food during Hellenistic as well as Imperial Roman times. Based on this diachronic approach we aim to derive general hypotheses about the economic system and the changing relationship between the city and its hinterland.
3. Maarten Loopmans (Sagalassos Archaeological Research Project) - Dries Daems, Sam Cleymans and Peter Talloen (KU Leuven), Tracing organisation of labour and material production.

Human societies – past and present – as open systems, are characterised by flows of materials and energy. People expend energy in the form of labour to sustain themselves, produce new things, and maintain a social organisation. For each of these activities, material resources are appropriated, distributed, transformed, consumed and discarded. The combination of these processes and flows can be subsumed under the moniker of 'social metabolism'. Different kinds of metabolisms, for example rural versus urban metabolism, are characterised by different material configurations expressed in various spatial compositions. By analysing these differences in material and spatial expressions in the archaeological record, archaeologists can trace the underlying metabolic processes and flows of societies in the past.

The Sagalassos Archaeological Research Project has been conducting multidisciplinary research at the site of Sagalassos and the surrounding environment ever since the late 1980's. Over the course of its long history, the project has amassed a variety of datasets pertaining to the production, distribution, and usage of artefacts in Sagalassos and its primary catchment of the Ağlasun valley, from the Archaic period until Mid-Byzantine times (8th century BCE – 13th century CE). This paper will use these datasets to trace and compare structures of organisation of labour and production of material culture. It will be demonstrated how changes over time in these structures and associated metabolic flows can be linked to overall developments and dynamics in the underlying social fabric of societies at that time.

4. Sabine Ladstätter (Österreichisches Archäologisches Institut), Ephesos: There is still much to say about Eastern Sigillata B, the table ware boom and Ephesos

With the establishment of a pottery industry in the large Meander Valley, the idea of sigillata production, which was begun in Italy, was transferred to Asia Minor. By means of the settlement of Italian potters and the initiation of subsidiary operations of Italian manufacture a direct transfer of knowledge and technology was also achieved. This, however, in no way led to the situation that exclusively Italian forms were imitated; instead, an individual style and a particular repertoire was developed in Eastern Sigillata B which can be clearly differentiated from other sigillata groups. The sales areas were located in the region, in particular including of course the large coastal cities.

Due to the abundance of material, yet also the exceptional state of publication, Ephesos provides the best preconditions for the discussion of the phenomenon of Eastern Sigillata B and for deriving economic-historical implications from it. The focus is on the 1st century AD, where after the dynamic Augustan epoch of the "table ware boom", an evident regionalisation, as well as a standardisation and re-definition of forms can be observed in the pottery market. In a comparison of the situations in the Augustan and Flavian periods trading- and supply networks will be thematised, and the significance of sigillata as an expression of Roman living culture will be investigated. Furthermore, the situation in Ephesos will be placed in a supraregional context, and the question will be posed whether the city can actually be approached as a case study, or whether in fact it is far more to be viewed as an exceptional situation.

5. Philip Bes (University of Leiden), Pergamon: Patterns of Diversification in the Pottery Production of Pergamon and its Micro-region

Pergamon and Pitane have long been known as places where, in Antiquity, the right combination of circumstances allowed the manufacture of pottery, particularly high quality slipped tablewares during the Hellenistic and Roman Imperial periods. More recently, this picture has been considerably expanded: research at both Pitane and Elaia have produced archaeological evidence also for later production. This new knowledge urges us to address several questions. Was, for instance, the region of Pergamon home to a number of individual workshops, or – perhaps more likely – did these workshops interacted with one another with regard to their organisation and output, both immaterially and materially: did these workshops operate contemporaneously, and to what degree did these share the shame or a similar morphological repertoire? And for whom did these cater? Even if ceramic products from Pergamon (and its micro-region?) may not have overwhelmed the international markets for slipped tablewares as
ESA and ARSW exceptionally did, they did make a significant regional impact, as well as travelling far and wide in smaller numbers. With the new evidence at hand, a re-evaluation of pottery manufacture in the micro-region of Pergamon is in place, which shows signs of regional, dispersed manufacture. Such a model may have been the rule rather than the exception in a number of case studies. This paper wishes to address these questions, set within a wider framework of urban and regional economies.

6. Jeroen Poblome (KU Leuven), Sagalassos: The ancient economy in dialogue with social-ecological systems: à quoi ça sert?

Classical Archaeology has a rich history in urban studies. Ancient historians like this theme too. One or other has to do with the recent past, in which modern European state formation was in need for a socio-political rationale and a cultural soul. The ruling/intellectual elites looked towards the classical past for exalted trajectories, combining the classical Greek ‘democratic’ urban past with the ‘orderly’ Roman approach with cities sustaining the message of empire as exemplary inspiration. More or less hand in hand the discipline of Archaeology was asserting itself, with the study of the Graeco-Roman past dominating the early agenda of the discipline. Many large-scale excavations in famous ancient towns were launched.

In the meantime, archaeology has gone global, luckily, and so did the European nations. The domain of classical archaeology has lost its dominance and also its innocence, in the sense that it too needed to develop its conceptual agenda. The latter has worked quite well as far as social and cultural themes and topics are concerned. The economic framework in which ancient cities were situated has fared not so good. Although many aspects of ancient towns are very revealing on aspects of economic logic, the debate has crystalized on idealized concepts and modes of production/consumption. Alternatively, there is not much debate at all, with aspects of ancient towns being approached from the implicit acceptance of the not very deeply considered principles of the neo-classical/liberal economy.

Against this background, archaeological case-studies have been growing ever richer, especially with the addition of truly interdisciplinary research strategies. These results highlight, on the one hand, the particular conditions of the classical past in economic terms, and, on the other hand, the challenging potential of the domain. Taking its cue from one particular case-study, ancient Sagalassos and its region, this paper wishes to present critical reflections on reconstructing the ancient urban economic framework, valuing the Sagalassos Project’s interdisciplinary tradition.

7. Martin Steskal (Austrian Archaeological Institute), Ephesos: The necropolis as a reflection of the city? The economy of death and burial in Ephesos

This talk discusses the economy of death and burial in Ephesos from a diachronic perspective. The core question will be: Is the economic power of the city of the living reflected in the city of the dead? Are there direct correlations or is the picture that we obtain filtered or idealized? Furthermore, are there differences between an individual and a collective level? This talk will also address the “economic factor death” with regard to the activity of building firms and developers on burial land: what kind of businesses were conducted and run in the area of the dead and how could the city profit? Finally, it will be discussed how the ownership and passing on of burial places was organized. Is it possible to specify the means and resources that needed to be used to get a decent funeral?

8. Felix Pirson and Ulrich Mania (Deutsches Archäologisches Institut, Istanbul), Pergamon: Layers of interrelation between Economy and Urban Physiognomy

Until today, the relations of ‘the economy’ with the urban physiognomy of Hellenistic-Roman Pergamon has only been assessed superficially. The state of research is characterized by general statements about wealth as precondition of urban splendor or the concentration of shops at the frequented main road. Our paper therefore attempts to characterize the levels on which future research might contribute to a better understanding of the complex interrelations. These levels include (1) resources of urban physiognomies and their dependence on the macro economy, (2) economic aspects of relations between city and micro-region, (3) spaces of production, distribution and consumption within the city, (4) actors, structures and processes of the urban economy, (5) stability and change in the urban econ-
omy. It is the aim to reassess the economy as a crucial factor for the development of an individual urban physiognomy besides politics, ideologies and cultural traditions.

9. Veli Köse (Hacettepe University), Trade and Routes in Aspendos in Pamphylia

Aspendos has witnessed significant developments in its economic life, thanks to its geographic location, natural resources, and the political maneuvering of its inhabitants. In its economic development, the political relationships with great powers such as Persia, the Hellenistic kingdoms and the Roman Empire, were a major factor.

In ancient sources, the city is famous for horse breeding, endless salt reserves, and grain cultivation. Thanks to some still-standing and clear structures in the city, economic ties can still be partially grasped. Archaeological surveys in the territory of Aspendos show that olive oil production was an important part of the economic revenues of the city and its inhabitants. The timber business was another of the industries of the ancient world, and Aspendos must have profited especially from transporting the rich cedar and other timber reserves of the Taurus Mountains along the river from both the city itself and other Pisidian cities further north.

Another contribution to the economic production of Aspendos is indicated by the detection of ceramic dumps where there is evidence for production of the rich 'Late Roman D' (Cyprotic Red-Slip Ware) probably from the 4. century AD onwards at least into the 7. Century.

This study will be concerned with the economic history and development of Aspendos alongside its socio-economic and political development and as determined from the archaeological and epigraphic evidence.

10. Martin Zimmermann, Lost cities - the settlement structures in western Asia Minor in an historical perspective

Like many others regions of the ancient Mediterranean world, western Asia Minor shows an interesting phenomenon that contributed to shaping ancient cultures: lost cities. Departing from the cultural landscape centred on the Attalid capital of Pergamum, a number of such cities shall be presented, all of which were abandoned already in the Hellenistic period. They provide an important indicator of the fundamental historical shifts in settlement structures both at the level of micro region and in broader geographical contexts. Economic Change, the development of the hellenistic agriculture and a new creation of rural landscapes is the background of these abandoned places.

Panel 8.12 Roman Street and Urban Economy

Organiser: Thomas Morard and Grégory Mainet (Université de Liège)

Friday | 25 May | 17:00-19:00 | HS XIV

Panel abstract

Among the urban infrastructures which shaped the economy, the street played a major role in ancient cities because it contributed to durably structure the urban economy. This use of the street has often been overlooked by archaeologists – until now. Indeed, such a topic naturally finds its place within the 19th congress of the International Association for Classical Archaeology whose theme is the economy of the classical world. First of all: how do we consider the street? As a mere route whose only purpose is traffic? No. This notion is wrong as it appears by reading ancient authors like Martial and Juvenal. The space of the street was built in three dimensions and was developed to answer the needs of the local population. It was indeed a place for important social and economic trades, constitutive elements of urbanity. The economic function of the street clearly appeared in its architecture which was shaped by the construction of numerous tabernae within the insulae and by the promotion of the activities (adver-
tising) which happened there. Therefore, the roman cities economy was not divided and confined into specific buildings such as macella. On the contrary, it was incorporated into the whole urban fabric through the streets. With this panel, we offer to shed a new light to the role of the street within the urban economies through the imperium romanum between the 2nd century B.C.E. and the 3rd century A.C.E. Is the economic importance of the streets the same across the whole empire? What about the cities where people were settled before Rome's arrival? On the contrary, what about all those which were founded by Rome? Did Rome and the Eastern Roman cities inherit their characteristics from Hellenistic cities? Or was the Roman model born in Italy? The problem is wide, contrary to the sources at our disposal. To solve it, two axis will be examined starting from precise archaeological cases, chosen within different periods: a) the qualitative study of the development of some streets well known thanks to extensive excavations like the Via dell'Abbondanza in Pompei or the Main Street of the Theatre District in Delos. b) the quantitative study of the distribution of economic functions along the network and the interactions between them thanks to comprehensive excavations or geophysical prospections.

Paper abstracts

1. Laura Ficuciello (University of Naples "L'Orientale"). The Commercial Streetscape of the Hellenistic Cities and the Development of the Roman Streetscape/La viabilità del "mondo greco" in relazione all'economia urbana: un rapporto possibile?

The name of some streets, evidenced in inscriptions and texts, suggests the importance of the economic activities along these urban thoroughfares. Moreover, archaeological evidence from Athens or Delos for example shows that Hellenistic streets are a space of economic interactions between indoor and outdoor so that they play a key role in patterning the economy of cities. Nevertheless, these interactions haven't been studied in detail so far. How commercial and craft activities are distributed across the urban fabric? How they shape the streetscape of Hellenistic cities? In contrast, how street architecture influences the development of urban economy?

During the Hellenistic period, craftsmen and merchants occupies the agora and its immediate surrounding as well as the streets, where could lay groups of the same speciality. The workshops' layout, in all likelihood, follows a precise organization across the urban fabric. For instance, access to water seems the principal criterion of organization, but the proximity to important thoroughfares also attracts workshops where products are manufactured and sold, as well as shops where goods are retailed. First, this paper aims to expand these relationships between streets and urban economy in Hellenistic cities. Then, as this economic logic of space seems similar to the Roman logic, this inquiry will focus on the continuity and discontinuity between the Hellenistic and the Roman commercial streetscape.

2. Grégory Mainet (Université de Liège), The Roman Streets Development and the Place of Economic Activities in the Urban Fabric/La « rue romaine » en Italie: un espace construit et aménagé pour répondre aux besoins économiques des cités?

The imperial streets of Ostia and Rome – as they appear on the severian Forma Urbis Romae – were edged by many shops, which shaped the streetscape of these cities. This situation is common in modern downtown, but it was not in Antiquity. In greek cities such as Priene or Olynthus, the space of the street is so different: since there is few doorways in the buildings façades, the frontages are more simple and the buildings more segregated from the thoroughfares. We observe the same characteristics in some italian cities, like Norba, destroyed at the beginning of the 1st century BC. Indeed, the streetscape seems to change from the Late-Republic in Italy: at Ostia for instance, we observe late-republican tabernae along the Decumanus, under the Horrea of Hortensius.

The progressive development of shops along urban thoroughfares shows evidence of the economic facilities offered by the space of the street, made up of building façades, roadway and street furnitures. This built framework hosts shopkeepers and their commercial activities, because it gave some market opportunities to them, just as a macellum, but far and wide throughout the city. So far, this architectural environment has been neglected in favor of the street network and the traffic. This paper would...
consider the evolution of the architecture of the streets in Italy, between the Mid-Republican time and the Severian period, and highlight the role played by the “street-as-market” in the organisation of urban economy.

3. Riccardo Helg (Independent researcher), Tonsor, copo, cocus, lanius sua limina seruant (Mart. VII, 61): spazi di commercio e architettura delle facciate lungo la Via di Nola a Pompei

In the cityscape of the Vesuvian towns domestic buildings played a key role in shaping the architectural and aesthetic features of the built environment and in the development of a variety of activities that took place in the streets, fulfilling also several functions beginning with those related to trade. The presence of shops and spaces for commercial activities in the façades of the houses was a frequent occurrence, especially along the busiest thoroughfares and near major crossroads, and most likely influenced the architecture of the frontage of the domus, becoming sometimes its most significant feature.

This paper aims to analyze how the opportunities of economic growth of individual business might have affected the façades, influencing architectural arrangements and decoration choices; this issue will be addressed from a diachronic perspective, taking all the above into consideration the last phase of life of Pompeii and Herculaneum. Via Di Nola will be analyzed as case study an important yet lesser known street.

The layout of this street has been largely altered by centuries of large-scale archaeological excavations and lack of proper conservation that have compromised our understanding of its original appearance; yet, a careful analysis of its architectural fabric combined with the retrieval of archival records enables to recover part of the original aspect of this important urban thoroughfare and re-establish the function it had in the carrying out of urban trades.

4. Daniela Liberatore and Riccardo Di Cesare (Università di Foggia), The road system of ancient Alba Fucens: town planning, trade and economy

This paper aims at discussing the connection between town planning, monumental development and the functions of the urban spaces in ancient Alba Fucens, with specific consideration for the economic facilities, trade activities and the social life of the city.

New information is provided by recent archaeological exploration of a taberna facing the Forum, which shed new light on the shape of a key space of the city and its transformations throughout centuries. It also allowed to re-examine the stratigraphic history of the Roman streets and their role, both inside and outside the city walls, from the foundation of the Latin colony at the end of the IV cent. B.C. until the abandonment of the valley floor after Late Roman Times.

The urban stratigraphy starts with the deduction of the colony, whose strategic position emerges from its location and connection with Rome and the surrounding areas, fulfilled by a well-organized road system.

This phase is followed by a second main stage during the Late Republican period, when the whole city was renovated, buildings were added such as porches and tabernae along the main roadways and the Forum. This urban shape remains unchanged during the Imperial age.

In Late Antiquity, general economic and social changes affect also the urban landscape: the road network of the city now mirrors the altered functions of the city and its economic life.

5. Aldo Borlenghi, Marine Lepee and Matthieu Poux (Université Lyon 2), Network of streets and shops in the upper town of Lugdunum between the Ist century BC and the IIIrd century AD

The heart of the ancient colony of Lugdunum, at the top of the hill of Fourvière, shows well how dynamic and long-standing the economical activities were for the four centuries of heroccupation. Lots of shops / workshops used for local commerce and retail have been recognized in close contact with the neighbouring domestic spaces. They keep close ties with the surrounding streets particularly well-known in the upper town. This one is structured since its foundation by an important urban network which mix different complementary layouts of streets and adapt to the difficult topography of the hill.

It's interesting to study the way the workplaces take place in the urban structure and their interactions.
with the major thoroughfares inside of urban blocks where the part of commerce /craftsmanship is significant. This presentation will deal with the notion of access and the fact that the shops overlook the streets, with the encroachment of the sales structures on the street or even with the hydraulic connections. The role of the portico, the distribution of the commercial activities and their potential specialisation will be discussed. Moreover, the modifications of the streets' layout are particularly striking in Lyon and affect directly the economic spaces which are located in most cases on the facade of the urban blocks, thereby showing the evolution of the patterns of settlement.

Panel 8.13 Central Places and Un-central Landscapes: Political economies and natural ressources in the longue durée

Organiser: Giorgos Papantoniou (University of Bonn) and Athanasios Vionis (University of Cyprus)
Friday | 25 May | 09:00-16:30 | HS XI

Panel abstract
This Panel aims to rethink and revaluate Central Place Theory in light of contemporary developments in settlement archaeology, methods and archaeological thought by bringing together ‘central places’ and ‘un-central landscapes’ and grasping diachronically upon the complex relation between town and country, as shaped by political economies and the availability of natural resources. The Panel covers the period between the Bronze Age and the end of Late Antiquity, and includes all the disciplines and regions that deal with the so-called ‘Greco-Roman civilization’. Micro-environments with natural boundaries (e.g. rivers, mountains, woods) and desirable resources (e.g. water, arable land, minerals) sustained nucleated communities and remained occupied for almost every period. On the other hand, ‘central persons’ may be as important as ‘central place’ and this is where the concept of political economy evolves. As T. Earle has eloquently argued on several occasions, all economic theories should recognise that, to whatever degree realised, power strategies were built on economic and ideological control over resources. Landscape archaeology is an area of study that overcomes the conventional boundaries between disciplines such as anthropology, history and geography, and provides a fresh perspective and a powerful investigative tool to address research questions related to the conscious and the unconscious shaping of the land and the processes of organising space, involving interaction between the physical environment and human presence. Temporality, spatiality, materiality and site-based analysis are all encompassed in the concept of landscapes, and therefore through its study much can be said about human responses to the changing conditions of life in the longue durée. We welcome papers addressing ‘central places’ and/or ‘un-central landscapes’ from a political economy or/and a natural resources perspective. Moving away from model-bounded approaches, Central Place Theory is used more flexibly to include all the places that may have functioned as places of economic or ideological centrality (even in a local context) in the past, including urban centres, agro-towns, countryside settlements, burial and ritual topoi. The diversity of the different disciplinary perspectives and approaches, combined with dialogues, enriches our task of multiple interpretations.

Paper abstracts
1. Athanasios Vionis (University of Cyprus) - Giorgos Papantoniou (University of Bonn), Central Place Theory reloaded and revised: Landscape archaeology and political economy

This paper aims to introduce the topic of the panel. It rethinks Central Place Theory and re-evaluates it in light of contemporary developments in settlement archaeology, methods and archaeological thought by bringing together ‘central places’ and ‘un-central landscapes’ and grasping diachronically upon the
complex relation between town and country, as shaped by political economies and the availability of natural resources.

2. Jennifer Webb (La Trobe University), Shifting centres: political, ideological and economic authority on the north coast of Cyprus over the longue durée of the prehistoric Bronze Age

Centres are, by definition, neither beginning nor end points within the landscape; the mobilisation, management and distribution of both symbolic and material resources are therefore critical to their political economies. This paper will explore possible mechanisms involved in the establishment of three localised centres of authority, which succeeded each other in the narrow, naturally bounded coastal strip of northern Cyprus during the 800 years of the prehistoric Bronze Age. Among the factors that appear to have played a role are historical contingency, a favourable natural environment (rainfall, soils, harbours), technological advantage and, potentially, coercion (actual or ideological), alongside less (archaeologically) tangible factors such as cultural and ancestral legitimacy, language and the role of entrepreneurial individuals ('central persons').

3. Diamantis Panagiotopoulos (University of Heidelberg), Unravelling the ancient and modern potential of (un-)central places: The case of Minoan Koumasa

The history of marginal Mediterranean landscapes seems to follow a pendulum motion, oscillating from periods of transregional significance to periods of total isolation and decline. One of the big challenges of archaeology and related disciplines is to explore from a diachronic point of view the stabilizing and destabilizing parameters which determined the ups and downs of 'peripheries'. For tackling this task, specialists need to adopt not only an interdisciplinary approach but also an explicit multiscalar perspective, moving back and forth between the macro-, meso-, and micro-level in an attempt to elucidate the intricate web of interdependent factors that shaped a region's historical trajectory. The present paper discusses an on-going field project in Southern Crete aiming at the systematic study of a thriving regional Bronze Age centre as a case study for exploring the hermeneutic potential of such approaches. The dramatic contrast between the flourishing Minoan settlement at Koumasa and the isolated modern village nearby begs for an explanation. A further objective of this project goes beyond the narrow limits of scientific analysis, striving to demonstrate the social dimension of modern archaeology. The fieldwork is integrated into an innovative strategy for landscape stewardship, in the course of which scientific expertise is combined with local experiential knowledge and – above all – local needs in a region suffering under the effects of a dramatic economic crisis.

4. Maria Iacovou (University of Cyprus), From the Hinterland to the Coastal Landscape: the political economy of a Cypriot central place

That Ancient Paphos functioned as a place of economic and ideological centrality in the context of a Cypriot polity, from circa the 13th c. BC to the very end of the fourth c. BC., is amply confirmed by a wealth of architectural and mortuary evidence, which in the Iron Age and, especially, since the Cypro-Archaic period are amplified by scores of early silver coins and royal inscriptions issued by state-leaders, invariably identified with the Greek term basileus (king).

The richness of the material and epigraphical evidence notwithstanding, the key question regarding the economic system(s) that led to the millennium-long success of Ancient Paphos as a central place, had not been approached before the initiation of the Palaepaphos Urban Landscape Project in 2006. We are currently in a position to suggest that the origins of the settlement of Paphos as a gateway community established on the coast circa 1700 BC, resulted from the interactive relation between the exploitation of hinterland resources (primarily minerals and timber) and the transformation of the hinterland's prehistoric settlement pattern, especially along the 25km-long route of the river Diarizos from the mountains to the coast.

The on-going diachronic analysis of the entire region's un-central and still little known landscape has begun to recognise in the interplay of natural and anthropogenic factors, the reasons behind drastic changes in the economic history of the region of from prehistory to the present day.
5. Christy Constantakopoulou (Birkbeck College), Landscape and hunting: the economy of the eschatia

In recent years, there has been a re-examination of the meaning of the term eschatia. Rather than a territory on the border of a community, the term is now recognized to mean a specific type of land, at the border of prime agricultural land (e.g. on a hill, as the term seems to be used in the Rationes Centesimariae in Attica, or by the sea-side, as the term seems to be used in the Delian accounts). The position of the eschatia in the borders of cultivated land, however, did not necessarily mean that the eschatia was not economically productive. Uncultivated land, or marginally cultivable land, could be extremely useful and agriculturally productive (for timber, coal, apiculture etc.). This paper examines the role of the eschatia for hunting. This is part of a bigger project on the social history of hunting in archaic and classical Greece, where emphasis is placed on the economic and dietary contribution of hunting for Greek communities. In this project, I would like to explore not just elite narratives about hunting (which arguably dominate the sources), but the relationship of different social classes to hunting (which is understood here to include poaching), as well as the role of gender, age, time of year, and use of landscape. This research aims to move current discussions forward by focusing less on the elite and more on everyday people and their practices.

6. Giorgia Di Paola (University of Foggia), Central places and liminal landscapes in the territory of Populonia

Research on the territorial organization of Etruscan city of Populonia has recently improved thanks to the results coming from archeological surveys planned in different parts of the ancient centre. The Landscape Archaeology approach has been revealed the most effective method to understand the processes of organising spaces, and so to detect both places of economic or ideological centrality and specific liminal landscape in the past. Starting from its origin, in the IX century BC, Populonia was provided with a really vary and heterogeneous supply basin, that included also the control on the Tuscan Archipelago Islands. Moving from the Iron Age (IX century BC) to the Hellenistic period (III-I centuries BC), Populonia carried out different strategies to manage inland and island natural resources, depending on the political circumstances in the Italian peninsula. These intentional planes had repercussions on the shaping of varied cultural landscapes, created in a dialogue involving cultural organizations, human strategies and topographic frameworks.

In this paper I will present results of my PhD research, focusing on the period between the VI century BC to the III century BC, before Etruscans were incorporated within the Roman Empire. In particular, I aim to prove the important role of Landscape Archeology approach to provide a fresh perspective concerning the crucial debate on “central places” and/or “un-central landscapes”.

7. Kyriakos Kyrousis (University of Cologne), Hellenistic Foundations in Asia Minor and their Economic Impact on a Local and Regional Scale

The foundation by royal initiative of new communities throughout the Near East during the 3rd and 2nd centuries B.C. is one of the most remarkable policies distinguishing the Hellenistic kingdoms from their predecessors. Research on the subject has emphasised their political and military importance. This paper, will handle the economic impact of the phenomenon and aims to present the progress of my research on these questions: firstly, how did new settlements in Asia Minor influence the cross-regional trade networks through which people travelled and conducted trade? Secondly, how did settlement patterns, and the rural landscape and its exploitation change?

We shall approach these questions through the presentation of a variety of historical and archaeological sources: data from surveys signifying changes in the pattern of human habitation, numismatic circulation and excavated evidence concerning imports and exports of goods, and written sources on ancient travel and trade routes.

From the milieu of urban studies, the underlying theoretical concept will be that of energised crowding, seen as a consequence of population aggregation and density. Economic growth is held as one of the main outcomes of energised crowding. In this context, I shall give an overview of royal foundations of
this period in Asia Minor and how and if they led to some form of economic growth. I will also present some results from my research on the case study of Alexandria Troas as a central place.

8. Rabea Reimann (University of Cologne), Approaching ‘central place theory’ in Greco-Roman Egypt: a closer look at the production and consumption of pottery at Bubastis

From the Old Kingdom onwards Egypt was traditionally divided into several administrative areas along the Nile valley, the so-called nomes. Over the course of Egypt’s long history, the nomes and their nomarchs were more or less independent from the pharaoh’s central power. This division survived well into Roman times and retained its primary function as an administrative system until the fundamental rearrangement in Late Antiquity.

Bubastis was the capital of the 18th lower-Egyptian nome and therefore the ‘central place’ in this region. Located in the western Nile delta and surrounded by two branches of the river, the area was rich in the natural resource ‘clay’ – the basis for the extensive pottery production of the city.

The aim of my presentation is to approach the ‘central place theory’ in the delta region using the production and (re-)distribution of pottery as a case study: To what extent did a ceramic network exist and what position had the larger cities of the nomes in the trade activities? What role played Alexandria, the political and cultural centre of Graeco-Roman Egypt, for Bubastis itself as a standard regarding ‘taste’ and as one of the primary hubs for the import and distribution of goods in Egypt?

To answer these questions, I will not only give a closer look to the production and consumption of pottery at Bubastis, but will also review other sources, mainly written records, for aspects of centrality or independence of nome capitals such as Bubastis.


The paper aims at a comparative interpretation of two different datasets from different ancient arid regions to exemplify how a perspective less from centers rather than areas can enhance or even change our economic understanding of the economy of past societies. One case study derives from survey and excavation data from the Eastern Marmarica in Egypt, the second one is reviewed published data from Southern Syria. In both cases scarce resources determine life strategies and social organisation in these regions in Graeco-Roman times. A perspective encompassing the interrelations with neighbouring areas or people as well as a detailed look onto the organisation of the inner-regional contacts offer insights into economic history of the marginal environments. The case of Southern Hauran starts from a site-based look to open up to networks of resource availability, while the example from the Marmaria takes an area-focused perspective to find explanations for the functioning of an economy under arid conditions. Only through the overcoming of the focus on central places, embedded in a hinterland, supported by methodologies of landscape archaeology, the complex economic and social history of marginal - and as such sensitive markers for long-term changes in the Mediterranean – and “un-central” regions.

10. Jody Michael Gordon (Wentworth Institute of Technology), Transforming Culture on an Insula Portuosa Romana: Port Cities as Central Places in Early Roman Cyprus

During the Early Roman period in the Mediterranean (ca. 30 B.C.E. – 330 C.E.), the key central places that distinguished socio-political landscapes were towns. These urban centers functioned as economic and administrative focal points that were controlled by local elites who oversaw wealth redistribution and maintained a dialectical relationship with Rome that mutually benefitted both parties. Yet, beyond providing such rudimentary observations, central place theory has recently been revised to examine how local factors, such as a place’s long-term geography and history, intersect with global ones to transform settlement hierarchies as well as economic, political, and cultural landscapes. This paper’s goal is to explore such intersections through a study of how port towns functioned as central places that connected globalized imperial networks to localized provincial ones within island contexts. It specifically examines the archaeological remains (e.g., ceramics, architecture, prestige goods, and coinage) from coastal places in Early Roman Cyprus (e.g., Nea Paphos, Salamis etc.) in order to in-
vestigate how the island province's integration into Roman economic and political networks created new central places that altered existing settlement types, hierarchies, and thus, local identities. Overall, this paper shows how the reanalysis of central places within their unique geohistorical contexts can shed new light on both regional and state-level processes of cultural change.

11. Lina Diers, Timacum Minus in Moesia Superior - Centrality, regional patterns, and urbanism at a Roman mining site

According to traditional urbanity criteria like administrative status and monumentality, several settlements in Roman Moesia Superior fall out of urban patterns. Timacum Minus is such a case. It was installed alongside the Timok road already in the 1st century AD and further developed due to mining ventures in the wider area from the 2nd century AD on. Timacum Minus never received official status and stayed comparatively small. Yet, the settlement displays certain urban traits in terms of social and economic agglomerative potential guided by local circumstances and acted out at different levels of centrality. First, its prominent location as the only urban settlement in the Timok valley made it geographically central. Secondly, mining as a major attraction factor created hierarchical centrality. Although settlement and mining are attested in and around Timacum Minus both in pre- and post-Roman times, the site has – except for during the Principate – never been central. Hence, the unique circumstances of the 1st-3rd century AD are a good example for both centrality patterns within the Roman World and specifics of urban evolution guided by economy in Moesia Superior. By embedding Timacum Minus’ development into regional patterns of settlement and economy this paper, thus, aims to brainstorm ideas for un-static CPT applications. In doing so, it also proposes more open approaches to urbanity as deriving from social and economic agglomerative potential and constantly creating it.

12. Gregor Utz, From contrary models to complementary ones - Central Places and Gateways in the Southern Provence (Arles and Marseille)

The contribution wants to focus on the concept of the “Gateway-City”, which was formulated as a direct response to the Anglo-Saxons’ application of Christaller’s Central-Place-Theory in the 1970ies (BURG-HARDT 1971). Nowadays the abstraction of “centrality” as a “relative concentration of interactions” permits to merge both concepts into a powerful tool for archaeologists (NAKOINZ 2014). Here the emphasis will lie on its functionality as a port of trade with infrastructure and buildings, on related administrations as well as on the supply and exchange of long-distance and local/regional products. By looking at the contact zones and contributory areas of Arles and Marseille in the Southern Provence, the dynamic evolution of these cities as competing and complementary places during time and space can be explained. Was it competition along the trading routes that led to a loss of locational advantage for one or the other city? What role did the political interventions for the development of economy and power play (confiscation, promotion, laws)? To what extent was this predetermined by natural resources and conditions (accessibility, fertility), was this influenced by geological changes (sedimentation, floods)? By means of several archaeological markers (trading spaces and goods, infrastructure, inscriptions) the modern understanding of the Central-Place-Theory will be proved partly helpful, partly discussion-stimulating looking at the interaction of two distinct economic zones.

13. Eli Weaverdyck (University of Freiburg), Understanding the central place functions of Roman forts through landscapes

The auxiliary forts that lined Rome’s northern frontiers contained a diverse population, craft production, and commercial functions, leading many to conclude that they acted as central places. If they did, the frontier would have offered a wealth of opportunities for local peasants to market their produce. Identifying such small-scale exchange is difficult due to the perishability of the goods and containers. I propose a new approach that relies on quantitative modeling of settlement landscapes, i.e. the spatial relationships between settlements and social and environmental features. By identifying the affordances that attracted and repelled ancient settlers we can begin to understand the economic conditions under which settlement decisions were made. Univariate analysis of the territories surrounding
settlements elucidates agricultural strategies, but simple statistical methods are less helpful in understanding marketing because most peasants prioritize production for auto-consumption over commercial exchange. Therefore, I have developed a novel method of comparative, multivariate modeling that illuminates the influence of market places on rural settlement location while controlling for other environmental factors. By varying the composition of the market system, I am able to test the economic relationship between auxiliary forts and the surrounding countryside. Case studies from the Lower Rhine and the Lower Danube are considered.

14. Erik Timmerman (University of Cologne), The Romanization of socio-economic life in the Lower Rhine region: blessing or curse?

By way of his Gallic Wars, Julius Caesar had successfully expanded the border of the Roman Empire up to the river Rhine. The native tribes that inhabited the area were now submitted to Roman rule and their territories became part of Rome's world empire. The central purpose of this paper is to find out to what extent the Roman occupation of the Lower Rhine region transformed the socio-economic landscape of this region in the long term (from the Late Iron Age until the Late Antique period). Did population and urbanization grow? What changed in the way and the intensity in which the natural landscape was exploited? Was there economic growth and, if so, are there also indications that per capita incomes rose? Did such improvements also extend into the lower strata of society, or were they confined to a relatively small elite, only leading to increased inequality? What was the role of the Roman army, the taxation system, infrastructural developments, and other aspects of the Roman political economy? To what extent did variation between sub-regions exist and how should this be explained? In finding answers to these questions, I will bring together a wide variety of (archaeological) studies in order to better understand the impact of Romanization in this particularly well researched part of the Roman World.

15. Giorgos Papantoniou (University of Bonn) - Athanasios Vionis (University of Cyprus), River as an economic asset: settlement and society in the Xeros Valley in Cyprus

Settled and Sacred Landscapes of Cyprus (SeSaLaC) surface survey project has recently initiated an archaeological programme in the Xeros river valley (Larnaka district), Cyprus. This paper, focusing on this valley and the preliminary results of SeSaLaC, aims to present a first synthesis of the diachronic settlement pattern in the region. After a short introduction on the area and the SeSaLaC project, we will attempt to interpret the settlement pattern of the region, from early prehistory to Late Antiquity. Following, we will focus on the main chronological phases recognised through the archaeological evidence, i.e. the Early and Middle Bronze Age, the era of the Cypro-Archaic and Cypro-Classical city-kingdoms, and the Late Roman period/Late Antiquity. We will discuss those periods in the framework of recent developments in landscape archaeology, central place theory and political economy. We conclude that the combination of these approaches can offer a better interpretative framework when reading material culture deriving from surface survey assemblages. Finally, it is demonstrated how the Xeros river played an important role in the settlement hierarchy and economic activity in the area.
Panel 8.14 The Economy of Hellenistic, Roman and Late Antique North Africa: Linking town and country

Organiser: Silvia Polla (Freie Universität Berlin) and Mariette De Vos (Università degli Studi di Trento)

Wednesday | 23 May | 11:30-13:30 | HS XIV

Panel abstract

"No area of study of Roman Africa has witnessed such dramatic advance in recent decades as that of the economy" (Mattingly and Hitchner 1995, 198).

More than 20 years ago, in a bibliographic essay on the archaeology of Roman Africa, Mattingly and Hitchner considered the state of the art and set up a research agenda in Romano-African studies. In the meantime, several fieldwork projects in urban as well as in rural context has been carried out and some synthetic re-appraisals of Romano-African Landscapes has been published. Nevertheless, despite of the very abundant archaeological information and literature on Roman Africa, we still lack a clear understanding of how town and country worked together in the different regions and historical periods. Moreover, the present politically sensitive situation makes fieldwork impossible in many areas, especially in the countryside. However, for no other Mediterranean region we dispose of a similar level of knowledge of the Roman and Late Antique ceramic production and intra-provincial distributional patterns like for Africa Proconsularis. This body of evidence has allowed shifting the attention to the African consumers and inland circuits of commodities distribution and consumption. Nevertheless, the economy of the Hellenistic North Africa, considering urban and rural settlements of the Numidic/ Libyan/ Punic periods and of the one of the early colonization phase, are still a poorly understood aspect, raising also questions on cultural and socio-economic diversity. Recently, the transformation processes characterizing the Late and Post-Antique phases have been reconsidered, analyzing urban and rural trends as they emerge from the archaeological evidence. In this panel we would like to stimulate discussion, on the one hand, on the diverse regional economic trajectories in Hellenistic, Roman and Late Antique North Africa especially concerning the relations between town and country, considering production, distribution and consumption of commodities and services; on the other hand we invite scholars who study the economic nature and function of urban and rural spaces to link together these two interwoven spheres.


Paper abstracts

1. David Mattingly (University of Leicester), The Pre-Roman origins and inter-relationships of urbanisation and agriculture in North Africa

It is widely acknowledged that North Africa under Roman rule experienced an extraordinary development of wealthy cities sustained by a boom in agriculture. This presentation will address the less commonly asked question of what lay behind these epi-phenomena. Insofar as the issue has been raised, the consensus has been that urbanisation and agriculture were exogenous gifts bestowed on Africa by outsiders (Phoenicians, Greeks and Romans). Drawing on new archaeological data from both the Maghreb and the Sahara, I shall argue that the endogenous contribution to these key socio-economic developments has been drastically under-emphasised. This has major implications for how we read the story of the achievements of ‘Roman Africa’.
2. David Stone (University of Michigan), Linked Economies: Regional Networks and North African Urbanism

Recent field survey evidence and ceramic analyses make it possible to investigate more precisely the links between North African urbanism and regional economic systems. This paper aims to analyze these links in two dimensions. First, it will define the chronology of urban growth and contraction. Next, it will assess differences between regions over the long period between the initial establishment of urban centers in the first millennium BCE and their decline in late antiquity. The result will show distinct differences between regional economies. The region of Northern Tunisia, consisting of Carthage and the Bagradas river valley, had both the largest and longest-lived urban centers and rural settlement systems. Central Tunisian systems were the next in size and duration of occupation. Examination of Cyrenaica, Tripolitania, Southern Tunisia, Numidia, and Mauretania Caesariensis will enable the regions of North Africa, and the different degrees with which they participated in wider economic activities throughout antiquity, to be assessed. A conclusion will show how a more precise understanding of the growth and contraction of North African regions contributes to a more nuanced, and less monolithic, evaluation of the southern Mediterranean over the long term.

3. Andrew Dufton (New York University), Everywhere the people: an archaeological approach to population growth in Roman North Africa

A connection between population growth and the economy is often identified in the scholarship on Roman North Africa. Increases in the number of urban dwellers—traced archaeologically through changes to the physical area covered by a city or town—are sometimes used as a proxy for increases in economic production. Similarly, the frequency and distribution of rural settlements identified through landscape survey are regularly invoked in discourses on the agricultural economy. These data are far less frequently studied holistically, however, meaning we have yet to fully understand provincial patterns of expansion or how urban and rural populations interacted during these demographic shifts.

This paper considers relative patterns of population growth across the Roman province of Africa Proconsularis through the first three centuries of Roman rule. I collate archaeological evidence for the expansion of cities—taken both from the results of excavations and geophysical survey at sites such as Utica, Leptiminus or Simitthus, as well as legacy data. This urban growth is then compared to the shifting numbers of rural settlements identified in the landscape surveys of the last three decades. The results identify distinct trends in coastal, inland, and frontier zones which hold implications for questions of the provincial economy. Moreover, I demonstrate how examining the process of growth at the local scale can also speak to the social impacts of a growing populace in the early empire.

4. Moheddine Chaouali (Institut National du Patrimoine de Tunis) - Heike Möller (Deutsches Archäologisches Institut), Simitthus/Chimtou: A manifold approach of economical questions regarding the city and its environment in Roman and Late Antique times

This joint paper consists in two parts, the first one dealing with the economic activities in general in Chimtou and beyond and a second one looking at the ceramic evidence of a town that was famous for its marble quarries throughout the Mediterranean:

„Le but de ma contribution est d'étudier les activités économiques dans la ville de Simitthus (Chimtou) et dans sa campagne environnante en Afrique proconsulaire (Tunisie) et les liens éventuels entre ces deux espaces. Concernant la ville, l'activité économique principale était basée sur les carrières de marbre numidique. D'ailleurs, très peu de témoignages archéologiques sont attestés sur une autre activité (artisanale par exemple) dans cette ville. Le marbre jaune-rouge extrait de ses carrières était très prisé et largement diffusé en Méditerranée, notamment sous le Haut-Empire. Les recherches tuniso-allemandes ont fait avancer les connaissances de ce marbre et les différentes activités qui lui sont liées.

Concernant la campagne, nos connaissances demeurent encore lacunaires. Il est vrai que les établissements agricoles de la campagne de Simitthus sont très mal connus. Il est donc difficile, de prétendre connaître les spécificités des fermes en l'absence de fouilles dans cette région. Les prospections archéologiques ont pu donner une idée schématique des exploitations rurales, faire une typologie des sites, non dessiner en détail telle ou telle ferme. Ce qui nous échappe, c'est la possibilité de restituer
avec précision l'organisation d'une ferme particulière. On peut cependant, rendre compte d'un ensemble vaste ou bien étudier beaucoup d'éléments tels que les bâtiments ou les monuments architecturaux qui ont été trouvés in situ. L'activité économique essentielle était basée sur la céréaliculture et l'oléiculture comme déjà attesté dans les autres campagnes des villes africaines.” (Moheddine Chaouali)

“The paper will focus on the ceramic evidence of the site with “open access” to the Mediterranean due to its role as marble exporter, to give an insight in the commodities and consumption patterns in Roman and Late Antique times of an inland region. How was Simithus/Chimtou embedded into an exchange network on intra- and interregional level according to its ceramic evidence? Which similarities and diversities to other inland sites can be traced down? What in general do we know about production and distributional patterns of a region in the inland, in the outer northwest of Tunisia that trade patterns clearly demonstrate a connectivity throughout the Mediterranean by its marble trade?” (Heike Möller)

5. Moncef Ben Moussa and Sonia Jebari (Musée National du Bardo - Tunis), Archaeological excavations in a pottery workshop of Pheradi Maius, Sidi Khlifa - Tunisia

Situated in a residential area of Pheradi Maius/Sidi Khlifa, a pottery production complex was partially excavated in 2016. The structures identified testify of the complexity of organization and of functioning of a set of kilns producing essentially north African Fine Wares. Besides the importance of the typological and chronological data obtained from reliable stratigraphical contexts, it was possible to place these productive structures within the framework of of the functioning of the various current economic forms for the considered period. It was if possible to analyze the complementarity of urban and rural productive activities to meet the various levels of demands, local, regional and Mediterranean. Numerous comparisons were made with productive structures discovered in the provinces of Byzacena and Zeugitana show however an adaptation to the space and the daily requirements in the case of urban kilns, with reorganization and re-uses while for the kilns situated in rural frame it is rather an adaptation to the natural conditions and to the networks of communication which characterizes the pottery production of the Late Antiquity.

Panel 8.15 Crisis on the Margins of the Byzantine Empire: Bioarchaeological approaches to resilience and collapse in the Negev Desert

Organiser: Guy Bar-Oz and Lior Weissbrod (University of Haifa)

Thursday | 24 May | 09:00-16:30 | HS XII

Panel abstract

Research funded by the European Research Council examines new approaches to documenting collapse in ancient complex societies, looking into the case of Byzantine settlement in the Negev Desert (4th-7th c. CE) across the Islamic conquest of the southern Levant. Unique contexts such as ancient urban landfills, sealed and abandoned residential structures, and relict agricultural fields provide rich data repositories, where information on both cultural and environmental dynamics—internal and external processes for generating change—is superimposed. Early findings drawn from analyses of plant and animal remains, radiocarbon dates, material culture and sediments suggest a much more complicated sequence of transformation from Byzantine to Islamic society than was previously appreciated. Proxies of societal decline and abandonment indicate a long and drawn-out sequence of events, beginning as early as a century before the Islamic conquest, and demonstrating change at a higher-order level of social organization versus continuity at a lower level. An integrated and high-resolution approach to synthesizing these data aims to link the chain of societal events to a series of potential causal factors, including
climate change, plague, natural disaster, war and conflict, and human resilience to reach comprehensive understanding of this historical trajectory.

Paper abstracts

1. Guy Bar-Oz and Lior Weissbrod (University of Haifa), Introduction to Crisis on the margins of the Byzantine Empire: Bio-archaeological approaches to resilience and collapse in the Negev Desert

Research funded by the European Research Council examines new approaches to documenting collapse in ancient complex societies, looking into the case of Byzantine settlement in the Negev Desert (4th-7th c. CE) across the Islamic conquest of the southern Levant. Unique contexts such as ancient urban landfills, sealed and abandoned residential structures, and relict agricultural fields provide rich data repositories, where information on both cultural and environmental dynamics—internal and external processes for generating change—is superimposed. Early findings drawn from analyses of plant and animal remains, radiocarbon dates, material culture and sediments suggest a much more complicated sequence of transformation from Byzantine to Islamic society than was previously appreciated. Proxies of societal decline and abandonment indicate a long and drawn-out sequence of events, beginning as early as a century before the Islamic conquest, and demonstrating change at a higher-order level of social organization versus continuity at a lower level. An integrated and high-resolution approach to synthesizing these data aims to link the chain of societal events to a series of potential causal factors, including climate change, plague, natural disaster, war and conflict, and human resilience to reach comprehensive understanding of this historical trajectory.

2. Yotam Tepper and Guy Bar Oz (University of Haifa), Towards solving the puzzle of Byzantine settlement archaeology in the Negev Desert

Issues of settlement continuity or significant interruption in different Byzantine sites of the Negev complicates interpretations of the end of the Byzantine period and the transition to the Early Islamic. Preliminary findings and observations from renewed surveys and excavations at the sites of Shivta, Halutza and Nitzana allow to fine-tune our understanding of the history of the sites and document processes of development and continuity in different archaeological contexts. We excavated several trenches in public buildings, domestic structures, open areas and trash middens. At Shivta, excavated contexts produced predominantly material from the Byzantine period (4th–7th centuries CE), whereas evidence for settlement in earlier periods, primarily the Early Roman (1st century CE; 'Nabataean') and from the Middle Roman periods (2nd-early 3rd centuries CE), are scarce and encountered only in middens on the outskirts of the site. Several public and domestic structures were abandoned prior to the Early Islamic period; some were collapsed by earthquake long after their abandonment. Remains of the Early Islamic period were found only in isolated contexts, indicating that in spite of apparent continuity in occupation Shivta may have begun to decline in the Late Byzantine period after having flourished and reached its zenith during the 5th–6th centuries CE. Supporting observations from Halutza and Nitzana are also discussed.

3. Xin Yan (Weizmann Institute of Science, Israel) and Elisabetta Boaretto, Sub-century resolution for dating the end of the Byzantine period in the Southern Levant: the radiocarbon approach

The Byzantine florescence and subsequent decline in the Negev Desert of Israel is variably considered as the outcome of anthropogenic or natural causes, occurring within less than a hundred years (6th-7th c. CE). Determining cause and effect within this sequence depends on obtaining absolute and high-resolution time determinations, while controlling for potential diagenesis and mixing. In three different key Byzantine sites in the Negev: Elusa, Shivta and Nessana we applied a site-tailored strategy for sampling materials for radiocarbon dating, combined with detailed context characterization to determine in-situ deposition of datable materials.

Though the chronological framework and issues of synchronization within and across these sites conti-
nue to be studied, we present the field and lab methods of microarchaeology that we applied together with preliminary results. Samples for dating included both charred short-lived botanical remains and bones, collected from living surfaces within residential structures, activity areas (e.g. garbage dumps), other types of structures and agricultural installations (e.g., dovecotes). Our preliminary data indicate continuous occupation in Shivta and Nessana from the Byzantine to Early Islamic period, whereas in the garbage dumps of Elusa, outside the city, dumping activities seem to have been halted or significantly slowed down after ca. 550 CE. Dovecotes near several of the Byzantine sites were only in use during the Byzantine period.

4. Tali Erickson-Gini (Israel Antiquities Authority), New Horizons in the Study of Ceramic Evidence of the Byzantine Period from Recent Excavations in the Central Negev Sites of Shivta, Halutza and Avdat

In recent years, archaeological excavations in Shivta, Halutza and Avdat have uncovered new ceramic assemblages that shed light on developments in those sites in the Byzantine period. Excavations were conducted in a variety of contexts, emphasizing the study of biological and ceramic remains, including those present in trash dumps in Shivta and Halutza, in a number of domestic structures and streets in Shivta, and inside buildings collapsed by earthquake in the Late Byzantine at Avdat. The ceramic material supports a division of the Byzantine into three definitive stages: Early period (350-450 CE), Middle (450-550 CE) and the Late (550-637 CE). The Gaza wine jar, corresponding to Majcherek's Form 3, is the predominate vessel type in the Middle Byzantine period at Shivta and Halutza, making up nearly half of the studied assemblage from the city dumps in Halutza. The massive quantities of these jars evidence the widespread Byzantine wine production in the city. Locally produced wares of the Central Negev made up only a minority of the finds. Wares produced in Halutza were evident at Shivta in both the Middle and Late Byzantine periods. Here, the locally-produced type known as the bag-shaped jar outlived the Gaza wine jar well into the Umayyad period, presumably in wake of the demise of wine production following the Islamic conquest. Evidence from both Shivta and Avdat points to a significant shift towards the use of bag-shaped storage jars after the mid-6th cent. CE.

5. Nimrod Marom, Yotam Tepper and Guy Bar Oz (University of Haifa), Archaeozoological Aspects of the Byzantine-Islamic Transition in the Negev

A comparative analysis of mammal and bird bone assemblages from the Negev sites of Haluza, Nizana and Shivta across the Byzantine/Islamic transition has revealed substantial changes that occurred in the 6th-7th centuries, including the cessation of pigeon keeping and changes in the representation of livestock animals such as sheep, goats, pigs and camels. These shifts shed light on both the cultural and the economic aspects of a period that marked the end of urban fluorescence in the region for more than a millennium.

6. Sina Lehnig (Johannes Gutenberg Universität Mainz), Animal Husbandry and Trade in the Negev Town Elusa

Since 2015, the Archaeological Institute of the University of Cologne in cooperation with the Israel Antiquities Authority has been conducting archaeological research in the Nabataean and Byzantine town Elusa, located in the northern Negev Desert. The archaeozoological study of animal remains revealed three different components of Elusa’s food supply during this period:
1) Domestic livestock dominated by caprines and pigs points to herding activity and animal husbandry in the urban hinterland of the town
2) Remains of gazelle, ostrich, wild boar and deer indicate the exploitation of natural resources in the Negev Desert and possibly import of wild game from the mediterranean woodlands
3) Imported molluscs and fish place Elusa within a trading network with frequent access to the resources of the Nile River, the Red Sea and the Mediterranean

Butchery marks on the bones and large trash accumulations at the outskirts of the town testify evidence to the processes of final preparation, consumption and disposal of the food, centered around
Elusa’s urban area.
This presentation will discuss how these different components were integrated within an environment which was characterized by aridity and high temperatures, and evolved in the context of an urban landscape surrounded by well-organized agriculture, and involved in trade networks.

7. Rachel Blevis and Guy Bar Oz (University of Haifa) - Irit Zohar (Oranim Academic College), From Sea to Desert platter- the Role of Fish in the Byzantine Negev

During the Roman and Byzantine periods (1st–6th centuries A.D.), we find evidence for major expansion of agriculture in the Negev. Recent excavation of some of the major sites: Halutza, Shivta and Nitzana, included application of systematic sieving with fine mesh. Surprisingly, among the vertebrate remains fish were highly abundant.

Here we present preliminary analyses of ca. 7000 fish remains recovered from garbage dumps and abandoned houses of Shivta (NISP=5,000) and Elusa (NISP=1380), dated to the Late Byzantine and Early Islamic periods. The preponderance of fish remains exhibits, for the first time that fish played a major role in the diet of the sites inhabitants, as well as in the economy and trade relations with neighboring areas. We find evidence that the fish originated from diverse and separated aquatic habitats including the Red Sea, Mediterranean Sea, Nile, and freshwater. All were exported through the Negev sites and were used for personal consumption or as trading goods. The information obtained from the fish remains, can significantly contribute to the debate regarding the impact of climate versus social and political shifts towards the end of the Byzantine period.

8. Daniel Fuks and Ehud Weiss (Bar Ilan University, Israel), Seeds of collapse: Archaeobotanical investigations of Byzantine and Islamic contexts

Macrobotanical remains are a central component of the refuse middens investigated by the Byzantine Bio-Archaeology Research Program of the Negev (BYBAN). Such finds allow us to examine the timing, causes, and nature of the Byzantine-Early Islamic transition through archaeobotanical proxies for diet, cultivation, trade, and the natural vegetation. Regional comparison of finds from three sites: Shivta, Nitzana and Halutza, will allow us to situate our findings within a broader reconstruction of local economic and environmental diversity. Chronological variations will provide evidence for transformation of the region's society, economy and environment, illuminating broad historical questions in the wider region. These include the effects of historical climate change versus those of societal transformation on settlement decline between the Byzantine and Early Islamic periods, the decline of Mediterranean trade, the urban transition “from polis to madina”, and the supposed Islamic green revolution. Here we present some preliminary conclusions gleaned from the plant remains.

9. Mordechay Benzaquen and Dafna Langgut (Tel Aviv University), Dendroarchaeological Investigations of the Byzantine Negev

Taxonomic identification was conducted for charcoal samples retrieved from the Elusa excavations. All of the analyzed specimens were found to be native elements of the local Israeli flora with a vast majority being characteristic of the current vegetation surrounding Elusa. This suggests that during the Byzantine period a broadly similar arid environment typified the vicinity of the site. Particularly, desert flora such as tamarisk and boxthorn were the main wood sources used within Elusa. While the presence of both species likely represents fuel use, tamarisk is considered a mediocre source whereas boxthorn, with its high wood density, is considered a superior one. Between the early to middle Byzantine period a marked increase in tamarisk is observed together with a decrease in boxthorn, suggesting a possible depletion of quality firewood between the two periods. This inference is also supported by the exclusive presence of other select fuel sources such as white broom during the early phase of the Byzantine period. Regarding Mediterranean flora, it was seen to be more abundant in the Early Byzantine phase. While Mediterranean tree species such as cypress, Aleppo pine, Kermes oak, buckthorn and terebinth must have been transported from neighbouring regions for use in construction and crafts, the occurrence of fruit crops such as common fig, Sycomore fig and olive within the carbonized wood assemblage likely attests to local agricultural endeavours in the Byzantine Negev.
It has long been thought that widespread cultivation of grapes and production of wine in the arid Negev in southern Israel (<150 mm per annum precipitation) flourished during the Byzantine period and possibly extended into the beginning of the Islamic period. During the 5th and 6th centuries the port city of Gaza gained a reputation as a producer of a vintage exported to the west and Gaza wine was highly popular with evidence for extensive demand for it across the Byzantine Empire. Archaeological findings relating to this large-scale industry, including large wine presses, abound near settlements across the Negev during this period. In this study we use ancient DNA including Next Generation techniques to reveal the grape genome during Byzantine and early Islamic periods. By comparing grape ancient DNA to that of a range of modern varieties found in the southern Levant as well as in other relevant regions we aim to reconstruct the ancient grape varieties, their origin and cultivation processes.

Much of what is known about past human adaptations in the Negev Desert of Israel is based on architecture and archaeological excavations within city walls. While these data have been put to excellent use in defining lifeways in the region, microarchaeological studies of sediments are currently making significant contributions to clarifying subsistence strategies. As a part of the Byzantine Crisis project, our research moves beyond the confines of settlement walls to investigate the sediments of hinterland trash mounds for evidence of economic dynamics. Focusing on trash mounds near the Byzantine-Early Islamic (5th-10th centuries C.E.) sites of Shivta, Elusa, and Nessana, we consider how microarchaeological evidence for different types of refuse and its management can improve our understanding of economic stability and change. Analyses of stratigraphy, mineralogy, and micro-remains suggest that construction materials comprise the majority of the Byzantine portions of mounds at Elusa and Shivta, with interspersed mixtures of burned wood and dung likely representing dumped fireplase ashes. A different scenario is emerging at the Early Islamic portion of a mound at Nessana. The mound appears to have been burned several times. Sediment analyses suggest that dung was burned at the disposal site. This type of refuse management may indicate shifts in the importance of pastoralism and agriculture, a key feature to understanding resilience within the Negev Byzantine settlement system.

This paper will present the preliminary findings of isotopic analysis of tooth enamel carbonate and dentine collagen of domestic caprines and wild bovid species from Halutza and Nitzana. The analysis aims to reconstruct animal management patterns across the Byzantine and Early Islamic periods in order to understand possible climatic and/or societal shifts across this historical transition. Patterns in animal feeding habits, interpreted through sequential enamel carbonate $\delta^{13}C$ and $\delta^{18}O$ values and tooth dentine $\delta^{13}C$ and $\delta^{15}N$ values, will be used to reconstruct local herding practices and shed light on seasonal availability of vegetation in the surrounding arid landscape. Additionally, measurement of $\delta^{7}Sr/\delta^{8}Sr$ ratios will provide information about the animals' origin of birth and possible movement along the trade networks. Contextualization of the stable isotope data with the matching radiocarbon sequence will enable an examination of chronological shifts leading up to the abandonment of the Byzantine settlements in the Negev desert.

During the Byzantine period there existed a flourishing urban society in the Negev Desert. Two significant activities in these settlements consisted of agriculture and trade. One of the most famous wines of the period came from the Gaza area, and it is possible that a major portion of the exported wine was in...
fact produced in the Negev and distributed throughout the Mediterranean by means of the harbor of Gaza and arguably also that of Ascalon.

The ancient routes that connected the Red Sea and the Mediterranean crossed directly through the Negev, and would have served for positioning the local settlements within the extended networks of both Seas and beyond, offering enhanced connectivity on both micro- and macro-regional scale. This latter feature is further accentuated by evidence for the intense importation of goods to the Negev. Remains of fish from the Red Sea were discovered in the excavations, most distinctly of the luxurious parrot fish. These indicators for production and trade offer a valuable insight into the social and economic conditions of the Negev micro region. Gauging the intensity of their appearance might offer an understanding of processes of continuity and change during the passage from the Byzantine to the Early Muslim period.

Panel 8.16 City and Territory in Ancient Sicily

Thursday | 24 May | 14:30-16:30 | HS XI

Paper abstracts

1. Roksana Chowaniec (University of Warsaw) - Rosa Lanteri and Maria Musumeci (Polo Regionale di Siracusa per i siti e musei archaeologici), The exploitation of landscape and raw materials in the ancient Akrai, in south-eastern Sicily, since its foundation

The presentation will bring the studies to the ancient Akrai, a Greek colony, founded in the interior of Sicily in 664/663 BC, in the part of the Hyblaean Mountains. The town developed while centuries, with an intense architectural boom in the second half of 3rd c. BC. After the fall of Syracuse in 212 BC, town was incorporated into the Roman province and functioned till Late Antiquity. The excavations brought to the light the remains of various phases (also households), showing stages of redevelopment and usage. Particularly Late Antique phases showed changed the previous urban design and function of the residential area, and were solely connected with zone of craft activities rather than habitation. The intensive manufacture and using raw materials is confirmed by a huge amount of different products (sulphur, bone and antler artifacts, iron) and semi-finished products, numbers of tools, small furnaces and lime kiln. But the exploitation of landscape and raw materials begun here much earlier. Already the Syracusan exploration since 1 half of 7th c. BC brought building activity and created a demand for stone, what resulted in two quarries created in the town, later were used for Christian necropoleis. Land was also wrested from the island nature for farming, planting, but also manufacturing (bone-carving, clay-production (?). Thanks to the interdisciplinary studies we are closer to understanding the processes of deforestation or exploitation of raw materials.

2. Johannes Bergemann (Universität Goettingen), The Hinterland of Agrigento - Survey results from Monti Sicani

The University of Goettingen Survey in the Hinterland of Agrigento is now in the phase of preparation for publication. The results of intensive and extensive field walking on some 200 sq kms discovered the settlement system between copper age and middle ages. The paper will focus on the relations between inland and coastal areas around Agrigento in Greek and Roman times. The Monti Sicani can be regarded as area of influence from the time of the Greek colonisation and the founding of Akragas onwards. After a crisis in the hellenistic period the Roman settlement system in the Hinterland of Akragas gives a starting point for new developments in the extrarural area, which might support the flourishing of the city of Akragas itself in Roman times. Economic specialisation in sulfur mining and grain production semms to be evident.
3. Rodolfo Brancato (Università degli studi di Catania), Rural Networks in Sicily: the Archaeology of Rural Landscapes in the Plain of Catania from the the Hellenistic to Late Roman period

My presentation seeks to outline the main developments in settlement organization in the Plain of Catania from the Hellenistic to Roman period, through the creation of a complete gazetteer of the archaeological sites, in order to fill our knowledge gap on “peripheral landscapes”. The rural landscape of Sicily is not one of the most studied of the Mediterranean: archaeological studies have traditionally preferred urban to rural landscapes, and this has only recently begun to be redressed. A systematic research on the rural landscapes of the Plain of Catania started in 1996 when a series of topographic surveys were carried out according to the Forma Italiae Project’s methodology. Mostly covering the western portion of the plain of Catania, due to their unexploited potential, these topographical surveys are of great interest for any attempt at analysing rural landscapes: within the survey area (500 kmq ca.) 203 new sites were identified, dating from the Neolithic to the Medieval period. Together with the legacy data available from eastern Sicily, the survey data were stored in the Ru.N.S (Rural Networks in Sicily) database. The results obtained through the use of the Ru.N.S database provide a vivid image of rural population trends in eastern Sicily in ancient times, and may help in reconstructing the organization of this agrarian territory between the Hellenistic and Roman ages with the contribution of epigraphy, numismatics and remote sensing.

4. Alessandro Corretti, Antonino Facella, Chiara Michelini, Alfonsa Serra and Maria Adelaide Vaglioli (Scuola Normale Superiore), Self-sufficiency and integration in wider production/exchange networks at Entella (Sicily) and in its territory: continuity and transformations from Archaic to Byzantine age

Thanks to 35 years of systematic research at Entella (Contessa Entellina, PA - Italy), the SAET Laboratory of the SNS can now manage complex data from both excavations in the town and surveys in the surrounding territory. This has allowed us to reconstruct patterns and trends of human settlement from Prehistory to modern times, and to check cases of continuity or transformation in landscape exploitation strategies, especially in connection to major social and political changes.

We will briefly discuss some case studies: the transition into polis of the settlement of Entella in Archaic age; the complex events involving Entella from the settling of Campanian mercenaries at the end of 5th cent. B.C. to the First Punic War; the Romanization and its effects on economy and land organization; the abandonment of Entella in the Early Imperial age; the consequences of the Vandal conquest of Africa on local economy; land-property features in Roman and Byzantine ages.

In all these cases, the analysis of rural settlement trends and of material culture in the investigated area (production for self-consumption, import/export), combined with data from the urban settlement, spreads new light on the diachronic knowledge of production and exchange systems in local economy, showing how they were affected by large-scale transformations in protohistoric, ancient and late-antique ages.

Panel 8.17 Roman Shops and Workshops

Friday | 25 May | 14:30-16:30 | HS XII

Paper abstracts

1. Riccardo Di Cesare and Daniela Liberatore (Università degli Studi di Foggia), Workshops and Tabernae: New Data for the Economic History of Alba Fucens

Recent archaeological excavations in Alba Fucens are shedding new light on the artisanal productions and the economic and religious life of the ancient Latin Colony. The discovery of a coroplastic workshop along the southern edge of the Forum, dating back to the III cent. B.C., has added new evidence and
allows to reconsider old data and broader archaeological-historical problems. The kiln produced terracotta votives, lamps and architectural revetments for a nearby sanctuary; inscribed items, such as moulds and pottery, refer both to the workshop and the religious activity of the first inhabitants of the city. The kiln was dismissed when a large terracing was built and changed the destination of the area in the II cent B.C. At the end of the II-beginnings of the I cent. B.C rows of tabernae were built in the city centre, along the main streets and the southern edge of the Forum: one of these, next to the terracing, has been also excavated in recent years.

The paper will discuss the role of the crafts and workshops, the cults and the economy in defining the city of the III-I cent. B.C. At the same time it will address the issues of the transformations of the economic life and of the urban space from the Late Republican times until the beginnings of Late Antiquity. A series of activities, of producers and customers, attested from the archaeological and epigraphical evidence, will also be analysed.

2. Eva Riediker-Liechti (Universität Zürich), Wirtschaft und Handel auf dem Monte Iato (Sizilien) in römischer Zeit - das Beispiel der Garküche


In Pompeji existierten über 100 Beispiele solcher Gastronomiebetriebe, während in Sizilien erst vereinzelte Garküchen identifiziert und publiziert wurden. Mit dem Lokal auf dem Monte Iato wird nun erstmals für das römische Sizilien eine Garküche im Detail vorgestellt.


3. Jordi Pérez González (Universitat de Barcelona), The Singularity of Rome. The sumptuary city.

The taverns were the focus point of artisanal and commercial activity in the capital of the Empire. In Rome it’s possible to recognize a movement of these shops as part of the urban and architectural evolution by the city, integrating within its urban and commercial fabric, consequence of its displacement from the original center to the periphery. This last displacement was also linked to the establishment of these stores in the new shopping centers of the time. This commercial concentration caused the commercial displacement for other merchants, who would be located in the premises closest to these buildings.

At the same time, we see that the displacement of commercial premises from an increasingly monumental center to a more distant area isn’t a problem for commercial activity to continue throughout most of the city. Thus, linked to the economic boom of the imperial period, there was an unprecedented commercial growth in the city, making Rome a kind of big ‘bazaar’.

An analysis of all the inscriptions found in the Roman Empire where the characters dedicated to the trade of the luxury products that we’re interested in here are mentioned, allows us to emphasize, first, the singularity of Rome as the focus of attraction of the sumptuous traffic in comparison to the ‘The rest of the Italian regions and Roman provinces’, and second, the high interest of the urban elites for the jewels, cloths and ointments.
4. Macarena Bustamante-Álvarez, The domestic tabernae in Hispania

The study of the urban craftsman, his productive space and his problematic socioprofessional in the Antiquity is a well-known subject and well systematized in some points of the Roman Empire from the seventies, as in France or Italy. On the contrary, other geographic spaces like in Hispania, do not enjoy this advantageous position; Either because of poor conservation conditions of material evidence, or because research has focused on other macroeconomic and monumental aspects. This is why it is an open field, constantly breaking and potentially very fruitful for research in the coming years.

The aim of this presentation is to carry out a first archaeological and socioeconomic characterization of commercial and productive urban spaces within the framework of the Hispania (I a.C.-III d.C.). Fundamentally, we pursue the identification of these spaces and the detailed study of the material remains located there in a functional, polysemic and interdisciplinary clause. We will present a first list of the domestic tabernae located in Hispania.

5. Hilary Becker (Binghamton University), Commerce in color: product choice in pigments at the Roman marketplace

Pliny's account of pigments makes it seem like a wide range of pigments from across the Roman empire (and beyond) were available to Roman consumers. But to what extent is this true? How much choice did Roman consumers actually have? These questions, as well as the marketplace envisioned in Pliny's "Natural History", are tested by looking at Roman pigment shops, a sector of study of the Roman economy neglected until now. This study looks at trade in pigments, fleshing out for the first time what pigment shops were like and the merchants who ran them (pigmentarii). An analysis of remains of pigment shops from Pompeii and one from Rome allows a consideration of what range of pigments might have been available to the average consumer. In addition, this paper considers whether there was one-stop shopping for pigments or whether some pigments had to be bought at other specialty shops.

This study provides an opportunity to step behind the scenes of a Roman fresco to understand the economic choices with which patrons and painters were familiar. In addition, this also offers an opportunity to compare text with archaeology. Pliny describes many different types of pigments in his text, but is this text representative—or is he operating at a super-capacity that collects more pigments than regular Romans could expect to experience?

Panel 8.18 Roman Water Management and Infrastructure

Friday | 25 May | 14:30-16:30 | HS XIV

Paper abstracts

1. Leonardo Radicioni (Sapienza, Università di Roma), The importance of water infrastructures in Rome: technical-structural analysis of a section of Aqua Claudia and its maintenance and consolidation works

A city like Rome, with an urban population never seen in the ancient world, always needed huge resources. And water is without a doubt one of these. The Aqua Claudia and the Anio Novus were therefore the aqueducts that in the first imperial age went to satisfy this increasingly urgent need, due to the insufficiency of the seven existing aqueducts. With a path of tens of kilometers, the last part of which overlapped on continuous arches that even reach 30 meters high, the two new aqueducts together had a double flow rate, or greater, of all the other aqueducts, and certainly demanded the greatest economic effort, about 350 million of sesterces against the 8 million of the Aqua Marcia. Choose to analyze a single section, although about 160 meters, talking about such an infrastructure may seem reductive, but it useful and necessary if we consider the variety of solutions adopted in a work as big as this. And the part here analyzed is the most outstanding, precisely because of the whole series of maintenance or repair successive, which have widely modified shape, size, and above all static and structural func-
tioning. A great commitment, therefore, economic, organizational, and above all lasting over the centuries, in keeping in function and in good condition an infrastructure so important, of which through the instrumental survey supported by 3D photogrammetry of the entire structure, it was possible to analyze every change and identify the causes that resulted in the necessity.

2. Konstantinos Tziampasis, Following the ruins of the aqueduct in ancient Lyttos

An impressive building- and large enough for its time, was the overground Roman aqueduct of Lyttos. It causes great impression to the people and passers-by in the area where, after so many centuries, it still dominates, feeding on the development of local legends, according to which it has been built by Sarantapechi. So far, there is no indication of the exact date of this construction. According to some scholars, the t masonry and the collection tank are considered to be of the middle of the 2nd century BC, very likely to be associated with Hadrian's reign.

The Roman aqueduct of Lyctos starts from the wells of Pano Kournias, which are located in the periphery of Krasi village, specifically from the Kefalovrisi well, and reaches to the eastern outskirts of the city. It passes through the rural areas of the villages of Krasi, Kera, Gonia, Avdou, Kastamonitsa and Xidas (old name of Lyttos). The actual distance is 22 km.

The purpose of the research is to illuminate the path of such a construction and to try to determine the period of its construction. It is also known that the Romans built aqueducts for two reasons:

- To provide large baths, which were their concentration centers for rest, pleasure and cleanliness.
- They wanted to impose their power and the sovereignty of Rome everywhere.

This famous aqueduct was put out of operation several centuries ago, but the legends surrounding it are a living monument, unique in Crete.

3. Paolo Storchi and Ilaria Trivelloni (Sapienza, Università di Roma), Rivers of blood: the role of the water in the functioning of ancient Roman buildings for public spectacles.

Apart from the Naumachiae that, of course were a peculiar type of spectacles that needed a lot of water supplies, the role played by this precious natural source has been largely underestimated by the scholars.

In fact, water is needed for a multiplicity of necessities such as let the spectators drink, clean the arena and the latrinae; for practical purposes connected both with decorative elements, such as fountains, and wastewater.

In the light of this, the presence of a river, according to our studies, may be considered as a determinant factor in the selection of the area where to erect the building.

As a matter of fact, the analysis of the positioning of these types of buildings reveals their frequent location near a river course. One of the reasons can be found on the fact that this seems to be the most economical and functional way to provide building materials during the construction phase.

These considerations can be applied to amphitheatres, but they involve also other typologies of buildings for spectacles; similar considerations can be suggested for circuses; in fact, the presence of water, attested in the spina, by iconographic sources, certainly could not have only a decorative role.

In conclusion, the connection of those buildings to a water resource should be evaluated in the multiplicity of its meanings. The aim of this paper is to clarify, by specific examples, this relationship and to include this aspect of the Roman towns in the debate about the urban landscape.
Panel 8.19 Economy of Judaea-Palestine

Thursday | 24 May | 11:30-13:30 | HS XVI

Paper abstracts

1. Gregg Gardner (The University of British Columbia), Archaeology and Economy in Roman Jerusalem: Markets, Material Culture, and Institutions in the First Century

This paper explores the archaeological sources related to the economy of Jerusalem during the early Roman age (63 B.C.E. to 70 C.E.). It examines the remains of shops and marketplaces, as well as coins, inscriptions, stone weights, and other artifacts. By focusing on the finds’ economic functions and meanings, this paper adds a new dimension to existing scholarship that examines these sources within their religious and cultic contexts. I find that market activity played a more substantial role in the city’s economy than previously appreciated. Reading material culture together with literature from the era and drawing upon ideas from neo-institutional economic thought, I find that commercial activity was enabled and promoted by the economic and social policies of the governing authorities (e.g. Herod, his successors, and Roman governors), such as maintaining the rule of law and constructing infrastructure. Doing so, moreover, enabled the state to capitalize on the city’s character as a pilgrimage destination. This paper contributes to our understanding of the economies of Roman Palestine and ancient cities. It also contributes to the broader study of archaeology and the ancient economy as it demonstrates how material culture can profitably be read together with economic thought.


The transformation of the Hellenistic-early Roman Jewish city of Jerusalem into the pagan Roman colony of Aelia Capitolina entailed the physical re-shaping of the urban topography and a population exchange, as reflected by the material culture. The garrison of the Legio Decima Fretensis, together with the arrival of Roman military and administrative personnel, resulted in a change in dining style and tableware; relief-decorated and mould-made fine drinking vessels and wine jugs were introduced, modelled on pan-Roman silver and bronze prototypes. Local manufacture is indicated by the extensive use of the nearby Moza soil formation for clays and marls, as confirmed by petrographical analyses. Although mere fragments of tableware were retrieved, their number, variety and quality stand out amidst the local material culture. Chalices imitate Italian Sigillata and the jugs copy Campanian bronze pitchers, while Dionysos and his retinue are prominent decorative motifs. The vessels with relief ornament display artistic and technical standards paralleled in the East by relief-decorated pottery produced at Pergamon, in the Ephesos region, and at Knidos.

Panel 8.20 Social Groups as Economic Actors

Friday | 25 May | 17:00-19:00 | HS II

Paper abstracts

1. Aleksandra Nikoloska (Macedonian Academy of Sciences and Arts), The gymnasium, statuary production and religious life in Stybera

The main objective of the paper is to demonstrate a case of city dynamics with the rise of the economy and to follow the merging of social, economic and religious practices of Stybera. One aspect of the urban life revolved around the Gymnasium and the Institution of Epheboi mostly attested through material from the middle of the first until the middle of the third century. The statuary production in Stybera
was very much connected to the Gymnasium. Statues of Epheboi, Palliates, and Herculaneum women were discovered in situ in these buildings revealing details about the religious and social life of Stybera. There are numerous lists of Epheboi and records of Ephebarchs, Gymnasiarchs and Polytarchs. Wealthy citizens donated sculptures and through epigraphy we know of quite a few of them, of their families, and of the gods they vowed to. There is evidence of a city workshop, while the region of Stybera is known for its queries of marble, of which great many of the statues were made. The Heroon housed sculptures of Asclepius, Hermes, and Heracles, gods protectors of youth and competitions. Later in time city priests of the Imperial cult donated a portrait of the Emperor Trebonius Galus thus involving the Roman administration in the Institution of the Epheboi and the life of the Gymnasium. The temple of Tyche, can also be observed within the study. The cult of Nemesis, often connected to Tyche as seen on the evidence from the nearby Heracleia Lyncestis, is also drawn in context.

2. Robert Stephan (University of Arizona) - Brad Hintz (New York University), The Business of Bodies: Calculating Return on Investment for Pimps in the Roman World

Although prostitution has been traditionally conceived of as a private encounter, the economic networks that facilitate these interactions stretch far outside the bedroom. While recent studies have greatly enhanced our understanding of the cultural perception of prostitutes, the economic incentives for procurers (pimps) have largely been ignored. This project builds on previous debates by investigating the return on investment for pimps in ancient Rome. In order to better understand the market dynamics underlying the prostitution industry, this study employs an interdisciplinary methodology, synthesizing archaeological evidence from the brothels of Pompeii, historical data from common graffiti, and ethnographic parallels from early modern America. In doing so, it establishes rough costs for engaging in the procurement industry and balances those expenditures with estimates for income generated by the prostitutes’ services. Preliminary results suggest that pimps in the Roman world might expect approximately a ten percent return on investment over time, a relatively lucrative business compared to the agricultural alternative. In addition to deepening our understanding of prostitution in the Roman world, this study provides a novel approach to an understudied aspect of the ancient economy – return on investment – and provides a model through which other industries in the ancient Mediterranean might be assessed and compared.

3. Marius C. Streinu (Institutul Național al Patrimoniului/National Heritage Institute), The cost of gladiators events in the Black Sea

Gladiator combats have always fascinated, both in Antiquity and in modern times, due to their grandeur, showmanship and exotic nature. These particular events took place during several days and not all of them ended in deaths. Most of the times, the combats were also accompanied by special hunts of more or less exotic animals exibited in the arena, enticing the public interest. Given the scale of such events, organising them implied very high costs, especially significat for the estern empire and the cities on the Black Se Coast. Staging gladiator combats fell within the obligations assumed by the priests and exposed them to considerable expenses and organising the events themselves took a great amount of effort. First of all, they had to find the gladiators willing to participate, their fees, find the people dealing with auxiliary services such as the referees, the musicians, specialized hunters to deal with the animals, buy and import the animals, building or preparing the spaces needed to hold the events. Thus, by means of this presentation, all these aspects related to organizing these spectacular events, from the people responsible to all the logistics entailed and economic impact, will be described in detail and offer a real insight of the general perception of the gadiatorial phenimenon and its spread in the Roman provinces around the Black Sea.
Panel 8.21 City and Countryside in the Roman East

Friday | 25 May | 09:00-11:00 | HS XIII

Paper abstracts

1. Erika Jeck (University of Chicago), Reinterpreting Survey Data, Reimagining Roman Greece

Survey data have often been used to confirm a decline in the countryside of Roman Greece described by ancient authors. But we need not be seduced by the plummeting number of alleged sites, nor by the sudden loss of finewares in certain areas, to read the rural landscape of this period as one of barren fields mottled with villa estates. Instead, using survey data from the provinces of Achaia and Epirus, I present an approach that avoids the methodological pitfalls of identifying discrete ‘sites’ by interpreting artifact scatter collectively as a sign of social, political, or agricultural investment. Attending to the artifacts themselves, this approach remains geographically rooted, simply at a much broader scale based on zones of investment rather than individual sites. In this way, the survey data rather suggest that investment in agriculture was largely maintained under the Romans, while investment in social display became concentrated in suburban zones of major metropoleis. This new pattern of spatial investment developed in response to the growth of cities and hinterlands far larger than pre-Roman poleis and chorai. In the end, rather than widespread economic decline throughout the countryside, these changes point toward a new landscape of grand metropoleis with a suburbium-style outspread of gardens, small farms, and villas, where social investments intensified at suburban nodes of connectivity—keeping urban and rural spheres deeply intertwined throughout the Roman era.

2. George Cupcea and Felix Marcu (University Babes-Bolyai), The Rural Environment of Northern Dacia. Systems of Habitat, Production and Supply

In the Romanian (and Dacian) particular case, research has tended to focus on military and urban sites, where clear traces of urbanization are recognizable and easy to present in a festive manner. Interestingly enough, this was not the case at the beginning of the 20th century, when Transylvanian archaeologists excavated several Roman villas and provided us with most of the results in this aspect of Roman Dacia. After WWII, interest began to grow in the rural settlements in Roman Dacia, but only from the perspective that they could offer evidence for the historiographical goal of more than one century of Romanian research – the native continuity in Roman Dacia and the traditional Romanian ethnic genesis. Not even the more recent, meaning from the 70’s and 80’s, excavations and their reports or the more recent catalogues of rural discoveries are satisfactory, as they are narrowly focused and produce doubtful results. The more recent, aerial approach is very pertinent and attempts to solve this gap, at least for the Mures valley. The objectives of our research, are, in short: The drawing of the map of the Dacia Porolissensis’ countryside; The identification of the systems of production, market and supply; The registry of people living/working in this countryside; The supply of the military on the northern frontier; all of these going towards a general/synthetic look on the provincial rural economy.

3. Alina Streinu (Bucharest Municipality Museum), The evolution of rural sites in Moesia Inferior/Scythia Minor

Moesia Inferior/Scythia Minor is a small province of the shore of the Black Sea, on the territory of modern day Dobroudja region, Romania. Despite its small size, in the 2nd and 3rd centuries AD there are ca. 22 fortified settlements attested, the number reaches 29 in the 4th century, while in the 6th there are 40 listed by the ancient writer Procopius. The aim of this presentation is to review the settlement patterns in the rural environment and the relation with the fortified centers during the 2nd-3rd centuries, when it was called Moesia Inferior and the change noticed starting with the 4th century AD, after the emperor Diocletian established the province of Scythia Minor and strengthened the frontier. Two major phases impacted the urban development of the province during Late Antiquity: the first is the rule of emperors Diocletian and Constantine and the second is the rule of emperor Justinian. Both moments
are marked by major architectural endeavors affecting most of the cities and fortifications that also impacted the spread of rural settlements in their respective territories. Recent research has shown different patterns for the use of land in rural settlements and new settlements have been discovered that bring new valuable information regarding the distribution of people and resources both in the first centuries of Roman rule and during late antique, as well as the evolution of trade networks between urban centers and settlements founded in their proximity.

4. Musa Kadioğlu (Ankara Üniversitesi), Wirtschaftliche Entwicklung von Teos


Panel 8.22 Transformation of Rural Landscapes in the Roman and Late Antique West

Wednesday | 23 May | 17:00-19:00 | HS XI

Paper abstracts

1. Luis Gutiérrez Soler and María Alejo Armijo and Antonio Ortiz Villarejo (Universidad de Jaén), The transformation of the Giribaile-Baessuci landscape in the hinterland of Cástulo (Jaén, Spain)

The second punic war changed the local economy belongs to the late Iberian Culture. The fortified Iberian city of Giribaile was founded in the agrarian colonization of the valley. This central political role was developed by the municipality of Baessuci from the Roman Imperial times. The new economic strategy was focused on a large scale exploitation of the miner local resources, linking this mountain landscape with far away zones of the Roman Empire.

The intensive archaeological survey campaigns carried out in the hinterland of Giribaile and Baessuci landscape has permitted us to show the evolution of the social and economic patterns from the IV century B.C. to the Roman Imperial times and beyond. Also, the recent low level of the water of the Guadalén and Giribaile dams has given us a good opportunity to survey an unknow part of the landscape.

This presentation try to show the new economic plan of the Roman Imperial times defined by a regular settlement pattern distributed around the Baessuci municipality and the global defensive control of the whole miner landscape in front of the Iberian economic strategy focused on the specific defences of the ancient city of Giribaile.
2. Isabel Sanchez Ramos (Autónoma University of Madrid) - Felix Teichner (Philipps-Universität Marburg) - Fernando Valdés (Autónoma University of Madrid), Late antique and medieval landscape in the Guadiana valley. The Roman villa of 'La Dehesa de la Cocosa' (Badajoz, Spain)

This paper aims to present the recent study about the evolution of the territory of the middle valley of the Guadiana between Late Antiquity and the Middle Ages periods (4th-10th centuries), to understand the articulation and management of this geographical border area in administrative, economic, social and ideological terms. One of the main goals is to know the impact of both Christianization and Islamization phenomena in the territory, and the new rural settlements evidences after the fall of the Roman Empire system, as well as the structural characterization of the new cultural landscape in which the transformation of the Hispanic Roman villae is inserted and involved.

3. Isabel Sanchez Ramos (Autonoma University of Madrid) - Jorge Morin de Pablos (Audema), Sacred landscapes in the Hinterland of Toledo (Spain) during the late antiquity (6th-7th centuries)

This work aims to present results from the excavations carried out from 2016 to 2018 in a large late antique both residential and funerary building located at Los Hitos (Orgaz, Toledo, Spain). Los Hitos is a relevant rural and sacred complex related to the local elites of the Visigoth capital of the Iberian Peninsula. The Regnum Gothorum was consolidated since the middle second half of the 6th c. An ambitious cultural and legislative programme, perfectly elaborated, was set into action in order to reach the new unification of ancient Roman Hispania. The site underwent some transformations regarding functions and architectural spaces from its foundation as rural privileged residence, mausoleum, ecclesiastical complex, and it continued being occupied during the Umayyad period.

4. Javier Salido (Universidad Complutense de Madrid), From the villae and villages: The Grain production in the Roman Spain

Food supply in Roman Spain has been a scarcely studied subject in historiography due to poor conservation of relevant structures (horrea –granaries and store buildings- and pistrina) and a lack of interest on part of experts dedicated to the archaeology of architecture, who have focused more on another types of sites and monuments. Consequently, the study of warehouses and other store buildings has been long neglected, despite being of great importance in terms of understanding the management of primary resources such as grain, one of the most crucial factors behind the functioning of a city.

5. Marion Dessaint (Paris 1 Panthéon-Sorbonne), Durocortorum and the Remi territory: dynamics and evolution of the economic relationships between the capital of a roman province and its territory

The multiplication of preventive excavations in Champagne-Ardenne in the last fifteen years brought forth new elements regarding land use in the Remi territory and its centre civitas, also capital of the Gallia Belgica: Durocortorum (Reims). Today, thanks to an exhaustive inventory of rural settlements in this area, made as part of a PhD thesis on the Remi territory between the c. 3rd BC and the c. 6th AD, it is possible to offer new leads concerning the relationships between cities and the countryside, as well as economic flows that animate them.

What are the ties between the provincial capital and the Remi territory? Can we determine if products made in the neighbouring area of Reims were destined for the city, and inversely? Is there a connexion between territory organisation and economic relationships in the city/countryside system?

Faunal and carpological studies, considered alongside a spatial approach to rural settlements, allow us to propose several hypothesis concerning the networks and economic dynamics that organise Durocortorum and the Remi territory. The recognised differences in productions in nearby and farther rural settlements bear witness to a specific economic organisation between a capital and its neighbouring territory.

Moreover, studying the spatial distribution of the settlements discovered in this area allow us to grasp the provincial capital’s impact on the establishment of rural settlements, main actors in the economic relationships with Durocortorum.
Panel 8.23 Rural Buildings and Villas in Italy

Wednesday | 23 May | 17:00-19:00 | HS I

Paper abstracts

1. Martin Tombrägel (Eberhard Karls Universität Tübingen) - Michael Feige (Christian-Albrechts-Universität zu Kiel) - Paul Pasieka (Freie Universität Berlin), The Villa Metro Anagnina

The Villa Metro Anagnina from the south-eastern Suburbium of Rome was built as a large agricultural estate in the 3rd century BC. The excavations undertaken since 2010 revealed the economic history of the villa until its destruction in the late 2nd century AD. Throughout the nearly 400 years of life the economic layout of the villa changed several times. After originally serving for the traditional production of wine and oil during the Middle-Republican period, the architectural modification and enlargement lead to a change of economic purpose. The change is visible after a complete destruction and rebuilding of the villa structures in early imperial times. Recent excavations (since 2016) have turned the attention to this latest villa phase and examined the question, whether the change can be identified as a transformation of the production type or if production ceased in the ongoing 1th and 2nd century AD.

2. Alessia Morigi and Riccardo Villicich (Università di Parma), Pars fructuaria. Nuovi dati dagli scavi della Villa di Teodorico (Galeata, FC – Italia) sugli impianti artigianali e produttivi delle ville urbano-rustiche dell’appennino romagnolo

L’àrea archeologica della Villa di Teodorico, scavo storico dell'Istituto Archeologico Germanico fin dal 1942, successivamente dell'Università di Bologna e, più recentemente, dell'Università di Parma, consiste in un comprensorio di grande rilevanza storica, nell'immediato entroterra appenninico di Ravenna, molto noto per il suo ruolo di collegamento stradale tra pianura romagnola e Italia centrale e per la presenza dell'acquedotto costruito da Traiano per rifornire Ravenna.

Di questo privilegio è testimonianza diretta la villa, dove è stato messo in luce il padiglione di rappresentanza dai bellissimi mosaici di maestranza ravennate, che confermano il legame simbiotico fra l'edificio e la corte di Ravenna e l'esistenza di un complesso di dimensioni consistenti e di straordinario pregio e bellezza, all'altezza della residenza di caccia dell'imperatore Teodorico.

Della villa romana è stata riportata in luce gran parte della pars fructuaria. Le stratificazioni intatte hanno restituito una concreta testimonianza delle lavorazioni all'interno del settore produttivo della villa grazie al rinvenimento degli attrezzi per la lavorazione dei campi, dei contenitori e di una importante quantità di cereali. Ne deriva un quadro efficace delle attività agricole governate dalla villa e della sua economia di sussistenza. La villa esemplifica altre analoghe ricorrenze in area appenninica romagnola e a meglio delineare commerci e produzioni del comprensorio.

3. Gloriana Pace (University of Pisa) - Sara Lenzi (University of Florence), Production from destruction: change of value of the recycled decoration. The Roman villa of Aiano-Torraccia di Chiusi (San Gimignano, Siena - Italy)

The excavation carried out since 2005 at Aiano-Torraccia di Chiusi, near San Gimignano (Siena, Italy) by the team of the Université catholique de Louvain, have unearthed a late antique villa, that covers an area of about 10.000 m2. This site, excavated only for a small part (about 3000 m2), presents various phases of occupation from the 3rd to the 7th century AD.

During the second half of the 5th century AD, the villa was gradually abandoned; however, most of the rooms were still standing.

Since the end of the 5th century AD, the site was reoccupied by a group of artisans who set up a series of workshops, carrying out the recuperation of both precious and raw materials from the villa’s structures; the villa lost a great part of its decoration, the elements of which were recycled in the productive processes implanted inside the rooms.

The site appears to be not only a real “mine” of reusable materials, but also a manufacturing centre of
metal objects, glass, gold, marble and pottery, as evidenced by the presence of hobs and kilns. The main focus of this paper will be the change of value of the recycled decoration and the interaction between craftspeople and buyers: the rich and huge furnishings of this Roman villa were destroyed, recycled and reused (marble for ceramic temper, glass tesserae for necklaces), thus shading light on different value given to this kind of more ancient products during the late Antiquity.

Panel 8.24 Urban Roman Production and Distribution Sites

Friday | 25 May | 17:00-19:00 | HS XII

Paper abstracts

1. Vanessa Elizagoyen (Institut National de Recherche Archéologique Préventive), New evidence on leatherworking during Antiquity: the case of the Burdigala Jean Fleuret site (Bordeaux, Nouvelle Aquitaine, France)

Our archaeological knowledge of skins and leather workshops in Antiquity is still very partial, due to the usual difficulties of studying crafts running organic matters. Moreover, these last years, archaeological sites traditionally interpreted as tanneries were questioned.

In 2011, French archaeologists of Inrap (National Institute of Preventive Archaeological Researches) excavated a complex located on the edges of the brook Peugue, in the western extension of the Roman city of Burdigala (South-West of France), that works between the middle of Ist and the middle of the IIth century AD. It is fitted with a building made of earth and wood in which workstations and spaces of drying and storages were identified, of a wooden monoxyle tank, as well as a big pool in which the water circulates permanently. The landfill of archaeological remains under the level of the groundwater maintained the organic matters in an exceptional state of preservation. Thus, evidences evoking alum tawing (characteristic bones of Goats and sheep, alum amphorae of Lipari, iron schafts intended to stretch out skins on frames, pebbles used as tools) and artefacts resulting from the work of the cobblers (tools, leather wastes) were recognized. In this last set, the harvest of about 20 kg of leather delivers the biggest collection of marks (stamped marks and graffiti) never brought to light, leading ourselves to wonder once more about their functionalities.

2. Elisa Panero (Musei Reali di Torino), Workshops and economic history in a roman town: An artisanal wool activity in Vercellae, Italy.

The city of Vercellae, which became a Roman municipium in 89 BC, was located at a key point on the Transpadanian routes, along the way from Mediolanum and Augusta Taurinorum to the Galliae. Since 2012, the Soprintendenza Archeologia del Piemonte began a systematic excavation in the southern suburb of the Roman city, in the area of the amphitheater, not far from the Sesia river and the river port. Here, several Roman features were found, including a rustic building (in some of its phases with an open portico), an underground context of uncertain function built with excellent masonry technique, some channels and many pits dug directly into the clay beds and then filled. There are many indications that suggest the area was used as a site for crafts activities. In addition to the structures, clear evidence includes a volcanic millstone, several large mortars and numerous loom weights of various kinds. However, it was thanks to the analysis of materials, particularly amphorae, which has strengthened the hypothesis that is was a lanarius. For example, amphorae with coarse paste, believed to have contained alum and oil, should be considered in relation to the production cycle of wool. These draw a strong analogy with the Altinum and Patavium area, famous in antiquity for its fine wool production. In this paper, I will present, in a preliminary way, the excavation structures and materials that are deemed to be connected to the textile production, waiting that further investigations add new data.
3. Jared Benton (Old Dominion University), Workshops, not Factories: Late-Antique Bakeries outside of Large Urban Centers

Late antique bakeries are usually characterized as large – almost factory like – workshops, analogous to those found at Ostia or to those described by Socrates Scholasticus. But an examination of the evidence from around the Roman empire reveals that most late-antique bakeries were much smaller and more akin to the bakeries in smaller Roman cities from earlier periods. The operation of such bakeries can be divided into two broadly inferred, but related systems: bakeries in large houses, probably grounded in slavery, and small independent bakeries couched in the modest Roman familia.

The focus on the high-productivity bakeries largely resulted from an interest in assessing economic growth and intensification of production. This preoccupation led to a concentration on large urban centers which hosted the larger bakeries, such as Ostia - and central Italy in general – or textual evidence for Rome and Constantinople. Smaller cities, such as Volubilis or Augusta Raurica, which indeed have late-antique bakeries, have largely been overlooked. The bakeries at these locations, along with papyrological and legal evidence from different parts of the Empire, reveal the smaller scale of production for most bakeries. Such continuity with early bakeries shows the importance of the urban fabric of a city in determining the nature of its industries, but it also provides better context for the origins of the small-scale production of the early Medieval period.

4. Javier Salido (Universidad Complutense de Madrid) - Macarena Bustamante, Bakeries and Mills in Hispania

This study deals with recent developments in the research of Hispania's bread-making tradition. More specifically, we'll analyze the handling, transformation and production of baked products from a technological perspective, based on infrastructure and tools found on the Iberian Peninsula.
Session 9: The Military Economy at War and Peace

Panel 9.1 The Production of Military Equipment – Fabricae, private production and more

Organiser: Stefanie Hoss (Universität zu Köln)
Thursday | 24 May | 14:30-16:30 | HS XIII

Panel abstract
The production of military equipment is a subject that has advanced much less in the last thirty years since Mike Bishops article in 1985 than one would have thought from the amount of new finds made and new research methods developed during that period. This is especially striking when compared to the advances made in the research on civilian production in the same time. Most research on military production is either concerned with production for the military centring on grain and meat (where large advances have been made) or with production by the military centring on tile production.

The fact that the soldiers owned at least those parts of their equipment that had to confirm to their body measurements (helmet, armour, sword, sword-belt) and the horsemen also owned the horses and their equipment is proven by various written sources. Other implements, such as the tents or the catapults, were owned by larger units, such as the contubernium or the legion. Which influence did these different systems of ownership have on the production of these objects?

Another consideration is the difference in the products: The production of a shield is much different from that of a sword and that again differs from the production an arrow. Could these differences in production have influenced the manner of production?

Because of several forth century literary sources, the famous fabricae are often seen as the only source of military equipment. But the mere word is already a problem: Do we really mean the workshops found in forts and legionary fortresses? The buildings often named as such within the fortress walls have such widely differing sizes and forms that one is left with the impression that any building without another obvious function is named fabrica by the excavators, regardless whether there is any true evidence for metalworking or not.

But perhaps, fabricae means something else entirely, namely the large – large as in industrial - production sites often situated in the hinterland of the garrison like the production site of the legio Prima Minerva at the Bonner Berg or the Sheepen site less than a kilometre from Camulodunum.

Paper abstracts

1. Stefanie Hoss (University of Cologne), Military equipment: an overview of different production systems for different times, places and items

When looking into the production of military equipment, we have to consider the size of the army and the variability of the territories it was spread out on – both in terms of the development of surplus production and the availability of craftsmen. In addition, the development that must have taken place over the four hundred years between Augustus’ reforms that turn the legions into professional standing armies and Late Antiquity has to be taken into account.

A final consideration is the difference in the products: The production of a shield is much different from that of a sword belt and that again differs from the production of a sword. The result of these considerations is the realization that there could not have been one model, one system or one ‘grand plan’. Production probably varied according to both need and possibilities.

In my paper, I would like to give an overview of what we know about the production of different kinds
of Roman military equipment, both on the level of the individual fort or fortress as well as the underly-
ing systems of supply.

The purpose of this session is to collect what we do know and work towards terra incongnita from there. We thus invite papers that present productions sites or production systems for military equip-

2. Astrid Lindenlauf, Necessity is the Mother of Invention: The use of improptu offensive and de-
fensive weapons in Greek warfare

Centaurs are often portrayed as wild and untamed creatures in Greek art and literature that would pick fights with Greek heroes. Owing to their lack of military equipment, they are forced to use impromptu weapons, that is artefacts and ecofacts that were readily available and that can be used to either distract or cause damage. In close-range combats with Greek heroes centaurs are seen to be employing unusual weapons such as tree branches, thymiateria, metal and clay vases, or even potsherds. In the ideal world of images, Greeks required proper metal arms to distinguish themselves in warfare, but textual sources acknowledge the occasional use of impromptu offensive and defensive weapons in ac-
tual historic battles. In this paper, I explore the range of artefacts and ecofacts that might temporarily serve as weapons in Greek warfare. Which instinctive choices did Greek soldiers make in times of crisis? Why, how and to what extent did they align themselves with creatures beyond the realms of civilized order such as centaurs? What was the impact of social conventions, perceptions of value and everyday praxis? The aim of my paper is to gain a better understanding of the creative uses of inexpensive, free or readily available resources and objects at times of need. I argue that both real and imaginary prac-
tices of appropriation and temporary transformation were deeply influenced by everyday practices of recycling.

3. Leida van Hees, The tools of production

The production of military equipment could not be realised without the access to proper tools. Tools generally can only be used for certain materials and tasks. The exact shape of a tool often allows its original purpose to be determined. For example the space between the teeth on a file may show whether it was used for wood or metal, and while hair scrapers and certain knives may both be used on leather their purposes serve different parts of the production process. Research into tools found at a site can therefore shed light on the production of a large range of items. The personal military equip-
ment of soldiers consisted mainly of leather and metal. Metal and leatherworking tools found at a site may therefore provide insight into the production of military equipment.

Albaniana, a fort and vicus of the limes of the western Netherlands, was located far from the produc-
tion centres of the Roman Empire. It must have been impossible for its inhabitants to exclusively rely on import for the military equipment they needed. Over 200 tools for different materials and purposes were found at the site, allowing the soldiers to produce and repair many items themselves. Among the-
se tools are those used for metals and leather, many of which were found inside the fort’s fabrica. In my paper I will present the tools and other clues of crafts executed in Albaniana in order to obtain a better understanding of how well the soldiers were equipped to produce and repair their own equip-
ment.

4. Martijn A. Wijnhoven (VU University Amsterdam), Workshop traditions: A long-term look at military equipment production

As any craftsman will tell, there are many different ways of making an artefact. The steps a craftsman takes and the tools he uses are often the result of an (implicit) workshop tradition, which translates into slight differences in the end products.

Using mail armour production as a case-study, this paper takes an artefact-based approach aimed at showing that apparently insignificant variations may in fact be a rich source of information on how mili-
tary equipment was manufactured, when analysed in a comparative long-term perspective.

Taking a closer look at the collective archaeological evidence of mail armour between 300 BC – AD 1000 (i.e. from its invention until the High Middle Ages) allows us to appreciate changes in workshop tradit-
ons over time. A particular feature of mail, ‘the direction of the overlap’, is used in this case to compare production processes through the ages. I will discuss how this simple attribute: 1) can aid to distinguish the Roman from the Barbaricum mail making tradition; and 2) reveals whether the Roman workshop tradition persisted into the medieval period.

5. Vince Van Thienen, State control, regionality or guidelines? The production of the crossbow brooch

Many debates on the production of military metal items, such as brooches, often focus on the aspect of control by the Roman state or military on the one hand or on the regional differences across the provinces on the other hand. Research on both object and context information on the crossbow brooch, a significant Late Roman military symbol all across the Empire, has uncovered that it does not always have to be one or the other. Uniformity plays a major role in many military equipment, but as do stylistic differences tied to a certain identity, be it personal, unit-based, geographical or other. The changes and similarities in the production of the crossbow brooch through time form a good example in showing that not only the objects and their social context undergo changes, but that the production techniques and production systems change subsequent to new socio-political requirements and Empire-wide military infrastructure. This paper wishes to illustrate that the fabrica conceptually can be seen as a fluid production environment, as changeable by the larger transformations in the Roman Empire as the objects themselves. Recent research has uncovered that, instead of regarding uniformity contrast to variation, that standardization is present in the shape of the brooch, while maintaining stylistic freedoms in the decorative details. The degree of standardization or variation allows us to investigate the different ways in which production of the brooch was organized.

Panel 9.2 Strapped for Cash: Needy soldiers, reluctant authorities

Organiser: Panagiotis Iossif (Université de Liège) and Evangeline Markou (National Hellenic Research Foundation)

Thursday | 24 May | 09:00-13:30 | HS XIII

Panel abstract

War has always been an expensive enterprise for cities and rulers as, from as early as the classical period, it has not been cheap to pay for mercenaries. The war could be seen as a "growth" machine generating money which, in a second phase, could be used to fuel the everyday exchanges and, later on, to remunerate military operations. It is a general consensus that soldiers wanted to be paid in "fresh money" but when quantifications are used to estimate the sizes of a given coinage, we come to realize that most of the issues were either limited or insufficient for sustaining an army over a longer period of time.

But armies were paid in various ways; epigraphic and literary sources offer precious hints on how coins and mercenaries were related and that the soldiers were not only paid in precious metal coinages, but also received allowances in bronze coins (opsonion and siteresion) and, of course, in kind (siteresion?). An important part of their expected benefits was booty, although this remains difficult to quantify based on the available evidence.

Despite the general consensus relating the issues of coins with military activities, little (or no) information is known on the practicalities of the payments while various questions arise: how were the resources raised by cities and rulers in order to fund their armies? who decided the salary of the army or was this part of an ad hoc negotiation? and what were the practicalities for the payment of mercenary soldiers? were they paid in large denominations of precious metal and how were those coins exchanged with smaller issues that could be used in local markets? were they paid before or after the
campaign? did they receive an advance before and the rest after the (successful) campaign? where did they receive these payments and did the usual or "military" mints operate to cover their needs? did they receive a misthos in bronze when affected in garrison activities, as recent studies proposed? and how did the soldiers act when not engaged by an army, often far away from their motherlands? Did the issuing authorities try to keep them calm and satisfied or did they find excuses not to pay what they promised? do we have testimonies of rebellions and mutinies related to such circumstances? And how about local economies? can we trace back the impact of the military payments in local economies? and what effects the presence of an army had in the market?

These are only some of the questions that will be addressed in the proposed panel focusing on the numismatic aspects and the direct connection between coinage and army. The aim is to investigate the prolific use of the coinage for military needs through time, starting from the Classical city, moving to the Hellenistic period, and through the passage of the Roman Empire arriving to the Gallo-roman Emperors of the third century A.D.

Paper abstracts

1. Evangeline Markou (National Hellenic Research Foundation) - Panagiotis Iossif (Radboud University Nijmegen), Introduction and Conclusions to the Panel

War has always been an expensive enterprise for cities and rulers as, from as early as the classical period, it has not been cheap to pay for mercenaries. The war could be seen as a "growth" machine generating money which, in a second phase, could be used to fuel the everyday exchanges and, later on, to remunerate military operations.

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2. Sven Günther (Institute for the History of Ancient Civilizations), War Zone-markets: Mercenary-payment, Generals and Market-manipulations in the 4th century BC

During the 4th century BC, the war-business (not only) in respect of payment became gradually more professionalized on both sides, for mercenaries and generals. While the former has been studied quite well, the latter still lacks a comprehensive analysis. Particularly the questions of how the many attested generals dealt with the financing and funding of their soldiers and to what extent they created, framed and influenced, and even sometimes manipulated, the local markets at the war zone, permanent and temporary ones, have not been systematically analyzed yet. The paper will address this question by first examining the better known case of the general Timotheus (cf. Günther 2016) and will then draw attention to the other sources (numismatic evidence; Xenophon; speeches of Demosthenes and other Attic orators; Aeneas Tacticus; Ps.-Aristoteles, Oikonomika; Polyagenus etc.) for successful and unsuccessful generals, their organization of army-payment and handling of war zone-markets in the poleis of the 4th century BC before the Hellenistic period.

Further Literature

Günther, S. 2016. "Die Söldner und das liebe Geld. Überlegungen zum Zusammenhang zwischen
3. Charlotte Van Regenmortel (University of Leicester), Adam Smith at Taenarum? Labour Markets and Paid Military Service in the Early Hellenistic Period

From the early Hellenistic period onwards, armies increasingly consisted of paid soldiers who had voluntarily joined the campaigns in which they were employed. This shift in the nature of military musters led to the emergence of new incentive structures for military employment, of which pay was the most important. The presence of these military wage labourers forced their employers to begin to adhere to market forces. This can be seen during the Successor Wars, when Eumenes, for instance, increases the pay of his soldiers in order to combat the shortage of men (Diod. 18.61.4-5), and soldiers are often encouraged to desert in exchange for higher pay (e.g. Diod. 20.75.1); while the soldiers themselves appear to have been aware of their power over their employer, and use it to receive further compensation (e.g. Diod. 19.20.1-2).

This paper will discuss whether the presence of these military labourers during the Successor Wars indeed led to the emergence of a functioning labour market. It will do so by discussing the variations between wages within a single army, as well as across the armies, and see whether these are subject to market forces. The presence of a labour market among this large group of military professionals in the Hellenistic world would be of great importance in the study of the emergence of Hellenistic capitalism, and mean that these men had a much larger influence on Hellenistic society, than the mere redefinition of various borders.

4. Gunnar Dumke (Martin-Luther-Universität Halle-Wittenberg), Paying for a round with squares - The Indo-Greek kings after Menander I and their coins

The Greek kingdoms of the Far East have always been regarded as a true heaven for mercenaries and it has long been realized that the imagery of Indo-Greek kings is extremely rich in military imagery. The fact that we find twenty kings in a time span of about sixty years shows in addition that we have to anticipate struggle between different families of Indo-Greek (and partly Indo-Scythic) kings.

In my recent project I undertook a die-study of these twenty kings and queens, reigning from ca. 130 – 70 BC in the regions south of the Hindu Kush mountains in a region that is equivalent to present-day southern Afghanistan, Pakistan und North-West India. Although the data does not answer all the questions raised in this panel, it will for the first time be possible to estimate the volume of the kings’ coinages and to argue if these coinages were used mainly to cover military expenses. Since I also include the bronze series in my studies, we will further have the possibility to compare the output of silver and bronze coins for these kings and try to draw further conclusions.

5. Stéphane Martin, Quantifying the impact of military payments on local economies: the case of Gaul in the 1st c. BC

Military operations had a strong impact of Gaul in the second half of the 1st c. BC, documented both by texts and archaeology. A number of large silver coin hoards are known from this period; they are generally interpreted as remnants of payment for Gallic soldiers. This paper will try to assess their economic significance in two ways. First by trying to quantify the necessary amount of bullion and its possible sources in the years following the Gallic wars. Second by envisaging their impact on monetary circulation, monetisation and distribution of wealth in this crucial period.

6. Cruces Blazquez Cerrato (University of Salamanca) - Marta Gómez Barreiro (Junta de Castilla y León), Caesaraugusta and the Roman army: copies of PreClaudian and Claudian coinage to supply troops?

The closing of the provincial mints in the middle of the first century AD brought about noteworthy changes in the economic formulas of the Western Roman provinces. The so-called “copies” of the Roman official coin constituted a significant resource that contributed to the reduction of the coinage scarcity. The manufacture of “copies” was frequent and is well documented around the time of Claudius I
in several provinces, including Hispania. However, the recent analysis of the Caesaraugusta mint (Zara-goza) has revealed the existence of coins with similar neglected manufacturing during the governments of Tiberius and Caligula, which could mark the beginning of the “copies” phenomenon that would later become generalized.

The circulation and purpose of the coins is clearly military suggesting that the coinage from Rome was insufficient and that the “copies” covered the economic needs of the troops stationed in the provinces. Until now the existence of two Hispanic mints has generally been accepted: one in the West and one in the East, located in Tarraco. Now, however, it is believed, based on the Tiberian issues, that there is a link between Caesaraugusta and the “copies” of Claudius I. This mint played an important role in the organization of the Roman army and in meeting its needs from the beginning of its colonial life and, afterwards, it continued to manage the production and distribution of the necessary items for the northern-most military establishments.

7. Fleur Kemmers (Goethe-Universität Frankfurt am Main), Military pay and monetary economy in Rome’s expanding Empire

The largest part of the Roman imperial budget was needed for the regular pay, in cash, of the standing army of the Principate. But when did this start? In the middle and late Republic, culminating under Augustus, we can observe a development from an annually levied citizen army to a professional standing army, comprising citizens and auxiliaries. There is literary evidence for some sort of military pay to have started in the late fifth or fourth c. BCE, long before coined money was introduced in Rome. The earliest Roman coin production is too insignificant in scale to have contributed much to any kind of military pay. This paper aims to discuss the transition from payments largely in other forms of money than coins into payments largely made in coinage. Related are the issue of at which point military pay was disconnected to specific campaigns and became regular and of a fixed amount. Drawing on numismatic, archaeometallurgical, literary and archaeological evidence these developments and their impact on the monetary economy in Rome’s expanding empire will be addressed, mainly with a focus on the western Mediterranean.

8. Liesbeth Claes (Leiden University), Circulating Legitimacy and Loyalty between Roman Emperors and their Germanic Soldiers (AD 180-285): A case study

For centuries, the Roman Empire united more than 60 million people belonging to various ethnic and social groups. Traditionally, the survival of the Empire is attributed to its professional central government, supported by the military and urban elites. Recently, scholars have started to question this traditional view by stressing the importance of the quasi-permanent dialogue that took place between emperors and the Senate, the military and the provinces, which resulted in the acceptance of imperial power.

The hypothesis of my paper is that from the end of the second century onwards effective communication with the frontier armies became a decisive element in establishing imperial legitimacy and securing loyalty among the military, in part because of their increasing prominence in politics and administration. In turn, the project assumes that soldiers reacted to these imperial messages, translating them into loyalty towards their emperor.

By the uncommon combination of evidence from coin hoards and honorary inscriptions from Germania Inferior and Superior, this paper seeks to demonstrate that those emperors who were most successful in adjusting their modes of communication to the expectations of the Rhine soldiers were more successful than their rivals in acquiring loyalty. Furthermore, it wants to show that effective communication became a key element in the strategies of those emperors who managed to reunite the Empire at the end of the prolonged crisis of the third century.
Session 10: Economy of Knowledge: Education, innovation, literacy

Session 11: Methodology: Survey archaeology, natural sciences, quantification

Panel 11.1 The Rural Foundations of The Roman Economy. New approaches to Rome's ancient countryside from the Archaic to the Early Imperial period.

Organiser: Peter Attema (University of Groningen)
Gabriele Cifani (Tor Vergata, Rome)
Günther Schörner (University of Vienna)

Wednesday | 23 May | 09:00-13:30 | HS XIII

Panel abstract
Over the last decades excavations, survey and environmental studies have generated a wealth of data on the countryside around Rome north and south of the Tiber. The data pertain to rural settlement from the small farmstead to the large villa and comprise of non-urban burial grounds, production facilities such as pottery kilns, smithies, mines, infrastructure, field systems or give information on crop choice, manuring, land reclamation and land degradation. In combination this wealth of information, often still unconnected, can inform us on the functioning and performance of the Roman economy in a crucial period of Rome's rise to power during the Archaic and mid-Republican periods and investigate its subsequent development during the Late Republican and Early Imperial period within a globalizing context. The geographical scope of the double session will include Etruria and Lazio and its time frame will cover the period from the Archaic to the Imperial. In the first part we will deal specifically with the Archaic to Mid-Republican periods, in the second part the focus will shift to the Late Republican and Imperial periods. Papers covering the total chronological range will be grouped separately. Rather than descriptive single cases, the session aims at data-driven, quantitative and interpretive studies in order to investigate drivers and performance of the Central Italian rural economy during a period of an up-scaling economy. Besides the papers mentioned, other research groups have also expressed an interest.

Paper abstracts
1. Gabriele Cifani (Università degli studi di Roma "Tor Vergata"), The rural economy of early Rome

This paper discusses the evidence of some rural buildings recently investigated in the suburb of Rome as historical documents to reconstruct the economy of Rome and central Tyrrhenian Italy in the archaic phase.

During the sixth centuries BC there was a large population increase in Etruria and Latium, as revealed by the rise in the number of archaeological sites and the beginning of systematic production of wine.
and olive oil. Survey data testify to new territorial organisation and, for the first time, the presence on a large scale of scattered open sites. Archaeological evidence suggests an agricultural strategy far beyond one of mere subsistence, and comparable to that seen the contemporary rural landscapes of Etruria and Greece. Olive and wine cultivation imply the evolution of land property rights, a greater sophistication of the agricultural sector in terms of culture and organisation, the need for a more specialised labour force and the increase in entangled economies.

2. Peter Attema (University of Groningen) - Tymon de Haas (University of Cologne) - Gijs Tol, The Pontine Region from Archaic to Imperial times: settlement, economy, demography

In the Pontine region, south of Rome, the Groningen Institute of Archaeology has carried out regional surveys for over 30 years now. This has resulted in a substantial database holding classified site and ceramic data that we consider representative for the various landscape zones of the region investigated so far. The Pontine database is suited to analyse regional rural settlement patterns in space and time and to reconstruct economic and demographic trends on the local and regional scale between protohistory and Imperial times. So far we have carried out a restricted number of quantified socio-economic case studies of specific landscapes within the Pontine Region as well as one aggregated regional analysis of long-term demographic trends. We now aim at more refined regional analyses and comparison with nearby regions around Rome.

In short our objectives are to:

a) carry out regional socio-economic analyses against which local situations can be measured in order to study internal socio-economic dynamics within the Pontine region
b) to integrate our database with other databases available for the study of the Suburbium of Rome to study supraregional socio-economic dynamics within Rome’s hinterland.

The latter objective is part of a new collaborative initiative to study the Suburbium of Rome north and south of the Tiber.

In this paper we will discuss the progress we have made in working with the Pontine Region database to achieve the objectives described and present new initiatives.

3. Stephen Collins-Elliott (University of Tennessee), Measuring Rural Economic Development through Categorical Data Analysis in Southern Etruria and Latium (400 BCE – 50 CE)

The comparison of the results of rural surveys and excavations has been a long-standing interest in the study of the ancient economy, seeking above all a way to measure changes in settlement patterns and site hierarchies over time. This paper presents a model that utilizes a flexible semantic concordance to standardize site- and artifact-level features from published surveys and excavations, which can then be used to map the presence and prevalence of different economic activities, namely, the production and use of different commodities, the transport, storage, and consumption of resources, as well as monetized exchange. Then, methods of categorical data analysis, primarily but not solely multiple correspondence analysis, are used to measure variability in the dynamics of production and consumption among multiple microregions within the hinterland of Rome over time. The use of a probabilistic framework of inference, along with resampling and sensitivity tests on the quality of the data observed, further allows for estimates of uncertainty to be incorporated into the model. The method thus yields a picture of long-term change in the rural economy as the population of Rome increased over the last several centuries BCE and first half of the first century CE, a multi-faceted perspective of economic development and integration in the countryside beyond just the intensity of agricultural productivity.

4. Simon Stoddart (University of Cambridge) - Letizia Ceccarelli, Incorporation into the Roman world: rural settlement and production on the frontier between Etruria and Umbria

Recent work with the assistance of Marco Amadei, Jeremy Bennett, Nicholas Whitehead, has studied the potential frontier between Etruscan Perugia and Umbrian Gubbio which lies close to the watershed north of Montelabate (Perugia). Systematic field survey on the Gaslini estate has established an interesting local trajectory for the incorporation of a probable Etruscan enclave on the left bank of the Tiber.
into the Roman world. Within the immediate area of Montelabate only three sites, Civitella Benazzone, Civitella d’Arna and Col di Marzo appear to have been occupied in the Etruscan period. Excavations at the small naturally defended centre of Col di Marzo suggest an occupation from the fifth century BC until the first half of the third century BC. Incorporation within the Roman political orbit first led to a complete abandonment of the area, but gradually from the late first century BC, small farmsteads began to be inserted, reaching a peak in the early imperial period. The excavation of a kiln complex close to Montelabate itself suggests the economic motive for this demographic shift, that lasted in two distinct phases from the first until the fifth century AD. In the first phase the local landscape was part of a network of wine supply for the major population of Rome and the local market for over two hundred years. This led to the production of flatter bottomed amphorae suitable for shallow draft river craft which could have navigated the Tiber from a point just below the site. The gentle slopes of the low hills of the Apennines were highly suitable for wine and olive production whilst also offering clays of reasonable quality, limestone for temper and plentiful wood supplies for firing the kilns. In a second stage, the kilns we employed for the production of tiles and coarsewares, serving a local economy. From the study of this small region we have an insight into the microeconomics of the Roman empire.

5. Alessandro Launaro (University of Cambridge), A view from the margins: Interamna Lirenas and its territory in the long-term

There can hardly be any doubt that goods moved in large quantities and over great distances under the Roman empire. However, uncritically assuming that everything managed to get everywhere and in comparably high volumes might lead to over-emphasise the impact of overseas trade at the expense of (comparably less understood) local production, distribution and consumption patterns. As a result, our understanding of landscapes which were placed at the margins of the Mediterranean trade network might be seriously affected by their reduced archaeological visibility. A case in point is the Roman town of Interamna Lirenas, in Central Italy: although located at the margins of the Mediterranean distribution network, it was very much embedded in a regional system of periodical markets (nundinae). Recent excavations and field-surveys have produced a rich dataset of pottery consumption at this site and across its territory, putting special emphasis on the full range of local/regional commonwares. This makes it possible to contrast and compare the relative incidence of local and imported wares as much as the more general impact their analysis has on the reconstruction of settlement and demographic patterns.

6. Veronika Schreck and Günther Schörner (University Vienna), Production and trade in Late Republican and Imperial Inland Etruria: Integrating archaeological and archaeometric results of the Val di Pesa and Val Orme-Project

Northern inland Etruria is one of the least studied areas in Italy, especially as far as the Roman period is concerned. The Vienna Orme and Pesa valley Project addresses this situation and covers a microregion defined by the two river valleys of Orme and Pesa, between the surroundings of Empoli in the Arno plain and the more mountainous inland territory to the south. One of the main aims of the project is to investigate the economic relationship between the Roman town of Empoli and the rural sites in the valleys of Pesa and Orme. After a short description of the methods used the focus of the paper will be laid on pottery production and distribution. Pottery is an excellent tool for tracking indications of subsistence production and/or manufacturing for exchange. By determining regional forms, identifying the raw materials by archaeometrical analyses and studying wasters the production centres of pottery can be determined. This led, in a second step, to new possibilities for tracing trading routes along the main and secondary itinerary roads in the Arno valley, facilitated by the pottery. In conclusion issues of identity could be addressed asking if people in the Etrurian valleys want to copy an urban life-style or if they attempt to preserve or establish a distinctly rural identity.
7. Anna Maria Mercuri (Università di Modena e Reggio Emilia) - Emanuele Vaccaro (Università di Trento), Peasants, agriculture and the local economies of Roman central Italy (1st BC-5th AD)

This presentation wants to give a contribution to the understanding of agriculture development during Roman times as it was obtained by the study of pollen and plant parts trapped in the archaeological layers of small farmhouses in central Italy. The archaeobotanical perspective of rural Roman economy is introduced. In general, the study of macroremains is known to help ethnobotanical investigations and palynological analyses allow the reconstruction of land-use and transformations at local and regional scale.

A multi-disciplinary archaeological project – the Roman Peasant Project, directed by Kimberly Bowes – has focused on lower-class rural dwellers of southern Tuscany. The small sites were probably only occupied for seasonal agricultural works during the 1st BC-5th century AD. Plant remains – pollen, non-pollen palynomorphs, charcoal particles, and seeds and fruits – reveal site function and environmental conditions of rural dwellers.

Pollen was quite common with variable concentrations depending on the preservation and organic matter in the sediments. They showed a relatively high plant diversity mirroring crop cultivation of cereals and legumes. The floristic composition of pollen spectra well describe the different uses of the sites. In fact, the sites studied represent a whole range of functions – temporary work or stabling point, drain, agro-processing point, permanent habitation – that show great human control over productive landscapes.

8. José Ernesto Moura Knust (Instituto Federal Fluminense), Far from the walls. Explaining rural settlement dispersal within Roman, Mediterranean and Global frameworks

One of the most outstanding findings of field surveys in South Etruria and Lazio was the identification of an expansive pattern of rural settlement dispersion along the Roman conquest of these regions (fifth to third century BCE). Since the sixties, these findings have reshaped our images of the Roman countryside. Although the Roman pacification of the region has been initially pointed as the crucial factor, soon the discovery of coeval similar patterns in other regions of the Mediterranean outside of the Roman conquest area urged other ways of explaining it. The purpose of this paper is to survey and evaluate the ways in which different scholars have tried to explain this dispersion of the rural settlement in a Mediterranean scale. I will analyse and compare the theoretical and methodological bases of these explanations to identify the general outlines of the current state of the debate. Then, I will consider this current state of the debate in a broader framework. I intend to reframe the dispersion of the Mediterranean settlement within a great narrative of a global history of the development of complex agrarian societies, and of the specific way in which the Mediterranean countryside developed one.

Panel 11.2 New Views for Old Cities: Settlement, survey, and legacy data towards a holistic economy of the city and countryside

Organiser: Andrew Cabaniss and Troy Samuels (University of Michigan)

Wednesday | 23 May | 14:30-16:30 | HS XIII

Panel abstract

Narratives of the urban and rural economies often focus on a single scale of analysis, trying to answer questions with either regional or site-specific data rather than a synthesis of the two. The divide in archaeological methods between the techniques of surface survey and those of settlement excavation, exacerbated by the administrative separation between many excavation and survey projects, has contributed to a disjunction between regional and site-specific histories in academic scholarship. The chal-
The challenge of creating complementary narratives of economic development in the city and countryside is intensified by a temporal divide in the collection of the data: urban and rural datasets are rarely produced in unison. The integration of various legacy data, spanning the past century of field work, is often crucial when producing a holistic picture of ancient economic activity on multiple scales.

Constructing narratives about the modes and intensities of production, distribution, and consumption requires controlled methods of multiscalar comparison in order to successfully interpolate coherent conclusions about social and economic processes. The goal of this session is to bring new perspectives to studies of economic activity that place survey and excavation data in dialogue and suggest avenues for the further integration of multiscalar and legacy data into the study of the economic past.

The papers of this session will deploy novel methodologies that integrate multiple scales of data in analyses grounded in a holistic approach to regions and settlements. Rather than perpetuating the disciplinary divide between rural and urban economies through the continued separation of survey and excavation data, this session will propose new avenues for approaching economic questions that allow for the use of all available data: rural or urban, old or new, survey or excavation.

Paper abstracts

1. Maeve McHugh (University of Birmingham), From farm to fork: Micro-regional agricultural economy in Classical Attica

Farmsteads played a fundamental role in the agricultural industry of individual territories. Their presence in the archaeological record from excavations and landscape surveys, or lack thereof, can lend great insight into how agriculture functioned as an economic entity within specific landscapes. The advancements in the quality of data from landscape survey and its application with excavation data dramatically increase our understanding of the role of farmsteads in agricultural industry.

The aim of this paper is to investigate the role of farmsteads within Attica using the whole suite of evidence available, with the goal of illustrating how farmsteads related to other urban and rural centres, but also how they along with roads formed a network to ensure economic success. In order to realise this aim, the paper uses case studies of demes and their territories and investigates their potential for connectivity between rural sites and their interconnectivity with the city of Athens. The purpose of this paper is to demonstrate the infrastructure available to farmers in the form of sites for occupation, storage, and processing of agricultural goods, the available road networks that supported the movement of produce, and the urban and rural markets which provided opportunities for trade and exchange. The ultimate conclusions from this study illustrate how this comprehensive and contextual approach helps draw a fuller picture of the interconnectedness of the agricultural landscape.

2. Matthew Mandich (ISAR), An Interconnected Economy: Urban Expansion and Land Use Succession in Rome and its Environs

Although Rome's so-called 'suburbium' has frequently been viewed as an extension of the City – physically, economically, and demographically - the spatial and economic development of this zone is rarely assessed directly in conjunction with Rome's urban expansion. Since Rome's 'sub-urban' zone essentially began where the City's built-up area, or continentia aedificia, ended any outward physical expansion would have had a wider ripple effect, impacting the entire suburban system by causing the successive displacement of people and socio-economic activities (i.e. land uses) surrounding it. To analyze the impacts of this process on a local and regional scale this paper exploits models and theories from economic geography and urban morphology that allow for traceable changes in suburban and rural land use to be understood as a function of the City's urban growth. By re-examining the available archaeological evidence (both excavation and survey) with the forecasts and predictions of these frameworks in mind, a new model is advanced to chart and analyze land use change on Rome's urban fringe and in its environs that highlights the interconnected economic activity occurring in and around the City. It is hoped that the methodology presented here will also have value for examining other ancient cities and their surroundings, allowing for further comparative study in the future.
3. Laura Surtees (Bryn Mawr College) - Margriet Haagsma (University of Alberta) - Sophia Karapanou (15th Ephorate, Larissa), Connecting the Sherds: Understanding the urban economy of Kastro Kallithea in Thessaly (Greece) through excavation and survey data

Understanding urban economies requires the extrapolation of information from complex cultural and natural datasets. Primary methodologies used to collect this data - surveys and excavations - are often viewed as producing complimentary yet distinct datasets that are not often integrated in a holistic analysis. Rather than viewing these data as incompatible, we, at the Kastro Kallithea Archaeological Project (KKAP), believe that integrating all archaeological evidence in a sound interpretive framework provides a nuanced diachronic perspective of a site's history and explores the interplay between physical and cultural landscapes.

KKAP is a collaborative investigation of the Late Classical/Hellenistic site of Kastro Kallithea in Thessaly. Drawing from early 20th century maps and data, our team began an intensive survey to document the urban environment before expanding the scope of the project to include excavations of public and private buildings. This paper focuses on the intersection of these distinct datasets in order to connect all artifacts and ecofacts and draw together a more comprehensive understanding of the site's sociopolitical and economic history. Coupled with spatial and environmental data from neighbouring projects at Pharsalos, Halos and the Enipeus Valley, we connect localized activity occurring in the city with the region in order to expand the urban-hinterland narrative and situate the city within the greater environmental, economic and geopolitical context.

4. Benedikt Grammer (University of Vienna), Integration of remote sensing, survey and archival data in the exploration of the hinterland of Carnuntum

In recent years many archaeologists have come to laud the promises of integrated approaches to landscape archaeology: a combination of different methods of prospection and excavation allows to mitigate their respective weaknesses and create more robust datasets. A considerable number of case studies proved that integrated data can even offer entirely new perspectives on the archaeological record, e.g. by giving wide spatial context to small trenches of rescue excavations. Above the level of a single site or the area of a small case study, integrating datasets which are often created for vastly different purposes can prove to be quite challenging. In order to create a convincing model of a past landscape, integrating data that is mostly available in various forms of archives is a time-consuming, but worthwhile necessity.

This paper presents the results of an attempt to combine data from remote sensing, survey, geophysics, excavations and archival sources in the hinterland of the Roman town of Carnuntum. Practical issues and complications which arose during the process will be discussed and a possible workflow for dealing with data integration proposed. The quality of the integrated dataset allows to reach reliable estimates of agricultural production in Carnuntum’s territory and assess if the city and related military instalments could be supplied by its immediate hinterland, or if and to what degree it depended on integration in long-distance trade networks.

5. Caterina Ingoglia (Università di Messina) - Simon Stoddart - Nicholas Whithead - Gianna Ayala - Caroline Malone - Letizia Ceccarelli - Matthew Fitzjohn - Charles French - Lorenzo Zurla, Archaeology in Central Sicily: The example of Troina (EN), integrating city and territory

The understanding of the ancient human landscape of Central Sicily is still poorly developed, and yet the area holds enormous potential for the study of an upland Mediterranean region. A project, started in the 1970s by the Superintendency of Agrigento and the University of Messina, had a watching and excavation brief in the territories of Troina, Cerami, etc. that led to important results before it was abandoned. The most significant results were achieved in the area of the city and territory of Troina, although they have never been fully published. At the turn of the millennium, the University of Cambridge undertook systematic archaeological and geological survey in the immediate environs of Troina and particularly of the approaches to the city up the Fiume sotto Troina. This was followed by limited geophysical survey and excavation of mainly prehistoric remains. In an important collaboration, both the University of Messina and University of Cambridge are now joining forces to produce an innovative
synthesis of methodology, through new fieldwork, public display and fresh academic publications. The University of Messina will continue to focus on the city centre, while the University of Cambridge will concentrate on the surrounding human landscape. It is significant that through this initiative, with innovative methods of interaction of various disciplines (geology, architecture, sociology, etc.), it was possible a new hypothesis on the urban-rural economic development of the area in the past and an interesting comparison with modern era. The paper will summarize the state of knowledge of the Troinense between 1000 BC and 600 AD, setting a research agenda for future collaborative work.

Panel 11.3 City-hinterland Relations on the Move? The impact of socio-political change on local economies from the perspective of survey archaeology.

Organiser: Tymon De Haas, Dean Peeters and Luigi Pinchetti
(Research Training Group 1878, Universities of Cologne and Bonn)

Friday | 25 May | 14:30-19:00 | HS XIII

Panel abstract

The impact of societal transformations (e.g., the development of Greek poleis, Roman territorial expansion or the rise of the Church in late Antiquity) on regional settlement patterns and economies has been a central concern in field survey archaeology from the 1970s. However, with the intensification of field methods and the maturing of both typological and technological ceramic studies, the past decades have witnessed an exponential increase in the quantity and quality of settlement and ceramic data acquired through field surveys. For example, ceramic studies increasingly facilitate a better understanding of how local systems of production and exchange were affected, and a stronger attention on the economic role of non-urban, minor centres has lead recent scholarship away from static town-country models. This data now allows a much greater spatial and chronological detail in the study of the impact that large-scale transformations had on local economies. This panel aims to explore how survey archaeology can refine our understanding of the links between socio-political change and local economic landscapes. We invite case studies that re-examine the coherence, interplay and (dis-)continuity between town and country in times of rapid and seemingly far-reaching socio-economic transformation: in which way did the foundation of colonies subvert traditional systems of production and exchange? How did settlement hierarchies change during late antiquity and how did this affect economic interrelations? We welcome contributions dealing with different periods and different areas within the Mediterranean, and are particularly interested in papers that present methodological innovations that enhance more traditional studies on settlement patterning and ceramic distributions.

Paper abstracts

1. Alexandre Baralis (Musée du Louvre) - Vasilica Lungu (Institute of South-Eastern European Studies, Romanian academy of science), The impact of the Greek colonization process on the local socio-economical pattern in the southern Danubian delta

The museum of Louvre and the Institute of South-Eastern European Studies (Academia Romana) pursue a program of multidisciplinary research devoted to the Greek colonization in the southern sectors of the Danubian delta. Surveys had revealed a very complex process structured around a long chain of secondary settlements founded in shifting landscapes, directly impacted by the nearby river. Beyond the structuring role of the both major cities of Istrus and Orgame, settlers were established on the margin of local communities, each with their own social and economic pattern. The studies, carried out, on different spatial scales, from the site until a more regional approach, cross-check data obtained by several methods well adapted to each of them - macrobiological and palaeozoological analyses, ar-
chaeometry, photo-interpretation, geomagnetic surveys...-. Beyond the mutual influences, results outline the selective adoption of other consumption behaviors, according to differentiated economic strategies which explain in turn some particularities in the integration of Greek and Getic settlements into local and supraregional exchange networks.

2. Anton Bonnier (Uppsala University), GIS-based kernel density analysis and the re-evaluation of previously published survey datasets from the Peloponnese, Southern Greece

Since the 1970’s intensive survey has had a profound effect on the understanding of Mediterranean landscapes. The careful recording of both sites in the landscape and scatters of off-site archaeology provides important data relating to the development of settlement systems and land use patterns over time. Traditional approaches have generally utilised dots-on-a-map visualisations of settlement distributions in different periods, providing an overview of site clusters but little information on the potential use of the surrounding landscape. The introduction of new survey practices and GIS in recent decades, with a more careful presentation of artefact scatters, has improved our understanding of spaces in between “sites” or other points of specific landscape focus. In the current paper, we apply new GIS methods to the older, already published, survey data and argue that the traditional point distributions can be used to model land use patterns through kernel density analysis. By employing kernel density analysis of digitised datasets from the Peloponnese, S Greece, we explore how kernel density heat maps can be used to quantitatively evaluate patterns of expansion and contraction, land use intensity and use of varied topographic zones over time. Such evaluations will allow for a more complex picture of land use dynamics to be correlated with broader socio-economic developments in the 1st millennium BC Peloponnese.

3. Vladimir Stissi (University of Amsterdam), A tale of five cities: comparing survey finds from Boeotian poleis from the Early Iron Age till the Roman takeover

Over the last 17 years, I have had the honor of being part of a team of scholars who by now have finished cataloguing several hundreds of thousands of sherds from five cities in Boeotia (Central Greece) and their surroundings, including smaller and larger rural sites. While these finds have mainly been studied to produce publications of individual areas, together they offer a unique regional collection, allowing both diachronic and intraregional comparisons of results from individual sites or groups of sites, and to confront interpretations of the data at local level. First explorations by several members of the specialists’ team, including myself, of some of this information have already offered interesting new insights in spatial and social aspects of formation of larger polis centers, and differences in what one may label as ‘ceramic culture’, related to both production and consumption, in between urban centers, but also between centers and their rural surroundings. In my paper I want to expand on these results, attempting to see whether we can see coherent (sets of) trajectories in first the formation and then the decline of polis type city states, in terms of economic and demographic development, spatial organization and articulation of local identities. While these may seem rather grand concepts when studying very humble ceramic finds, and it is certainly unrealistic to pretend to grasp them in detail through field survey, I do think we can see very relevant glimpses.

4. Dean Peeters (University of Cologne), Micro-regions and socio-economic change in and around Late Antique Askra and Tanagra (Boeotia, Central Greece): Ceramic production and circulation in dialogue

Late Antiquity is a period of dramatic socio-economic change in Greece, and the Mediterranean by extension, in which regional differences in economic development become increasingly apparent. Though also within areas that are traditionally seen as ‘regions’, like Boeotia, socio-economic trajectories of localities are proven to diverge considerably on a micro-regional level. Exploring the evidence that was gathered through the intensive field-surveys of the Boeotia Project since 1978, this paper aims to get a better understanding of the specific development and the spatial embeddedness of economies. Special attention will be given to Askra and Tanagra, and their respective hinterlands, which both housed flourishing ceramic industries and experienced an increase in agricultural activity, yet which developed in
their own way. Although providing only a couple of pieces of a complex puzzle, the creation of a dialogue between the production and circulation of pottery offers invaluable insights for reconstructing economic micro-regions, as traditional chora-areas appear to become more fluid in Late Antiquity. Besides, amphorae, appear to move strikingly different from tablewares through economic systems. While this observation likely signifies the different nature of these commodities and their exchanges, the penetration of imported tablewares and amphorae in agricultural areas further away from supposed market-places seems rather unexpected at first sight.

5. Gijs Tol (The University of Melbourne) - Tymon de Haas (University of Cologne) - Barbara Borgers, The impact of Early Roman expansion in the Pontine Region: Combining landscape archaeological and ceramic approaches

The Pontine Region (Lazio, Central Italy), situated ca. 50 kilometres south of Rome, played a pivotal role in Rome’s earliest expansion over the Italian peninsula. It provided a corridor towards Campania (and subsequently southern Italy), and the ancient sources inform us on the major investments made in the foundation of colonies and road stations, as well as the construction of infrastructural works (roads and canals) in the 4th century BC. Data from field walking surveys from different parts of the region, obtained by the Pontine Region Project, not only showcase long-term developments in settlements and economy; as we illustrate in this paper, our most recent work also has the chronological resolution to highlight the impact of these major transformations in more detail. Using an integrated program of non-invasive archaeological fieldwork (geophysical prospections, field surveys adopting highly intensive pick-up strategies, coring) combined with typological and petrographic pottery analysis, it has been possible to shed light on the wide-ranging effects that Roman colonization brought about in the Pontine Region. The region was subjected to a well-planned operation, comprising major infrastructural and reclamation works. They transformed this formerly marshy area into a densely settled agricultural landscape in which road stations functioned as local service centres both for local populations and passing travellers.

6. Simonetta Menchelli (University of Pisa), Ceramic Sherds and Roman Economies in Picenian Landscapes

Surveys carried out in Southern Picenum provide useful data both to define the general trends in settlement patterns and economic activities in the different regional districts, and to identify the peculiarities of the landscapes which stratified from the Picenian Age up to Late Antiquity. Careful field-work and morphological and technological ceramic studies enable us to understand complex economic and social phenomena such as the acquisition by Piceni of Roman lifestyles much earlier than the military conquest. The impact of “Romanization” appears to have been very strong in Southern Picenum, both with the foundation of the colony of Firmum along the coast and the reorganization of the Picenian centre afterwards called Novana in the inland district, and the centuriation of large sectors of the countryside which became dotted with colonial farmsteads. Concerning the following centuries, surveys document transformations due to the large-scale Roman economic plans: in the coastal strip the market-oriented strategies led to investment in the specialized agricultural production by means of the villa system, while in the inland mountainous districts business focused on the “industrial” livestock farming. These activities, however, were realized with due respect for, and the enhancement of, local resources and potentialities, and that is why even today, in the Picenian landscapes, some of the economic choices made in the Roman Age are still to be found stratified.

7. Luigi Pinchetti (University of Bonn), Studying late antique settlement hierarchies in the framework of catchment productivity: a review of legacy survey data from Southern Central Italy (Molise)

A common issue of survey data is its reliance on the size of the scatters. Traditionally, survey archaeology classifies rural settlements (farmstead, villa, village) depending on the size and the quality of the recovered material, but is this representing the ancient settlement hierarchy? How does this static no-
menclature deal with transformations? What justifies cities topmost position in such hierarchy? During Late Antiquity, socio-economic innovations had a strong impact on rural settlement hierarchies in the Italian peninsula. In survey archaeology, this transformation was visible in the disappearance of smaller farmsteads and the survival of few bigger sites until the 5th-6th century. While various projects confirmed this trend, questions arise on its effects on the economic relations between rural settlements, towns and new central places.

In this paper, I apply a methodology to review settlement hierarchies by placing in direct relation site-size and catchment-productivity. Originally developed in Mesoamerican archaeology, the method offers a way to identify settlement hierarchies and the possibility of comparing the whole sites spectrum (from farm to town) in the same perspective. The application of such method on legacy survey data from Molise will offer a novel perspective on the economic meaning of secondary aggregation in Late Antiquity, on their relation with towns and how late antique transformations anticipated some traits of the early medieval rural economy.

8. Amaury Gilles (Université Paul Valéry UMR 5140), Economie et société dans le territoire de la colonie romaine de Valence (Gallia narbonensis)

Cette communication s'appuie sur les résultats de prospections pédestres et l'étude de la culture matérielle à l'échelle du territoire de la colonie de Valentia entre le IIe s. av. J.-C. et le Vie s. ap. J.-C. On présentera les mutations touchant les structures économiques (agricoles, artisanales) au cours de cette période en détaillant les phases d’abandons et de créations des établissements ruraux, des agglomérations et l’évolution de la culture matérielle (modes de constructions, objets de la vie quotidienne). On examinera dans quelle mesure ces mutations peuvent être liées aux transformations socio-culturelles suscitées par la conquête de ce territoire par Rome à la fin du Ile s. av. J.-C., la fondation ex nihilo de Valentia vers 46 et 36 av. J.-C. puis son développement, enfin par les mutations socio-culturelles de l’Antiquité tardive.

Il s’agira de notamment de montrer la complémentarité entre les prospections pédestres qui livrent des données quantitatives nécessaires pour formuler des hypothèses économiques et les apports des fouilles stratigraphiques qui permettent de tester et/ou préciser les hypothèses formulées à partir des données de prospections. Le mobilier archéologique sera particulièrement sollicité puisqu’il joue un rôle clé dans la périodisation des mutations économiques, mais aussi dans l’identification de flux commerciaux par la diffusion d’objets à plus ou moins grande distance et permet de cerner l’évolution des modes de vie.

Panel 11.4 Geochemistry and Economic History: Approaching ceramic productions in ancient times with portable Ed-XRF

Organiser: Lars Heinze (University of Cologne) and Markus Helfert (University of Frankfurt)

Wednesday | 23 May | 17:00-19:00 | HS XIII

Panel abstract

As archaeometric services become more affordable and prices for instruments are decreasing, a wide range of techniques and methods (i.e. geophysical prospections, 3D-laser scanner, aerial photography) gets more frequently implemented into new archaeological projects. Moreover, with easy-to-use interfaces and Archaeometry becoming a regular field of study at universities, many of these approaches are now applied by archaeologists themselves on a regular basis, with fewer “experts” accompanying, guiding and controlling these projects.

This panel aims to explore how this trend has impacted geochemical analysis of pottery assemblages over the recent years. This field in particular was revolutionized over the last decade by the introduction
of portable X-ray analyzers finally becoming affordable for research institutions and even larger university projects. These devices not only promise full flexibility for chemical measurements ('handheld'), but also instant results without taking and processing samples from the objects under research ('non-destructive'). However, after the initial euphoria, critique arose about how or if at all to use the devices as a new standard for the study of ancient ceramics provenances.

The presentations within this panel therefore will deliver an overview over the various ways projects have successfully implemented portable XRF devices into their pottery studies. Lecturers are encouraged to not only focus on results for the production and distribution of the studied pottery, but also to critically review their methodology and to demonstrate how they have learned to handle and overcome some of the intrinsic downsides of these portable analyzers. Furthermore, lecturers are welcome to attest ways of combining portable XRF measurements with other, more conventional analytical techniques, such as ceramic petrography, stationary geochemistry (WD-XRF, NAA) or others.

**Paper abstracts**

1. **Elena Cuijpers (University of Bonn), The production and distribution of tiles in Classical Chalkidiki: a geochemical analysis of clay samples, excavation and survey material with portable XRF**

   In my presentation I will discuss the results of a geochemical analysis of classical tiles and clay samples from Chalkidiki (Northern Greece) that will be carried out with a portable XRF device in the coming months. The analysis is part of my PhD dissertation at the University of Bonn that will also include ceramic petrography. The majority of the dataset for this analysis consists of tiles recovered via excavations and surface survey (led by the Olynthos Project, 2014-present) in and around the ancient settlement of Olynthos. While much progress has been made in reconstructing domestic life at this settlement, there are many unanswered questions about the ceramic economy of the city. Additionally, tiles from other classical settlements in Chalkidiki are being incorporated to provide a regional perspective on this topic. The first aim is to characterize and distinguish ceramic tile fabrics based on their chemical composition and to compare the results to the macroscopically identified fabric groups. A second goal is to compare the fabric groups to the (fired) clay samples collected in the region to investigate possible provenances of the material. Overall, this analysis could provide insights into clay sourcing, tile production and distribution in Olynthos and the surrounding region. While discussing the results and observations I will critically review the application of a portable XRF device to this ceramic study.

2. **Silvia Amicone and Christoph Berthold (University of Tübingen) - Lars Heinze (University of Cologne) - Claudia Lambrugo (University of Milan), Pottery Consumption in the Chora of Gela: The Case of the ‘Fattorina Officina’ of Manfria**

   This research focuses on a 4th century BC rural complex in Manfria, a site situated 12 km west of the Greek colony of Gela (CL) in Sicily. Excavated in the 1950s but still largely unpublished, the so-called Manfria Farm yielded a rich archaeological assemblage that can shed new light on human population in central 4th-century BC Sicily following a phase of intense social disruption and warfare that resulted from the Carthaginian invasion. After a period of silence regarding the territory of Gela, crucial new research conducted over the last few years has provided new stimuli for the study of the chora of this important Greek colony. Despite this new interest, there is still a lack of a systematic study in the relation to pottery production and circulation within the chora with the application of archaeometric methods. And while the material from the colony of Gela was partially using different analytical methods in order to characterise its composition and technology, the pottery from the chora remained mostly studied only from a typological point of view. This work for the first time combines different analytical methods, including p-XRF, petrographic analysis and X-ray diffraction, to study the vast pottery from the important assemblage of Manfria. The re-
results are expected to not only elucidate on different aspects of pottery technology and circulation in the chora of Gela, but also to constitute a reference study for the territory of this important colony.

3. Anno Hein (N.C.S.R. “Demokritos”) - Agata Dobosz (Jagiellonian University) - Vassilis Kilikoglou (N.C.S.R. “Demokritos”), Portable ED-XRF as tool for defining the sampling strategy – Case study of a Hellenistic amphora assemblage from Paphos (Cyprus)

Provenance studies of archaeological ceramics based on their elemental composition provide important information about the organization of production and the distribution of the ceramic vessels or the commodities that they contained. Basic assumption is that the elemental composition of ceramics from a specific workshop or production area can be distinguished from other ceramic production groups mainly because of the use of geochemically different clays. In some cases, however, the compositional differences between production groups are quite small. Thus, commonly laboratory methods with high performance, in terms of precision and accuracy, are preferred for analyzing archaeological ceramics, such as neutron activation analysis (NAA) or wavelength dispersive X-ray fluorescence (WDXRF). Handheld portable energy dispersive XRF systems (pEDXRF), although increasingly used in the last years, present a less sufficient analytical performance, which might obscure compositional differences. Nevertheless, due to the potential of fast and non-invasive measurements, considerably larger numbers of samples can be analyzed. Taking this in account, pEDXRF can be applied for an initial analytical survey of a large ceramic assemblage as basis for an efficient sample selection for laboratory analysis, avoiding for example redundant measurements. A case study will be presented of pEDXRF of c. 300 fragments of Hellenistic amphorae mainly from the excavation of the Agora in Paphos (Cyprus). The assemblage analyzed comprised imported amphorae from the entire Eastern Mediterranean region. The pEDXRF results were evaluated by grouping on the basis of elements which reflect mainly the type of raw materials used in pottery production. Out of these groups, 97 fragments were selected, from which eventually samples for NAA were taken for provenance study based on trace element compositions.

4. Markus Helfert (Goethe-Universität Frankfurt am Main), Discovering ceramic production and consumption at Olbia Pontike in archaic and classical time – Application of portable ED-XRF and laboratory INAA for Greek Grey Ware

Ancient Olbia is one of the cities founded in the northern Black Sea area during the so-called Great Greek Colonization (8th-6th century BC). In its urban core area, field research has been carried out for several decades. In contrast very few is known about the suburban area, so that a new interdisciplinary German-Ukrainian research project under direction of J. Fornasier and A. Buiskich is carried out to investigate the settlement structure there. Thanks to the support of the Fritz Thyssen Foundation, the project was able to conduct geochemical analysis of ceramics from Olbia and the nearby Berezan settlement in a pilot study in 2015/16. By means of the P-ED-XRF 120 samples of the so-called “Grey Ware” from closed findings were analyzed for their “fingerprints” to find out characteristic groups. In a second step a selection of 40 samples were additionally analyzed by H. Mommsen at the University of Bonn by instrumental neutron activation analysis to compare the recognized groups with references in the Bonn ceramic database. The approach known as the Frankfurt concept, which has been evaluated at the Goethe University and successfully tested and optimized over several years, combines the advantages of portable and laboratory methods to get the possibility to detect and evaluate larger ceramic sample series geochemically. The paper will present the method and results of the pilot and a following project in 2016/17.

5. Lars Heinze and Rabea Reimann (University of Cologne), CeramEgypt: Pottery production and consumption in Hellenistic and Roman Egypt

About 20 years ago, Morgenstein und Redmount (1996, 76) stated that there is “a general paucity (...) of geochemical information for Egyptian ceramics, both spatially and through time”. The authors later took upon themselves to change this situation, partially with stationary machines but also via portable ED-XRF (Morgenstein – Redmount 2005; Emery – Morgenstein 2007). However, theirs and the projects of others who employed portable XRF devices in Egypt were usually limited to certain locations and
never aimed at comparing data on a supra-regional level. The aim of the French-German project 'CeramEgypt' instead is to sample and investigate pottery spanning from Hellenistic to Roman times and to cover the whole of ancient Egypt, while focusing on pottery produced in Egypt itself. For this, multiple portable XRF devices (Niton XL3t) are employed that operate with the same calibration and use the same measurement protocols. The presentation will focus on the methods that are used to collect, calibrate and further process the geochemical information. It will also show the multi-leveled way in which the projects integrates the vast pXRF data with the archaeological information and, as a first pilot project, a limited amount of ceramic thin-sections. Based on this, first results covering multiple sites in Egypt will be presented and discussed.

Panel 11.5 The Economy of Progression and Regression through a Zooarchaeological and Material Culture Perspective

Organiser: Lee Perry-Gal (Israel antiquities authority/The university of Haifa)
Artemios Oikonomou (University of Nottingham)
Friday | 25 May | 09:00-13:30 | HS VII

Panel abstract

The Greco-Roman and Byzantine cultures in the South Eastern Mediterranean have gone through both processes of progression and regression which deeply affected human economy, society and environment. Archaeologically speaking, progression (i.e. prosperity, growth) or regression (i.e. catastrophe, degradation, degeneration) of a site during a specific time period, is identified mainly through various factors/processes which are evident in the archaeological record such as destruction layers, poor or rich material culture, artistic expression, level of commerce, food remains etc. Here we suggest a combination of two characteristic indicators: animal remains and material culture, as some highly effective tools for reconstructing and describing the above powerful processes. The study of these indicators follows an interdisciplinary approach incorporating zooarchaeological methods (to study faunal distribution, managements and exploitation patterns), and various modern and innovative scientific techniques such as isotopic and trace element analysis (to study organic and inorganic materials). In addition to focusing on progression and regression individually, we will also use the above indicators to recognize and reconstruct the longue durée process whereby a single site transit from a state of catastrophe to a state of prosperity (and backwards). The main goal of this panel is to encourage a multidisciplinary, original and fertile discussion between scholars from different fields of knowledge. While focusing on prominent wide-range archaeological case-studies, this symposium will create new insights regarding the processes of progression and regression, a topic that had yet been discussed with such multidisciplinary approach and to such extent.

Paper abstracts

1. Artemios Oikonomou (University of Nottingham), The prosperity of Thesprotia, Greece. Evidence through the interdisciplinary study of glass.

Thesprotia, one of the most remote regions in Greece, was inhabited from as early as the Palaeolithic period. The particular geomorphological terrain, with the mountainous and fragmented landscape, has been determinant in the formation of economic and social institutions throughout antiquity developing Thesprotia gradually developed into an important node of trade. During the second half of 4th c. BC the cities of Elea, Gitana and Dymokastro were founded within a few years from one another. Built at geographically crucial locations that ensured the control of the valleys
or the riverside crossings and sea routes, they evolved gradually into political, economic and administrative centers for the surrounding areas. The Roman conquest in 167 BC brings the decline of the whole region and most of the cities were abandoned after the raid of the Romans.

In the present study an assemblage of glass objects coming from the three major Hellenistic cities of Thesprotia is investigated using innovative and state of the art analytical techniques. The main aim of this study is to improve our knowledge on the technology of the glass and the provenance of the material, thus providing valuable information on the position of the Hellenistic cities of Thesprotia in the commercial networks of this period. Through this knowledge, the socioeconomic interactions of the Thesprotians with the Greek world will be shown, identifying the prosperity of the region during the Hellenistic period.

2. Lee Perry (Israel antiquities authority/The university of Haifa) - Adi Erlich and Guy Bar Oz (University of Haifa), Transformations in the Levantine economy under the Hellenistic umbrella: A zooarchaeological perspective from the site of Maresha (Israel)

Here we focus on the Hellenistic key-site of Maresha (Israel). Through zooarchaeological investigation of the animal remains, we firstly provide a reconstruction of the growing change/prosperity in the economy, transportation and commerce of the southern Levant cultures during this unique period. The faunal composition in Maresha indicates a highly productive self-sustain city, with no significant dependency on the central regime. Here we notice the emerge of a more diverse animal economy, which has yet seen in earlier periods. It involves not only large mammals as cattle and caprovine, but also largely based on chicken - a species that is firstly seen in such high quantities, different fishes and some game meat. Pig remains are very scarce in Maresha. Its sporadic representation emphasizes the dietary transition of some Levantine cultures towards poultry protein, as an efficient substitute for pork. This dietary trend is later increased, and had reached a crescendo during the Roman empire. Far-reaching changes in the local economy are also reflected by the intensification of camel exploitation. As the site is located on a central crossroads, camels in Maresha were extensively exploited for transportation, but also for their meat and dairy. The economic strategy taken by Hellenistic Maresha inhabitants led to a prosperity which is not evidence in earlier periods in the site. This welfare is reflected by all aspects of the material culture.

3. Nuha Agha (University of Haifa), A Tale of Two Cities: faunal remains from Crusader Acre and Mamluk Safed

The Crusader (1099–1291) and Mamluk (1291–1516) periods are of special importance in the history of the Holy Land. The demographic, economic and administrative changes that took place in the transition between these two periods – from a Franco-Christian state that is closely linked with Western Europe, to a lesser province in an Islamic empire – left their footprints on its economy and shaped its character to a great extent even until modern times. Still, the archaeozoological research of the Crusader and Mamluk periods in the Holy Land is in its infancy, and very little is known even of some key sites, including the capital cities Acre and Safed. Acre was the most important harbor of the Crusader state, and served as its capital after the fall of Jerusalem; whereas Safed took its place as a capital of the Galilee in the Mamluk period. This paper presents an analysis of faunal remains from various archaeological contexts from these two cities in order to shed light on the Crusader and Mamluk animal economies. It is argued that the significant differences between the two periods derive from economic, religious and cultural factors.

4. Pam Crabtree (New York University), Growth or Decline: Animal economy in the Dakleh Oasis, Southwest Egypt, during the Late Roman Period

The analysis of animal bone remains from Roman sites can shed light on the Roman economy by providing archaeological evidence for animal husbandry practices, hunting patterns, and diet. This presentation will explore the animal economy of the Dakleh Oasis during the Late Roman period as a way of understanding changes in the late Roman economy of the region. Most of the data will be based on
animal bones recovered from the site of Amheida (Roman Trimithis), including a 3rd-century house that was involved in the trans-Sahara trade (Area 1) and a 4th-century villa (Area 2). Additional data will be provided by animal bones recovered from the rural monastery of Ain al-Gedida (4th-5th century CE). The presentation will examine species ratios, age profiles for the domestic animals, evidence for hunting, and bone measurements to determine whether or not there is evidence for a decline in the Roman animal economy during the late Roman period.


The era of Justinian I. (527-565 AD) can be perceived as a period of restoration when the Roman Empire was resurrected in its splendour, now as a Christian state. Justinian's reconquests, his efforts to secure the Danubian frontier, and his spectacular building programme seem to be tokens of a time of confidence and prosperity. However, Justinian's reign was haunted by catastrophes: the empire was afflicted by disastrous earthquakes, raids of Barbarians, civil unrest, climatic disturbances, and, above all, the horrors of the plague. Mischa Meier argued convincingly that the Byzantines perceived the trials of this era as tokens of imminent doom, that they expected the end of days anytime. When working on a period of such social, ideological, and economic upheaval, can we think in the usual terms of progression and regression? Or are the archaeological finds remains of a time which is better measured by its own standards because it escapes the linearity of history?

We want to approach this question by reviewing economical subsistence modes as evidenced by plant and animal bone finds of the 4th to 7th centuries, with regard to linearity and ruptures. Focusing on the archaeological remains most closely linked to survival, we want to trace economical coping strategies and frame them with the mind-set of the era of Justinian I. In doing so, we want to find out whether our modern axioms of progression can be applied to a period when people seem to have felt that they have no future.


The slaughtering and meat dissection patterns reflect valuable information about economies and cultures. The importance of animals in human societies extends beyond economical aspects and is frequently associated with cultural, ethnic and religious patterns. In this paper we provide preliminary results from the ongoing analysis of Roman cultural-ethnic influences on rival cultures as reflected by animal bone surface modifications. Despite the great geographic and cultural distance between the Gauls in Dangstetten, and Jerusalem in Israel, many similarities have been found in Roman influences on meat consumption pattern among these cultures. A study on animal remains found in Dangstetten, identified significant changes in Gaul slaughter and dissection patterns after the Roman conquest, compared to traditional Gaelic sites. Accordingly, a typical Roman slaughtering patterns were introduced in the Gaul sites, including evidence of expert butchers work, using heavy cutting tools such as axe and cleaver. On the other hand, in Jerusalem, while professional ritual slaughter were common even before the Roman conquest, in the Late Second Temple Period Roman influence on butchering patterns include the usage of Roman dissection tools (ax and cleaver). Hence the appearance of Roman cuisine characteristics in Gauls and Jewish bones assemblages may reflect Roman influence on both cultures.
Panel 11.6 Computational approaches to Classical Archaeology

Wednesday | 23 May | 17:00-19:00 | HS IV

Paper abstracts

1. Evan Levine and Daniel Plekhov (Brown University), Integrating legacy and modern remote sensing data for the study of land-use history on Samothrace

The rugged and varied topography of the island of Samothrace is the setting for a complex history of human-environment interaction and settlement over time. The small size of the island and its long history of archaeological investigation make it a suitable case study for investigating the relationships between land-use and settlement patterns through time. Drawing on historical CORONA and modern multispectral satellite data, we characterize the distribution of land-use areas and topography on the island, which we then integrate with data provided by archaeological investigation. The use of legacy and modern remote sensing data allows for the identification and description of parameters typical to anthropogenic landscape modifications, such as terraces, which can then be queried on a landscape scale. While such features are notoriously difficult to date, their spatial distribution relative to archaeological sites and areas of cultural importance can better inform our understanding of what areas were considered suitable for settlement and exploitation during different periods, taking account of use, reuse, and abandonment. The integration of these data provides a more nuanced understanding of land-use change, economy, and settlement history on Samothrace.

2. Katherine A. Crawford (University of Southampton), A Landscape of Gods? Reassessing the Study of Processional Movement at Ostia

Religious processions were complex multi-sensorial rituals which varied considerably across time and place. Despite their differences, one consistent feature was the way in which they interacted with the surrounding urban environment, bridging and incorporating otherwise disparate spaces. However, the ways in which processions can be studied is complicated by their limited surviving evidence which manifests predominately through monumental architecture, fragmentary literary accounts, and iconographic depictions. While indicative of their importance, these sources of evidence present an incomplete picture about how processions were integrated within a specific cityscape. Focusing on Ostia, Rome's ancient port, this study develops a new framework that questions how the built environment and urban activity helped to structure processions. In particular, the use of digital computing methods allows for the exploration of religious processions as a social and spatial phenomenon that intersected with all aspects of urban life. The ways in which processions were structured by the urban landscape and how they navigated the city's streets are studied by using agent-based modelling as a heuristic tool to visualize possible movement routes. This enables new examination about how religious practices were disseminated across Ostia's cityscape.

3. John Hanson (University of Colorado), Complex systems theory, construction, and the economies of ancient settlements

Although there has been increasing interest in using the volume of construction in ancient settlements as an indication of the economic development of the ancient world, it has been difficult to use to this method to assess the economic life of individual settlements. There is now a collection of theories, known as settlement scaling theory, which has drawn on both recent theoretical work on complex systems and new empirical work on urbanism in a range of contexts. This research suggests that there is a consistent set of relationships between the sizes of the inhabited areas of settlements and various measures of their infrastructure and wealth. In this talk, I will evaluate the extent to which these theories can be used to inform our understanding about the links between the sizes, volumes of construction, and levels of resources of ancient settlements. To do this, I will draw on my own estimates of the sizes of their inhabited areas and new measurements of their urban form, including the sizes of fora
and agora, the dimensions of urban grids, and the capacities of various kinds of structures, concentrating on a number of case-studies from throughout the Roman world in the imperial period. In doing so, I will argue that these theories not only allow us to bring some kind of order to the mass of material we have for ancient settlements, but also help us to sharpen our thinking about relationships between the built environment and the economic life of ancient settlements.

4. Michael Loy (University of Cambridge), Quantifying the unquantifiable: Bayesian analysis of uncertain economic networks

Over recent years, archaeological studies of the economy have adopted new digital tools and models from the social sciences. One such approach has involved using formal Social Network Analysis (SNA) to represent sites and the complex interactions which took place between them. However, SNA as conducted with regard to its roots in sociology is often practised upon a closed and complete dataset; archaeological material can be described as selective and partial at best. This paper will therefore consider the challenges of using quantitative archaeological data within computer models, and propose a new direction based around the concept of ‘uncertainty’ and Bayesian statistics. Specifically, the case study of a probability- and network-based analysis of material data from the Aegean basin 700-500 BC will be used. By these means, three levels of uncertainty in the archaeological record will be discussed: the uncertainty associated with a context's date, the question of how representative a dataset is, and the size of datasets from different sites relative to one another. Furthermore, this paper will propose as another solution the potential of Open Data in quantitative studies of the ancient world. By collaborating on shared databases - particularly across large geographic areas which encompass many sites - quantitative archaeological research into much larger and complex economic systems is made more possible, and provides new opportunities in methodology and practice.

5. Antoni Martín i Oliveras and Víctor Revilla Calvo (Universitat de Barcelona) - Iza Romanowska (BSC-Barcelona Supercomputing Center) - Jean-Marc Montanier (TAO - Univ. Paris-Sud, INRIA, CNRS-LRI, Bat.) - Simon Carrignon (BSC-Barcelona Supercomputing Center) - Xavier Rubio-Campillo (University of Edinburgh) - José Remesal Rodríguez (Universitat de Barcelona), Reconstructing laetanian roman wine economy using agent-based modelling (1st century BC-3rd century AD)

Viticulture has played an important role in the economy of the Mediterranean coast of Hispania Citerior Tarraconensis between the 1st century BC and the 3rd century AD. The vineyards, wineries and pottery workshops are usually found clustering in specific areas, such as the Laetanian region located in the northeast coast of the Iberian Peninsula. Their spatial and temporal distribution has been previously interpreted as a proof of the existence of intensive and specialized winemaking economy, associated with large-scale production & trading of wine in bulk quantities targeting predominantly to overseas markets such us Gallia, Germania & Rome itself. This fact is further supported by the wide geographical distribution of specific Tarraconensis amphorae forms, which appear in the record of archaeological sites throughout the western part of the Empire. Here we present a explanatory data analysis coupled with an agent-based model simulating economic processes involved in the production, consumption and trade of the Laetanian wine. The model evaluates the strategies that this economic system could adopt in response to the competition from other provinces and the evolution of the wine consumption in the Roman society. We then compare the outcomes of such strategies with two sources of data: the changing dynamics of winemaking ab origine, i.e., in the Laetanian region and the changes in the frequencies of Tarraconensis amphoras ad destinum, that is, in the port of Ostia (Italy).
Panel 12.1 Classical Archaeology in a Digital World (The AIAC presidential panel)

Organiser: Kristian Göransson (Swedish Institute of Classical Studies, Rome)
Saturday | 26 May | 09:00-13:30 | HS XII

Panel abstract
Classical Archaeology is a discipline which has undergone major changes in recent decades. From its origin as an "Altertumswissenschaft" with a strong emphasis on art and architecture, Classical Archaeology has embraced the most modern methods in field archaeology and analysis of data. The application of digital humanities to Classical Archaeology has changed how archaeologists work, how data is collected and preserved and how results are made available to colleagues and the public in general. AIAC itself has been a forerunner in digital humanities with the creation and running of Fasti Online and the online peer-reviewed journal FOLD&R. The digital development of the discipline varies from country to country and the purpose of this panel is to present the current situation through examples from different countries. The case studies will provide a basis for a discussion on Classical Archaeology in a digital world - benefits, challenges and where the fast development may take our discipline in the future.

Paper abstracts
1. Ortwin Dally and Reinhard Förtsch (German Archaeological Institute), Introduction: Classical Archaeology in a Digital World
Classical archeology is a discipline in transition. Over the past twenty years, the relationship between the history of art and the field archeology has changed. A crucial part of this is the already very advanced conversion from former analogue to digital research data, storage systems (e.g. libraries, archives) and research practices. Depending on projects and questions, either 'primary data' is generated (e.g. field projects, investigation of texts and objects) or 'secondary data' (e.g. interpretations), which are then published. The specific fields of application of computers in archaeology are manifold: databases are used to structure and manage information about sites and objects including concepts for their long term preservation, geographic information systems help in the analysis of spatial data etc. Depending on the point of view, these methods increasingly replace the established practices so far. To a growing extent, such systems are integrated into cross-linked structures (object databases, Gazzetteers, etc.). The added value is mainly in the grouping of meaningful and logical units, which are extracted and linked by automated procedures. These data in turn, are increasingly involved in the consideration of larger contexts: challenging concepts (e.g. space, memory and memory). Thus, Interfaces to data from other disciplines and knowledge stocks are growing rapidly. These tendencies are discussed with a special focus on classical archeology.

2. Paolo Liverani (University of Florence), 3D reconstructions: a critical reflection starting from the Roman Forum
3D reconstructions in archeology are now relatively common, but their use is still evolving and there are not yet shared standards. On the one hand, the evolution is technological: new solutions make it easier and more user-friendly to use these tools, even online. On the other hand, we are understanding better both the potential and the methodological issues of this approach. The paper discusses this second point considering a case study whose importance is equal only to its complexity: the reconstruction of the Roman Forum. This architectural complex highlights in a very clear way the advantages and risks of
3D reconstructions, considering not only the archaeological and technical issues but also the impact on the scientific community and the wider audience for educational and cultural purposes. The discussion considers the various virtual reconstructions of the Roman Forum up to now, taking into account, as well, some more traditional proposals.

3. Bernard Frischer (Indiana University) and Gabriele Guidi (Politecnico di Milano), Uffizi-Indiana University 3D Digitization Project

In this talk we will present the results of the first two years of the five-year project to digitize in 3D all the ancient sculpture in the collection of the Uffizi Gallery, Florence. Topics to be covered include: the overall goals of the project; techniques of data capture in the gallery (including an innovative way to gather data from statues positioned close to walls); data processing; interactive, online publication with pertinent metadata and paradata.

4. Simon Keay (University of Southampton) and Graeme Earl (Kings College London), Digital Approaches to the Archaeology of the Portus Romae

The Portus Project is a collaborative research initiative involving the University of Southampton, the British School at Rome and the Parco Archeologico di Ostia Antica. Since 2007, it has been employing an integrated archaeological methodology to investigate the development of the Portus Romae and its relationship to Ostia, Rome and the broader Mediterranean. Both the large scale and richness of the archaeological site meant that a flexible digital strategy was needed for this research from the start. As such, the recording of the topographical and geophysical surveys, standing buildings, the excavations and the recording of the finds at the site can be said to have been "born digital", but at the same time to have also incorporated more traditional approaches. This paper explores some of the components of the strategy employed by the project, focusing upon digital mapping and enhancement of the existing records, digital recording of standing structures, the computerised excavation record, computer-graphics simulations of buildings at different periods, outreach strategies through the PortusTour and education strategies including the Portus MooC. It also explores issues related to data storage, both at Southampton and the Archaeology Data Service at York.

5. Alfred Schäfer and Gregor Wagner (Römisch-Germanisches Museum, Cologne), The past on its way to a digital future - urban archaeology in Cologne

As a city with a history of more than 2,000 years, Cologne has its own urban archaeology, which performs the tasks of archaeological excavations and monument protection in the approximately 400 square kilometer urban area. In the course of current profound changes in a phase of accelerated urban growth, urban archaeological monument conservation is facing particular challenges. In order to plan effective measures for a responsible and sustainable management of the existing archaeological heritage, it is necessary to draw a detailed picture of the underground monumental heritage, which is to be expected locally, in the run-up to construction measures by analysing the available archaeological and historical sources of a concrete plan area and its surroundings. The ability to digitally access and link the existing data sets makes it possible to realise this task efficiently. By means of a GIS-based evaluation on the basis of the available spatial data, the archaeological potential of the planned area can generally be determined reliably particularly in the inner city area, with a large number of well-documented archaeological discoveries, thus achieving a high degree of effectiveness of the urban archaeological monumental conservation.

Using the example of the so-called Roman harbor gate, which was excavated in 2007/2008 during the construction of the North-South urban rail line in Cologne, individual steps of the archaeological documentation are to be presented, ranging from the accurate assessment of archaeological features, 3D laser scanning to digital reconstruction.

6. Elizabeth Fentress (Rome), Melting into Air: Online Publication of Excavations

Publishing excavations online has been possible for over two decades, although the results have been mixed, with the standard solution the simple presentation of a pdf. However, several more recent publications have exploited the opportunities provided by the web to publish in greater depth, allowing
the reader to navigate through multiple layers of text and data. Some of these approaches are compared here, with an attempt to weigh their advantages and drawbacks, including issues of sustainability and the market.

7. Tom Elliott (New York University), The Pleiadic gaze: Looking at digital archaeology from the perspective of a digital gazetteer

The Pleiades gazetteer of ancient places (https://pleiades.stoa.org) is a descendant of the Classical Atlas Project, which in the year 2000 produced the Barrington Atlas of the Greek and Roman World. In the decade since receiving our first grant of funding in 2006, we have sought to digitize, disseminate, improve, and extend the data we inherited. We have served a variety of scholarly and pedagogical needs: from the production of custom maps for presentation and publication to the unambiguous identification of places, toponyms, and locations in databases, catalog records, and linked data applications.

In January 2017, the Archaeological Institute of America gave Pleiades its Award for Outstanding Work in Digital Archaeology, yet one can still enumerate ways in which the Pleiades approach to ancient geography is orthogonal to archaeological practice and needs. In this presentation -- as the Pleiades Principal Investigator and Co-Managing Editor and as an ancient historian and computer scientist -- I will unpack some of the keys ways in which I think Pleiades is and is not "archaeological." I will explore how the gazetteer depends upon and facilitates archaeological concerns, as well as what is changing as a result of dialog with the archaeological community. I will address the relationship of Pleiades to other projects (like Fasti and OpenContext) and address our emerging "archaeology first" approach to the identification and presentation of attested ancient sites.


Epigraphy embraced the digital world relatively early, and several large scale epigraphic text databases have been in general use for some time. However, the use of TEI-XML (EpiDoc), developing image technologies, and the possibilities of Linked Open Data have opened up much more powerful and flexible ways of treating text and object together. This paper presents the I.Sicily project, an EpiDoc corpus of the inscriptions of ancient Sicily, which is attempting to pioneer the in-depth application of EpiDoc and other technologies to a medium sized regional corpus (c.4,000 inscriptions, across half-a-dozen languages, covering 1,500 years).

The Sicilian corpus presents familiar challenges (such as variety of publication, difficulties of access, and widely scattered material that requires multiple disciplines and specialities for study), which make a single unified corpus simultaneously desirable and previously unobtainable. Digital techniques, and digital media not only make the material accessible, but facilitate collaborative study and publication, while also allowing material to be studied within a single framework, for example across language and space, in ways that were previously almost impossible. I.Sicily is working with museums, scholars, schools and technical development projects in order to explore ways both to enrich the content (through a wide range of contributors) and the use of the corpus, enabling engagement with the material for the widest possible audience.

9. Thomas Fröhlich and Sabine Thänert (Deutsches Archäologisches Institut), Bibliotheken, Archive und digitale Forschungsumgebungen in Dienste der Archäologie


Panel 12.2 Communicating Archaeology in the Digital Era

Thursday | 24 May | 09:00-11:00 | HS XV

Paper abstracts

1. Kristin Oswald (Kulturmanagement Network), Communicating antiquity. German archaeology and the state-of-the-art of science communication

Because ancient historian May Beard pointed out that Roman Britain had a pluralistic society – a fact that hardly astonishes professionals in the field – she recently had to experience digital attacks by the British alt-right movement. This incident shows that "Archaeology in a Digital World" also has to consider the implications of social changes through digitization for the discipline and its researchers. Thereby, science communication is a central aspect. But to use digital platforms successfully, researchers need to ask themselves how their findings are perceived and in what contexts their specialist knowledge might be useful. Thereby, German archaeologists seem to be especially cautious regarding dialogues with non-scientific communities. This becomes clear by the fact that although wrong or out-dated archaeological knowledge is regularly abused in the current migration debate in Germany, hardly any researcher takes the floor to add rational arguments to these emotional and opinion-led discussions. At the same time, studies show a high interest among German people in archaeological topics, methods and work routines as well as in archaeological remarks on current issues. The talk will ask how this discrepancy can be solved, and therefore wants to show insights from psychology and communication science on opinion and identity formation that can help archaeologists in developing an understanding for their interlocutors and disseminate their research.


The Swedish Pompeii Projects research platform (www.pompejiprojektet.se) was created as an extensive on-line publication of the material generated by the project since 2000. In its present form the platform (initiated in 2008) is adapted to suite the documentation and results from the Swedish Pompeii Project, though it is designed as ‘all-purposed’ for publishing archaeological material on-line. The platform guarantees unlimited space for text (in striking detail), drawings, footage, tables, and 3D scanning and other media in digital form. It is important to emphasize that the platform is a working tool and a resource to publish material in an interactive environment, not only an alternative to the expensive monographic publication. It is an interactive structure, with possibilities to navigate by plan, 3D model or linked text: the user constructs, or deconstructs, the information according to purpose, creating new links and networks by the tool provided – the potentials with this technique in combination with the tremendous amount of information excavations generate are dynamic and unexplored.

However, the wide range of pros and cons with the technique triggers challenges and have to be discussed and evaluated: among others, the low cost and fast deliverance, the amount of material possible to publish, the wide audience reachable – to problems with data storage, switching to new publication model, the copyright issues and the lack of high impact factor for digital media.

Pafsanias Traveler is an innovative acoustic application for exploring Greece. A pioneering technological project of culture, aiming at the promotion of the Greek cultural heritage all over the world, facilitating every friend of Greek culture and visitor. With the Pafsanias Traveler platform, a thematic, multilingual, and interactive navigation is enhanced through GPS, web and mobile applications for all owners of mobile devices. A journey through space and time, which frees the mind and feeds the imagination of the users, who enjoy this new experience of senses. Acoustic tour through all archaeological sites, monuments and ancient theaters, becomes now, with Pafsanias Traveler, innovative and different. A smart idea that reveals the cultural heritage of Greece to every traveler. The first acoustic walking tours include the major archaeological sites of Greece. Pafsanias Traveler asks every friend of the web and every lover of Greek history to travel with him through the spacetime. A contemporary Pausanias of our time, a new experience of the senses.

4. Carlo Baione, Virtual Poggio del Molino: communicating the archaeological excavation to the public.

The destruction of the archaeological stratification that the excavation necessarily implies, imposes a correct acquisition and a systematic management of the data. Whether the datum is topographic, alphanumeric, stratigraphic units sheets or pictures, it serves as a base to recompose the stories contained in the archaeological record. The desirable valorization of the archaeological site goes inevitably through this awareness and especially through a correct communication of the data. The three-dimensional graphic documentation produced at the site of Poggio del Molino (Populonia, LI) is a critical tool for a more complete and accurate view of the different phases of life of the multilayered archaeological site. But most importantly it has become a crucial element for the communication of the excavation to the public and its valorization projects. Archaeology utilizes everyday more any technology to acquire and manage data, but also to inform the public on the progress and the results of the scientific research. It is on these premises that the excavation of the roman villa of Poggio del Molino has started to communicate its discoveries via Sketchfab, virtually recomposing the story of its many phases of occupation or also showing the digital copy of several of its many artifacts. This open virtual communication of the excavation allows scholars and visitors to have a better perception of the information that the site contains.

Panel 12.3 Beyond Academia: Classical sites and local communities

Organiser: Javier Martínez Jiménez (University of Cambridge)
Manuel Moreno Alcaide (University of Granada)
Thursday | 24 May | 09:00-11:00 | HS XVI

Panel abstract

This panel aims to discuss the impact of classical archaeology beyond the academic community on local communities who live near or around classical sites and the general public who visits these sites and museums. We will be very interested in hearing from museums, local authorities, and archaeologists involved with the general public. In this sense, we would like to address three main issues: First, does the general public value or appreciate classical sites more than other types of sites? Do towns and cities with monuments from various periods promote differently Roman remains and, e.g., Gothic cathedrals? Second, how do local communities interact with their classical sites? Do they generate a sense of identity or belonging, or are they seen just as a resource (or as obstacles in construction
developments)? Third, should the research and excavation of classical sites by the academic community come second when it comes to their touristic exploitation (e.g., musealisation)?

**Paper abstracts**

1. Tamara Peñalver (Universitat de València), "Saguntum": the current pride of a classical past

Public Archeology stands for the need of cultural dissemination as an instrument to guarantee the support and conservation of its heritage by society. "Saguntum" is one of the best Hispanic Roman settlements that allows us to study the current social perceptions of the past. As an allied city of Rome, "Saguntum" was besieged by Hannibal becoming the "casus belli" of the 2nd Punic War, recovered by the Scipiones, it achieved the municipality rank with Augusto.

One of the motivations that generated this strong collective imagination is its visible archaeological heritage: the Theater, the "Circus", the "Forum", the "Via del Portico", the "Domus dels Peixos", the epigraphic collection...

Proof of the saguntine's pride for their classic Roman past is reflected in the names of its streets, related to the legacy of the Roman past; in recent architecture, with classic constructive details or in the names of shops. Several events, such as the summer festival “Sagunto a Escena” and the “Off-Romà” where various plays, music and dances take place, use classical spaces such as the theater. Also, noteworthy is the didactic projects for children, such as the “Domus Baebia Saguntina” a Classical Culture Hall, the “Ludere et Discere Association” or the “Ludi Saguntini” which are workshops held each spring.

My aim with this paper is to analyze how this classic past is responsible for the process of identity construction of the current saguntines, showed through all these examples.

2. Ana Ruiz-Osuna (Universidad de Córdoba), Arqueología Somos Todos. Socialize heritage in the historic city

The Sisyphus Research Group has been contributing for decades to the interpretation, protection, conservation and appreciation of Cordova's archaeological heritage; a city of renowned prestige that, however, has not found the formula to coexist with its main asset: the past.

Since 2011, our scientific culture project Arqueología Somos Todos has laid the foundations to make citizens understand the potential of our heritage, its value as a sign of identity and its possibilities as a resource for the future. Our aim is to consolidate an archaeological dissemination model capable of actively transferring historical knowledge, combining culture, technology, education, land management and civic engagement in an unprecedented cocktail.

To date we have developed more than 10 projects, which have generated a large number of tools on archaeological dissemination available at www.arqueocordoba.com and an annual programme with a large number of activities (visits, trips, workshops, conferences, exhibitions, etc.), which have made us a national and international reference (Europe Nostra Award). In the coming months we plan to develop a map of the city's heritage needs, as well as a survey to define the profile of archaeological tourists, which will allow us to design sustainable and quality products, at a time when mass tourism, and its consequences, are being put on trial.

3. Olivera Ilic (Institute of Archaeology SASA), Archaeological Park Viminacium as a unique tourist destination

Today cultural and archaeological tourism is gaining more importance especially in countries with numerous preserved archaeological monuments among which is Serbia. The first results show that the Archaeological Park Viminacium has developed into a tourist destination of great importance in recent years, especially since it lies along the cultural-historical road which became part of a tourist project Itinerarium Romanum Serbieae.

As confirmation of these assertions, we can mention the results of a poll among foreign visitors who come to Viminacium on the cruise ships on the Danube. The visitors positively evaluated park, but also noted all the problems in the surrounding area (Kostalac power-plant). All of them submitted encouraging and constructive comments. In modern tourism it is very important that a place has its own dis-
tinctive spirit that helps to create the experience of the visitors. With the revitalisation of the Viminacium amphitheatre, started in 2013, one can still feel the spirit of ancient times in an ancient setting, whilst fulfilling modern needs, with the aim to make a building live again, just as it did during the Edict of Milan celebration. We could say that the whole presentation of the park was rated as a complete, educational experience and a perfect way to preserve history.

4. Javier Atienza Fuente (Universitat Rovira i Virgili) - Santiago David Domínguez Solera and Michel Muñoz García (ARES, Arqueología y Patrimonio Cultural), Las termas romanas de Valeria (Cuenca): Balance de las campanas arqueológicas de 2014 a 2017

De la ciudad hispanorromana de Valeria apenas se había excavado el área monumental del foro. Desde el 2013 se intervino en lo que fue el extremo oriental de la ciudad y en 2014 se comenzaron a exhumar los restos del primer edificio termal conocido de la ciudad. Los restos se han datado genéricamente a lo largo de la época imperial y, durante cuatro campañas se ha recogido información sobre su morfología y distribución, sus técnicas constructivas, su decoración, su disposición en el interior del espacio urbano y, finalmente, su proceso de abandono y ruina.

Destacan la diversidad tipológica de sus mármoles decorativos, la abundancia de restos de mosaico y de estucos polícromos, así como el empleo de conchas de Cardium edule para la decoración de algunos de los ambientes.

También se han documentado ciertas soluciones hasta ahora sin paralelos conocidos de uso en otras termas públicas o baños privados de esta parte de la Meseta, de la Península y del Imperio.

Se han realizado estudios específicos sobre materiales constructivos y zooarqueológicos.

Además de información sobre un tipo de edificio crucial para entender el ámbito sociocultural de una ciudad romana, se han alcanzado los objetivos sociales, didácticos y divulgativos propuestos dentro de un plan de trabajo a largo plazo y que ha de terminar con la musealización y puesta en valor de esta zona del yacimiento, para acelerar su dinamización como recurso económico principal, de carácter cultural y turístico, para el municipio.

Panel 12.4 Targeting Economic and Cultural Hotspots: An alternative view on early Roman expansionism

Organiser: Tesse D. Stek (Leiden University)

Thursday | 24 May | 09:00-16:30 | HS XIV

Panel abstract

Roman colonization and expansionism in the Republican period, and its impact on the ancient Mediterranean and beyond, are intensely debated in current ancient historical and archaeological research. Traditional, diffusionist views from the late 19th and especially the 20th century have recently been heavily criticized, and many socio-economic and cultural developments in ancient Italy (e.g. agricultural developments, 'romanization') have been disconnected from Roman conquest and expansionism. Although this development has been extremely important and salutary, this session departs from the idea that we should be careful not to throw away the baby with the bathwater. Very recent and ongoing research can be seen as pointing at real Roman impact in various spheres - if in different ways and places than traditionally assumed. Building on a preliminary paper, in this session, we investigate whether, and if so to what extent, we can invert the causal logic between a series of new socio-economic and cultural developments in the ancient Mediterranean and Roman colonization. In particular, we will explore the notion that Roman expansionism actively targeted hotspots in both economic and cultural networks of special interest in the conquered areas. Seeing local cultural resources at equal footing with more standard local economic resources, and exploring the ways the Roman conquest further
enabled and energized these hotspots, stimulates us to rethink the primary workings of Roman expansionism.

**Paper abstracts**

1. Tesse D. Stek (Leiden University), Targeting hotspots, energizing networks: an alternative view on the rationales behind early Roman expansionism

Roman imperialism studies are going through turbulent times. Conventional, diffusionist views from the late 19th and 20th century of Roman expansion have been heavily criticized over more than a decade. Quite some socio-economic and cultural developments in the ancient Mediterranean (e.g. agricultural developments, ‘romanization’) have been disconnected from Roman expansionism and the agency of other communities than Rome has been highlighted. Also our team of the Landscapes of Early Roman colonization project (NWO, Leiden University, Royal Netherlands Institute at Rome) has contributed to this revision. At the same time, however, we should be careful not to throw away the baby with the bathwater, and mistake local variability for lack of strategy. As an introductory hypothesis for this session, this paper argues that we should be more attentive to active Roman rationales and strategies (again), but particularly to those that differ from standard expectations and are usually not associated with Roman behavior. To do so, first the creation of those very standard expectations in the long historiography of Roman imperialism is reviewed. Second, it is suggested that, in fact, real Roman impact in various spheres may be detected in the form of the conscious energizing of existing regional and local networks and opportunities. On this view, local diversity in colonial situations does not indicate a lack of strategy or implementation, but instead was central to Roman imperial strategies.

2. Gabriele Cifani (Università degli studi di Roma "Tor Vergata"), Expansion and economy in Archaic Rome

The aim of this paper is to discuss the archaeological data of the long term strategies of territorial control carried out by Rome in the 6th-5th century BC and the economic patterns behind the rapid expansion of the city in Latium and southern Etruria. Within such a framework, two historical theses will be tested.
1) The economic basis of the great urban transformation of Rome in the 6th century BC should be seen as the result of a new centralized exploitation of the resources of the territory, which was previously controlled by local aristocracies under the hegemony of the city.
2) The limited character of the early Roman colonization in the 5th century BC can be seen as the effect of the political aim to avoid huge land distributions, in order to preserve the political and economic privileges of the elites.

3. Jeremia Pelgrom (Royal Netherlands Institute in Rome, KNIR), The rural organization of early Roman colonies

Conventionally, Roman colonization is thought to have led to a very dramatic and geometric reorganization of the landscape which fundamentally changed existing land tenure systems. This change is often implicitly understood as a progressive development, at least in economic and social terms, although the dramatic impact on the indigenous communities is likewise emphasized. In a previous set of papers I have argued that this paradigm needs to be scrutinized, especially in light of new settlement data. In fact, the available literary and archaeological evidence suggest that early Roman colonial strategies were structured according to a very different logic in which communal property regimes and village communities play fundamental roles. As part of the ongoing research by the Landscapes of Early Roman colonization project (NWO, Leiden University, Royal Netherlands Institute at Rome), in this paper I will look more in detail at the practicalities of such alternative rural systems, in terms of labor organization and specialization, mobility and distribution networks. Through a comparative analysis the potential working and effectivity of such rural systems in colonial contexts are explored.
4. Anita Casarotto (Leiden University), A GIS approach to investigate settlement location preferences during the Roman expansion

This paper explores the impact of Roman expansion through the analysis of patterns in location preferences exhibited by site-based survey datasets, studied and complemented in the Landscapes of Early Roman colonization project (NWO). Specifically, a GIS location preference analysis is carried out to investigate settlement developments in the rural landscape of the ancient town of Venusia (southern Italy) in the 4th-1st century BC. The settlement strategy inferred from these data seems to indicate that cultural factors (e.g. pre-existing settlement organization, distance from town) played a key role in directing the choice of where to establish settlements in the colonial period. Site hotspots targeting specific zones exist, suggesting that a precise rationale determined colonial-period settlement strategy.

5. Marleen Termeer (Leiden University), The introduction of coinage in and around Rome

Coinage was introduced in the Roman world in a period of rapid Roman expansion on the Italian peninsula, in the late fourth and early third centuries BC. While the abstract of this session rightly notes that “many socio-economic and cultural developments in Italy (...) have been disconnected from Roman conquest and expansionism”, the timing of the adoption of coinage by Rome and many other communities on the Italian peninsula warrants a relation to Roman expansionist activities. At the same time, however, diffusionist explanations for this development are clearly insufficient, as there was no Roman model available. The adoption of coinage in the Roman world was the result of Rome's interaction with others, outside the city itself. Not only was most of Rome's earliest coinage produced and used outside the city; also many other communities on the Italian peninsula produced their own coinages, often as a result of interaction with Rome.

By focusing, in the context of the Landscapes of Early Roman colonization project (NWO), on “hotspots” of coinage production in Italy in the period of early Roman expansion, this paper investigates how the pattern of coinage production in third century BC Italy is shaped both by previous coin-producing activities in Greek and Italic communities and by Roman interference. The interrelations between these forces help to reconsider the mechanisms of Roman expansionism in this period, with a specific focus on the role and significance of coinage.

6. Valentina Livi (American University of Rome), Sanctuaries and terracotta decoration at Minturnae. Romanization in the Auruncan territory

The territory of Minturnae is located on the southern boundary of the Latium, an area which preserves evidences both related to the native Auruncan population and to the Romans, who conquered the area at the end of the 4th century BC. The archaeological context previous to the Roman expansion has been recently enriched with new studies that have contributed to the assessment of the impact of the Roman conquest. The most significant evidences are represented by cult remains (temple structures, architectural terracottas, votives, inscriptions) that provide some information about the changes occurred during new occupation. The present paper aims to draw some considerations on the Auruncan and Romans cult sites through the study of architectural terracottas, focusing in particular on the area of Minturnae.

According to the sources, the conquest of the Auruncan territory by the Romans, completed in 314 BC, implied the destruction of the population and the three main settlements (Ausona, Minturnae and Vescia), followed by the reorganization of the territory, the foundation of new colonies (Sessa Aurunca, 313 BC, Minturnae and Sinuessa, 296 BC) and new repopulation. This historical situation is reflected in archaeological documentation, particularly in the new distribution of cult sites and the typology of the materials. Roman cult sites are either documented in pre-existing areas, whose use is attested either by votive deposits and the restoration of the Auruncan temple decoration (e.g. Sanctuary Temple of the Goddess Marica); or constructed ex novo, with new temple structures and the presence of votive offerings (e.g. the urban sanctuaries). This new phase, clearly linked to Roman colonization, is very strongly characterized in terms of cultural and artistic production. These elements, with their developments until the first half of the 1st century BC, testify one of the aspects of the Roman conquest, and how it is been reflected in the religious sphere of this area.
7. Roman Roth (University of Capetown), Rome’s Hegemony and the Transformation of Economic Regionalism: Two Ceramic Case Studies

This paper explores the impact of Rome’s imperial expansion on the economic networks of Italy and the central Mediterranean. In response to recent tendencies either to minimise the changes that follow in the wake of the Roman conquest, or to relativise them with reference to concepts like connectivity, the outlook of this paper is deliberately historical. The author approaches the issue through stylistic and distributional analyses of two principal types of pottery: black-gloss wares and Graeco-Italic amphorae. The paper demonstrates that, despite the existence of pre-Roman archetypes, both transport containers and fine pottery show very distinctive patterns of style and distribution, which cannot be explained with reference to traditionalism or even resistance. Rather, the author argues that they be viewed as material culture typical of Rome’s emergent Mediterranean empire, and produced in the context of economic networks that were decidedly shaped by specific mechanisms of hegemonic control.

8. Tymon de Haas (University of Cologne), Modifying urban networks, settling the margins: the short-term aims and long-term consequences of mid-Republican expansion in the Pontine region

This paper uses perspectives from network studies and historical ecology to assess the impact of mid-Republican expansion on urban networks and specific ecological niches in the Pontine region. Roman expansion in this area on the margins of Rome’s direct hinterland entailed major investments and demographic movements, and brought about fundamental changes in infrastructural networks and urban connectivity (as such, this paper seeks to counter-balance recent scholarship that has questioned the impact of early Roman expansion on landscapes and settlement systems). At the same time, the impact of these efforts was variable and not always sustained: thus, the construction of the Via Appia initially increased the integration of many colonies, but in the longer run effectively marginalised them. Also, its construction was accompanied by reclamations and virtanite settlement of previously marginal marshlands, which in this specific chronological context therefore served as hotspots of agricultural and demographic expansion at relatively short distances from Rome. Despite the scale of these investments, the longer-term effects were ambiguous: although the Roman reclamations still today form the basis for the drainage structure of the area, settlement in the area soon (within a few generations) declined, suggesting that this specific niche no longer served its purpose within Roman expansion.

9. Jesús García Sánchez and Rogier Kalkers (Leiden University), Intra-site survey as proxy to explore countryside colonization and exploitation. Models and patterns from the hinterland of Aesernia

The aim of this paper is to reflect on the impact of the foundation of the Latin colony of Aesernia (263 BC) on the pre-existing Samnite rural landscape, characterized by the presence of large fortified hilltops and a socio-economic rationale that is traditionally expected to be very different from the Roman model. Between 2011 and 2017, the Landscapes of Early Roman Colonization project (NWO, Leiden University, Royal Netherlands Institute in Rome) gathered a large set of archaeological data from the area, using a variety of field-survey methods. In this paper, we will focus on the results of the intra-site survey, which comprises sites of different chronology and typology, and in various landscape units (hilltops, mountain slopes, ridges and valley floors). Moreover, we will integrate these data with the results of other non-destructive tools, such as remote sensing and geophysics. We will select several study cases (i.e., Colle Palumbo, Colle Cioffi, Castagna, La Romana and Lo Monaco) to address different models of settlement, and countryside colonization and exploitation, in the light of the ongoing debate on early Roman colonization.

10. Miko Flohr (Leiden University), Bridging the discourse gap: fora, tabernae and Rome’s emerging economic network

There has been surprisingly little interaction between discourse on Roman economic history on the one hand, and discourse on Rome’s political expansion in the last centuries before our era. While Roman economic historians acknowledge the impact of political developments on the emerging Roman eco-
nomics, and while scholars of Roman expansionism fully acknowledge the economic aspects of conquest and colonization, the relation between expansion and economic history has only rarely been problematized.

This paper starts from the idea that the period of expansion not only shaped Rome's economic network, but also played a crucial formative role: many structural aspects of the Roman economy, and several key institutions, emerged in this period in response to challenges or opportunities related to the rapid increase in scale of the Roman economy. The paper will focus on what perhaps must be seen as the key economic institution of the Roman world – the taberna. Looking at the fora of Middle Republican Italy, the paper will particularly assess the role of public (Roman) authorities in spreading the taberna phenomenon.

11. Michel Tarpin (Grenoble University), The Roman conquest of the Alps: a laboratory for the domination of a complex territory?

Explaining the Roman conquest remains still a challenge. The worst way to do it may be what we could call « monocausality » or the search of a unique motivation. This kind of explanation, for instance the control of natural ressources, made E. Badian publish an explicite anti-marxist book in 1968, in which he tried to demonstrate that war an conquest, in ancient Rome, had many others causes, as glory, for instance, and that economy was a minor motivation. This scientific conflict reflected the ideological positions of the 60', and Badian's proposition was not so much better than the « all economic » one. However it seems that the conquest was always or quite always guided by broad economic causes: land, natural resources, slaves, etc. But the way the Romans conceived the conquest was adapted to the specific objects of each new extension of their power or territory.

The way the Romans approached, used and, finally, conquered the Alps may be a good example of a very differentiated conquest. Depending on the one hand on whether they wanted to control commercial outlets, roads or local resources, on the other hand on the political situation in Rome, or on their military capabilities, they adapted the solutions. Even Caesar, who had the Alps between his provinces, was eventually more involved in the creation of new cities and markets in the east than in the west part, where he had to travel between Cisalpine and Transalpine. We may assume that this contrast was never caused by confusion but only by a kind of pragmatic imperialism in front of a very unaccustomed and complex territory, which may be one of the best places to study the Roman capacity of adaptation in the framework of the conquest.

12. Mateo González Vázquez (Universitat de Barcelona), The Iberian rural economy in the face of early Roman expansion (from the 3rd to the 1st centuries BCE)

The North Western Mediterranean Basin during the Early Roman transition period (late 3rd-early 1st centuries BCE) has been often described as a period of agricultural prosperity. In this alleged scenario, the role of subjugated Iberians consisted mainly of producing more to support the campaigning needs of the Roman military in the region. This presumed intensification is mainly based on an unprecedented increase in the use of grain storage pits during the 2nd century BCE. Their extended use was shortly followed by a sharp decline in favour of the dolium, a more 'sophisticated' storage facility, as it has been labelled. This explanation gives storage a pivotal role, but fails in addressing storage as an economic process itself.

Rhoda H. Halperin in 'Cultural Economies: Past and Present' (1994), introduced the term 'cultural economies', by which she referred to an analytical perspective that emphasizes economic processes and patterns 'as they are culturally and institutionally constructed'. In line with this approach, in this paper I shall focus on storage per se, rather than as an indicator of something else. This approach will allow me to overcome many assumptions that very often misrepresent the ecological and social function of storage, and shed new light on the impact of Roman colonization and expansionism in the region.
13. Rui Mataloto (Lisbon University), Creating a Province, building a Roman Landscape: Central Alentejo and the emergence of Lusitania by the end of the 1st century BC

The beginning of the process of administrative and productive transformation in the Western Iberian Peninsula, by the mid 1st century BC, culminated in the fully-fledged creation of the province of Lusitania and its integration within the wider Roman provincial world. The early steps of this process are visible in the territory of Alto Alentejo, where an unprecedented array of small fortified sites dating to the early Roman phase has been found. In such sites, we can recognize the traces of a deeper transformation which eventually will lead to the creation of the Roman provincial culture and society. In this paper, the particular character and development of the Western Iberian Peninsula is considered, also in light of the specific socio-economic challenges and opportunities that the area offered.

Panel 12.5 Ancient Sculpture

Saturday | 26 May | 14:30-16:30 | HS VII

Paper abstracts

1. David Ojeda (Cordoba University), New roman portraits from Villa Adriana

During the years 2008-2011 the University Pablo de Olavide (Seville) and the University of Cordoba accomplished a cataloging project on the roman materials preserved in the magazzini from Villa Adriana. Most of these materials were fragments of architectural decoration and sculptures. Between the catalogued material were found some fragmentary imperial portraits, which to date have not been published. I hope to be able to present these portraits, discuss their identifications and the consequences they imply to the general knowledge of Villa Adriana. Since all these portraits were made after Hadrian’s reign, their analysis will mean some conclusions on Villa Adriana economic role after Hadrian’s death.

2. Pedro Rodríguez Oliva (University of Malaga), Manifestaciones de la escultura iberorromana en las cercanías del Fretum Herculeum

Resulta de especial interés una serie de manifestaciones de relieves pertenecientes a un monumento funerario que ofrece una localidad antigua, la ciudad de Lacipo, situada a no mucha distancia del Estrecho de Gibraltar.

La principal notoriedad de estos relieves, de entre los siglos III y I a.C., estriba en su originalidad frente al mundo púnico en el que este territorio está plenamente inserto.

3. Isabel López García (University of Malaga) - José Beltrán Fortes (University of Seville), Reportorio Escultórico romano-provincial de la Colonia Iulia Genetiva (Osuna, Sevilla)

La práctica de las “Misiones Francesas” motivó actuaciones dirigidas a la recuperación de conjuntos arqueológicos, como en la colonia Genetiva Iulia Vrbanorum Vrso, donde las excavaciones de A. Engel y P. Paris en la muralla romano-republicana, pusieron a la luz un elenco de relieves figurados e impulsaron una ferviente actividad en la confluencia de las vías del enclave romano, donde se habían rescatado fragmentos de la Lex Vrsonensis y se desvelaba el teatro de tipo mixto con un posible pòrtico doble.

Junto al flanco suroeste de la cauea del ediificio escénico, en el predio adquirido por A. Gutiérrez Martín, se localizó en el estío de 1903 un pozo amortizado con series escultóricas, arquitectónicas y epigráficas del propio teatro o de la inmediata plaza forense.

Estos fragmentos serían descritos en la prensa local y fotografiados por G. Bonsor, pero el tiempo borraría su existencia habiéndose producido en la actualidad su redescubrimiento, desvelándonos la existencia de un repertorio escultórico marmóreo colossal, del que destacan el posible retrato idealizado de un príncipe julio-claudio y la efigie de Dea Roma, obras de un taller romano-provincial, junto a otros materiales estatuarios fragmentarios, uno de los cuales presenta la firma del es-
4. Takashi Seki (Osaka City University), Study on Roman Copy - “To be colored or not to be colored; that is the question”

In terms of economics, copy should be made with less expensive material than original. Marble copy after bronze original is suitable for the purpose.

R. Carpenter thought that Hermes was a copy of Praxitelean original, which was of hollow-cast bronze. He seems to be wrong because original must be in marble: Hermes stands in total relaxation despite Dionysus sits on his forearm. Actually the infant tries to stand up on his right foot on the tree. Here we notice that the tree trunk has two roles, first, a support of the statue and second, a footing. Since it is indispensable in the composition, original must be in marble.

Marble statues were colored in the ancient times, and also in the medieval period, stone statues were colored. But Roman copies in color are seen seldom: Hermes group is one and Vervakeion statuette of the Athena Parthenos is another. But why is it so?

Though glittering, gold and bronze are monochrome. If marble copies were not painted gold but left colorless, then we should wonder why marble works of Michelangelo were not colored. Or why marble works of those who colored wooden statues in the Renaissance were not colored.

The Renaissance artists couldn't tell the difference between the ancient original and the Roman copy. They didn't know it was copyists who left marble statues colorless. Instead, didn't they believe by mistake, they were following after the original artists?

Panel 12.6 Sanctuaries and Ritual

Thursday | 24 May | 14:30-16:30 | HS X

Paper abstracts

1. Bianca Ferrara (Università degli Studi di Napoli FEDERICO II), I louteria dal santuario di Hera alla foce del Sele - Paestum

Dal santuario di Hera alla foce del Sele proviene una cospicua quantità di frammenti riconducibili a louteria, rinvenuti nei pressi degli edifici del settore N/E del santuario, edificati in età lucana e destinati all’accoglienza dei pellegrini e alla celebrazione di particolari pratiche rituali o di pasti comunitari.

L’analisi realizzata ha permesso di evidenziare una significativa varietà tipologica degli individui attestati, i più antichi dei quali risalgono al VI-V sec. a.C., periodo, dunque, durante il quale i cerimoniali libatori dovevano avere già larga diffusione nell’ambito delle pratiche rituali dedicate ad Hera.

L’esame dei louteria del santuario al Sele ha consentito di formulare alcune ipotesi sul significato ideologico e sulle modalità di impiego di questi oggetti nell’ambito delle attività che si svolgevano all’interno dell’area sacra; inoltre, le variazioni morfologiche riscontrate, oltre che indicare un differente ambito cronologico di utilizzo e di diffusione, ha consentito anche di precisarne in maniera più dettagliata la funzione, sottolineandone così una loro valenza fortemente simbolica.

L’analisi dei materiali associati ha, inoltre, permesso di formulare nuove ipotesi sugli edifici di provenienza, definendone con più puntuale precisione funzione e cronologia.

2. Laura Maniscalco (Soprintendenza Catania) - Brian McConnell (Florida Atlantic University), The Sanctuary of the Divine Palikoi: cult activities and economic activities around the sacred lakes.

Archaeological investigations conducted since 1995 have brought to light substantial remains of what was considered by numerous ancient sources to the principal sanctuary of the indigenous population of eastern Sicily. Fieldwork has revealed both the structural layout of the sanctuary in the fifth century
B.C. and at least three phases of the sanctuary in the Archaic period, as well as the presence of prehistoric cult deposits. A bothros with the remains of animal sacrifice and libations datable to the fifth century B.C. offers also rare documentation of monetary offerings that accompanied these activities. Ancient authors refer in passing to sureties in cash that had to be given to the priests of the cult, who served as judges of water-trials that took place at the sanctuary. Even the oracular function of the Sanctuary of the Divine Palikoi permitted the receipt of notable properties, which some sources describe as ‘fat’. Study of the complex system of canals, which were created around the sanctuary’s hill beginning in the sixth century B.C. suggests that the water of the lakes, which were the core of the cult, as well as the distribution of water to surrounding fields may have permitted the sanctuary to manage the rich agricultural resources of the surrounding territory.

3. Marcella Boglione (Universität Bern), Ritual dynamics in a new sacred area on the ‘Piano del Tamburino’, Himera
A new horizon in the field of the sacred archeology and votive offerings, within the territory of the Greek colony of Himera, has been identified by the researches of the Institute of Mediterranean Archeology at the University of Bern (2012 – ongoing).
The purpose pursued in this paper aims to highlight both the analysis of the ritual dynamics within one of the sacred areas on the Piano del Tamburino and the understanding of the spaces dedicated to the rite focusing on ritual as action.
The investigation of these actions involves several issues related to the interpretation of the ritual in use and the motivation behind deposition. What really defines a deposition? Is it only the materials? Attention will turn to the actions as expression of social activities and relations of the community that generated them, as a sign of territorial acquisition.

4. Gino Canlas (University of Alberta), Investing in the Sacred: Divergent Monumentality in Thessalian Sanctuaries
Although Greek temples were often the most prestigious manifestations of Greek religion, they were by no means a mandatory feature of sanctuaries. The poleis of Thessaly largely eschewed the construction of large temples, of which only three large Doric peripteral temples (Metropolis, Pherai, Python) survive, preferring smaller and non-peripteral forms instead. This paper investigates the reasons for this apparent lack of investment in colossal temples in Thessalian sanctuaries from the Archaic to Hellenistic period.
A diachronic examination of the archaeological remains of Thessalian cities does indicate that many polities in Thessaly did possess the ability to undertake large building projects but chose not to do so. Contrary to what is seemingly evident from the architectural remains (or lack thereof), the epigraphic and votive record, as well as archaeological evidence for renovations in sanctuaries, indicate that a significant amount of financial investment poured into these sacred sites. Contextualized with the literary sources, I demonstrate that the supposed lack of monumentality was in fact a monumentalization of local forms of worship, often as a reaction to broader events in the Greek world, such as the Delphic, Aitolian, Macedonian, and Roman wars in which Thessaly became embroiled. I also demonstrate that these same events were a factor in the decision to construct the few large temples that do exist, as an assertion of panhellenic affiliation.

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Panel 12.7 Idalion

Thursday | 24 May | 11:30 - 13:30 | HS XV

Paper abstracts

1. Stephan G. Schmid (Humboldt-Universitaet zu Berlin), The Importance of Max Ohnefalsch-Richter´s Excavation at Ancient Idalion

Max Ohnefalsch-Richter (1850-1917) excavated intensively in and around ancient Idalion (Cyprus) during his sejourn on the island from 1878 until 1890 and again in 1894/5. However, most of his activities remained unpublished. Recent archive studies in Berlin, Saint-Germain-en-Laye, Nicosia and elsewhere showed, however, that much more of detailed documentation does exist than previously supposed. Using the different documents, it is possible to draw a rather detailed picture of his activities. In some cases, the almost complete reconstruction of excavations, mainly of sanctuaries, is possible. In other cases, at least a precise localisation of his excavations can be realised. This contribution presents in short the different activities and, more specifically, the location on a modern GIS-based map, offering for the first time a concise picture of Max Ohnefalsch-Richter´s activities in and around Idalion. Not least given the important modern construction activities, this map will be an important tool for the management of the cultural landscape in the region of Idalion (modern Dali) on Cyprus.

2. Angelika Corinna Walther (DAI/Humboldt-Universität zu Berlin), A sanctuary of a female goddess excavated by Max Ohnefalsch-Richter (1850–1917) at the Gialias river in Idalion (Cyprus)

The presentation at the AIAC 2018 will present the first results of the author’s PhD project editing a yet unpublished excavation carried out by M. Ohnefalsch-Richter in the ancient city of Idalion in 1885. The excavation site, identified as the Temple of Aphrodite in the 19th century and today more carefully interpreted as the temenos of a female goddess, has brought to light numerous objects of terracotta, stone and metal, which since have been scattered over the museums of Europe. The approach of a comprehensive analysis of the material remains identified in collections and museums, and the documentation of the excavation left by Ohnefalsch-Richter linked together in a database promises a new and whole perspective on the votive practices of this cypro-archaic sanctuary. The finds, the majority of which has never been published, show the whole spectrum of dedications typically found in temenoi of female deities in Cyprus.

Together with a stylistic analysis of the objects to identify regional styles and imported goods, it will shed light on the economic importance of the city of Idalion and its role in regional trading patterns reaching as far as Egypt, the Levant and southern Turkey. A closer examination reveals a strong influence of levantine art in the votives of the sanctuary. Metal objects, which have been interpreted as equipment used in the cult, and close observations made by Ohnefalsch-Richter during the excavation may even give us a concept of the cult practices.

3. Sophie Geraldine Horacek (Humboldt-Universität zu Berlin), A sanctuary of a female goddess excavated by Max Ohnefalsch-Richter (1850-1917) on the eastern acropolis in Idalion (Cyprus)

This work, as part of my PhD, focuses on material remains and a manuscript of the excavation of a sanctuary in Idalion (Cyprus), which was investigated in the 19th CE. by Max Ohnefalsch-Richter (1883/1894-95). His work on the subject has never been systematically processed or published. The finds are widespread in different museum’s collections (Berlin, Nicosia, London). The subject of the presentation on the AIAC 2018 will be the first conclusions about this cult place (finds and architecture) which developed in Cypro-Archaic times and was situated on the eastern Acropolis of one of the Cypriot city-kingdoms. Besides having arable flatland and access to a flowing river, leading to a fertile ground, Idalion also controlled parts of the copper ore repository of the Troodos mountain. The minings were an important economical source of income for the greater part of the existence of the city. In addition
to the question of cult practice, period of use, function and political development of the site, the economic relevance of the city plays an important role for this intra-urban sanctuary. In this context, stylistic analyses of votive offerings (regional and imported goods; metal objects, clay vessels, terracotta figurines and votive steles) can not only reflect the adoption, adaptation and transformation of the cultural influences on the indigenous population but also give us new insights into the trans-regional trade of Idalion with the Levantine, Egypt and the mainland Greeks.

4. Will Kennedy (Humboldt-Universität zu Berlin/Topoi), A Landscape Archaeological Attempt at Defining the Territory of Ancient Idalion (Cyprus)

It is known that during the Cypro-Archaic and Cypro-Classical periods (c. 750-300 BC) ancient Cyprus was ruled by ten kingdoms. These were governed by respective capital cities. However, these political entities were by no means stable as, for example, indicated by the fact that the kingdom of Kition purchased its neighboring kingdoms of Idalion around 450 BC and Tamassos around 360 BC. Thus, although ancient Cyprus was ruled by various city states which held specific territories since the Early Cypriote Iron Age, due to political separations and alliances these territories most likely shifted according to the particular political circumstances of the time.

While past archaeological research on Cyprus has focused strongly on investigating the known urban centers, the subject of defining the respective territories of Cypriote city states remains comparatively under-researched. However, considering the unique topographical characteristics of the island, it may be well assumed that the extent of the respective territories was heavily influenced by the specific natural landscape conditions of the area.

Therefore, this paper presents preliminary results of a still on-going research project that – as a case study – aims at further investigating and defining the particular territory of the ancient Cypriote city state of Idalion by adopting a strong landscape archaeological approach in addition to the re-evaluation of the available archaeological and historical data.

Panel 12.8 3D Documentation and Interpretation of Ancient Buildings

Saturday | 26 May | 14:30-16:30 | HS XII

Paper abstracts

1. Lucia Michielin (University of Edinburgh), Lightning the ancient Rooms: Using the 3D reconstructions to analyse the importance of the doors and windows barriers in the life of the Roman Private Houses.

Roman houses have been the subject of numerous studies; however, few have focused explicitly on the door and window systems of these buildings. Yet doors and windows are critical if we want to fully understand these dwellings, and it is impossible to decode the appearance of private buildings without taking into account their contribution. Not only were doors and windows important for providing light and air, but they could also significantly modify the appearance of single rooms and of whole houses. They could therefore change the way in which the decoration was perceived and could shape the way in which people experienced buildings, e.g. the same room looks totally different by changing the typology of the entrance (curtains, folding doors or proper wooden doors). While the limitations of traditional archaeological methods hinder a full comprehension of their importance, the advent of new digital methods has provided us with a new perspective that enables us to study this topic in an efficient manner. This paper will analyse three different case studies of Roman Imperial period houses using 3D reconstructions to look at different types of windows and doors (e.g. the presence of a grill, a glass window, a shutter on a window), and explore how they radically change the experience of a room and even of the whole dwelling.
2. Maria Papaioannou and Peter Dare (University of New Brunswick) - Michalis Koutellas (Ephorate of Antiquities of the Dodekanessa), Economic activities of a private and public nature at Abdera and Kalymnos: Terrestrial laser scanning and visualization theory.

A project supported by the Social Sciences and Humanities Research Council of Canada afforded a unique opportunity to employ a virtual approach to the study of the economic activities of an urban dwelling where associated lead fishing gear (fishing weights, rings, and needles) were identified, and also examine the involvement of the Church in the economic life of an Early Christian town with the construction of the 5th century basilica of Christ of Jerusalem on the island of Kalymnos. This was accomplished through the terrestrial laser scanning in 2016 and 2017 of a large peristyle house of the Roman period at Abdera, and the basilica at Limniotissa on Kalymnos, respectively. More specifically the data have permitted us to create a 3D model of the house and basilica in order to present a visualization theory for both sites- that is one of the many possible images that may represent size, function and distribution of space for scientific and public purposes - and also an extended reconstruction of each site by incorporating a cultural context. This multidisciplinary approach, which incorporates archaeological, textual and ethnographic data, sheds light on the economic activities associated with a well-to-do urban dwelling of the Roman period and highlights the island's wealth, accumulated through trade and various economic activities, as exhibited by the construction of basilicas, in particular that of the aforementioned basilica on the island of Kalymnos.

3. Sebastian Hageneuer, Eckhard Deschler-Erb and Sabrina Geiermann (Universität zu Köln), The burial chamber of Köln-Weiden

The burial chamber of Köln Weiden is located approx. 9 km west of Roman Cologne directly at the via bellica, the main route from Colonia Claudia Ara Agrippinensium to Boulogne sur mer. It is one of the best-preserved roman burial chambers north of the alps and features for example two wicker chairs made of stone, three busts made of Carrara marble and a sarcophagus with reliefs also made of marble stone. This exceptional sample of Roman burial architecture is, although situated directly in Köln-Weiden and easily reached by public transportation, not accessible for most of the time, due to very short and seldom opening hours. The accessibility for disabled persons is not given at all.

In a cooperation project by different departments of the University of Cologne (Archaeoinformatics, Archaeology of the Roman provinces and the Regional Computing Centre), it is planned to change that unfortunate situation. The project aims to document, reconstruct and virtually rebuild the burial chamber, to offer worldwide and unrestricted access to it and provide further information for educational purposes (for example explain burial rites of Roman society, show and explain different phases of the chamber and provide detailed information of the interior of the chamber).

We therefore, thanks to the support of the TH Cologne, laser-scanned the chamber to create a detailed, georeferenced, colored point cloud as a first step. On this basis, we created a simplified 3D model of the burial chamber. We want to create a multi-purpose model to use in different scenarios: a) as visual aids for presentation and exhibition, b) as a sharable and web-friendly 3D model, so that there is the possibility to discover the burial chamber worldwide and c) as an immersive experience, so that the user is able to virtually enter the chamber itself with the help of so called head-mounted displays (HUDs).

4. Asuman Baldıran - Nizam Abay (Selcuk University), New suggestions about Monumental tomb architecture known as the Macellum (fish market) in Iasos

Iasos ancient city which is located about 26 km west of Milas, is in Kıyıkışlacık, Neighborhood of Milas District of Mugla Province. The earliest archaeological finds in the ancient city date back to the 3rd millennium BC. The earliest architectural remains are the wall remains of the Bronze Age settlement dating to the 2nd millennium BC. The monumental tomb structure that constitutes the subject of the work is reached when Kıyıkışlacık is followed by a straight continuing road and passing through the village and continuing straight just before entering the left side. The Guidi made a comment in the middle of the first half of the 20th century, the breadth of the structure and the livelihood of the people is based on fisheries so considering that
this could be a Macellum. The monumental tomb, dated to the middle of the 2nd century AD, in the middle of a courtyard surrounded by portik while it is still recognizable, was thoroughly researched and first described accurately by excavation by the Italian archaeologist Prof. Dr. Doro Levi and his team, who started archaeological excavations in Iasos in 1960. In this study our aim will be to document the architectural features of the monumental tomb structure which is important for the ancient city with, modern technological facilities (Restitution, 3D-modelling). Through with technological facilities, we will be able to discover specifications about the monumental tomb and preserve them.

Panel 12.9 From Hellenistic to Roman Times: Trade relations, cultural exchanges and funerary practices in the Southern Illyria.

Organiser: Belisa Muka (Department of Antiquity, Tirana)
Thursday | 24 May | 14:30-16:30 | HS XVI

Panel abstract

Since the very first archaeological researches in the early years of the 20th century, the archaeology in Albania has gone through different stages: from a complete "closure" during the communist period to a general ouverture by the end of the same century, leading to new collaborations and new researches areas.

This panel aims to give a general panorama of the researches that have been undertaken by the Institute of Archaeology in a variety of areas: trade relations and food import in Apollonia from the 3rd century BC to the 3rd century AD; The monetary reform engaged by the city of Apollonia during the 1st century BC; An overview on the domestic architecture of Southern Illyria during the Roman period; “Archaeology of death” in the Hellenistic and Roman necropolis at Phoinike; Some aspects on the cultural development of the western Dardania.

Paper abstracts

1. Bashkim Lahi, Handelsbeziehungen und Lebensmittelimporte in Apollonia während des 3. Jh. v. Chr. bis zum 3 Jh. n. Chr. Die aus den Transportamphoren gezogenen Erkenntnisse

Die Amphorenmauer ist der beste Beweis für die Verbreitung der Transportamphoren (in Apollonia) während des 3. Jh. v. Chr. Etwa 90% der innerhalb der Amphorenmauer getroffenen Funde kommen aus Süditalien (griechisch-italische Typen: MGS V und MGS VI) und der Rest kommt aus der griechischen Welt (von Korinth: korinthischer Typ A; von Korkyra: korinthischer Typ B, Amphoren von Rhodos und von Chios.). Während des 2.-1. Jh. v. Chr., kommen fast die ganze Importe von Süditalien (Typen Dr. 1A, 1B, Lamb. 2, Apani III, Apani VIII A und Giancola 5) und seltener sind Funde ursprünglich von Mittelitalien (der Typ Dr. 1C) und vom nordöstlichen Italien (Lamb. 2). Inzwischen seltene Funde gehören zu den rhodischen Amphoren und dem Typ Maña C vom punischen Gebiet. Einen andere Blick haben wir für den Zeitraum vom 1. bis zum 3. Jh. n. Chr., wo die Handelsbeziehungen fast das ganze Mittelmeergebiet einschließen. Der Haupthandelspartner bleibt Italien mit Sizilien (vertreten von Amphoren: Dr. 2-4, Dr. 6 A, Forlìmopoli, Ostia I 452, MRA1, Grado Ia und Dr. 21-22). Dann kommen die Importe von Kreta (Typen: AC1, AC2, AC4, Zemer 57, MRA2), vom ägäischen Gebiet, hier eingeschlossen auch Rhodos und Kos (Agora G 199, Kapitán II, MRA18, Camulodunum 184, Dr. 5), aus der Westtürkei (MRA3), von Gallien (Galois 1 bis 5), von Nordafrika (Typen Keay III A, Keay V, Tripolitane II), vom Schwarzmeegebiet (Typen Zeest 93, Zeest 94) und von Spanien (Dr. 7-11, Dr. 28, Dr. 38). Der Hauptteil der Funde weist auf Wein als importiertes Hauptgetränk und die beschränkte Anzahl von Öltransportamphoren legt die Meinung nahe, von 3 Jh. v. Chr. ohne Unterbrechung bis 3 Jh. n. Chr. Im 1.
2. Shpresa Gjongecaj, La réforme monétaire d’Apollonia d’Illyrie au première siècle av. J.-C.

Les six trésors trouvés à Apollonia et dans le territoire sont des témoignages d’une réforme monétaire entreprise par Apollonia vers la fin du Ier siècle av. J.-C., par suite des grandes transformations politiques et économiques produites en Illyrie du Sud à l’époque. La crise économique et politique qu’avaient connue les deux cités les plus importantes de l’Illyrie, à savoir Dyrrachion et Apollonia, au cours des guerres civiles entre César et Pompée, l’afflux de plus en plus intense du denier romain, mais aussi des monnaies de bronze de Rome sur les marchés de l’Illyrie, ont entraîné le besoin de la réalisation d’une réforme dans le système monétaire pour affronter une crise éventuelle. Apollonia se trouvait dans des conditions plus favorables que Dyrrachion du fait qu’elle a eu de très bonnes relations avec les autorités romaines et en particulier avec César, qu’elle a soutenu dans cette guerre. Cette réforme avait pour objectif un rapprochement avec le système monétaire romain. Elle a touché les monnaies de bronze et celles d’argent.

Dans le cadre de cette réforme, on a tiré du marché les monnaies de bronze qui étaient en circulation depuis le début du IIe siècle av. J.-C., les dévaluant et les remplaçant par une nouvelle série de monnaies qui portent les mêmes symboles de droit et de revers que les précédentes, mais qui changent de celles-dernières du point de vue du poids et du diamètre, s’adaptant ainsi au système monétaire romain.

3. Luan Përzhita, Some aspects on the cultural development of the western Dardania

The territory that is subject of this presentation, including Drini i Bardhë (ancient Drilon), in the first centuries AD was within the western part of the new province of Moesia Superior (created in AD 86). There is a considerable lack of historical sources and archaeological finds for the first phase of Roman occupation in Kosovo. However, it is clear that the numerous mineral resources and the fertile fields of Dukagjin basin (Rrafshi I Dukagjin) that attracted Romans toward the Dardans’ territory.

This presentation, by taking to consideration all the data at our disposal, aims to give some of the aspects that characterise the cultural development of the western Dardania.

4. Altin Skenderaj, Un aperçu sur l’architecture domestique d’Illyrie méridionale à l’époque romaine

Ce sujet vise à jeter plus de lumière sur un domaine peu étudié jusqu’à nos jours, celui de l’architecture domestique à l’époque romaine, tenant compte des anciennes et nouvelles campagnes de fouilles ou bien des prospections faites du nord au sud d’Albanie moderne, ainsi que les publications qui les ont suivies.

Les plus importants exemples des anciennes colonies grecques sur la côte est de l’Adriatique - Apollonia et Dyrrachium - et des sites d’arrière pays illyrien vont se présenter au fur et à mesure dans cette contribution.

Leurs localisations par rapport à la zone urbaine et extra-urbaine, l’organisation interne, le mobilier archéologique, ainsi que des nouvelles données sur le processus des transformations dans ce territoire vont être également présentées.

5. Belisa Muka (Department of Antiquity, Tirana) and Giuseppe Lepore (University of Bologne ), “Archaeology of Death”: Hellenistic and Roman Necropolis at Phoinike

Every ancient necropolis constitutes a complex and dynamic space: it is at the same time a physical area, organized and structured in order to meet the needs of the funeral; it is a symbolic one, where the community of the living puts in place a "performance" of rituals and practices, on one hand in order to overcome the loss of one of its members and to give to the deceased a "good death" and on the other, to represent itself.

This communication aims to give some of the results of researches that have been undertaken by the Italo Albanian collaboration in the Hellenistic and roman necropolis at Phoinike.
Panel 12.10 AIAC Round Table Discussion. Diversity in the past: Diversity in the Present? Issues of gender, whiteness, and class in ‘Classical’ Archaeology

Organiser: Eva Mol (Brown University), Lisa Lodwick (Oxford University)

Wednesday | 23 May | 14:30-16:30 | HS I

Panel abstract

In light of the dismay of many concerning the initial all-male keynote panel at AIAC2018, this session is aimed at discussing broader issues concerning diversity and intersectionality in the field of Greco-Roman archaeology. As archaeologists, we have made it one of our principal tasks to bring to the fore ‘the people without history’; women, slaves, the poor, the disabled, and show a more diverse image of the Greek and Roman past. Then why is this diversity not reflected in the discipline itself? The all-male panel we believe, is symptomatic of more fundamental problems that the discipline suffers from, concerning gender and its inseparably related issues of whiteness, class, and the ‘Classical’. The AIAC-session will be a meeting ground in which we can discuss how to approach matters of inequality and injustice in our field; at conferences in teaching, research and during fieldwork. This is not just a case of female representation; if we want to survive as a discipline, we must change in more fundamental ways. We therefore wish to initiate a constructive round table debate, addressing issues of inequality and discussing the future and viability of Greek and Roman archaeology. This session also intends to produce practical and structural proposals to be presented to the AIAC council, to prevent future imbalance.

We would like to invite people to participate in this discussion and address and share specific issues of imbalance, statistics, demographics, comparisons, and solutions to make Greek and Roman archaeology more accessible for a diverse group of people. The session will be open to all, please get in touch with us if you want to contribute. We will create a round table with short 5 to 10 minute contributions by those who wish to participate as panel member, followed by discussion.
3. Poster Abstracts

1. Njim Adel (University Tunisie), Maghreb toponymy: reading the landscape and its resources

In Maghreb toponymy I defined four axes: geographical place names, urban toponyms, economic, ethnic and political names. The topography theme comes first. The name de de Kebili in southern Tunisia is the name of the Mountain "Jebel" pronounced otherwise. The toponym of Ammaedara in Tunisia is the Latin pronunciation of the term "flowing water". The city of Madaure in Algeria is another version on the same theme. Place names related to the urban landscape relate to the city walls and its components such as habitat and harbors. The town of "Igilti" became "Jijel" in Algeria is originally "Hajar Ki-la" which means stone walls. The name of the city of Lepcis or Leptis in Libya relates to its lighthouse. This is the Semitic name for "Kabass" meaning torch that refers to the lighthouse of this city and gave this name. Afterwards Leptis Magna (the Great) and LeptisMinus (Little) were created to differentiate them. Resources and economic activities have given rise to toponyms. In Tunisia, the stone resources located at Cap Bon have given the name of place of "Latomies" which is a distorted pronunciation of the Semitic term of "Makael" which means quarries in general and here they designate the quarries of stone. Clay and pottery facilities also have their share in (ethnic) toponymy. The name of Africa corresponds to that of the Afri. The name Libya is drawn from the Liboux ethnic group.

2. Javier Atienza Fuente (University Tarragona) - Santiago David Dominguez Solera and Míchel Muñoz García (ARES Arqueología y Patrimonio Cultural), La decoración marmórea del frigidarium de las Termas de Valeria (Cuenca): Análisis cuantitativo y tipológico de los fragmentos recogidos en la Campaña de 2017

La serie de intervenciones arqueológicas llevadas a cabo desde 2014 en el yacimiento de Valeria han permitido sacar a la luz los restos de un edificio termal que debió tener una cierta monumentalidad si tenemos en cuenta la entidad de las estructuras conservadas y la profusión decorativa empleada en sus paramentos.

Hasta ahora se ha exhumado prácticamente en su totalidad uno de sus ambientes principales, identificado como un frigidarium o sala de baño frío. Además de mosaicos policromos y pintura mural, los paramentos de este ambiente debieron estar decorados por una amplia variedad de marmora, de los cuáles se han recuperado varios centenares de fragmentos. Estos mármoles no sólo fueron utilizados en forma de crustae de revestimiento parietal o como losas pavimentales, sino que se han conservado molduras, fragmentos de elementos arquitectónicos y algún resto escultórico.

El análisis cuantitativo arroja una información valiosa para determinar la cantidad de mármol empleado en la decoración de este ambiente. Por otro lado, el análisis tipológico de las variedades marmóreas empleadas nos indica, entre otros aspectos, la explotación de los recursos pétreos locales del territorio o, también, las relaciones comerciales establecidas entre la ciudad de Valeria y los núcleos extraprovinciales, provinciales y extraprovinciales.

Algunas marcas realizadas sobre las piezas recuperadas nos ofrecen también información puntual sobre el trabajo de los marmorarii en esta ciudad del Imperio.

3. Paola Baldassarri (Città Metropolitana di Roma) - Simona Faedda (UB Barcelona), Household economics and commercial networks: the role of the Roman domus of Palazzo Valentini between the Imperial age and the Late Antiquity

The aim of this research is to present the data emerged from the study of Imperial and Late Antique pottery contexts from two domus excavated underneath the Palace of the Metropolitan City of Rome Capital, north of Trajan's Column, in the earth of both the ancient and the modern city.

The excavations, promoted by the administration of the Metropolitan City between the 2005 and the
2007, have led to the discovery of two residential areas built between the half of the I and the II century A.D., widely refurbished during the IV cent. A.D., and then abandoned during the V-VI cent. A.D. The study has included the total amount of the pottery fragments found in the two domus, tracing a complex excursus through different times and places, thanks to the extraordinary variety of pottery classes and production identified.

The relevant information resulted from the analysis of this vast amount of materials have offered the opportunity to reconstruct the economic context related to the phases of life and abandonment of the domus, and to compare it to the general economic context that saw Rome at the centre of the commercial exchanges.

The examined materials have permitted the definition and interpretation of the spaces in the domus, the taste of their inhabitants, the phases of abandonment and, starting from these private aspects, the comprehension of the general economics trends, tracing step by step the growth, crisis and changes of the imperial economy.

4. Josipa Baraka Perica and Ante Uglešić (University of Zadar), Rivine – Crkvina: An Example of Production Quarters by a Church

Rivine – Crkvina: An Example of Production Quarters by a Church
Archaeological site Rivine – Crkvina is situated near Stolac in Bosnia and Herzegovina. Several archaeological campaigns were conducted there from 2011 to 2014, which brought to light an Early Christian church, a small cemetery within it and by it, and a villa rustica with extraordinarily well preserved remains of production quarters, most probably intended for the olive oil production.

The site fits very well to the topic of archaeology and economy in Antiquity because the church was built in the immediate vicinity of these production quarters with which - in one of its later phases - it was even architectonically conjoined.

The site has still not been published, so it is the intention of this poster to - as much as the spatial limits of the medium will permit - present it to the wide professional and scholarly community, as well as other similar sites from the Roman province of Dalmatia.

5. Nicoletta di Benedetto (University Catania), Centuripe: a roman bride over the river Simeto

In Centuripe's municipal area, at about km 11 south-east away from the city, there are roman bridge's ruins that crossed the Simeto river along the route a Centuripis Aethnam of the important itinerary a Catina Thermis. The monument, about which we do not have any informations before the ending of the XVIII century, when Jean Houel painted it and described it as "une des plus belles que les Romain aient jamais faites dans ce genre" is sited 350 metres west from the current river course. These are some of the most impressive archeological ruins which belong to the imperial age in Centuripe.

They are visible today only the superstructure with part of the arches, the tympanums and the tread plan. The monument is made of opus caementicum and the facade's visible part is made of opus testaceum. Some architectural gimmicks and, in particular, the use of fired clay bricks as surface of the superior part of the bridge, whit the associative analysis, allow us to date the bridge from the II century a. D., when Centuripe reached an economical and monumental development which surely had a role of attraction on the ancient itineraries. The facing's bricks do not find any comparisons with the ones used in other public monuments in Centuripe and probably the bridge was built by workers who did not come from Sicily, who used imported materials.

6. Leonardo Bernardi and Maria Stella Busana (University of Padua), The reconstruction of the organisation of space and work through iron-working microresidues distributional analysis: the case of the Roman smithy of Montebelluna (Treviso, Italy)

Montebelluna, one of the most important urban centre of Venetic population, during the Roman period became a secondary vicus directly connect to Acelum. Excavations in Posmon (a small area in Montebelluna), managed by the University of Padua (Dep. of Cultural Heritage) under the scientific direction of Prof. M.S. Busana, unearthed a Roman structure. The presence of a large amount of slags in an outer discharge and of iron-working microresidues in the South-Eastern room (G) clearly showed that this
building was an iron workshop, working from the mid of 1st AD to all 2nd AD. The presence of microresidues in primary deposition context was a good opportunity to understand formation processes connected to smithing operations and try to reconstruct the organisation of space and work within the smithy. In order to maximize the information potential of microresidues, room G was excavated according to a grid, the soil strata with microresidues totally collected and, later in lab, the magnetic content was separated. This method allowed to draft distribution maps of the magnetic content of soil in relation with structures and stratigraphic evidences. The analysis of these maps allowed to recognise with certainty two preferential blacksmith's working positions, to identify a square basement as the support for an elevated forge and to reconstruct the typology and the location of technical structures used by artisans.


The purchase of the National Archaeological Museum of Naples of the terracottas collection of Raffaele Gargiulo (1785-after 1864), ceramist and restorer, leading figure of the Museum of Naples, neapolitan merchant of antiquity in the twenties and thirties of the 19th century. The proposed sale to the Museum of Naples is made on December 1852, but only after more than two years of hard deals it comes on May 29th 1855, for 6000 ducats. In the Gargiulo's collection the little plastic (443 specimens, 73.88%) is the most documented class, accounting for about three-quarters of the collection. At the top lie the towns, both in Apulia (Gnathia, Ruvo and Canosa) and Campania (Capua and Cales), most famous for the coroplast products. If the architectural material is dated from the end of the 6th century BC to 1st century AD, the coroplastic material lies mostly between the mid-4th century BC and the end of the 3rd BC. The pottery range between the 4th century and 3rd century BC, especially the plastic and polychrome decoration and the achromatic ceramic.

8. Giacomo Biondi (Consiglio Nazionale delle Rice), A New Attic LPG (10th century BC) Crater from Prinias (Crete) in the Context of the Coeval Attic Pottery Distribution

Consistent fragments of a rare Attic Late Protogeometric crater (1.000-900 BC) come from the Tholos F of the Siderospilia necropolis of Prinias, in the centre of Crete. They belong to the southernmost exported specimen in the Aegean Sea and to the only one Attic Protogeometric crater so far found in the island. Here only its imitations - the so-called kraters of mainland type - were so far known. These were attempted from the Knossian Middle Protogeometric (920-875 BC) onwards and were a rare alternative to the type of Minoan origin, the deep bell-craters.

The Prinias specimen is the only one preserving also the profile of the foot. Form and decoration are intermediate between a well-known crater of the "Museum Antiker Kleinkunst" in Munich and another one found in Nea Ionia, Attica. The decoration allows us to attribute it to the same workshop that produced the latter.

The presence of such a crater in Crete will be studied in relation to the distribution of the coeval Attic ceramics in the island and in the rest of the Aegean Sea.

9. Giacomo Biondi (Consiglio Nazionale delle Rice), La ceramica laconica figurata dal deposito votivo di piazza San Francesco a Catania

Il deposito votivo di un santuario di Demetra a Catania, recuperato negli anni Cinquanta dello scorso secolo da Giovanni Rizza, comprende un vasto e ricco campionario delle ceramiche circolanti nel Mediterraneo durante il VI secolo a.C. Tra queste, c'è un consistente nucleo di ceramiche laconiche a vernice nera e figurate. Saranno presentate quelle figurate, sia a silhouette piena sia “a figure nere”, tutte appartenenti a vasi potori.

Il loro esame e l'attribuzione a singoli pittori o botteghe consentiranno di aggiungere ulteriori tasselli al quadro di distribuzione già elaborato da altri studiosi.
10. Gloria Bolzoni (Università degli studi di Sale), Differenti abitudini di consumo nell' Impero Romano del III sec. d.C. contesti a confronto

Tra gli indicatori archeologici che possono essere utilizzati per indagare le società antiche, la ceramica è certamente quella che fornisce maggiori informazioni di vario tipo, commerciali ed economiche ma anche socio-antropologiche, che permettono di inquadrare la cultura materiale di un luogo in una sfera culturale definita. È questo il motivo per cui i contesti ceramici devono essere studiati da diverse prospettive e sempre riferiti ad un sistema antropologico e sociale, la cui definizione è spesso sfuggente. In questo poster si prenderà come punto di riferimento un momento cruciale della storia del Mediterraneo romano, ossia l'età severiana, nella quale si possono riconoscere le radici di una transizione non solo economico-commerciale, ma anche sociale e culturale, nell'impero romano mediterraneo. Si metteranno in relazione diversi contesti ceramici riconducibili a questo periodo, cercando di volta in volta di definirne la sfera d'influenza culturale e commerciale/economica, in modo da delineare in modo più netto i confini dei sistemi sociali cui esse fanno riferimento in questo periodo di forte transizione.

11. Diana Busse (Universität zu Köln), Römische Malereifunde aus dem Saarland: Überlegungen zum "Lokalstil"


Neben der Aufnahme des weitestgehend unveröffentlichten Bestandes an Malereifunden aus dieser Region, wird deren chronologische Einordnung sowie eine Bewertung der Funde nach ikonografischen, sozialen, ökonomischen sowie regionalen Gesichtspunkten angestrebt. Als Ergänzung zum Themen schwerpunkt des Panels 3.22 ("Local styles or common pattern books in roman wall painting and mosaics") sollen in einem Poster das Projekt und erste Beobachtungen zum "Lokalstil" präsentiert werden, die wiederum die Grundlage für Überlegungen zur Existenz und Arbeitsweise von Werkstätten bilden können.

12. Ana Caessa and Nuno Mota (Câmara Municipal de Lisboa), A monumental structure at the riverfront. Archaeology and architecture of the Felicitas Iulia Olisipo cryptoportic (Lisbon, Portugal)

The discovery in Baixa Pombalina of a flooded subterranean building consisting of a complex of vaulted galleries dates back to the end of the 18th century, after the great 1755 earthquake, when it was recognized of Roman period. Unconsciously used as a cistern even before its discovery, it was subject to countless interpretations until it has been consensually recognized as a cryptoportic, in the last quarter of the 20th century. The current dynamics of urban rehabilitation of Lisbon historic center and the interest of the local administration in the valorization of the city archaeological heritage promoted an investigation and conservation municipal project which will lead to the opening of the monument, now equipped with an interpretation center. Since 2015, this project has created numerous possibilities for the scientific study of the monument, namely through archaeological interventions and rigorous architectural surveys (almost impossible to accomplish till then). The results of the investigations undertaken up to now together with the rest of the archaeological information about Lisbon at the Roman Period enable us, at last, to know about the construction's timeline of the of the building, about the technical contingencies of its construction and to suggest proposals for its function and urban integration at the ancient river front as a monumental port structure in a city with a commercial vocation that was a platform between the Mediterranean Sea and the Atlantic.
13. Erika Cappelletto (Landesamt für Denkmalpflege Baden Württemberg), Understanding old and new evidences of sacred ways in Caria and Lycia

The project I am going to present in this venue is in its early stage and represents a side “venture” beside my work in the cultural heritage but I think that giving my work experiences in Turkey I am real-ly into the topic and overall picture.

14. Charlotte Carrato (UMR 5140-Archéologie des sociétés méditerranéennes, CNRS), The dolia in the wine producing installations in Early Roman Gallia Narbonensis

The dolium is a ceramic storage jar of Greek and Etruscan origin, and is the largest container ever used in the ancient world. It appeared in Gaul during the fourth century B.C., became increasingly widespread until the first century B.C., and then flourished during the Early Empire. At that time, jars were installed in large storehouses and their capacity ranged from 600 to 2,500 l, ensuring the storage of significant quantities of wine.

This great tool is at the heart of the wine producing process that is why its study informs us about numerous aspects of the antique wine economy in Gaul. For example, the composition of the wine storehouse, made of new dolia or second-hand ones, shows trade channels and economic logic of each establishment. The arrangement of dolia and wear also offers a vision of their use and of the internal organization of the production. Finally, the marks of capacities and the estimations of stored volumes allow to study the evolution of storage capacity.

A significant number of dolia were discovered at early agricultural sites from the Roman period in Narbonese Gaul, following the expansion of viticulture during the course of the first century A.D. The compiled data from 70 sites spread over the Pyrenees and the Italian border, allows for the first time to grasp the overall of this phenomenon at provincial level.

15. Murat Çekilmez (Adnan Menderes University), Multidisciplinary Researches at Myrina and Gryneion in Aiolis-Turkey

A new archaeological survey project was started by the Adnan Menderes University at Myrina and Gryneion in 2015. Myrina and Gryneion are archaeological resources: a well-preserved and almost completely unexplored ancient city, lying on the seaside in Aiolis/Western Turkey. The Myrina and Gryneion Archaeological Surveys are an interdisciplinary research project aiming to understand how populations adapt to local conditions dictated by environmental constraints. Major objectives of survey researches at Myrina and Gryneion are to clarify the long-term history of the site. Our primary fieldwork goals were to conduct intensive survey at ancient city of Myrina and Gryneion. Field work surveys were started in 2015. On the other hand laboratory work focused on refining the ceramic typology; efforts concentrated also on establishing a centralized database system to manage and eventually make public all project files. 2015 program yielded significant quantities of pottery including a representative sample of the typical Hellenistic and Roman wares. One interesting result about Myrina and Gryneion are the lack of monumental architectural remains. Preliminary results suggest that the large architectural blocks remain underground. Examination of nearby villages suggests that they were not extensively reused in modern buildings.

16. Mila Chacheva (Sofia University), Glass Beads from Apollonia Pontica. Chronology and Types

From ancient times until present-day, glass beads have always been fashionable trinkets. Their small size and variety of colours, shapes, and motives predefined their success in the Mediterranean. The Black Sea region in Classical and Hellenistic periods was not isolated and the influx of various glass beads with other imported goods is not unexpected. The poster aims to present the diversity of these beads and to offer some chronological observations. What is important for the known beads from Apollonia is that in most cases their provenance is from burials, i.e. from closed contexts. They could contribute for narrowing the proposed dates and also throw some light on the use of these small colourful items. One or several glass beads are most often found among beads of other materials and pierced sea-shells in the Classical strings, while in the Hellenistic Period a general change is observed. Splendid strings with dozens of glass beads of various new types appear in some graves in the Ionian
17. Kalliopi Chatzinikolaou (Archaeological Museum of Thessaloniki), *Economy of Cult – Examples from Macedonia during the Roman Period*

The issue of the possible economic benefits of the sanctuaries that derived from donations or offerings is examined in specific examples from Macedonia during the Roman period.

A) The production of wine is an economic benefit of a sanctuary that derived from a donation to Zeus Hypsistos. A votive stele from Upper Macedonia (Eordaia) (2nd-3rd century AD) depicts the vine-grower Chrysseros (Χρυσέρως) offering two rows of vines from his property to Zeus. Vine offerings to various deities are also known from other areas of Macedonia. The most distinctive example is an inscription of the 3rd century AD from Thessaloniki, whereas there are much more similar offerings in Asia Minor.

B) A large number of manumission acts comes from the sanctuaries of deities in Central and Western Macedonia (Merides). They concern the donation of slaves, who will eventually offer their services to the sanctuary, probably fulfilling in this way a master's promise to the deity or paying a debt or a loan. The increase of the manumission acts of slaves after the 2nd century AD at sanctuaries with wide popularity is generally observed in Macedonia. This special phenomenon is possibly related to the management of slaves as an asset and the sanctuaries' financials.

C) A number of examples of the sanctuaries' savings comes from the second use of the monuments mainly due to the lack of the material (stone). The sanctuary possibly participates in some way.

18. Olga Christakopoulou (Ephorate of Antiquities of Achaia), *A mortuary testimony as a guide for a society's economic evaluation. Case study: the establishment of Protogeometric Stamna, Aetolia, Greece*

This presentation refers to the study of burial architectural diversity and mortuary practices at Stamna, Greece in the Protogeometric period, in order to reconstruct burial customs, as well as to define or re-establish social hierarchy and relations as a guide of economic practices of this specific social group. The establishment as well as the maintenance of power for this population who had control of a key geographical location, were of vital importance to their general organization. A settlement of this size ought to control the broader area so as to ensure adequate supply as well as appropriate security from external enemies who would wish to benefit from its strategic location, aiming, among others, at controlling commerce. The Protogeometric Cemetery of Stamna includes a long dotted necropolis of a well-structured population, designed to fully exploit the space, creating a perfect cohabitation model, attached to the opportunities and potential of the region.

Particular clusters of graves, of the most prominent of the clans that comprised a tribe, give us the evidence of complete mortuary patterns and mostly the role the elites played in structuring strong social relationships. The interpretation of the political and economical structure of the population after the destruction of the Mycenaean civilization, guides us in the awareness of its peculiarity, which is based on its own, familiar context of values.

19. Enric Colom Mendoza and Ramón Járrega Domínguez (Institut Català d’Arqueologia Clàssica), *A phase of the wine trade process on the east coast of Hispania Citerior: The production of Pascaul 1 and Dressed 2-4 parvae amphoras*

In a recent revision of materials deposited in the museums, we were able to verify the existence of a new variant of wine amphora production of the Pascual 1 kind in the east coast of the ancient Hispania Citerior, which corresponds to the current Catalunya and north of the País Valenciano. It is a variant smaller in size than the standard form, although it presents its own morphological characteristics and a better weight/capacity ratio, which we have been able to document in several figlinae, especially in the area close to the mouth of the Ebro River.

In Sagunto, located in the País Valenciano, the existence of amphorae similar to form Dresses 2-4, which are smaller in size and we may call Dressel 2-4 parva, has been documented for quite some time. We believe that the production of both variants is contemporary; hence, their study allows us to unveil...
a new aspect of the production and commercialisation of wine amphora in the east coast of the ancient Hispania Citerior, which we can set chronologically in the Augustus times, towards the change of era.

20. Ada Cortes (University Rome "La Sapienza"), Definition, analysis and interpretation of a new typology of the Roman house: the tetraestyle courtyard house, a domus with a hybrid cultural conception sheltered by a global civilization of antiquity

In the recent decades, some studies have found a particular typology of Roman house in different parts of the Empire. This typological feature is the result of a hybrid house scheme between the Greek and Roman conceptions of the house. The new typology provisionally named “Porticated Courtyard House” has been observed in different Roman cities with a Greek past, but in different geographical contexts and chronologies. This type of home, with its variants, has not been enough analysed by the Roman domestic architecture studies. There are still many Roman cities with a Greek past which private architecture has not been thoroughly studied.


Apollonia in the Black Sea (present-day Sozopol on the Bulgarian coast) was founded by Milesian settlers in the late 7th c. BC. In addition to the excellent harbour, the first safe stop after the Bosporus, the site had one more advantage – its proximity to the metal deposits in the nearby hills of Medni Rid (Bulgarian for “Copper Ridge”). The exploitation of these riches was a major factor for Apollonia’s prosperity in the Archaic and Classical periods, culminating in the colossal bronze statue of Apollo, erected in the second quarter of the 5th c. BC. Since 2009, investigations on the small offshore island of St. Kirik revealed the main temenos of Apollonia, as well as traces of the Archaic settlement. Observations of various structures (remains of dwellings, pits, etc.) enable specifying the chronology of the earliest metallurgical activities there. Practically all contexts have yielded slag and other evidence of metal processing. Pieces of slag were even used as insulation of the floors of some of the early houses, and a bipartite structure has been provisionally interpreted as a metallurgical workshop. The poster will focus on the pottery from some of these contexts in order to explore when the Greeks got access to the copper deposits of Medni Rid.

22. Adrien Delahaye (University Paris Sarbonne), The Spartan Austerity through the Laconian Iconography during the Late Archaic Period

The ancient literary sources from the Classical period depict Sparta as an austere and conservative city, almost with no diachronic evolution. Nevertheless, these testimonies contain many contradictions and the archaeological evidence for the archaic period reveals a city at once quite different than the general view on Sparta and at the same time quite similar to many other contemporary greek cities. Many scholars have contributed in the last 30 years to renew the Spartan studies and especially the question of the austerity. But many problems remain to relate the history of Sparta and its artistic productions, the so-called “Laconian Art”, as R. Förstsch has underlined it. Therefore, which links can we establish between these products and the Spartan society, supposedly composed by equal landowners entirely devoted to war and the service of the polis? Can we discern any trace of this austerity in the Laconian art? Some attempts have tried to link the decline of the artistic production at the end of the 6th century to the establishment of an austere way of life. The study and the contextualization of the laconian iconography, combined to the consideration of the identity of producers and consumers, could give us a key to understand the reality of the Spartan austerity.

23. Emanuel Demetrescu (Istituto per le Tecnologie Applicate ai Beni Culturali Roma), Digital solutions for Virtual Reconstruction in Archaeology

Virtual reconstruction is an archaeological matter that began a digital matter only in the last decades. Virtual (from the Latin term virtus), is a synonym for “potential” and expresses the likelihood of a certain artefact having existed in the past. Despite a diffuse commonplace, the virtual reconstruction is not only a digital matter: it started long before the introduction of the computer, both in terms of methods and practice of research. Nevertheless, the digital solutions provide more and more improvements to
the virtual reconstruction applications in terms of new methods and innovative solutions for the visualisation.

24. Eckhard Deschler-Erb, Sebastian Hageneuer, Sabrina Geiermann, Ulrich Lang, Paul Benölken and Daniel Wickeroth (University of Cologne), Das Römergrab von Köln-Weiden, eine virtuelle Rekonstruktion


25. Charalambos Dokos, Kyriakoula Manaridou, Katerina Dokou, Christos Tsakalidis and Ulrich Fetzer (Université Paul-Valéry, Montpellier 3/LabexArchimède), Issues in Late Hellenistic and Roman public health in Cyprus

Roman Empire had great cities with increased number of population and immigration. Apparently one of the major causes of epidemics was the high level of immigration that brought new pathogens in the cities. One of the most important aspects of Roman public health is the evolving of different diseases from one place to another. This study explores some of the issues of public health in late Hellinistic and Roman period in Cyprus.

Harbors are considered by historians and archaeologists as “hot places” of different endemic and exotic infectious diseases. Malaria is one of the first disorders affected Hellinistic and Roman Paphians. that is further discussed. In addition syphilis and leprosy were common diseases that were transferred from travelers to the island. Research in the areas of Tropical and Travel medicine concluded that there must be a genetic association between anaemias and malaria. Zoonoses, animal derived diseases, have been spread to humans and influenced human evolution in Cyprus. For certain people leaved beside with their domesticated animals from the Late Roman period until modern times. Until the latest century, zoonoses were persistent in Cyprus society due to the custom of animals and humans sharing dwellings. This custom was catastrophic for Roman Cypriots leading to tuberculosis, echinococcosis and brucellosis. This study presents the findings of excavations and a medical and pathophysiological connection of the findings with the epidemics.

26. Corinne Dubler (University Montpellier 3), Der Handel und die Verteilung des spanischen Olivenöls Richtung Gallien und Germanien zwischen dem 1sten und dem 3ten Jh. n. Chr. Erste Forschungsergebnisse

Der folgende Betrag beabsichtigt, die Dissertation “Le commerce et la diffusion d’huile de Bétique vers les provinces des Gaules et des Germanies (Ier-Ille s. ap. J.-C.)”, die an der Universität Paul-Valéry/ LabexArchimède in Montpellier durchgeführt wird, vorzustellen.

Durch den römischen Handel werden voneinander abseits gelegene Regionen des Imperium Romanums miteinander verbunden. In diese Handelsströme integriert sich auch die Dressel 20 Amphoren, emblematischer Vorrats-und Transportbehälter, des in der römischen Provinz der Baetica hergestellten Olivenöles. Der epigraphische sowie historische Reichtum dieser Amphoren gibt uns die Möglichkeit, eine umfassende Studie über den Handel dieses zentralen Mittelmeerproduktes auf provinzieller und interprovinzieller Ebene durchzuführen. Um die Organisation und Funktionsweise dieses Warenaustausches
zu verstehen, wurde eine geografisch grossflächige und quantitativ solide Studie angelegt. Diese unter-
sucht die Verbreitung des Olivenöles in Gallien und Germanien, aufgrund der vor Ort gefundenen Am-
phorenstempel.

Das Ziel dieser Dissertation ist die Erstellung eines interaktiven, elektronischen Onlinekatalogs der ge-
findenen Stempel (zurzeit über 5300 Exemplare) und die daraus folgende Auswertung des Materials. Schlußendlich sollen die historischen Fakten mit den archäologischen Daten verglichen werden, um 
den Fragekomplex rund um den Olivenölhandel zwischen der Baetica und den nordwestlichen römi-
schen Provinzen zu beantworten.

27. Renata Esposito (University Napels Federico II), Puteoli between East and West: new data for
the late Republican Age

The archaeological excavations carried out since the Nineties of the last century in Pozzuoli, Rione Ter-
na, (the promontory on which the colony was situated), gave important informations about the Phlegrae-
an city in the late-republican age; the new data concern monumental architecture and topography of
the ancient city and contribute to the reconstruction of the economic history of Puteoli thanks to the
conspicuous quantities of pottery found.

The archaeological documentation confirms literary and epigraphic sources and adds new data on the
commercial and productive relationships of Puteoli with the Campanian cities, especially those located
in the Bay of Naples and on the circulation of goods and commercial relationships between the Phle-
grean city and the main Mediterranean harbours.

This paper is focused on some contexts of the late Republican Age (first half II - first half I century B.C.),
useful for the reconstructions of routes and trades.

28. Stella Falzone (1) - Federica Michela Rossi (2) - Ivana Montali (2) - Carmelita Ariosto (3) - Laura
Cianfriglia (2) Un edificio sulle sponde del Tevere: testimonianze produttive e commerciali nella
basse valle tiberina

(1) Centro Studi Pittura Romana Ostiense
(2) Ricercatore Indipendente
(3) Soprintendenza Archeologia, Belle Arti e Paesaggio di Roma

Dal 2005 in via delle Idrovore della Magliana (Roma) indagini archeologiche della ex Soprintenden-
speciale ai Beni Archeologici di Roma hanno portato all'individuazione di un edificio di 4 vani (di ca 250
mq), realizzato con scheggioli di tufo legati da argilla, conservati per un'altezza m 2 e di cui sono state
evidenziate due fasi costruttive (tra il V e gli inizi del IV sec. a.C.). All'esterno dell'edificio sono riferibili
alla fase più recente pavimentazioni in ciottoli di fiume, un pozzo e un lungo muro di contenimento del-
le acque. Il rinvenimento di lastre e scheggioli di tufo misti a numerosi
fittili sono da ritenersi l'esito
della distruzione alluvionale dell'edificio stesso e probabilmente di una struttura in funzione di un
approdo sul lato destro del Tevere. La presenza di tali manufatti a ridosso del fiume, associata ad ingenti
quantità di frammenti ceramiche caratterizzati da un'ampia tassonomia tipologica, consentono di ipotiz-
zare una preminente funzione di stoccaggio di materiali lungo il corso del Tevere. Inoltre, il cospicuo
numero di frammenti ceramiche interpretabili come scarti di lavorazione e la presenza di distanziatori
e di probabili piani di cottura nell'area esterna dell'edificio stesso edilifico di un'attività manufa-
turiera. Queste evidenze consentono di acquisire nuovi elementi utili alla comprensione della natura
degli insediamenti del territorio posti sul lato destro la bassa valle del Tevere, recentemente rinvenuti e
in corso di studio.

29. Zeina Fani Alpi (Lebanese University Beirut), Les iconographies de Psyché sur les monuments
antique du Liban

Personnification de l'âme chez les Grecs, Psyché fut introduite au Liban dès la période hellénistique.
Sur les terres cuites de Kharayeb, elle figure en couple avec Éros. Comme l'indique son nom grec, Psyché
peut alors apparaître en papillon. À Kharayeb toujours, une terre cuite montre Éros qui retient
contre sa poitrine un papillon.

Nous retrouvons l'iconographie de Psyché assise pensive devant la mort, avec des variations multiples,
sur des cippes et des sarcophages de Sidon d'époque romaine.
Parmi ces iconographies communes au Liban, il faut distinguer trois cas. D'abord, la grotte de Mogharât el Khan où trois médaillons représentent l'épisode du sacrifice de la mythologie grecque de Psyché. Sur le linteau du temple de Sîrê, on voit Éros abandonner Psyché. Enfin, une mosaïque de Byblos montre un jeune homme (Éros) dirigeant son arc vers une jeune fille (Psyché) qui protège son cœur de sa main.

La mythologie grecque d'Éros et de Psyché semble donc s'être parfaitement implantée au Liban hellénistique et romain, et cette acclimatation suppose une singulièr e capacité d'assimilation du milieu oriental.

30. Hadi Faraji Cheshmeh Zangi, Seyed Keramat Hashemi, Mohsen Mansorizadeh, Motahareh Hatami, Marjan Ghanbari, Fatemeh Mehdikhani, Measuring the Potentials and locating Tourism centers in Kohgiloyeh and Boyer Ahmad

Tourism, as a European industry is considered as one of three money making jobs in the world, but in Iran it hasn`t prospered yet. Since the basis for many tourism activities is natural attractions, ecotourism is in focus of attention for researchers who process the interactional relation between human being and environment. The implementation of tourism projects necessitates an exact recognition of potentials and limitations in the regions. After the advent of GIS (geographic information system), suitable places for tourism were recognized and located. In this research, necessary substructures were designed in 5 and 10- year periods to develop tourism in the province in accordance with the standards of culture and tourism heritage organization. Then we applied topographic conditions of different fields based on systematic and practical method. SPSS software was used to analyze the data and ARC GIS was applied to analyze locations and establishments of specific points on the map. GIS was used to locate suitable attractions, suggested substructures in the cities in Kohgiloyeh and Boyer Ahmad, and then suggested tourism services map was designed for each city. The results showed that about half of tourism attractions in this province haven`t been located properly and lack tourism services and facilities, although they have many good potentials.

Key words: tourism, GIS (geographic information system), measuring potentials, locating, Kohgiloye and Boyer Ahmad

31. Ricardo Fernandes (Max Planck Institute Jena), Is radiocarbon dating a useful tool for Classical Archaeology?

Essential to historical research is the availability of reliable and precise chronologies. This is often achievable within Classical Archaeology given the abundance of written sources and well-datable artefacts. However, chronological uncertainties may persist when contexts are poor in datable remains, the stratigraphy is unclear or has been disturbed, or when organic artefacts (e.g. bone) are decontextualized. Under these and other circumstances one can pose the question: is radiocarbon dating a useful tool for Classical Archaeology?

Within this paper, the basis of the radiocarbon dating method will be presented and its principal weaknesses and strengths discussed. Particular attention will be given to the importance of secure contextual associations and of a reliable stratigraphy, quality assessment of datable organic samples, and how the radiocarbon calibration process impacts on chronological precision. Following this, chronological Bayesian models will be introduced. These models allow for the combination of multiple sources of chronological information (e.g. radiocarbon dates, stratigraphic sequences, typology) leading to more precise chronologies of artefacts or events.

Finally, new radiocarbon results from excavated Roman archaeological sites will be shown. These examples serve to illustrate how an approach combining radiocarbon dating and Bayesian modelling can provide unexpected insights into the chronology of burial practices and artefact production and exchange.
32. María Fernández-Baizan Portaencasa (University of Alcalá), Los ejércitos privados como manifestación de la continuidad del sistema económico provincial en Hispania desde el s. IV d. C.

I fenómeno de los ejércitos privados ha sido definido, en contraposición al ejército regular. La utilización de este tipo de tropas muestra la continuidad del sistema económico provincial en Hispania desde al menos el s. IV d. C.: grandes predios repletos de villae (Arce, 2007, p. 43), en manos de una clase terrateniente. J. Arce señala, además, que el proceso de recluta por parte de los terratenientes hispanos, de cara a la organización de la resistencia frente a los conflictos de usurpación comunes en la época, fue “largo y costoso”, en referencia a la afirmación de Orosio de que reunieron efectivos durante mucho tiempo. Sin embargo, lo probable es que estos ejércitos no fuesen una creación ex novo, sino que existirían previamente, aunque, por su composición (esclavos, siervos, clientes, colonos, además de mercenarios, y otros procedentes de levas eventuales en los alrededores), no estarían en funcionamiento todo el tiempo. La cuestión de cómo habrían obtenido medios para armar y mantener a su ejército privado no es baladí, ya que, ni estaba permitido que los privados portasen armas (aunque se debe admitir la posibilidad de abastecerse con sus propios hornos de fundición) ni había una fabrica armorum en Hispania con la que abastecerse. Los estudios arqueológicos, en lo que se refiere a la circulación de armas por la Península, en esta cronología, muestran un gran auge de las lanzas como arma ofensiva, además de una importante ausencia de espadas.

33. Isabel Fernández-García (University of Granada) and Manuel Moreno Alcaide (Universidad de Granada - University of Cambridge) Notas acerca del comercio de la terra sigillata hispánica de origen bético. El caso de los alfares romanos de Los Villares de Andújar (Jaén, España)

La ciudad romana de Isturgi (Los Villares de Andújar) albergó un importante barrio artesanal destinado a las manufacturas alfareras. Cuando la terra sigillata hispánica comienza a fabricarse se impone masivamente sobre el resto de clases cerámicas. El camino hacia la reconstrucción de las estructuras de comercialización de los alfares isturgitanos es una tarea compleja, no exenta de inconvenientes propiciados por la diversidad de los datos que manejamos. Un primer intento de aproximación a la difusión de los productos isturgitanos se centrará tanto en los sigilla como en las sintaxis compositivas de determinadas officinae cuyas creaciones con personalidad propia permiten diferenciarlas del resto de los alfares de sigillata hispánica conocidos tanto de la Baetica como de la Tarraconense. Sigilla de carácter epigráfico se documentan durante las dos primeras generaciones de alfareros productores de terra sigillata (época prefлавa y flavia respectivamente). Igualmente en ambas generaciones se observa una gran riqueza ornamental en los productos decorados. La tercera generación (fines siglo I/siglo II), aunque menos conocida, se caracteriza por las marcas de entalle con la que ciertas officinae firman anepigráfamente sus manufacturas.

34. Begoña Fernández Rojo (University Leon) - Verónica del Río Canedo, La forma López Mullor XLVII en vertederos altoimperiales de Augusta Emerita: Producción en paredes finas y en cerámica común

A través de esta propuesta de póster, pretendemos exponer los resultados obtenidos en la primera fase de investigación realizada sobre la forma XLVII de López Mullor documentada entre el repertorio material procedente de varios vertederos de cronología altoimperial de Augusta Emerita, (Badajoz, España).

Nuestro principal objetivo se centra en dar respuesta a la problemática surgida sobre el origen de esta manufactura cerámica enunciada, entrando en la disputativa sobre si su origen es local, o si, por el contrario, su centro de producción se ubica en otro punto geográfico, aunque su dispersión llegase a la capital lusitana y su entorno. El enfoque con que hemos abordado este tema es más bien estadístico, realizando un muestreo selectivo para corroborar la presencia y frecuencia de esta tipología en diversos vertederos de la ciudad augusta, donde hay constancia de una producción consistente de paredes finas.

Los resultados de los primeros contextos analizados son satisfactorios, estableciendo un porcentaje semejante a otras producciones genuinamente emeritenses. Si bien la tipología objeto de estudio se centraba hasta el momento en paredes finas, hemos encontrado que esta forma se realizaba en cerá-
mica común romana con cierta asiduidad, llegando a alcanzar algunos de estos ejemplares unas dimensiones considerables. Este dato, podría ayudarnos a sustentar la hipótesis de la posible producción propia dado la recurrencia de esta forma en diversas pastas.

35. Stefan Feuser (Christian-Albrechts-Universität zu Kiel), Ancient Cities. Creating a Digital learning Environment on Cultural Heritage

In the Strategic Partnership “Ancient Cities” (ERASMUS+) six European Universities cooperate in creating an innovative pan-European digital learning module for universities as well as a MOOC for a broader audience on an important part of the shared European heritage: Cities of the Greeks and Romans. The digital learning module will apply the didactic method of inverted-classroom, combining phases of self-learning by video lectures and introductory texts with online seminars let by a tutor/teacher. Both video lectures and learning material are open educational resources.

36. Manuel Fiedler, Die Kleinsiedlung Babunja bei Apollonia (Albanien). Ein Beitrag zur Kolonisierung am Adriatischen und Ionischen Meer


37. Wolfgang Filser (Humboldt-University Berlin), Emulation als Leitmotiv. Conspicuous consumption in der Casa della Fontana Piccola


38. Mariagrazia Giuseppina Finistrella (University of Bonn), Late Roman Amphorae in Garrison's Camp area, Nea Paphos: the most attested types and some considerations about

In this speech the mostly unpublished data about the most attested types of Late Roman Amphorae found during the excavations of University of Catania in Garrison’s Camp area, in the north-western part of the city of Nea Paphos, will be presented together with some considerations about their presence in the area. This contribution is part of my Research Project, in progress at the University of Bonn from the end of 2014, about all the transport amphorae from Garrison’s Camp area and, generally, about the commercial routes in the Eastern Mediterranean through the study of this particular vessel found in different areas of the site of Nea Paphos. The analysis of the most important Eastern late Roman productions is useful for a deeper understanding of the transformations occurred in Garrison’s camp area starting from the IVth century AD, until the destructive arrival of the Arabs in the VIIth century AD. The presence in the site of a remarkable quantity of fragments especially from the Microasiatic, Aegean and Palestinian areas, proves the existence of numerous commercial links, regional and extra-regional, underlining the peculiarities of its particular role, both religious and residential, during the late Roman-early Byzantine time.
39. Agnese Livia Fischetti (University of Groningen), The Villa of Quinto Voconio Pollione in the suburbium of Rome: indicators of production from recent excavations

In Ciampino, a Municipality close to Rome, is located the villa of Q. V. Pollione, one of the most important Roman Villa of the suburbium. The villa is already known from the end of the 19th century, thanks to the documentation of R. Lanciani, who described the richness of the residential space, and provides a lot of detail about the building, the decorative elements and the marble statues that emphasized the status of its owner. After more than one century the archaeological excavations in the same area brought to light more features linked to the pars rustica of this villa. These include a doliarium, tanks excavated in the tuff, located at different levels and connected together by lead pipelines, a big cistern close to the ruins of a pillar and perhaps the remains of a torcular. Moreover, based on the recent analysis of the archaeological materials from the site, suggests that glass production took place inside the villa.

This poster presents a study of the productive space, in particular of glass, which has not been considered until now. It aims to give a preliminary idea about the artefacts associated with the several production contexts identified and tries to understand the chronology of the production. Moreover, an assessment will be made whether the production was aimed to meet the demands of the villa or if it also aimed at the commercial market of the city of Rome, with which the site is connected through the via Castrimienense.

40. Anca Cezarina Fulger (Accademia di Romania in Rome), La guerra, strumento che implica la realizzazione di nuove infrastrutture: il ponte sul Danubio

L'intervento pone in primo piano l'analisi di fonti antiche letterarie, epigrafiche e iconografiche relativi alla costruzione del ponte sul Danubio. Se da un punto di vista archeologico l'indagine conoscitiva è tutta da impostare, migliore è la situazione dal punto di vista storico-interpretativo anche se, a tale riguardo, risulta poco credibile l'ipotesi che il ponte sia stato reso impraticabile dall'imperatore Adriano. Capolavoro dell'ingegneria antica e del genio di Apollo dorodo di Damasco, il ponte era la chiara manifestazione degli intenti di Roma: impiantarsi stabilmente sulla sponda nord del Danubio e preparare l'annessione dell'intera Dacia. Costruito per l'ordine dell'imperatore Traiano il ponte sul Danubio rappresenta una delle più spettacolari e significative opere costruttive di questo genere, una vera infrastruttura romana, sia per la sua grandezza, la qualità del lavoro svolto, ma più che altro per la sua brevità di esecuzione, tra la primavera del 103 e la primavera del 105 d.C. La costruzione del ponte, certamente deve aver avuto per il suo ideatore quanto per l'Impero Romano, un doppio significato: da una parte esprimere lo stupore per la grandezza del manufatto, il tempo di esecuzione e la manodopera impressionante impiegata, ma anche l'indiscussa supremazia romana verso ogni altro popolo, connotazioni bivalenti che conturano l'avanzata in deprecabile della civiltà latina verso l'Europa centrale, attraverso il processo di romanizzazione.

41. Martina Fusi, Economy of pottery production: new clues from Populonia

The discovery of a missing handicraft district in Populonia used in the production of ceramics has changed the perception of the local pottery industry. Local production had been hypothesized for common pottery and for some cups of Atelier des petites estampilles. These assumptions had not been supported by the necessary evidence of finding either production indicators or by chemical analysis. Based on this hypothesis, a study was launched to determine the local pottery production in Populonia, with special attention being paid to the Hellenistic period. The results of this investigation permitted the recognition and classification of a variety of pottery spacers found. One bell-shaped and four ring-shaped spacers come from the so-called House of Seeds, close to the Populonian harbor. Three ring-shaped spacers uncovered from a layer dating to the Hellenistic period in the Necropolis of Casone. Another group of 15 pottery spacers – ring, bell, cylindrical-shaped – were recovered from the archaeological materials unearthed in Populonia, these have been stored in the archives of the ex-Soprintendenza Archeologia della Toscana.
The pottery spacers from Populonia are an important novelty: they have finally been identified as local productions. Thanks to this study we have plausible affirmation of the existence of a local ceramic industry: typology and contextualization of the spacers allow us to hypothesize some of the different pottery classes manufactured in this area.

42. Marialucia Giacco (University Naples Federico II), Le pitture mitologiche a soggetto amoroso da Pompei ed Ercolano: riflessioni su tecniche di produzione, iconografie, contesti e significati

Alla luce dei più recenti filoni della ricerca iconografica e iconologica, l’intervento si propone di analizzare le modalità di selezione, ricezione e rielaborazione dei miti dell’amore raffigurati sugli affreschi che decoravano le abitazioni private delle città vesuviane.

Partendo dall’assunto fondamentale che, in ogni società e in ogni epoca, alle immagini è sempre sottesa la volontà di trasmettere un messaggio specifico, attraverso uno screening ragionato e complessivo dei motivi iconografici ricorrenti, si tenterà di definire le possibili ragioni alla base delle scelte figurative, della creazione di determinate sequenze e associazioni di immagini e di nessi tematici, nonché delle necessità auto-rappresentative dei committenti, in relazione alle diverse epoche storiche e ai diversi contesti socio-culturali.

Attraverso la disamina dettagliata e la scomposizione degli schemi iconografici utilizzati, si tenterà di individuare e definire l’allora corrente concetto di amore, in tutte le sue possibili manifestazioni gestuali, simboliche, espressive e, laddove possibile, emotive e psicologiche, ponendo lo studio delle singole iconografie in rapporto costante con i rispettivi contesti di destinazione e di fruizione e giungere così alla concezione dell’immagine, del suo significato e del suo contesto come unità polisemica di un unico sistema di comunicazione, espressione dei valori e delle aspirazioni dei singoli o di un’intera comunità.

43. Maria Teresa Giannotta (CNR - Italian National Research Council) - Mariateresa Lettieri (CNR – IBAM), The knowledge of classical food for babies in the Southern Italy through the analyses of organic residues from pottery

In the Greek funerary contexts, a peculiar pottery vase called “guttus” is sometimes found. The “guttus” is a closed vessel with low base ring, globular or ovoid body, a short and narrow neck, a small rim, a vertical handle from below rim to shoulder; a spout is placed, at right angles with the handle, in the upper part of the body.

In the past, the function of this vase was attributed to pour oil into the lamps. However, the presence of these vessels mainly in infantile funerary goods, as proved by the contextual presence of toys, has led to debate about the actual function of the “guttus”.

In the southern Italy, this kind of vase is usually found in tombs, dated to 4th and 3rd centuries BC, from both the Greek colony of Taranto and the Messapian region.

In this study, chemical analyses (such as FTIR spectroscopy) were performed to investigate the presence and the nature of the contents in similar vases from tombs discovered in Manduria, near Taranto. The presence of residues due to milk-based foods accounts for the use in the nutrition of babies. The analyses allowed hypothesizing that ovine milk was used.

The results of our research contribute to reconstruct the dietary choices for babies and implement the understanding of the archaeological data related to diet in the Mediterranean classical world.

44. Rossella Gigli (CNR - Italian National Research Council), Jewellery from the Necropolis of Prianiàs (Crete)

I propose in this poster some preliminary remarks on the study of the precious ornaments found in the tombs of the Necropolis of Siderospilia at Prianiàs (Crete) during the excavations conducted by the University of Catania since 1969. They consist mainly of small golden and silver artifacts - pendants, finger rings, earrings, plaques originally applied to clothes - and by rock crystal, faience, hard stone beads, most of them belonging originally to necklaces. This group of precious items constitutes one of the most relevant complexes of materials of such type, comparable to those found in the necropolis of Knossos and Eleutherna. The presence of golden items inside the cemetery is able to provide a lot of
information about the status and wealth of the inhabitants of the site just at the beginning of the first millennium BC, and can be symptomatic of contacts with abroad, in particular with Cyprus. Already in the depositions of the first phase of the necropolis gold is often associated with bronze objects. It is not unlikely that the very early examples have arrived in Priniás from outside, following the flux of Eastern influences and imports that in this period seem to involve different aspects of the Cretan material culture.

45. Emanuele Pio Guida (1), Cosimo Damiano Diella (2), Melissa Mangione (1), Production and trade in the Roman Empire: the villa of Masseria Selvaggi

(1) University Bari
(2) Università degli Studi di Firenze

The excavations made by Soprintendenza per i Beni Archeologici della Puglia near Masseria Selvaggi (Lucera, Foggia) between February and June 2002 showed a roman furnace which produced tiles, bricks and amphorae with the inscription Q(inti) Cassi. Through the analysis of big amount and variety of materials found near the buried structure, which includes common fire-proof and dining pottery, black painted pottery, thin wall pottery, sealed pottery, currencies, oyster shells, chassis weights, vitreous paste and objects made up of glass, lead, bronze, iron and nacre, it’s possible to deduce Quintus Cassius was the owner of a villa of late republic-early empire. The interpretation of the archaeological evidence are increased by the lack of precise stratigraphy and the absence of the survey of residential structures, but the topographical survey of site of Masseria Selvaggi contextualized in the larger territory of Ager Lucerinus, the study of the furnace and the analysis of thin wall pottery will point out the productive activities and the economical relationships between the villa of Masseria Selvaggi and the other regions of Southern Italy in the Late Republic and Early Empire.

46. Margriet Haagsma (1), Sophia Karapanou (2), Laura Surtees, Domestic Economies and Social Organization at Kastro Kallithea, Thessaly, Greece: an Integrated Approach

(1) University of Alberta
(2) 15th Ephorate, Larissa
(3) Bryn Mawr College

The so-called Kastro of Kallithea represents an urban center dating to the Late Classical and Hellenistic period in Thessaly, Greece. The 15th Ephorate at Larissa and the University of Alberta have worked together at this site since 2004. The project’s main goals are to establish a regional archaeological context for the social and economic transformations in Thessaly in the Hellenistic period which we study through the lens of the household in its urban-rural continuum. The past 13 years have seen the conclusion of the archaeological and architectural urban survey and excavations at the city’s agora and housing area which have provided important information on the city’s occupation span and role in regional economies.

Our poster will focus on the economic interaction between household, city and chora based on the results of the excavation of ‘Building 10’. Located on the eastern slopes of the site, Building 10 is a large structure, with a surface area measuring approximately 300 m2 (20m x 15m). The analysis of the architectural configuration and excavation data suggests that the building, constructed in the late 3rd or early 2nd century BCE, had a domestic function. We will present an overview of our approach towards the organization of domestic activities and the economic foundations of the household in which we place the artefact and ecofact assemblages in their geopolitical, economic and environmental contexts.

47. Carina Hasenzagl (Ghent University), Breaking news! How a sherd's fresh break can help to reconstruct the distribution patterns of African Red Slip Ware

African Red Slip Ware was produced in the Roman provinces in modern-day Tunisia and exported to the whole Mediterranean basin on a massive scale. It has long been used for tracing and explaining supraregional trade. However, the economic link between the individual Tunisian production centers and the Mediterranean consumption sites has been rather neglected. Fundamental for reconstructing these links is to identify the exact origin of African Red Slip Ware – a task that frequently fails due to the con-
troversial subdivision (A, C, D, E etc.) of African tableware and due to financial limitations for archaeometric analyses. Alternatively, fabric analysis is a tool to distinguish the products of Tunisian workshops by their specific microscopic features discernable on a fresh break.

Samples with archaeologically secured provenance from the pottery collection of the Dutch archaeologist Jan Willem Salomonson were used to characterize the tableware of several North and Central Tunisian workshops. Tracing these distinguished productions in selected Mediterranean consumption sites enables to reconstruct economic relations between the Tunisian producers and Mediterranean consumers. This contribution presents preliminary results of the distribution patterns of different Tunisian workshops in the consumption site of Pantelleria during late Antiquity.

48. Julia Janicka (Catalan Institute of Classical Archaeology), The influence of the Tyrrhenian Group on Etruscan pottery

Etruria was a very attractive and competitive market for the Greeks to export pottery. Since the 6th c. BC we have proof of it, beginning with the Corinthian Group (early 6th c.), continued by the Tyrrhenian Group (from 575 until 530 BC), from a rival Attic market and followed by Nikosthenic amphorae (550-510 BC). The trade affected the domestic market and triggered a production of its own, the so-called Pontic Group (550-500 BC) and the Caere Hydriai (530-510 BC). The pottery mentioned above was excavated since the beginning of the 18th c. with no acknowledgment for stratigraphy. My goal is to evaluate the impact of the Tyrrhenian Group on the Etruscan pottery by analyzing the iconographic style, inscriptions and shapes of the vases. Factors such as the shape, choice of mythical subjects and scene composition, general decorative scheme and noticeable Corinthian influence show a strong resemblance to the works of early Attic black-figure painters such as the C Painter, Kleitias, Lydos and Sophilos: artists who worked in Athens during the mid to late 570s BC. Furthermore, instances of Tyrrhenian Group specimens found in tomb excavations throughout southern Etruria show the Group reaching prominence during the mid-6th century BC. Why did the Etruscans favour Greek pottery? What was their awareness of Greek myths? Was it in the buyers hands to request the iconography motives on the vases or was it imposed on them? These are the questions I will try to answer.

49. Brita Jansen, Seleukeia Gadara (Umm Qays, Jordanien) - ökonomische Aspekte einer hellenistischen Befestigung


50. Eva Kanis, Die Vatergottheiten - Aussehen, Aufgaben, Attribute. Die Problematik der ähnlichen Darstellung in griechischer und römischer Zeit

Mein Promotionsprojekt mit dem Arbeitstitel „Die Vatergottheiten – Aussehen, Aufgaben, Attribute. Die Problematik der ähnlichen Darstellung in griechischer und römischer Zeit“ soll einen Beitrag leisten zu der Diskussion um die Interpretation antiker Darstellungen von bärtigen, männlichen Gottheiten. Die Relevanz des Themas besteht darin, dass es in der Klassischen Archäologie immer wieder zu kontrover-
sen Diskussionen über die nahezu gleiche Darstellung der sogenannten Vatergottheiten Zeus, Poseidon, Hades und – ab dem 4. Jh. v. Chr. – Asklepios und Serapis kommt.

51. Abdelfattah Ichkhakh (1) - Mohamed Kbiri Alaoui (2) - Charlotte Carrato (3) - Elsa Rocca (4) - Laurent Callegarin (5) - Claire-Anne de Chazelles (6) - Véronique Mathieu (6) - Jean-Baptiste Pineau (3), New discovery of an urban winery in Rirha, Gharb Valley, Morocco (3nd century AD)

(1) Moroccan Ministry of Culture
(2) National Institute of Archaeology and Patrimony Sciences
(3) UMR 5140-Archéologie des sociétés méditerranéennes
(4) Université Paul Valéry UMR 5140-Archéologie des sociétés méditerranéennes
(5) Casa de Velazquez
(6) UMR 5140-Archéologie des sociétés méditerranéennes, CNRS

Since 2004, the archaeological programme at Rirha is exploring the remains of a major settlement in the Gharb plain in northern Morocco. The site – continuously occupied from the 5th BC to the 14th AD – provides the possibility to study the cultural identity of Mauri people in a diachronic perspective. In Roman times, the urban centre was integrated to the province of Mauretania Tingitana, at the boundaries of the Roman Empire. From this period, we especially know the eastern neighbourhood (Ensemble 1), along the urban wall, which has delivered the remains of a domus annexed to an urban producing facility.

52. Nisa Kirchengast (University Vienna), Fleischkonsum und Umgang mit Schlachtabfällen im Kontext ökonomischer Formationsprozesse in Carnuntum, Österreich


53. Rebecca Diana Klug (Georg-August-Universitaet Goettingen), Settlement dynamics in rural Sicily in Roman times

The Agrigento-Hinterland-Survey was conducted from 2008 to 2013. The research area covers the territories of the modern communities Cianciana, Alessandria della Rocca, Bivona and Santo Stefano Quisquina, in total 274 km². 80 spots with roman ceramics were detected, 60 of these were surveyed intensively and were qualified as sites. The deeper research of the finds, predominantly ceramics, allows us, together with the size of the sites, the find density, and the quantity and quality of finds, to interpret the type or the functions of these sites, and to date them.

Beside some villae rusticae, in this area, we have located several farmsteads of different scale. In parts, the villae rusticae and the farmsteads are close together, especially the smaller farmsteads. Therefore, it is necessary to analyse the relationship between these sites to understand the settlement pattern and the settlement dynamics. However, we should not forget to consider the vici. Several of these are located in the research area.

In my paper, I will try to analyse the relationship and the dependencies between the vici, the villae and the farmstead to understand the use and therefore the settlement pattern of a rural area without a roman city as a centre.

The analysis of sites dating to the roman times is a good starting point conduct further research on Roman settlement patterns and settlement dynamics in Sicily.

54. Rifat Eser Kortanoğlu (Anadolu University), Political-Economy Discourses in Metaphorique Construction of Greek Temple
The principal search for the presentation is what is the "Greek Temple" question. Presentation, what is the temple? What is the Greek Temple? Which discourse is the result? What discourse does it produce? Such as the questions themselves want to be. Within this framework, origins, meanings of the terms of naos, peribolos, temenos and bomos and the manner of producing the hierarchies created by those meanings in our minds become supplements to the structure of the text. Worshipping rituals of polytheistic religions and monotheistic religions and the difference between the sacred structures realized by those rituals have great role on the meanings given to the metaphorical structure of mass. The transformation between semantic fictions can only be attributed to the discontinuity of the architecture. Temenos has been the most fundamental space element of worshipping from the beginning. Peribolos is the wall lining the framework of sacred area. But it represents the hierarchy of discontinuity as a "parergon". Bomos is the worshipping itself. All three are essential elements of the Ancient Greek religious architecture. So, what is naos? When is it revealed? How does it come to the point where it would represent a civilization alone in addition to being the most inspired structure of Greek Architecture? How does it transform this singularity into a tradition surviving to date? And The Power, How it benefit produced of economic-political discourses of the Greek temple?

55. Patrick Kremser, Work in progress. Trade depictions on the so-called topographical border of the "Yakto mosaic"

Since its first publication by Jean Lassus in 1934, scholars have been captivated by the "topographical border" of the late antique Megalopsychia mosaic from Yakto. It has generally been accounted as unique by its distinctive combination of architectural, figural and inscriptional layers, the exact reading of which still challenges the scholars. Three 'genre scenes' (a term originally established by Doro Levi) showing different labourers in pursuance of their trade might be of special interest. It is during the search for iconographic parallels which would help to identify these rather badly preserved and therefore hardly discernible images that one finally comes across the dissertation of Gerhard Zimmer (published 1982), in which he thoroughly concerned with the iconographic evidence of Roman trades, mostly on the basis of Roman funerary reliefs dating from the 1st cent. BC to the 3rd cent. AD. This leads to the following questions: Is there indeed less proof for trade depictions in Late Antiquity than for Classical Antiquity? Or is this lack of proof simply based on a lack of knowledge? The poster aims at illustrating in which way the topographical border hands down classical motifs concerning the depiction of trades and therefore functions as an important missing link for this sort of everyday life depictions in the 5th century.

56. Paulina Kucharska-Budzik, Anaxyrides in the Greek Art

The poster aims at presenting the issue of west-Iranian trousers called anaxyrides and their representations in the Greek art. The period analyzed in the poster are the years from the 6th c. a.C. until the 4th c. a.C.

Anaxyrides were worn by the Medes, Persians, Armenians, Scythes and Cappadocians but also by the mythical Amazons and Arimasps. We base our knowledge about those Iranian trousers on literary records and Achaemenid and Graeco-Persian iconographical sources.

In the West, in the Classical period Greek aristocracy often incorporated items of Oriental dress into their own Greek costume. Nevertheless, anaxyrides were rejected in the Greek and Macedonian world. Even Alexander the Great who adopted many elements of the Iranian costume after 330 a.C. did not use anaxyrides. One of the goals of this poster is to present the thesis why trousers were not used by the Greeks and Macedonians.

And yet, anaxyrides were depicted in the Greek art of this period on various objects which is proved by the extant works of art. Persons wearing anaxyrides on those artefacts are the Iranians, Amazons, Scythes and Arimasps.

The poster will attempt at presenting a typology of anaxyrides depicted in the Greek art. I will divide the trousers into different types according to their shape and decoration and assign those types to different groups of people wearing them in the analyzed depictions and to the periods in which the depictions were created.
57. David Laguna Palma and Pablo Barruezo Vaquero (University of Granada), Commercial networks and prestigious goods exchange in the Oriental Mediterranean sea during Antiquity

This presentation is due to a huge interest and a need of trying to understand how diverse cultures - which experienced their born and development around the Mediterranean sea during the Antiquity - were less hermetic than at first glance can be seem. It is going to show that this sea played a conductive role for the transferation of elements of all kind and from diverse areas within the territories, marking the development and evolution of each one of these cultures. On account of the complexity and great extension, we will focus in the Oriental Mediterranean sea. Building our research upon an interdiscipli-nary methodology, it is going to be analised archaeological, pictorical and linguistic sources, which are testimonies of political, economic and cultural contacts between different worlds. In these relationships, the Oriental Mediterranean sea was an essential place. In such a way, it is necessary to define the material conditions which made possible such interactions, as well as the maritime commercial routes. Ultimately, for getting close to this historical reality, it is going to be used a diversity of sources, with the final aim of throwing light to the societies and economies which were developed in this space, that was way more dynamic than previously thought.

58. Sina Lehnig (University Mainz), Dietary Habits in Roman and Byzantine Palestine on the Background of Ecological, Demographic and Cultural Realities

Food is a basic human need and therefore a defining characteristic of all societies. Our diet reflects the tight limits of our ecosystems, with their unique climates, soils, fauna and flora on the one hand, and our cultural affiliations with their fasting rules and traditions on the other hand. The aim of the presentation is to investigate dietary concepts in Palestine during the Roman and Byzantine period: Even today the working area is characterised by a diversity of ecosystems and cultural areas on a small space. From the fertile Carmel Mountains in the north, to the arid regions of the Negev, people had to face different ecological and social challenges to subsist. In the Roman and Byzantine period land use patterns and dietary habits were subject to continuous change due to political and religious transformations: An emerging Christian community mixed with the local pagan and Jewish population, and by the end of the Byzantine period the region was affected by the Arab Conquest. In this strong area of tension between environmental, demographic and cultural challenges, the investigation of past human diet is the key to decode how people responded to them. Therefore, faunal remains from archaeological sites of different ecological context, settlement size and cultural affiliation are selected for study. Their investigation will allow to compare dietary habits between different ecosystems, as well as between large towns, villages and rural farms.

59. Majlinda Liçi (University Tirana), Economic and social life in Illyria

In this paper we will try to highlight some aspects of the economic and social life of the predecessors of the Albanians, the Illyrians. Illyrians as one of the oldest entities in the Balkans and Europe have attracted the attention of many Albanian and foreign scholars and have been subject of their studies and archaeological expeditions, intentionally, deepening the recognition of life, economic development, Illyrian civilization and collecting materials that prove the Illyrian-Albanian continuity. This study, which analyzes documenting historical data and source materials, use descriptive research method to describe the characteristics of the Illyrians that had lived in a vast territory of the Western Balkans and organized into tribes and during the 4th-3th century BC some of these tribes strengthened their positions and dominated other tribes, creating monarchic state formations such as the Illyrian kingdom, the Dardanian kingdom, and state of Epirus. Despite this seemingly unrestricted tribal organization, they developed a culture that distinguished them from their Greek and Roman neighbours. I also argue that Each of those tribes was characterized by cultural, social, environmental and economic particularities, as a result of their position, location, favorable or disadvantageous factors of relief and other economic factors. In general, the Illyrians engaged in activities such as agriculture, livestock farming, etc.
60. Eftixia Ligouri-Tolia, Anna Maria Anagnostopoulou, Mary Giamalidi and Kornilia Daifa (Ephorate of Antiquities of West Attica), Organization of space in the countryside of Attica: a new potter's workshop in the ancient deme of Aixonides Alai

The site of Aghios Nikolaos Pallon (Voula, Attica) comes under the auspices of the Ephorate of Antiquities of West Attica, Piraeus and Islands. Since 2011 excavation has brought to light substantial antiquities that cast light on our understanding of life in the coastal demes of Attica. The site falls within the geographical boundaries of the ancient municipality of Alai Aixonides. Ongoing research testifies its continuous use from the classical up to Byzantine times. Part of a burial enclosure and remains of a road are dated to classical times. In Roman times operated an industrial facility comprising four kilns, two of which were built within the boundaries of the enclosure. East of the kilns lies a building complex consisting of thirteen rooms arranged around an open area. The kilns and the architectural remains point to the existence of a potter's quarter. According to finds the complex was in use until late antiquity. Its location is nodal for commerce for it lies close to the ancient road that led from Athens to Souinion and close to the sea. Furthermore, its discovery has significantly enriched our knowledge about the organization and the economy in a coastal deme of Attica during Roman times and late antiquity, since it is the first pottery workshop discovered in the wider area. During the Byzantine period two small churches were erected on top of the classical enclosure and the workshop. Both belong to the type of single-aisled basilica.

61. Anna Rita Marchi (Soprintendenza Archeologia di Parma e Piacenza) - Marilena Salemi, Evidences about the production of black glazed ware in Parma during Republican age

The recent archaeological excavations carried out at via del Conservatorio in Parma (2011-2017), beside putting in light part of an insula located near the south-western part of the walls of the Roman colonia of Parma (established in 183 BC), allowed to investigate part of a productive complex dated between late 2nd and 1st century BC, ie before the complete urbanization of the area occurred during the principate of Augustus.

In particular, evidences have emerged of at least two pottery kilns, one of which was surely used in its ultimate stage of life for the production of thin walled ware, a workshop with lathe and other structures functional to the processing and storage of the ceramic forms. To the south of the complex, a large pit filled with multiple discharges of different materials has been excavated: these materials were connected to the processing of vitreous pastes and animal bones, and mostly to the production of thin walled and coarse ware forms, including lids.

Interesting and totally unexpected was the discovery of numerous black glazed ware specimens, characterized by clear baking errors, beside to scraps of the same production: based on these evidences, it is therefore possible to hypothesize the existence in the area of a workshop specially crafted for the production of open forms and linked to a local context characterized by original aspects and stylistic and cultural contaminations coming from the Etruscan-Padan world.

62. Bartolomé Mora Serrano (1) - Ana Arancibia Román (2) - Víctor Martínez Hahnmüller (3) - Carmen Ana Pardo Barrionuevo (4), Phoenician and Punic Malaka: centrality or periphery?

(1) University of Malaga
(2) Taller de Investigaciones Arqueológicas
(3) Ghent University
(4) University of Almeria

The main purpose of this paper is to show the ancient topography and urbanism of the city with a reliable diachronic topographical model of the urban evolution of the city and its ground adaptation. It should be noted in this regard that Malaka is one of the few cities of Phoenician-Punic tradition in which has been documented, even incomplete in most of the cases, domestic structures, military walls, temples/sanctuaries, necropolis and industrial areas. Its unequal urban design stands in direct opposition to its control of the hinterland, where Malaka functioned as a main center of a big area in which
mining, farming, livestock farming and fishing were usual activities for its rural sites. Last but not least, its important commercial role as main trade port of the Western Mediterranean, which important links with nearby cities (Iberian, Phoenician and Libian), influenced the urban topography of the city and, above all, its evolution.

63. Nicolò Masturzo (University Torino), Architecture as political and social investment in Late-Classical Ionia and Caria

The paper aims at investigating building activity in Ionia and Caria under the Hekatomnid satraps. Since a long time this phase has been studied under the heading ‘Ionian Renaissance’ or ‘Ionic Renaissance’. W.B. Dinsmoor thought that the distinctive feature of this phenomenon was the new use of the Ionic Style after the 5th century stasis. This is only partially true. New discoveries and studies let appear the political weight of the Hekatomnid building activity in a different light. By employing the traditional Ionic order in the main core of their domain, the Carian basileis signaled perhaps an ideal membership to the Hellenic World. However, also different elements were used by them to qualify themselves in other cultural situations, as in Tegea or in Delphi. That the Hekatomnids court paid a special attention to the perception of stylistic choices by the civic élites of their satrapy, also appears clearly in the mixed order used in the Labraunda andrones. Certainly, we suffer from a lack of evidence from some important sites in Ionia, and also one of the main examples of the representative architecture of Caria, the Mylasa Mausoleum, has been till today only partially published. Despite that, the Hekatomnid building policy results the first and most organic attempt to realize in the West a kind of architecture which is functional to dynastic promotion: in all this, the Achaemenid models stayed only in the background.

64. Daniel Mateo Corredor, Juan Francisco Álvarez Tortosa and Rubén Santana Onrubia (University of Alicante), Production centres and trade relations in the Early Empire. Analysis of the amphorae production from the Tarraconensis central coast: The ARCEA Project

Over the last years, the scientific community has shown a great interest in the studies focused on the production and trade of Roman amphorae in ancient Hispania, as evidenced by projects such as CEPAC, Amphorae ex Hispania or Amphora Project. However, the advances in the knowledge of Hispanic amphorae productions have been uneven, being Tarraconensis northern coast and Baetica the best-known areas. On the contrary, amphorae production of the Tarraconensis central coast is less known, despite the fact that these containers would be traded in the western empire, as shown by classic authors’ references such as Juvenal (SAT., V, 26-30) and Fronto (Epistulae, I, 4, 8-13) and the amphorae findings in Rome. For this reason, a research program has been started which intends to improve the knowledge of this production and its distribution, the ARCEA project, “Production centres and trade relations in the Early Empire. Analysis of the amphorae production of the Tarraconensis central coast”, funded by the University of Alicante. The main action lines that are being developed within this project are:

- Field surveys and excavation of the production centre of La Rana (Gata de Gorgos, Alicante).
- Typological revision, archaeometric characterisation and epigraphical analysis of the central Tarraconensis amphorae.
- Analysis of the cargo of the main evidence of its commercialization "in transit", the Mariposa E shipwreck.

65. Chiara Maria Mauro (University College Dublin), Archaic and Classical Greek Harbours between the Aegean Sea and the Eastern part of the Ionic Sea: a digitised database

This poster presents a project aimed at the study of Greek ports, their evolution and their infrastructures between the archaic and the classical period, a pivotal moment of transition from natural harbours (where protection from wind and current was offered by the natural features of the coast) to artificial intervention on monumental scale. In particular, the focus will centre on the Aegean and Eastern Ionic Sea areas.

The project itself consist of an exhaustive assemblage of data about archaic and classical Greek harbours for the given periods managed into a digitised database, which will form a comprehensive up-to-
date catalogue. This catalogue will be realised thanks to a MySqI database over a WampServer and it will collect the names and the main characteristics of harbours spread all over Greek and Asian coast-scape. Each data sheet will be records ancient and modern toponyms, location, presence of any kind of artificial structures, literary sources and bibliography. In this way, everyone who shows interest in Greek harbours can find different information and consult the database depending on different features. This same catalogue will be used as a documentary basis for examining the evidence for Archaic and Classical harbours. In particular, collected data will serve to determine the most attractive natural places chosen for the location of ancient harbours, the most important kind of the different harbour models in Greek world.

66. Marsha McCoy (University Dallas), Economies of War and Ritual: The Gallic Carnyx

The Gallic or Celtic carnyx, a war trumpet played to unite the Gallic troops, intimidate the enemy with its loud, blaring sound, and frighten opponents with its large boar or serpent head visage, is reported in the Gallic attack on Delphi in 279 BCE, Caesar’s campaigns in Gaul in the 50s BCE, and Claudius’ invasion of Britain in 43 CE. It is one of the most distinctive identifying elements of the Gallic warrior, and is almost always depicted on Roman coins showing Gallic defeats (Crawford, RRC 282/1-5; 448/2a-3). It also appears on reliefs on Trajan’s Column, and on the silver Gundestrup cauldron found in northern Denmark and dating to 150 BCE-50 CE. In 2004 seven carnyces, one almost complete, were excavated in a Gallic military and religious deposit dating to the time of Caesar’s conquest in Tintignac, France, near Limoges. Evidence from the excavations suggests that the carnyces served a ritual as well as a military function. This paper analyzes the extraordinarily prominent place given to the carnyx in representations of Gauls by the Romans, and in Gallic art and burial deposits. Using the theories of cultural anthropologist Dan Sperber in his seminal work, Rethinking Symbolism (Cambridge 1975), it suggests that the carnyx functioned as a cultural symbol for the Gauls, containing a variety of meanings, in this case destructive as well as apotropaic and protective; meanings contradictory, and, consequently, inherently ambiguous, as many symbols are.

67. Emmanuelle Meunier (University of Toulouse) - Elin Figueiredo (Centro de Investigação em Materiais) - Tony Silvino (Eveha) - António Sá Coixão (ACDR Freixo-de-Numão), The tin mine of Vale do Mouro (Coriscada, Portugal): a preliminary study

This poster presents the first results about tin mining vestiges detected on the archaeological site of Vale do Mouro, in Coriscada (N Portugal). This site is a roman villa (IInd-IVth c. AD) where a production of wine and olive oil has been identified. The mining remains are located nearby the villa and are composed by numerous opencast trenches, nowadays partially backfilled. One of the buildings in the villa revealed a significant fill of its base floor with quartz pieces, which were most likely waste heaps of the ore processing phase. Analyses showed the presence of cassiterite inclusions within the quartz. Less than 50 m away from this building is the nearest opencast trench, which was excavated in its upper part for this first study. The excavation showed that the trench was following a vein, and it was possible to identify tool marks on the granitic walls. The shape of the works and the techniques used for sinking are consistent with a roman exploitation. Likely, the other nearby backfilled mines could also be of this period.

The sources of antique tin are known in broad lines (European Occident) but precise elements about the mines which were actually exploited during Roman period are very scarce. The site of Vale do Mouro gives us an opportunity to bring data about tin procurement and about the way this production was integrated within the villa’s economy.

68. Julia Mikocka (University of Warsaw), Change of the function of the city insula during the Late Roman period: the case of Late Roman insula from Maloutena district in Nea Paphos (Cyprus)

During this presentation the function of the Late Roman insula from Nea Paphos will be indicated. Surveys showed that the oldest structures in this part of town are dated to late Classical period. In Hellenistic and Roman period probably residential buildings were erected. During the 4th century the Hou-
se of Aion was build. This building is called house, but its architectural plan, decoration and specific elements indicate that it could have served public functions. This insula, for some reason, was distinguished from others. At this territory unusual features, not seen before in other buildings from the area of Nea Paphos, were indicated. This issue is interesting in the context of the location House of Aion in a representative part of the city and in the immediate vicinity of the Villa of Theseus, interpreted as the residence of an official. Of particular importance is the fact that at the time when the House of Aion still functioned, the quarter in which the late Roman insula was located had already been abandoned. In order to obtain a complete picture of the functions which this insula performed in the city of Nea Paphos the comparative analysis will be presented. Results of the research will be presented in a wider context of the cities of the Mediterranean World. This research will bring new data on the history of Nea Paphos during late Roman period and shed light on the social, administrative and economical changes that took place in Nea Paphos during this period.

69. Lukasz Miszk (1) - Wojciech Ostrowski (2) - Weronika Winiarska (1) - Malgorzata Kajzer (1), Databases and research procedures in the archaeological studies: scientific standards versus reality - case study of Nea Paphos
(1) Jagiellonian University in Kraków
(2) Warsaw University of Technology
At the CAA International conference, which was held in Atlanta this year, bold, but controversial postulate of necessity of the introduction of scientific rules to archaeological studies has been proposed. Such a regime based on standards prevailing in the exact science would require the use of statistical methods and publication of raw data. Despite of rightfulness of presented postulate, fulfilment of the scientific requirements constitutes a big challenge for archeologists. There are two main issues, lack of standardization in terms of data acquisition and the problem of their management. In this work we would like to present diagnosis of this problem on the example of research conducted by six independent expeditions in Kato Paphos Archaeological Park. Currently, teams conduct excavations without any established principles of cooperation. The scale of the problem will be illustrated on the basis of experience gained during the realization of research project concerning analysis of oil lamps collected at the excavations carried out by different research teams. The essential obstacles in the process of comparison of the material from different areas occurred due to the various methods of exploration, documentation and analysis. As a result, comparison of studied material using quantitative methods is impossible. In our presentation we would like to present a research program which might constitute the basis for the creation of comparable archaeological procedures.

70. Lukasz Miszk and Ewdoksia Papuci-Wladyka (Jagiellonian University in Kraków), Holistic archaeology and “Braudel’s perspectives” – the economy of Nea Paphos (Cyprus) in an interdisciplinary approach.
Contemporary archaeology has become a platform for cooperation in many fields of humanities and science, aiming to facilitate the construction of mankind's past narratives. Research focused on ancient cities, where individual sites, i.e. dwellings, public places, workshops, etc. operated within the broader context of the urban landscape, is an ideal matter for holistic studies. The city can therefore be treated as a "closed archaeological landscape", which, in order to be understood, should be examined both as a single site and from the "survey" perspective.
In this paper research by the Paphos Agora Project, focusing on the reconstruction of Paphos city's economy, based on the Braudel's vision of history, i.e. three perspectives: long, medium and "histoire éventuellement", will be presented. This approach has been implemented in archaeological research in recent years. For this purpose, the conditions for cooperation of specialists from many fields of humanities, science and technology, i.e. geomorphologists, chemists, geophysics, photogrammetry specialists, conservators, archaeometrists, archaeologists (including ceramologists), architects, historians, numismatists and others, have been ensured. We would like to show within the context of our research results thus far that cooperation is currently the only possible approach that can provide the appropriate source base for trying to reconstruct the economic life of an ancient city holistically.
71. Łukasz Miszk, Ewdoksia Papuci-Wladyka and Jaroslaw Bodzek (Jagiellonian University in Kraków), Shop, service area, administrative area, maybe all of these? Contextualisation and interpretation of archaeological objects within the perspective of the Eastern Portico at the Agora in Nea Paphos (Cyprus).

One of the pillars of correct interpretation of archaeological material is its appropriate contextualisation, i.e. the understanding of the original environment in which it existed and functioned. This issue has become particularly important in recent years for further developing research on ancient economies. The problem of contextualisation of the findings has led to a change of thinking concerning the possibilities of their interpretation. This question has been reflected in the studies on agoraï, where the hitherto simple interpretation of all acquired materials as a manifestation of commercial activity was considered incomplete or even misleading. The paper will show the casus of the Eastern Portico of the Agora in Paphos excavated by the Jagiellonian University in Cracow research teams. The destruction layers of an earthquake probably dating to AD 126 have provided various sets of artifacts buried simultaneously, located in many of the Portico’s rooms. However, their consistent interpretation as remains, for example of the Agoranomos office (based on inscription) or "The Office of a Paphos Surgeon" (based inter alia on a set of medical instruments) raises many problems. The purpose of this talk will be to discuss such unequivocal interpretations, endeavouring to answer the question of to what extent archaeology today is able to provide comparable and precise qualitative and quantitative data for the reconstruction of ancient economies.

72. Sonia Antonelli, Alice Dazzi and Marco Moderato (Università G. D’Annunzio Chieti-Pescara), Blies Survey Project

Blies Survey Project is a transborder, International research project that aims at reconstructing the historical landscapes of the Blies Valley, thanks to the joint cooperation between the Département de la Moselle - Parc Archéologique Européen de Bliesbruck-Reinheim (PAEBR), Kreis-Saarpfalz - Europäische Kulturpark Bliesbruck-Reinheim (EKBR) and the University G. D'Annunzio of Chieti-Pescara (UdA). Since 1980, the research activities focused on the excavation of the vicus and the villa; the project will integrate this knowledge with a larger focus on the surrounding landscape, through diachronic and multidisciplinary analysis.

Goals:
- To define the population patterns in the study area through all the main chronological phases and their transitions
- to reconstruct the transformations of the natural landscape in the longue durée
- to understand the dynamics of organization and exploitation of resources
- to identify settlement hierarchies and their changes
- to understand how road networks worked

The research area of 10 km radius, which, according to what we know so far, may match with the area under Bliesbruck roman minor settlement influence. The chronology of the project fares from the Bronze Age to the end of the Middle Ages, in order to keep in consideration short, medium and long term processes in the landscape. The study area will be investigated with the modern approach of global landscape archaeology, using a wide choice of methodologies and investigation practices.

73. Marco Moderato (University Chieti-Pescara), Legacy data in the context of a roman town: new (and old) data from the Campus of Corfinium

More often than not, legacy data contain useful information about the site that we are working on: even if data were gathered with an old or different methodology they can still provide insights on urbanism, landscape, material culture aspects which are otherwise completely lost. The work of the archaeologist is then also to provide a useful framework in which this data can be elaborated and compared. The case study of Corfinium (present Corfinio,AQ,Italy) can reveal how legacy data can be crucial to the understanding of the urban landscape of a roman city. The city, renowned in antiquity for being the capital of the italic rebellion during the bellum italicum, has been investigated variously since the end of the XIX century. In this framework we will compare data from three different excavations (end of 1800,
1990, 2014-2017) in its Campus and how the joint elaboration of them creates a solid narrative for this area.

74. Manuel Moreno Alcaide Manuel (University Granada) - María Isabel Fernández-García, La terra sigillata hispánica de origen bético: una aproximación a su simbología

Conocemos en la Baetica siete complejos alfareros productores de terra sigillata hispánica. Uno ubicado en la antigua ciudad de Isturgi (Los Villares de Andújar), dos en Iliberri (Granada), uno en Antikaria (Antequera, Málaga), uno en Singilia Barba (término de Antequera, Málaga) y dos en los actuales núcleos de Teba y Alamed (provincia Málaga). Las peculiaridades de sus sintaxis compositivas así como las técnicas decorativas aplicadas a las sigillatae lisas permiten una clara distinción entre ellos. Igualmente dentro de cada complejo alfarero es posible determinar las diferentes officinae, conocidas o anónimas, que elaboraban productos ornamentados. Influjos alóctonos combinados con elementos autóctonos confieren cierta originalidad a estas manufacturas. De todos estos alfares, sin lugar a dudas, el barrio artesanal ubicado en la antigua ciudad de Isturgi sobresale del resto tanto por su volumen de producción como por su amplia comercialización. A través de las sintaxis compositivas de las diferentes manufacturas de origen bético, recuperadas en los centros productores y receptores, es posible discernir una simbología dirigida quizá hacia unas élites indígenas siempre deseosas de productos novedosos por cuanto implicaban de prestigio y representación.

75. Asunción Martínez Valle (Museo Municipal de Requena), The agricultural territory of La Solana de las Pilillas (6th-5th centuries BC)

La Solana de las Pilillas is an Iberian tower-farm that started the production of wine in the early 6th century BC. The site is located at 65 km from the Mediterranean coast in the ravines of Los Morenos (Requena), next to the Cabriel river. This is an area of limestone soils with a microclimate that is optimal for the cultivation of the vine, very sunny and with plenty of water from the ravines. The winery is formed by four wine presses located next to the spaces required for the production of wine. Pressing systems, which give the site a commercial dimension, are appreciated in all the presses. Las Pilillas site shows the remains of an agricultural territory, with vineyard and several villages that controlled the surrounding territory. From the 5th century BC, the production of wine increased. It was a production associated to scattered farming settlements, located next to numerous isolated wineries. The growing production resulted in greater control of the territory with the creation of new settlements on the hills, next to the main communication and trading routes. Las Pilillas winery is associated to two pottery kiln workshops, where amphorae and tableware for consumption were produced. Both, pottery and wine production show a significant Phoenician influence in the Know-How transmission.

76. Gloria Olcese, Andrea Razza, Domenico Michele Surace (University Rome "La Sapienza"), Rock-Cut Units and Wine Production in Sicily: Preliminary Data from the Multidisciplinary Project

The project “Fare il vino nell’Italia antica: i palmenti rupestri” intends to carry out original research on the economy of Italy in the Tyrrhenian area, with a specific focus on rock-cut units for wine-making (“palmenti”). The project, adopting a multidisciplinary approach, aims to reconstruct the history of the production of wine in Italy. Sicily is one of the principal sample areas. In particular, the Valley of Alcantara is rich in palmenti. The structures, thanks to their morphology and archaeological context, can be dated to at least the beginning of the 1st millennium BC. Other important areas are the territory of Ragusa (ancient Ibla) where numerous palmenti are attested, and the province of Agrigento, where another important structure is located at Sambuca di Sicilia. The comparison of the basins’ different morphologies could be particularly innovative and significant for dating: indeed, until now, the only elements used are the ceramics and inscriptions found near the palmenti, if they are contemporary to the construction of the palmento. The study carried out in Sicily has identified three principal types for the period between the Late Classical and the Byzantine period: 1) square pressing and fermentation bas-
ins, with the latter being smaller 2) quadrangular pressing and circular fermentation basins 3) complexes of basins with varied morphology (rarer). The residues analysis conducted on some sample vats has confirmed the use of these palmenti for producing wine.

77. Erik Østby (University of Bergen), A Protocorinthian vessel with an early myth scene from Tegea

During the recent reorganization of the museum at Tegea in Arcadia, it was discovered that a sherd from a Middle Protocorinthian aryballos with a complicated figure scene, found during the Norwegian excavations of the 1990’s in the sanctuary of Athena Alea, joined with the lower part of the same vessel found during the French excavations in the early 20th century. In this way, the scene is now almost complete. The main group consists of six human figures with two warriors attacking and killing a horse-shaped monster, in the presence of two women, one of them perhaps Athena, and a crouching dwarf playing a flute between them. The scene is clearly narrative and almost certainly mythical if Athena is present, but the myth represented defies easy identification, and there is no known parallel to the scene in archaic art. A secondary group with the legs of two men facing one another across a crater, probably for a match of wrestling or boxing, is an early example of a well-known iconography. The vessel was made in the first quarter of the 7th century BC, by an accomplished artist in the circle of the so-called Huntsmen Painter. At a surprisingly early moment he has managed to create a complicated, many-figured composition with subtly differentiated relations between the various participants, completely different from the narrative style of his famous contemporary, the Ajax Painter.

78. Adalberto Ottati (Pablo de Olavide University), Quarry marks and carving lines on marble elements in monuments of Roman Athens

In several monuments of Roman Athens, carving lines and quarry marks associated to realization and positioning process of marble elements in architecture, are visible on many artifacts. Remarkable, for example, are carving lines and quarry marks within the Hadrian Library, preserved in a series of marble artefacts that, in addition to their pure architectural meaning, retain, therefore, traces linked to their realization and subsequent use. Some are still in situ, others re-employed in the later stages of the Hadrian building, when the complex becomes a Byzantine basilica. All cases that will be presented return an image of some aspects of the working activity in ancient workshops: the know-how transfer for realization of marble architectural elements. Traces of the production process, in large or small-size, show the way used by manpower to visualize what had to be realized.

79. Bilsen Şerife Özdemir ( Nevşehir Hacı Bektaş Veli University), Der Einfluss politischer und wirtschaftlicher Verhältnisse auf das religiöse Leben: das lykische Beispiel

80. Banu Özdilek (Mustafa Kemal University), The Elements of Social Status Demonstration in Hellenistic and Roman Period Theatres: In the Light of Archaeological, Architectural and Epigraphic Evidence

In the antiquity, theatre culture has been shaped around a certain religious view in the form of open-air displays in accordance with the belief, cultural and political structure of the time. With the Archaic Period, because of the growing interest in this ceremony, the timber structures of the theatre architecture gradually transformed into stone structures starting from cavea in line with needs. Acceleration in theatre architecture also continued in the Classical Period. In the Hellenistic period the cavea and stage building has taken its final shape of the traditional Greek Theatre Architecture form. When it came to the Roman period, the most important step of globalisation as a dispersal policy of the empire was zoning. Theatre structures were built by Roman engineers in the provinces outside Rome, as the number one propaganda tool for reflecting the empire's power. The context of theatrical games reflected the politics and the philosophy of the period, and it is seen that the theatre architecture was also shaped in this direction.

81. Ainhoa Pancorbo (City Council of Cardona) - Albert Martín Menéndez (City Council of Cabrera de Mar), The origins of the village of Cardona (Barcelona) in relation to the salt exploitation: the republican settlement

In 2015 and 2016 and due to the construction works in the football field of Cardona the remains of a roman site were uncovered. The archaeological fieldwork held during almost a year allowed us to find and study those remains in a surface of almost 1000 square meters, but the settlement extension is much bigger. Although we're still working in the laboratory stage we can advance that the remains are a part of a republican settlement with marked italic characteristics. It was built at the foot of the hill were the castle of Cardona presides de landscape and under which is supposed to be and Iberian oppidum. We're also only some metres west from the Salt Valley, the first exploitation of gem salt in Europe, worked since the mid Neolithic. We know the salt mountain of Cardona was well known at that period thanks to written sources. Now, the findings in some of the republican rooms, abandoned during the third quarter of the 1st century BC, let us know that we're in control point to supervise the extraction and trade of that appreciated mineral, the salt.

82. Alessio Paonessa (University of Cologne), Productive, commercial structures and territory around Roman Albintimilium. An overview

My poster aims at giving an overview to the most important buildings connected to commerce and production of the Roman city of Albintimilium.

The city now called Ventimiglia is located in Italy on the western coast of Liguria. Since the antiquity it has been known to be an important gateway from Mediterranean to Alps, but it is in the Roman times that the city grows up as never seen before.

The archaeological researches carried out since the end of the 19th century show up a city strongly linked to the Roman commercial network, with import of goods from overall the Mediterranean. Strabo remembers us that the city was «good-sized», moreover the settlement was reached by the road Iulia Augusta and it is indicated on the Tabula Peuntingeriana as plagia. The hypothesis of an ancient harbour before the Medieval one is currently under debate.

Despite the absence of productive structures inside the city walls area, many of them have been uncovered in the surroundings. The villa in the district called Latte was situated next to city centre and three more were discovered in the location of Villa Matutiana. There was inside the territory of Albintimilium also the Portus Herculis Monoeci and probably the recently brought to light villa of Costa Balenae. All this makes Albintimilium a very interesting case of study of ancient economy.

83. Martina Cecilia Parini (Università degli Studi di Firenze), Between farms and canals: exploring the centuriated landscapes in the northern Pisa plain

The northern Pisa territory, located in the municipality of San Giuliano Terme, is a plain delimited by the Tyrrenian Sea to the West and by the Monti Pisani to the North-East. An important role in the morpho-
logical shaping has been played by the rivers and channels network, Arno and above all Serchio, that frequently changed their path before their embankment during the Modern Age. The plain, populated since Prehistory, notably modified its aspect during the roman times, when a centurial grid was imposed over the landscape. Various projects studied the centuration process and the survival of this grid in the contemporary landscape. Some Roman farmsteads have been identified during surveys carried out since 1980, and various limites has been recognized in the modern features of the landscape.

The aim of this research, developed as part of the author’s MA dissertation, is to investigate the changing population patterns of the plain, focusing on the territorial management during the roman period, both analysing published data (legacy data) and providing new data. Surveys have being carried out both in not explored areas and in yet surveyed areas, in order to collect new information about the landscape organization and to verify the visibility of the already known sites. The study of the centuration grid has been performed through the regressive analysis, based on historical cartography, and the documentation of the limites on the ground.

84. Kleanthi Pateraki (University of the Aegean), The diet of the classical athletes and the opinions of ancient writers, philosophers and doctors concerning it

The aim of the poster presentation is to scientifically highlight an issue that has so far almost been undetected or little researched: the nutrition of the athletes during the classical era, era of great prosperity for the four Great Panhellenic Sports and Music (performing arts) Games (that is the Olympic Games, held in the Sanctuary of Zeus at Olympia, the Pythian Games, held in the Sanctuary of Apollo at Delphi, the Isthmian Games, held in the Sanctuary of Poseidon at Isthmia and the Nemean Games, held in the Sanctuary of Zeus at Nemea).

Information about the athletes’ nutrition (e.g. from ancient sources) from the early times of sports to the Greco-Roman period will be presented. Particular importance will be given to the evidence from the classical era, which marked a new phase in the dietary habits of athletes (the consumption of animal proteins was introduced, especially before the race).

Subsequently the views (positive and negative) of ancient philosophers (e.g. Plato, Aristotle), writers (i.e. Euripides) and even doctors (Hippocrates, Galen) on the diet and generally on the lifestyle of ancient athletes will be examined.

Finally, the relationship of diet, that is the result of a natural need for human survival, to athleticism, a crucial socio-political institution of ancient Greece will be presented.

85. Yolanda Peña Cervantes (National University of Distance Education Madrid), Production spaces and commercial spaces in hispanoroman city of Italica (Seville, Spain): economic topography of the city

Within the project “Public space, private space and service space in Hadrian’s Villa (Tivoli, Rome) and Italica (Santiponce, Seville). The formation of Hadrian models and their diffusion”, subsidized by the State Program for the promotion of excellence scientific and technical research of the Ministry of Economy, Industry and Competitiveness of Spain, we are studying those spaces that are suitable to be linked to the economic activity in the city of Italica.

In this way, we have isolated, from the analysis of the exhumed structures and based on the revision of the excavation memories and the existing bibliography, a good number of workshops and commercial spaces. This fact allow us to propose an approach to the handicraft and commercial topography of the city of Italica in our poster. Thus along with the re-reading of its well-known bakeries, we put forward several hypotheses about the use of its abundant tabernae. In this sense we will focus especially on the industrial and commercial spaces located in the so-called "Cañada Honda", domus that is being re-excavated in the works related to the aforementioned project.

86. Peter Pflaumer, Analyzing Age at Death from Roman Epitaph Inscriptions

Thousands of inscriptions of age at death from Roman epitaphs are statistically analyzed. The Gompertz distribution is used to estimate survivor functions. The smoothed distributions are classified according to the estimation results. Similarities and differences can be detected more easily. Cluster ana-
ysis provides three typical distributions. The analysis of the force of mortality function of the three clusters shows that the epigraphic sample is not representative of the mortality in the Roman Empire. The results in North Africa are compared with data from epitaphs from the European provinces. Africa is quite different. The general mortality level is much lower. The African cluster is much more homogeneous than the European cluster. The mortality distributions are determined by three factors: mortality levels, commemorative processes, and population growth rates.

87. Annegret Plontke-Luening (Friedrich-Schiller-Universität Jena), Between Pontus, Caucasus and steppe: A Late Antique Fortress in Colchis

Research on the extraordinary big fortress of Lesale in Northwest Georgia is still at the beginning. The fortress is not yet identified with localities mentioned in literary sources; the paper deals with different possibilities. Anyway, the fortress must have been an important place at the passage from the Colchian lowland into the mountains of Svaneti in the main range of the Caucasus. The exploration of this way is part of the complex research of the fortress and its communication in the region. This old way seems to be used still today by transhumance routes.

88. Julia Pygoch (University Bochum), “High Standards”? – Transportamphoren zwischen Ökonomie und Identität


Nach Mark Lawall würde eine voranschreitende Vereinheitlichung von Transportamphoren, da sie ein Anzeiger der antiken, ökonomischen Entwicklung waren, ebenfalls auf eine bestimmte Art von 'Gleichsetzung' verschiedener wirtschaftlicher Strukturen innerhalb dieses Zeitraums bedeuten. Über eine quantitative Analyse soll anhand eines Schiffskargos bei Tektaş Burnu der Grad der Normierung für einen bestimmten AmphorenTyp ermittelt sowie anhand dessen Rückschluss auf ihren Herstellkontext und ökonomische Bedeutung gezogen werden.

89. Luigi Quattrocchi (University Madrid Carlos III), Cultura musiva della Sardegna meridionale in età imperiale e tardoantica: ispirazioni e botteghe

La Sardegna meridionale è la zona dell'Isola che, numericamente parlando, ha dato il maggior numero di pavimenti musivi. Concentrati principalmente in tre aree (Nora, Cagliari e Sant'Antioco), questi pavimenti, forniscono dati interessanti circa le botteghe d'esecuzione. Da un'iniziale ispirazione centro italica si assiste all'arrivo di cartoni musivi provenienti principalmente dal Nord Africa. Durante il III secolo si ha un incremento esponenziale della messa in posa di tessellati, forse dovuto al rinnovamento edilizio di età severiana; gli artigiani locali non sempre riescono a reinterpretare il cartone arrivato, che sia di provenienza algerina o tunisina, e dunque copiano in maniera pedissequa i copybook.

Negli ultimi decenni si è cercato di capire quale fosse l'ispirazione di questi mosaici, ma ben poco si sa sulle botteghe locali. Grazie a nuovi studi, oggi, possiamo cercare di individuare alcune delle botteghe musive locali operanti nel sud Sardegna, analizzando anche alcune direttrici commerciali con il Nord Africa molto interessanti.

I mosaici che si prendono in considerazione si trovano, oltre che nelle città sopra indicate, anche a Capoterra, Villaspeciosa, Sinnai, Settimo San Pietro e Antas.
90. David Quixal Santos (University Valencia), The ancient beekeeping in the Eastern Iberian Peninsula during the Iron Age (4th to 2nd centuries BC)

In this poster we focus on the study of the ancient beekeeping during the Iron Age in the Eastern Iberian Peninsula, the area of the Iberian Culture (Classical and Late periods). The purpose is to present all the new discoveries from the last years, especially all the materials from the excavation of Fonteta Ràquia (Riba-Roja, Valencia). In this rural settlement we have documented thousands of fragments of at least 200 ceramic beehives, which far exceeds the previous records of this type of objects, placing it as one of the reference sites along the Mediterranean in terms of abundance and specialization. Nevertheless, the study of the materials from this site and from others in the ancient Iberian Edetania has provided a lot of information about the phases of the honey production, storage and commerce.

91. Salvatore Rizza (Consiglio Nazionale delle Ricerche) - Giacomo Biondi, Nuovi dati sul c.d. “Edificio degli Augustales” di Centuripe (Sicilia)


Ora, l’esame della documentazione di scavo degli anni Cinquanta, emersa recentemente in occasione della redazione di una carta archeologica di Centuripe, assieme ad una revisione critica dei dati pubblicati permettono una valutazione più oggettiva del complesso.

92. Julio César Ruiz Rodríguez (Institut Català d’Arqueologia Clàssica), La reutilización de elementos ornamentales y epigráficos de ámbitos públicos altoimperiales en la Necrópolis Paleocristiana de Tarragona

El complejo funerario junto al río Francolí, en Tarragona (España) constituye una de las necrópolis paleocristianas más destacadas del Mediterráneo occidental. Datada por los indicios más antiguos a finales del siglo III d.C. pero con una época de esplendor situada en las siguientes centurias, se halla al suroeste del perímetro ocupado por la Tarraco romana. En ella fueron encontradas numerosas sepulturas individuales, pero también destacados enterramientos colectivos y complejos basilicales. Para la construcción de todos estos monumentos funerarios fue utilizada una gran cantidad de materiales, destacando el reaprovechamiento de elementos que previamente habían formado parte de programas ornamentales en espacios de representación. Incluso estatuas e inscripciones imperiales en marmora de importación, testigos del antiguo esplendor de la ciudad y sus élites locales, fueron transportados para su reutilización como meros elementos constructivos.

Nuestra atención se centra en todos aquellos elementos propios de programas ornamentales procedentes originalmente de espacios públicos altoimperiales, habiendo establecido criterios que permitan identificar su carácter oficial. El objetivo es compilar un primer catálogo de piezas, llegando a alcanzar pautas que expliquen las finalidades de su reutilización, y que nos sirvan para conocer con mayor precisión la procedencia primaria de determinadas piezas, cuyo contexto original nos es absolutamente desconocido en la actualidad.

93. Julio César Ruiz Rodríguez (Institut Català d’Arqueologia Clàssica), Los retratos imperiales de Tarraco (Hispania citerior): técnicas, talleres y modos de producción

En Tarraco se conserva un total de once cabezas-retrato que representan a emperadores y miembros de su familia, suponiendo prácticamente el 15% de los retratos imperiales conocidos en Hispania. En
94. Vera Artemisia Rondano (University of California, Los Angeles), Standardization and modularity in the Egyptian funerary industry of the first millennium BC

My research seeks to define patterns of economic growth and social mobility during a time of political fragmentation in the first half of the 1st millennium BC in Egypt, by means of an analysis of the production system of funerary commodities. Despite the ample evidence for reuse of New Kingdom (ca. 1550-1069 BC) coffins during the Third Intermediate Period (ca. 1069-715 BC), there is little doubt that coffins of the Late Period (ca. 715-332 BC) exhibited a design that made it difficult to reuse earlier coffins. Moreover, new types of coffins appeared together with other innovations that included "basalt" sarcophagi, Ptah-Sokar-Osiris statues and mummy nets. Given the technical difficulties presented by new designs, it seems safe to assume that the demand for brand new funerary objects increased considerably during the Late Period, and that Egyptian artisans needed to make the production system more efficient in order to keep up with the demand. The standardization of at least part of the production process would have resulted into more efficient ways of producing and assembling funerary objects, while still allowing for regional variability in the decorative program. My poster will focus on methodology, and explore some of the ways in which statistical analysis and visualizations performed with the software R can facilitate the investigation of the dynamics of standardization and modularity of Egyptian funerary assemblages.

95. Paul Salay (University of Southern California), Nothing Happens in a Vacuum: Institutional Supports for Archaic Maritime Trade (6th c. BCE)

A major revelation of the New Institutional Economics is that persistent and frequent long-distance trade cannot take place in the absence of essential supporting institutions (clearly defined property rights, enforceable contracts, etc.). When trading partners are separated by distance, the benefits of shirking produce levels of risk that are prohibitive except under limited conditions (North 1981, 1990, 2000). Meanwhile, in the western Mediterranean of the 6th c. BCE the archaeological evidence from both contemporary shipwrecks and analysis of pottery assemblages provides unambiguous testimony of significant increases in the scale, volume, and complexity of long-distance trade. Thus, we should be able to presume the existence of such institutions even if uncertain what they were or what specific forms they took. I believe that certain lead letters of the period offer genuine insights into these questions. They are testimony for various institutional arrangements including contracts, the use of intermediaries and witnesses, ownership and transferability of shares, deferred payment schedules, and enforcement arrangements. In other words, they show institutions that lower barriers to entry, ensure compliance, and reduce risk and uncertainty, all fundamental to sustained long-distance trade. Finally, they demonstrate the heuristic potential of combining literary and archaeological analysis to provide insight into ancient economic practices that might be otherwise impossible.

96. Julian Gabriel Schneider, Die tabernae von Pergamon – Eine Studie zu Form und Semantik von Wirtschaftsräumen im Stadtgebiet einer hellenistischen Metropole

Die Metropole Pergamon bietet durch ihre langjährige Forschungstradition und die grossflächige Freilegung des Stadtgebiets ideale Voraussetzungen für zahlreiche Forschungsschwerpunkte. Einblicke in die wirtschaftliche Entwicklung der bedeutenden hellenistischen Polis bieten sich aufgrund der mangelnden schriftlichen Quellenlage jedoch nur selten und punktuell. Umso mehr ergibt sich für die Archäologie die Möglichkeit, in dieser Lücke einen Beitrag für das Verständnis von Wirtschaftsprozessen der antiken Stadt zu leisten. Anhand der tabernae, die im Allgemeinen als Beleg für wirtschaftliche Akti-
vitäten unterschiedlicher Art gelten, lässt sich die Entwicklung von wirtschaftlichen Funktionszonen innerhalb des eumenischen Stadtgebiets nicht nur besser verstehen, sondern auch im Spiegel der Urbanistik in den grösseren historischen Kontext einordnen. Dadurch lässt sich der Zusammenhang zwischen der ökonomischen und urbanistischen Entwicklung Pergamons verdeutlichen.

Das Poster soll die Entwicklung von Wirtschaftsräumen im hellenistischen Stadtgebiet anhand der taberna bis zum Ende des 1. Jh. v. Chr. visualisieren und knüpf an aktuelle Forschungsprojekte an. Dabei werden auch die übergeordneten und zusammenhängenden Baukomplexe in die Diskussion mit einbezogen, um aufgrund dessen die Stadtentwicklung besser verstehen zu können. Des Weiteren soll dargelegt werden, wie taberna als Forschungsgegenstand für die Untersuchung wirtschaftlicher Funktionsbereiche herangezogen werden können.

97. Nico Schwerdt (Max-Planck-Institut für ethnologische Forschung), Ceramics and exchange in the lower Meander Valley from Roman to Early Byzantine times - the view from Miletus (Turkey)

In my paper I will discuss economic ties between Miletus and its micro- and macro-region by means of the distribution of regional ceramic wares. Distribution patterns will be compared to textual evidence and other sources for production, trade, and exchange in the lower Meander valley.

Pottery deposits do not constitute direct proxy evidence of economic integration in antiquity, but rather form an indirect source, which must be critically evaluated in a broader context. Because of the high density of well investigated sites, e.g. Miletus, Didyma, Priene, Samos, Ephesos, Magnesia, and the proximity to large scale pottery production centres such as Phokaia, Talleis, Pergamon, and Çandarlı the study area is particularly well suited for this purpose.

In recent years excavations in the city of Miletus revealed a dense sequence of stratified pottery assemblages dating from the 1st to the 7th cent. AD. The study of their ceramic shapes in combination with quantification and archaeometry (Matrix Group by Refiring, Wavelength Dispersive X-ray Fluorescence) provides new evidence for the connectivity of the city in the longue durée: During the 2nd and 3rd centuries supra-regional production centres dominate. For Late Antiquity I will raise the question if regional ceramics like so-called Meander Sigillata and red-slipped table ware, cooking ware, Late Roman Amphorae 3 and Aegean bag-shaped amphorae were produced locally or only in a few regional centres.

98. Ilaria Serchia, Michele Matteazzi (1) - Anna Rita Marche (2), Evolution of the town-countryside relationship during Roman times: the case of Parma (Italy) as inferred by the excavations at via del Conservatorio

(1) Catalan Institute of Classical Archaeology (Tarragona, Spain)

(2) Soprintendenza Archeologica Belle Arti e Paesaggio per le province di Parma e Piacenza

The peculiar relation between the Roman colony of Parma and its ager has been well defined since the time of its establishment in 183 BC, likely suggested by the need of controlling the mouth of the Parma creek valley, where the watercourse was crossed by via Aemilia.

In the first phase, the separation between the urban area of the colony, surrounded by mighty bricked walls, and the area extra urbem was very clear. During the recent archaeological excavations at via del Conservatorio, part of the southern perimeter of the Republican wall near an urban gate was documented. It is certain that between 2nd and 1st cent. BC, a production district arose and developed in this area, taking advantage of the proximity to the ancient course of Parma creek and to a roadway directed to the countryside.

The high commercial value and the strong outward opening of this part of the town might have suggested, at the time of the augustan re-establishment of the colony, to rebuild the entire area by breaking down the urban walls and realizing at least two porticated domus facing the roadway.

This situation still persists during the Late Antiquity (4th-5th cent. AD) when the original commercial vocation of the area seems to be further reiterated by the presence of bone processing workshops and large warehouses. In the 6th century the building of new urban walls, probably due to the Thedoric enterprise, came to re-propose the ancient division between urban area and extra-urban area.
99. Alexander Smith (State University of New York), The Balearic Interface: Changing Trade Routes and Indigenous Persistence in the Late First Millennium B.C.E.

The Balearic Islands in the Western Mediterranean were home to the Talayotic people, a particularly late iteration of Iron Age culture. The islands of Mallorca and Menorca witnessed the dramatic shifts of economic and political power that occurred in the Western Mediterranean in the second half of the first millennium B.C.E. The islands, however, were not passive observers, but interacted with these foreign powers while also retaining many elements of their Iron Age, indigenous practices. This paper is a synthesis of the changing nature of trade routes around the islands of Mallorca and Menorca through the analysis of shipwreck data from roughly the fifth century B.C.E. to the first century C.E. During this time, it is clear that the nature of trade and exchange was shifting around the islands, yet many of the indigenous settlements retained their domestic and ritual practices while incorporating new, foreign material culture elements.

Although the islands are considered minor entities in the grand scheme of Mediterranean development by many modern and ancient scholars alike, this study will illustrate the potential these islands offer for a critical examination of the nature of Punic and Roman colonialism and trade. Simultaneously, this paper will challenge the conception of “cultural purity” in the Late Iron Age by illustrating the mutable nature of cultural identity with the incorporation of foreign goods into indigenous customs at major sites on the islands.

100. Alka Starac (Archaeological Museum of Istria), Construction of the Hercules' Sanctuary in Pola

The Hercules' sanctuary in Pola consisted of a temple, sacred square yard with a well and surrounding portico. Sanctuary complex occupies 900 square meters in explored part, while complete surface could be estimated to nearly 1500 square meters. In place is remaining temple stereobate 8.9-9.5 x 16 meters. Terrace was fenced by foundation walls of portico and filled by soil, quarry stone and a large deposit of empty amphorae turned upside down. Deposit in foundations of the sanctuary and leaning thermae contained more than 2119 amphorae, mostly of the type Lamboglia 2, especially transitional forms toward Dressel 6 A. Construction of the terrace was finished in about 15 years. Ten percent of amphorae were stamped. Stamps and tituli picti indicate possible names of senatorial owners of praedia with amphorae workshops, well known in Istria. An old find of inscription concerning building or renovation of Hercules' sanctuary at Pola is reconsidered as a part of temple architecture. Inscription is fragmentary preserved and it was discussed in two possible ways: as confirmation of public business ruled by duumviri of Pola and as a private donation. Paper discuss legal and property state, possible building cost, number of specialized workers and optimal duration of construction project.

101. Daniela Stoyanova (Sofia University), Archaic roof-tiles from Apollonia Pontica

The archaeological investigations on the island of St. Kirik, where the temenos of Apollonia Pontica (present-day Sozopol) was located, continue since 2009. The most important results include the uncovered remains of monumental structures (a temple, an altar, etc.) from the Late Archaic Period, when the entire excavated area was reorganized and monumentalized. The remains of roofs with tiles have been detected. The aim of the poster is to present the main types of pan and cover tiles, eaves tiles, and antefixes that were part of the roofs of the uncovered Archaic temple and other structures that have been completely dismantled already in ancient times. The available evidence allow for an almost complete reconstruction of the elements of the roofs that have exact parallels in Miletos and Didyma in term of types and decoration – a testimony to the active exchange in the period and the transportation of bulky goods between metropolis and colony. The presence of various types of pan and cover tiles and of architectural terracottas indicate the use of various standards, as well as different phases within the Late Archaic Period. The new evidence about Archaic ceramic building materials from Apollonia Pontica add considerably to our knowledge about their use and distribution in the Greek colonies on the western coast of the Black Sea.
102. Nazanin Tamari, Economic crisis of the 3rd century CE and its role in the rise of the Sassanid dynasty

The rise of the Sasanian dynasty (224-650 CE) to the power, their aims, motives and reasons is in the shadow of history. Our existing knowledge about the Sasanian family before the foundation of the Sasanian empire by Ardashir I (224-239/40 CE), is based on confusing historical data, incomplete evidences and distorted sources. In fact, this part of the Sasanian history has many unclear points that require more great efforts to understand. With consideration of the economic factors and its important in political events of the last days of Arsacid dynasty, I shall seek to economic motivations of the Sasanian family's revolt against their Parthian king of kings. In this survey I will discuss the role of the Sasanian family in the Arsacid agriculture, the basis of the Parthian economy, its role in the economy and as a result in the economic crisis of the 3rd century CE. That led to their rising to the power. Surveying on the economic role of the Sasanian as Arsacid landholders and the owner of water, land and human sources in the heterogeneous geography, dispersed and dry land of the Iranian plateau is done for the first time by this paper.

103. Marco Tartari - Marcello Gelone, Iron trade middlemen and managers during the II century A.D.: case studies from Puteoli and Cumae

Starting from the recurrence of the terms actor ferrariarum and negotiator ferrariarum contained in two Latin inscriptions, the one from Puteoli and the other from Cumae, this study will regard some investigations about the role of that sort of officers or managers, probably involved in the iron trade, during the Roman imperial age, particularly under Nerva-Antonine dynasty. The mentioned officers probably centred their business on moving iron ingots from the harbour city of Puteoli to different buyers in other areas.

This work intends to compare these officers to others connected with commerce, trying to figure out their functions, and if they belonged to the imperial family or they were private businessmen. At the same time a survey of well-known evidences of iron ingots will help to clarify the commercial routes throughout the Empire and maybe it will offer some additional elements, which may enable a more precise interpretation of these often uncertain figures.

104. Ljuben Tevdovski (University Goce Delcev), Deciphering and interpreting economic and social transformation and challenges through the research of the Roman solar cults, deities and rituals

The study of roman history has pointed towards complex transformation of the presence and importance of the solar cults, deities and rituals in the Roman world. The gradual appearance of these religious tendencies, from the intimate worships of the marginal or culturally isolated to the presence in the villas of the wealthy, has intriguingly and rapidly transformed into powerful mystic cults that penetrated deeply into the socio-cultural milieu of the entire empire. Finally, in a striking conceptual shift these foreign and repressed cults, deities and rituals of the late-republican period, managed in just two centuries to assimilate into a syncretistic religious system that was not secretive and mystical as much as it tended to emanate divine universality of the Sun god and religious and political domination.

A scientific research, that combines well the limited literary sources, often loaded with preconceptions, with the more abundant and comprehensive archaeological evidence, has the capacity to transform the quest for this religious transformation into an integrated approach towards the social and economical history of the Empire.

Such approach is able to provide key answers to the questions of economic and demographic changes, social and economic stratifications, regional dynamics and knowledge exchange throughout the Empire, as well as deep understanding for the mindsets and policies created in reaction to the economic setbacks and political crises in Late antiquity.

105. Agnes Ismene Thomas (Universität Göttingen), Slavery and its impact on socio-cultural practices in the ancient Greek society
With slavery being a basic factor of ancient Greek economy, this paper focuses on social and cultural consequences of unfree labour, as well as of slavery as a phenomenon in everyday life both of citizens and slaves, during the classical and hellenistic times. Therefore, it would be interesting to examine the ways in which slaves and (the legitimation of) slavery were perceived in the ancient societies and what distinguished free from unfree people.

From an archaeological perspective, there is a scarcity in direct material evidence from a slave's daily life, with only faint exceptions, such as findings from the ancient silver mines of Laureion in Attica. Therefore, most material evidence on the topic described above is available through iconographical sources, i.e. reliefs on grave stones, vase painting or terracotta figurines. By understanding these images as media of social discourse, the iconographical characteristics of different groups of a society can help to define, among others, the various concepts of slavery for the period.

Thus, the paper will focus on questions regarding main characteristics of slave depictions and their implications in Greek iconography as they developed over time, as well as on the differences between the various political centres since the 5th century BC, taking into consideration the recipients of the under discussion objects and, in this way, opening up the possibility to discuss recent theories like neo-institutional economics and others.

106. Mikhail Treister (Deutsches Archäologisches Institut Berlin), Kantharoi of Vysochino type – chronology, manufacture and distribution of a specific type of 1st century AD North Pontic Sil- verware

The kantharoi with biconical body, with the upper part decorated with friezes of cyma and cyma reversa and the lower strigil-shaped part, with wish-bone handles ending with balls in their upper part and with leaves as lower attachments are attributed to the type Vysochino after the find of a set of 4 such vessels in the cache of the second half of the 1st century AD Sarmatian burial in a Barrow-mound 28 of the group Vysochino-VII in the Lower Don region. These kantharoi have a rather compact area of distribution, with the concentration in the Eastern Crimea and the Lower Don area, though their finds originate also from the Mountain Crimea and the Kuban area. Recent finds of such kantharoi in the destruction layer of the fortified site of Artezian in the Bosporan Kingdom with a Greek dotted donative inscription on the bottom of one of them allow to settle the terminus ante quem for their manufacture – 46/47 AD and to suggest the possibility of their production in the workshop of the Bosporan Kingdom. Therefore I cannot accept the viewpoint of S. Künzl that the goblets of Vysochino type were manufactured in one of the workshops in the provinces Bithynia, Cappadocia or Pontus. It is noteworthy that the kantharoi discussed show more compact area of distribution than the related group of silver karchesia with a similar decoration of the body and execution of the handles, the finds of which originate from Western Ukraine, in Olbia, South-Western Crimea and the Kuban basin.

107. Füsun Tülek (Kocaeli University), The Burnaz Harbor, Tax Exempt and the Economic Boom in the East Mediterranean

Archaeological researches illuminate economic boom, and increase in number of settlements in East Plain Cilicia as of the fourth century AD mainly based on production and trade of olive oil distributed via marine trade in the East Mediterranean. Prosperity of the de novo settlements in size of a village, and foundation of ex novo settlements and farmsteads to take part in rising economic activity have been documented in the Late Roman East Plain Cilicia. Olive Oil, produced by the villages under organization of church, temple, or landlords of farmsteads, was dispatched to the main trade hub, to the major harbor, run under jurisdiction of a major ancient city, to be exported via interregional marine trade. During such an economic boom ex novo foundation of a settlement situated on a volcano, the Deli Halil, at the northeastern tip of the Gulf of Issikos/Iskenderun, overlooking the Gulf and controlling the marine trade at the ancient harbor of Burnaz appears as a deliberate enterprise of the closest major ancient city of Epiphanieia. Present paper aims to examine foundation of the ancient settlement of Deli Halil in relation with the Late Antique economic boom of the region, the tax exempt granted to the region due to the natural catastrophes, and the rise of marine trade at small harbors, such as Burnaz.
108. Uygar Ozan Usanmaz (Akdeniz University), Metal refining as a coinage revolution in the kingdom of Lydia

Lydians have an indisputable role in human history with the minting of first coins. Before inventing the coinage, people were swapping their property. On the other hand, electrum alloys became a payment way for a while, which their standards defined by authority in the seventh century BCE. Prior to issuing usual coins, these alloys, i.e. “proto-coins”, were standardized in terms of both their weights and incus traces in that period. However changing silver and gold rates in the content of electrum alloys lead to lost their values quickly. To overcome this obstacle, Croesus revoked all circulating electrum coins and decided to separate gold and silver compounds in the sixth century. In this way, he gave order to produce distinguish gold and silver coins to create fair trade in the Kingdom of Lydia. Refining process or the separation of gold and silver were made using the methods called “cementation” and “cupellation” by metallurgical experts. Just after the Lydians minted the first coins, coinage spread into the ancient Persian and Greek world entirely and it caused to shift economic and social life as well. This innovation which rose from Pactalus River in sixth century is so important to understand the archaeological impact of Lydians over the world trade.

109. Çilem Uygun (Mustafa Kemal University), Religion and ceramic: Late antiquity unguitaries from Tlos

The connection of ceramics with religious beliefs has manifested itself in the anthropomorphic vessels of the Chalcolithic Age and continued with the emergence of new forms or emeralds after the Bronze Age and Iron Age. This material group, which is defined as containers with liturgical purpose in the literature, has been typologically enriched in Greek and Roman cultures parallel to the more complex and comprehensive character of the belief system. Examples of ampulla and unguentaria used to carry important objects in spiritual terms during visits to the goblets and cross centers used in baptisms are as examples of liturgical vessels. Among these vessels are unguentaria, which began to be used with the Hellenistic Period and which we can interpret as the continuation of pagan tradition, and ampullas known from Greek and Roman ceramics typology as oil-bearing vessels. Unlike the elegant spindle form in the 6th and 7th centuries AD, the bottle forms with a rather thick scruffy and sloppy workmanship were called ampullas in early publications and were identified as Late Antiquity unguentaria in the direction of the common understanding of recent researchers. In this study, the unguentaria samples recovered in Tlos, one of the ancient cities of the Lycian region, will be examined in terms of the typological diversity of the form, which dates back to the Hellenistic Period and gained liturgical function under the influence of monotheistic religion.

110. Slava Vasileva (National Archaeological Institute with Museum Sofia), Late Classical lekythoi with polychrome decoration from Apollonia Pontica

This paper presents the results of research on a significant number of examples found during the large-scale excavations of the necropolis of Apollonia on the Western Black Sea coast. The decoration of the red-figure lekythoi with added colors allows for groupings based on the drawing and schemes applied for the figural composition on the front side and the palmette patterns on the back side of the vases. Parallels of the “Apollonian groups” from other parts of the Greek world are taken into consideration including their distribution and the information that they might give on the organization of the activities of their production.

111. Diego Romero Vera (University Bordeaux), Imperial properties in Roman Hispania: The Epigraphic evidence

Roman emperors owned several and varied properties along the provinces of Iberian Peninsula, among them were: landed states, quarries, slaves and mainly mines. This vast richness was managed by a healthy team of financial procurators, imperial freedmen and slaves. Naturally, these individuals and their activities made a mark in the epigraphical record. However, despite the economic and social importance and the high political role of the properties of Roman emperors, in reality there is not any complete study dedicated to this subject. So many questions such as geographical distribution, admi-
administration and economic value of the patrimonium Caesars in Hispania still unanswered. In this respect, we offer the result of the epigraphical survey to be a starting point of this research matter.

112. Paraskevi Vlachou and Antonis Vratsalis-Pantelaios (University of Crete), Natural resources and cultural interactions in the Neolithic and Early Bronze Age Mediterranean. A tentative response from the island of Gavdos

This paper aims at presenting some preliminary thoughts on the possible economic role and significance of the small island of Gavdos, off the southwestern coast of Crete, in the Libyan Sea. We will use as a case study the settlement site at Kavos Tsargoulio, which is set in a region of metamorphic rocks and minor copper deposits, and has provided abundant Neolithic evidence. This apparently favoured micro-insular environment, where early metallurgical activities are very possibly involved, has encouraged our approach of the small peripheral –almost marginal- island of Gavdos! as a vivid and interactive partner in socioeconomic networks of the Neolithic and Early Bronze Age. In which ways this small and remote place–but which is endowed with important natural resources and its islanders’ community on the Mediterranean fringe can respond to wider material but also cultural demands of the time, and, perhaps, in the longue durée?

113. Boaz Zissu and Omri Abadi (Bar Ilan University), Jerusalem Walk of Fame: Pilgrimage, Burial Monuments and Roads in the City’s Environs during the Early Roman Period

Understanding various aspects of pilgrimage to temples is of importance to the study of past economy. Therefore the quest after the pilgrimage pathways to Jerusalem and its temple in the early Roman period (second half of the 1st century BCE to the 1st century CE) had attracted scholarly attention. Most studies based their assessments on geographic and topographic considerations, which seek to follow the most convenient routes to the city, and the modern network of city’s roads and entrances, without taking into consideration various archaeological features around the city. The presence of burial monuments in proximity to the roads arriving at the city-gates is a common feature in almost any Roman city. In this paper we would like to propose and discuss a new reconstruction of the main roads to Jerusalem in the early Roman period, which is based on the location and visibility of monumental tombs in the city’s environs. Following the reconstructed roads, we will try to give a rationale to these routes, based on studies of pilgrimage and ritual practices.
4. Workshop Abstracts

WS 1: Werke und Wirkmacht

Organiser: Dietrich Boschung (Universität zu Köln)

Day and Time: Wednesday | 23 May | 09:00-11:00

In einem kürzlich erschienen Buch* wurde mit archäologischen Fallstudien erläutert, wie Artefakte einerseits intellektuelle Leistungen wiedergeben, sie dabei aber grundlegend verändern. Das gilt für Texte ebenso wie für Bildwerke aller Art, Architektur oder Rituale. Gerade die langfristig und konsequent betriebenen Projekte der Klassischen Archäologie zur Erschließung und Ordnung antiker Objekte stellen dafür ein reiches Grundlagenmaterial zur Verfügung. Auf dieser Basis konnte exemplarisch aufgezeigt werden, wie Zeitvorstellungen und religiöse Erwartungen, astronomisches oder historisches Wissen, politische und soziale Ansprüche in anschaulichen, damit auch suggestiven Werken eine Form finden, die sie wirksam und dauerhaft machen kann. Die dabei besprochenen Aspekte und die erzielten Ergebnisse sind weit über die Archäologie hinaus wichtig. Sie sollen daher in dem Workshop nicht nur von Archäologen, sondern auch aus einer medientheoretischen Sicht und aus einer ethnologischen Perspektive besprochen werden. Ihre Teilnahme bereits zugesagt haben Hans-Peter Hahn (Ethnologie, Universität Frankfurt), Ludwig Jäger (Medienwissenschaften, Universität Aachen) und Katharina Lorenz (Klassische Archäologie, University of Nottingham).


WS 2: Insula by insula: valorising the old excavations. The Pompeii case

Organiser: Antonella Coralini (University of Bologna)

Day and Time: Wednesday | 23 May | 14:30-16:30

So universally known as little analytically studied: this is still today the situation of one of the most famous archaeological sites in the world, Pompeii. Result of a long excavation history, officially started in 1748 and still ongoing, the archaeological site of Pompeii consists of buildings recovered by no stratigraphic works, often carried out roughly, with great loss of data. Today, most of the buildings are unpublished, waiting for a detailed study giving voice to all evidence survived the eruption and the modern recovery. Attempts made towards for a complete edition are very few and mostly limited to a single building, such as for the Hauser in Pompeii project, that since the 80s published twelve houses. In general, the main trend focused on cross studies, on specified topics, such as on the arcaic Pompeii, realized by the Regio VI Project. The systematic and complete study of a whole insula is very rare, even if the most appropriate for a urban scale study. Only exceptions, the insula I 10 (so called del Menandro) and the insula IX 8 (del Centenario). For these insulae it was demonstrated how a punctual analysis of material evidence and the data recovery of old excavations can enhance the value of Pompeii as archaeological site. The purpose of the workshop is to analyze the steps of this process, with the insula IX 8 of Pompeii as case study.
Isotope analysis of organic remains is a powerful tool in the study of past human lifeways (e.g. diet, nutrition, mobility), environments (e.g. climate), and agricultural management practices (e.g. irrigation). In spite of this huge information potential isotope analysis remains comparatively underutilized within Classical Archaeology. To address this situation the workshop will provide an introduction to archaeological applications of isotope analysis. The workshop will follow an interactive approach and no previous specialized knowledge is required to attend. Topics to be discussed consist of a mix of standard applications and novel methods with great research potential. These will include:

- Standard reconstruction of human dietary intakes using carbon and nitrogen stable isotopes
- Reconstruction of breastfeeding and weaning practices using carbon and nitrogen stable isotopes
- Reconstruction of past climates and irrigation practices from stable carbon isotope analysis of plant remains
- Reconstruction of mobility of humans and animals using oxygen and strontium isotopes
- Sample pre-treatment, lab procedures, and assessing measurement quality
- Relationship among diets, stable isotope analysis, and radiocarbon dating
- Quantifying diets using Bayesian mixing models (FRUITS)
- Isotopic baselines and databases (e.g. IsoArch, IsoMemo)
- Advanced diet and nutrition reconstruction through isotope analysis of single amino acids

WS 4: Ontology-based data access (OBDA) for classical archaeological and historical data: the EPNET experience

Organiser: Alessandro Mosca (SIRIS Academic)
Day and Time: Thursday | 24 May | 14:30-16:30

Semantic Web technologies are rapidly changing historical research and research in humanities. Over the last decades, an immense amount of new quantifiable data have been accumulated, and made available in interchangeable formats, opening up new possibilities for solving old questions and posing new ones. Historians are starting to use new digital sources to aggregate information about history: collections of data, information, and knowledge that are devoted to the preservation of the legacy of tangible and intangible culture inherited from previous generations. The workshop aims at discussing the results obtained in the EPNet Project ("Production and distribution of food during the Roman Empire: Economics and Political Dynamics", ERC-2013) on providing historians with computational tools to compare, aggregate, measure, geo-localise, and search data about Latin and Greek epigraphy on amphoras for food transportation, and it will cover: (i) a theoretical-oriented section introducing the usage of the OBDA paradigm (Ontology-Based Data Access and Integration) in the context of the historical research; (ii) the EPNet integration effort, and the OBDA implementation; (iii) a demo section based on examples of SPARQL-based querying over the EPNet dataset; (iv) an introduction on the interactive,
web-based interface for data exploration, providing non-technical users the means to easily access multi-dimensional, heterogenous datasets, for research hypotheses testing and validation.

**WS 5: ArchAIDE - Archaeological Automatic Interpretation and Documentation of Ceramics**

Organiser: Michael Remmy (University of Cologne) and Gabrielle Gattiglia (University of Pisa)

Day and Time: Friday | 25 May | 09:00-13:30

ArchAIDE is funded by the European Union’s Horizon 2020 research and innovation programme and aims to create a new system for the automatic recognition of archaeological pottery from excavations around the world. The ArchAIDE project will develop a new app that aims to change the global practice of archaeology, thanks to the latest automatic image recognition technology.

Pottery is of fundamental importance for the comprehension and dating of archaeological contexts, and for understanding the dynamics of production, trade flows, and social interactions.

Today, this characterisation and classification of ceramics is carried out manually, through the expertise of specialists and the use of analogue catalogues held in archives and libraries. The goal of ArchAIDE is to optimise and economise this process, making knowledge accessible wherever archaeologists are working.

ArchAIDE will support the classification and interpretation work of archaeologists (during both fieldwork and post-excavation analysis) with an innovative app designed for tablets and smartphones, designed to be an essential tool for archaeologists. Pottery fragments will be photographed, their characteristics sent to a comparative collection, which activates the automatic object recognition system, resulting in a response with all relevant information linked, and ultimately stored, within a database that allows each new discovery to be shared online.

**WS 6: Archäologiestudium – und dann? Kompetenzanalyse für Studierende archäologischer Fächer**

Organiser: Evelyn Hochheim (University of Jena) and Martin Streicher (University of Bonn and German Archaeologist Association (dArV e.V.)

Day and Time: Wednesday | 23 May | 11:30 – 15:30

Die Frage, was Archäolog*innen nach Abschluss ihres Studiums eigentlich können, ist alles andere als einfach zu beantworten. Schließt sich die Überlegung an, welche Fähigkeiten auf dem freien Arbeitsmarkt gefragt sind. Ist es wirklich das Fachwissen, mit dem Absolvent*innen archäologischer Fächer punkten, oder spielen eigentlich ganz andere Aspekte eine Rolle?

In diesem Workshop geht es darum, den Blick für Ihre vielfältigen Kompetenzen und Erfahrungen zu öffnen, die Sie während des Studiums erworben haben.


**ACHTUNG:** Der Workshop findet nicht im AKM, sondern im Hauptgebäude der Universität statt (3.051).
## 5. Index

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ABSTRACTS

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