Christoph Baier
Walter Gauß (Eds.)

APPROACHING ANCIENT GREEK COASTAL AND INLAND POLEIS IN THE NORTHERN PELOPONNESE

NEW RESEARCH IN THE MICROREGIONS OF AIGEIRA, LOUSOI AND SIKYON

ARETE 4 · Symposia 2

Austrian Archaeological Institute

AUSTRIAN ACADEMY OF SCIENCES PRESS

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ARETE
Publikationen des
Österreichischen Archäologischen Instituts in Athen
BAND 4

ARETE

PUBLIKATIONEN DES ÖSTERREICHISCHEN ARCHÄOLOGISCHEN INSTITUTS IN ATHEN

Herausgegeben vom Österreichischen Archäologischen Institut der
Österreichischen Akademie der Wissenschaften
Abteilung Historische Archäologie

Reihenherausgabe/Editor of the series: Birgitta Eder

Band 4

Österreichisches
Archäologisches
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OF SCIENCES
PRESS

Accepted by the publication committee of the Division of Humanities and Social Sciences of the Austrian Academy of Sciences by:

Michael Alram, Rainer Bauböck, Andre Gingrich, Hermann Hunger, Sigrid Jalkotzy-Deger, Nina Mirnig, Renate Pillinger, Franz Rainer, Oliver Jens Schmitt, Danuta Shanzer, Waldemar Zacharasiewicz

Published with the support of the Austrian Science Fund (FWF): PUB 1015-G
https://doi.org/10.55776/PUB1015

Cover image: Drone aerial picture of the northern part of the Lousoi basin, as seen from the northeast (© OeAW-OeAI/C. Baier)

This publication was subject to international and anonymous peer review.
Peer review is an essential part of the Austrian Academy of Sciences Press evaluation process.
Before any book can be accepted for publication, it is assessed by international specialists and ultimately must be approved by the Austrian Academy of Sciences Publication Committee.

The paper used in this publication is DIN EN ISO 9706 certified and meets the requirements for permanent archiving of written cultural property.

Contact address for product safety:
Austrian Academy of Sciences Press
Dr. Ignaz Seipel-Platz 2, A-1010 Wien
Tel.: +43-1-51581-3420
E-Mail: verlag@oeaw.ac.at

ISBN 978-3-7001-9304-3

Editing: Barbara Beck-Brandt, Judith Wurzer, Vienna
English language editing: Nicola Wood, Winkl
Layout: Andrea Pancheri, Absam
Print: Prime Rate, Budapest
https://epub.oeaw.ac.at/9304-3
https://verlag.oeaw.ac.at
Made in Europe.

CONTENT

Christoph Baier – Walter Gauss

AIGEIRA, LOUSOI AND SIKYON

MICROREGIONAL PERSPECTIVES ON GREEK POLIS CULTURE IN THE NORTHERN PELOPONNESE

INTRODUCTION

»The contrast between coastal and inland poleis […] is probably a characterizing feature of Peloponnesian history in all ancient periods«[1]. As Graham Shipley's statement points out, for our understanding of the development of Peloponnesian political communities, the effects of the varied physical geography on settlement patterns, agricultural and economic activities, mobility and participation in communication networks are a crucial factor to consider. This contrast is particularly pronounced in the focal regions of the present volume, the neighbouring lands of eastern Achaia, northern Arkadia and Sikyonia. Geographically and topographically, these regions do not form a ›natural unit‹. Rather, they represent a perfect example of the large degree of variability of the Peloponnesian landscape within a fairly small geographical range. The ancient sites of Aigeira, Lousoi, and Sikyon, which are at the core of this volume, are located within a distance of little more than 50 km but represent three very different microenvironments[2] whose landscape character, climate and position within regional and supraregional communication networks offer distinctive affordances to their inhabitants (fig. 1).

Located on a low inland plateau close to the coast, and in the most ancient periods probably located even closer to the sea, ancient Sikyon had direct and easy access to the sea and to the main east-west land route, as well as to the extensive and very fertile coastal plains of the Sikyonia that expand northeast towards the Corinthia (figs. 2. 3). Indisputably these characteristics of its position were a factor of crucial significance for the economic importance of the town in antiquity and the key role it played among the cities around the Corinthian Gulf in terms of production and trade. The proverbial fertility and gentle topography of its territory, especially the extensive coastal plains of the Sikyonia expanding northeast towards the Corinthia, and the excellent quality of its clay were assets that had already been praised since the Archaic period[3]. As a major polis at the end of sea trade routes, it acted as a gateway for trade with and traffic towards inland poleis like Argive Phleious, Stymphalos and other towns of northeastern Arkadia[4].

Somewhat similar in this respect, ancient Aigeira controlled an entry point to the coast-inland route along the Krios valley that led towards the polis of Phelloe[5] and from there further south towards Pheneos and west towards Nonakris. In contrast to the lowlands of Sikyonia, the coastal plain of Aigeira however, like all of eastern Achaia, is but a narrow strip of land backed by high mountains, on the slopes of which the town of ancient Aigeira towered above the coastline (figs. 4. 5).

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1 Shipley 2006, 40.

2 On the term see Horden – Purcell 2000, 79 f. 84. 123.

3 See Lolos 2011, 28–32; Trainor 2015, 19–39; also cf. Beck 2020, 99.

4 With regard to the hinterland networks of Sikyon see e.g. Lolos 2011, 115–154; Bonnier 2014, 51 f. 105–108; Bonnier 2016, 82.

5 See Bonnier 2016, 73 f.

1 The northern Peloponnese and the Corinthian Gulf: map of poleis mentioned in the volume (© OeAW-OeAI/C. Baier)

2 Drone aerial picture of the plateau of ancient Sikyon and the plains towards the coastline, as seen from the east (© OeAW-OeAI/C. Baier)

3 Drone aerial picture of the land to the northeast of Sikyon, as seen from the west (© OeAW-OeAI/C. Baier)

4 Drone aerial picture of ancient Aigeira (© OeAW-OeAI/C. Kurtze)

5 Drone aerial picture of the territory surrounding ancient Aigeira (© OeAW-OeAI/C. Kurtze)

6 Drone aerial picture of the northern part of the Lousoi basin, as seen from the northeast (© OeAW-OeAI/C. Baier)

7 Drone aerial picture of the western part of the Lousoi basin, as seen from the east (hilltop of Kyklaki) (© OeAW-OeAI/C. Baier)

The ancient polis of Lousoi, finally, like the majority of the small and middle-sized Peloponnesian poleis, was located away from the sea in a fertile upland karst plain which is the highest of its size in the northern Peloponnese at 965–1100 m above sea level (figs. 6. 7). Being the largest plain in the mountainous region of Azania, its territory offers a significant expanse of fertile arable and grazing land, but as a closed karst polje, is also susceptible to annual flooding episodes during the wet seasons. Importantly, it also gave access to summer pastures for sheep and goat pastoralism[6]. Certainly, compared to Aigeira and Sikyon, the approachability of the site was much lower due to the highly fragmented mountainous landscape (fig. 8). Still, various strategic routes for traffic and trade that connected the coastal towns of eastern Achaia with the uplands of central Arkadia and the plains of western Achaia with the Argolid[7] passed through the high plain and, above all, close by. People and products certainly flowed in both directions along these lines of communication, with seasonal transhumance of larger herds being a possible factor of importance for both coastal and mountainous communities[8]. The economic power and political significance of Lousoi were undoubtedly limited in comparison to the coastal sites of Aigeira and Sikyon, but its Sanctuary

6 For a discussion of pastoralist strategies like short- and long-distance transhumance in ancient Greece see e.g. Skydsgaard 1988; Halstead 1996; Bishop et al. 2020. For Arkadia in particular see Cruz Cardete 2019.

7 On the regional communication network see Baier et al. 2021; Alexopoulou 2021, 513–546; Alexopoulou – Santoriello 2016 with pl. 2; Tausend 1999b; Tausend 1999c; Petropoulos 2002, 156 f. fig. 14. More generally, on the connectivity of the coastal regions of the Corinthian Gulf and the hinterland see Bonnier 2014; Bonnier 2016. For the Late Roman and Early Byzantine periods also see Avraméa 1997/2016, 64–66.

8 See n. 6 above.

8 The mountains of Azania and the hinterland of eastern Achaia as seen from Mount Chelmos (© OeAW-OeAI/ C. Baier)

of Artemis Hemera was a cult site of considerable religious significance well beyond northern Arkadia from the Archaic up to the Late Hellenistic period[9].

Considering the very different physical settings of the three sites, the obvious conclusion is that the distinctive environmental characteristics of the landscapes, their different altitudes and microclimates, the available space for settlement and agricultural territories, the available resources and the different roles within intraregional communication networks had a decisive impact on the character of the local economies, the mobility and connectivity of their communities, and the possibilities for urban development. Obviously, however, this emphasis is not to be misunderstood as some sort of environmental determinism. While we acknowledge that communal and individual practices were not free of environmental constraints, we have to keep in mind that human behaviour is profoundly shaped by cultural and material social structures such as religious beliefs, cultural norms and customs, social positions, or political and economic systems[10]. Thus, the socio-cultural evolution of human communities cannot be understood as mere adaptation to environmental constraints. Rather, we are dealing with mutual relationships of socio-cultural and environmental coevolution.

The formation of specifically local place-based identities can be a case in point for the complex interaction of the aforementioned factors[11]. Ancient Sikyon, for instance, was already renowned for its traditions in arts and crafts, especially in clay modelling, by the Archaic period, not least thanks to the high quality and plasticity of the local clays, but it was also known for its toreutics[12] and painting, and the recognition of its cultural and artistic significance was also fostered politically[13]. In the case of Sikyon, we are particularly well informed thanks to the available ancient sources. There are certainly fewer written records for Aigeira and Lousoi in this regard, but combined with the archaeological evidence at hand, at least in the case of Lousoi, it becomes obvious that the community was strongly rooted in its religious traditions[14]. By the Hellenistic

9 On the significance of the sanctuary and the votive offerings found there see Reichel – Wilhelm 1901; Sinn 1980; Voyatzis 1990, 35–37. 133–138. 143. 155; Mitsopoulos-Leon 2009; Mitsopoulos-Leon 2012, as well as the contribution of M. Kerschner et al. in the present volume.

10 For a review of the various conceptual approaches to study the systemic and reciprocal relationships between human social change and the environmental and ecological dynamics throughout the past several decades see Fitzhugh et al. 2019.

11 Also see Beck 2020, 3 referring to Horden – Purcell 2000, 80.

12 Cf. Lolos 2011, 60, who discusses the possibilities of tracing back the tradition in bronzeworking at Sikyon even to the Mycenaean period on the basis of Linear B tablets from Pylos. Also see Beck 2020, 99.

13 Cf. Beck 2020, 104 with reference to the initiation of a law on the inclusion of the art of painting in the education of Sikyon's youth.

14 For rituals that seem to celebrate the religious traditions of the community see the contribution of C. Schauer in this volume.

period at the latest, the Sanctuary of Artemis had a widespread reputation as a sacred place of refuge and as the venue of the Hemerasia celebrated in honour of Artemis Hemera[15]. It has been suggested that its remote location in the high upland basin was a decisive factor in this regard, just as the naturally protected position of the Sanctuary of Apollon at Thermon was considered ideal by Polybius for the central sanctuary of the Aetolian League[16].

Also with regard to the matter of group identities beyond the polis level, the places and territories discussed in the present volume by no means represent a homogeneous entity, even if many economic, cultural, and at least in certain periods also political links between the communities existed. Ethnicity as a category for our appreciation of ancient material behaviour in our focus areas plays an important role, above all with regard to the debate on the organisational forms of living together in the Early Iron Age and the Archaic period and the formation of political associations and federal states in the Classical and Hellenistic periods[17]. In the past few decades, a number of studies from various perspectives have investigated the development of Early Greek regional and subregional ethnics and dealt with the question of how the formation of ethnicity may have affected the use of material culture and the interaction of political communities and individuals[18].

The regional ethnic group of the Azanes, of which the community of the Lousiatai were a part, lived in the uplands of northern and northwestern Arkadia[19]. While Herodotos seems to distinguish the Azanes explicitly from the Arkadians[20], later sources such as a scholiast on the Orestes of Euripides and Pausianas[21] denote them as a subgroup of the Arkadians, and in the Hellenistic period many Azanian towns were indeed identified as Arkadian even after their political alliance with the Achaian League[22]. Regardless of the still unsolved problem of the origin of the Azanes, various passages in Hellenistic, Roman and Byzantine sources indicate to us that a sense of an early tribal or cultural unity existed among the communities of Azania. Perhaps this group identity also reflected the distinct natural environment and ways of life in the mountains of northern Arkadia. It is a matter of ongoing debate, whether or not the available archaeological record might suggest a distinctive set of material statements of the Azanes[23]. We have no evidence, however, that they had ever formed a political unity. Similarly, Klaus Tausend's suggestion of a religious association of the Azanes centred on the sanctuary of Artemis Hemera in Lousoi is based on reflections about the character of this sanctuary and could help to explain some peculiarities of the site, but in the absence of textual evidence, it remains a matter of speculation[24].

With regard to Achaia, it has been repeatedly pointed out by Catherine Morgan and Jonathan Hall[25] that a growing sense of ethnic Achaian identity may have come up in the context of the foundation of Greek apoikiai in southern Italy by settlers from the central part of the north coast

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15 For a discussion of Polybios 4, 18, 10–12, who mentions that the Sanctuary of Artemis Hemera was esteemed by all the Greeks as a place of asylum, and of the inscription IG IX 1² 135, an Aetolian grant of inviolability to the Lousiatans, refer to Ducrey 1968, 310; Sinn 1992; Tausend 1993, esp. 25; Rigsby 1997, 91 f.; Knäpper 2018 108–110.

16 Cf. Sinn 1993, 80.

17 See e.g. Morgan 1992; Morgan 2003; Hall 2015, or the contributions in Funke – Luraghi 2009, and Beck et al. 2019.

18 Cf. Hall 2007; Morgan 2009a; Morgan 2009b. In contrast, also see Osborne 2012, who emphasises that ethnicity, just like geography, was just one resource used at will by communities for the construction of political and cultural identity.

19 On Azania and the Azanes see Pikoulas 1981/1982, 269–281; Jost 1985, 25–27; Tausend 1993, 14–18; Morgan 2003, 38–40.

20 Hdt. 6, 127.

21 Sch. Eur. Or. 1646; Paus. 8, 4, 2.

22 Cf. Roy 2003 on the Arkadian communities in the inscription IMagn 38.

23 In this regard also see the contribution of M. Kerschner et al. in the present volume, stressing the importance of defining a proper framework for local pottery productions.

24 Cf. Tausend 1993. More generally, also see Nielsen 2013 on the potential role of common religious activities and rural sanctuaries involving multiple poleis in the formation of ethnic identity.

25 On the ethnical and territorial construction of Achaia see e.g. Morgan – Hall 1996; Morgan 2000, esp. 205–211; Morgan 2002; Morgan 2003, 31–38; Morgan – Hall 2004.

of the Peloponnese »seeking a basis for their shared identity«[26]. The coastal communities on the Corinthian Gulf, among them Licyon (Sikyon) and Hyperesia (the later Aigeira), already feature in the Homeric »Catalogue of ships«[27]. The occurrence of the term »Aigialos« in the »Iliad«[28] and various later sources, such as Pausanias and Strabo, who claim that in ancient times this area was called »Aigialos« or »Aigialeia«[29], may indicate that a common territorial identity had already developed by the 8th or 7th centuries BC[30]. By the late 5th century at the latest, the complex and probably gradual ethnic and territorial construction of regional identity was probably converted into a formal political association with the formation of the first Achaian League[31]. In contrast to early Hyperesia/Aigeira, the formation of a common ethnic identity with its neighbours does not seem to have been of importance for Sikyon, even if Pausanias and Strabo refer to a mythological connection between Sikyon and the Aigialeia and claim that the city's original name was »Aigialeia« or »Aigialeis«[32]. Thanks to the eminent, supraregional political prestige and naval power that the city gained already during the Archaic period[33], Sikyon developed into a large one-polis state that possessed the second largest territory of the Peloponnesian poleis behind Corinth[34]. In contrast to Aigeira and Lousoi, we are comparatively well informed about the early political organisation of the community and the importance of tyranny for the rising city-state.

The social and material interactions between the communities of these microregions with their diverse social and political structures, their different natural environments and economic potentials affected the development of each of them in their own unique way, be it economically, politically, culturally or in terms of identity negotiations. The interactions can be traced in manifold ways throughout the centuries. An early and interesting example of transregional cultural interaction, which potentially could even point to joint political ventures by the populations of Achaia and Azania if we follow Tausend[35], is the transfer of the Azanian cult of Artemis Hemera from Lousoi to Metapontion according to Bakchylides[36]. Regardless of its actual historicity, the passage in Bakchylides testifies that this sort of interaction was considered plausible at his time, and in fact the material record of the sanctuary reassures us of its supralocal significance from quite early on, as the contribution of Michael Kerschner et al. in the present volume helps to point out. At the same time, we are not without reports of political conflicts between the communities of the microregions during the Archaic period, such as the hostilities between Sikyon and Pellene in the 7th and 6th centuries BC and the record of an early military conflict between Sikyon and Aigeira[37]. On the other hand, the existence of political networks between Achaian and Azanian communities is testified to, for instance, by an inscription recording a treaty between Lousoi and an Achaian community from the beginning of the 5th century BC[38]. The fact that it is written in the Achaian script, but using the Arkadian dialect further demonstrates that the boundaries between different identities were weak, shifting in accordance with material culture, language, religious activities, or political networks.

Moreover, it is possible to trace material and economic interactions between the coastal and hinterland communities in manifold ways. Early material connections between Azania and the

26 Morgan 2009b, 16. 26.
27 Hom. Il. 2, 569–575.
28 Hom. Il. 2, 572.
29 Paus. 7, 1, 1; Strab. 8, 7, 1.
30 Cf. Morgan – Hall 1996, 198; Rizakis 2016, 19 f.
31 Cf. Morgan – Hall 1996, 193–197; Morgan 2000, 210 f.; Morgan 2003, 37 f. Also see Freitag 1992, 22 f.
32 Paus. 2, 5, 6; Strab. 8, 6, 25. In this regard also see Lolos 2011, 60 f.
33 Cf. Lolos 2011, 61–66.
34 Cf. Lolos 2011, 27.
35 Tausend 1993, 24 with special reference to the potential role of Pellene; also cf. Tausend 1992, 23.
36 Bakchyl. 10, 95–116.
37 Cf. Tausend 1992, 23 f.; Lolos 2011, 61. 65. See also the contribution of W. Gauß in this volume for an alternative interpretation of the Sikyonian attack against Aigeira.
38 Nomima I, 57 = IG V.2 410. Also cf. Nielsen 2002, 95. 191. 195.

mesogeia of eastern Achaia and the southern territory of Aigion, but also with Corinthia, can be traced with the help of pottery shapes and decoration styles, as the contributions of Christa Schauer and Michael Kerschner et al. in the present volume demonstrate. Apart from the archaeological record, epigraphic documents provide further information about the tight entanglement, be it in terms of social and political networks, as indicated by a number of Classical and Hellenistic bronze decrees from Lousoi[39], or with regard to trade concerns, as testified for instance by building accounts of the 4th century BC from Delphi[40]. For the Hellenistic and Roman periods, finally, abundant material and written sources shed light on the impact of the political macrodevelopments on the microregions in the northern Peloponnese, the ever augmented mobility of people, goods and ideas, the increasing interdependence of political and social developments, or the spread of urban life. At the same time, the repercussions of large-scale processes can also be seen in the self-reflexive reactions of local communities in order to counterbalance the profound transformations.

THE DIVERSITY AND SIMILARITIES OF THREE MICROCOSMS

From what has been said, it is evident that each of the three microregions discussed in this volume offers a very different perspective on the development of Greek polis culture between the Early Iron Age and the Roman period. For the present publication, these microcosms serve as an analytical framework for an in-depth study of their interrelations as well as their diversity of material cultural expressions in order to appreciate them within the larger political, social and economic systems (fig. 9). The contribution from Catherine Morgan widens the perspective of the volume to the Corinthian Gulf, as a key region for our understanding of connectivity and mobility. All papers originate from a symposium held in Athens in December 2017, the aim of which was to promote the comparative study of the very diverse, but interdependent processes that affected the northern Peloponnese throughout antiquity, such as the exchange of products and ideas, or the impact of larger social and political transformations on a broad spectrum of material cultural expressions, from urban development to production and consumption patterns.

Another stimulus for dealing with the three quite contrasting microcosms in a joint conference was to discuss how the distinctive peculiarities of each site affected the methodological approaches. During the past few decades, the constant rise of new scientific techniques (e.g. archaeometric methods, stable isotope analyses, etc.) and digital technologies – especially the acquisition and integration of digital data on an unprecedented scale – as well as the interdisciplinary approaches towards studying material culture and human-environmental interactions have substantially changed the research design of archaeological projects and have also triggered new debates on the theoretical framework of archaeological research and research in the humanities and social sciences in general.

The analytical concepts of connectivity and localism, which had a profound impact on studies in the humanities in the past two decades, certainly provide useful and complementary perspectives for many of the research questions put by the various contributions to this volume[41]. The considerable amount of new data, documentation and information provided by the papers can help us to retrace the characteristics and transformations of each place within their unique local context, and if connected, this may in turn help us to fully appreciate the significance of the places

39 See the contributions of C. Schauer as well as C. Baier and I. Trinks in the present volume.

40 See the contribution of C. Morgan in the present volume.

41 In general see Beck 2020 *passim* pointing to the tight entanglement of the spheres of connectivity and localism. The theoretical framework for the study of connectivity and network exchanges in the ancient Mediterranean has been fundamentally influenced by Horden – Purcell 2000; Barabási 2002; Malkin 2011. The plea for a ›local turn‹ in Greek polis studies, on the other hand, has been raised in particular by Hans Beck's project on »The Parochial Polis«. See e.g. Beck 2017; Beck 2020.

9 Poleis and sites in the focal regions of the volume (© OeAW-OeAI/C. Baier)

within a larger network of sites and communities, and the different responses to connectedness on a local level. Hence, what we hope to offer is perspectives from three quite diverse, and yet interdependent constellations on a set of larger questions.

If it is true that »theory is about predicting what you haven't observed yet«[42], then most of the contributions to this volume certainly put their focus on observation, contextualisation and meaningful interpretation rather than on theoretical issues. Theoretical input is provided above all by Catherine Morgan and Anton Bonnier, who kindly agreed to give keynote lectures at the conference, and in their papers discuss scholarly approaches to the Corinthian Gulf as a centre of connectivity for coastal poleis as well as closely connected areas and potential analytical frameworks that can help us to approach the environmental history of the Peloponnesian poleis, respectively.

The thirteen papers assembled in this volume present a multi- and often interdisciplinary discourse on recent archaeological investigations at the sites and in the territories of Old Sikyon, Sikyon-Demetrias, Aigeira, and Lousoi. At the time of the conference, new research programmes were in their early stages at each of the three sites, and not least for this reason, the contributions raise a range of new questions that concern, among other things, early settlement phases, principles of town planning, the monumentalisation of space, economic growth and decline, and changes in material culture or cultural identity. Altogether, they reflect a heterogeneous spectrum of perspectives and research traditions, nevertheless having in common their scope to provide meaningful contextualisation and analysis of the data presented.

42 Bollier 2010, 6.

BASIC IDEAS AND KEY QUERIES OF THE CONTRIBUTIONS

Catherine Morgan sets the analytical frame for the other contributions. She focuses her attention on the Corinthian Gulf as a centre of particular connectivity binding together the coastal poleis, but also the areas closely connected to it, such as the mountainous hinterland of the northern Peloponnese, the Ionian islands, the Greek northwest and southern Italy. Morgan discusses characterisations of cities as central nodes in wider networks that uncouple the definition of urban centres from the material world of town- and cityscapes. While largely in agreement with this non-prescriptive definition, she argues that the key question is how the social and the physical interacted over time. With regard to the physical reality of the regions around the Corinthian Gulf, Morgan points to the diversity of distinct affordances and potentials of the natural environments on the one hand, but also to the different processes of town formation and the diverse configurations of urban space on the other. Major changes to these environments, from urban relocation to the construction of defences, residential areas, shrines or other facilities, are dynamic processes that result from social interaction and interaction with the environment (such as flows of trade and knowledge, socio-political negotiation processes, violent events and other drivers of change), and at the same time constantly reshape the material setting of these mechanics of interaction.

The contribution by Anton Bonnier, Martin Finné and Erika Weiberg addresses the relationship between the poleis and their surrounding microregional setting within the analytical framework of human-environment interactions between the Archaic and Early Roman periods. They review the current state of evidence for the archaeological and palaeoenvironmental data sources that need to be integrated in order to study the dialectics of multiple human and non-human actors which transformed the landscapes of the polis territories. Integrating several palaeoenvironmental archives such as pollen data, the zooarchaeological and archaeobotanical record, geological sediment sequences or palaeoclimatic information from speleothems with trends of archaeological site dynamics and off-site fluctuations, the authors outline the socio-environmental dynamics in the Archaic to Early Roman Peloponnese based on the current state of research, but also discuss problematic issues such as differing chronological resolutions and regional data comparability. They suggest that a considerable expansion of human activity in the landscape and agricultural exploitation before 150 BC that can be deduced from pollen data was driven by the growth of urban centres but potentially was also connected to the expansion of small rural settlements indicated by multiple survey projects. According to the available palaeoclimatic data, this picture coincides with a broad trend of an increasingly wet climate during the Classical and Early Hellenistic periods followed by fairly stable conditions into the 2nd century BC that might have favoured the increasing land use of more marginal soils. However, population growth and the intensified pressure on landscape resources may have decreased the sustainability of cultivation. For the Late Hellenistic and Early Roman times, on the other hand, the integrated datasets suggest that fundamental changes in the settlement pattern correlated with new economic strategies but also with a climate shift towards more arid conditions. While there is little doubt that socio-political factors played a major role for strategic shifts in land use focusing on cereal crops managed through a smaller number of large estates, climate variability and pollen data that suggest a decrease in human activity in marginal land and a regeneration of woodland add an interesting dimension to the discussion.

Our understanding of the spatial pattern and configuration of settlements is a crucial factor for any discussion about urbanity as well as settlement and land-use dynamics, and the integration of geophysical prospections in related archaeological research has become a standard approach. However, the potentials of different prospection methods are largely dependent on the specific challenges posed by the unique geological and topographic setting of each site and other factors such as human utilisation of the area or the character of the archaeological remains and their circumstances of preservation. Our possibilities and problems in detecting subsurface archaeological remains in the coastal areas along the southern shore of the Corinthian Gulf are discussed by Katharina Rusch, Harald Stümpel and Wolfgang Rabbel. As they point out, the specific geological

setting of the area significantly reduces the applicability of magnetometry that is successfully applied at other sites around the Mediterranean, among them the plateau of Hellenistic Sikyon and Lousoi also presented in this volume. Presenting six examples from Aigeira and Old Sikyon, the authors make a case for a combined methodological approach including areal ground-penetrating radar (GPR), electrical resistivity tomography (ERT) measurements and less commonly applied methods, such as shear wave seismics in order to overcome the specific problems and locate remains of ancient architecture and infrastructure at depth levels down to several metres.

The following chapters of the volume are structured thematically, starting with large-area studies of the urban settings of Sikyon and Lousoi and their integration into the surrounding landscapes. With particular regard to the early settlement phases, they point out that the character and quality of urban life before the Classical or even the Late Classical period still remains elusive at all of the focus sites of the volume. The contribution of Silke Müth and Konstantinos Kissas presents a new systematic attempt to tackle this challenge on a large scale, with the aim of identifying the precise location and spatial configuration of early Sikyon and providing a much-needed case study of Archaic and Classical urbanism. An interdisciplinary approach that combines remote sensing methods, geoarchaeological and archaeological surveys, geophysical investigations, and targeted excavations as well as architectural studies in the plain east of the Hellenistic city proves fruitful in order to define the extent of the pre-Hellenistic city, several main features of its internal structure and the location of its harbour. The results suggest a rather loose settlement pattern spreading over a large area of approximately 170 ha, similar to what is suspected for Archaic Corinth and known for Sparta. Still, linear geophysical anomalies might also indicate the existence of a roughly rectangular pattern of streets, which however, do not form a strict grid. In terms of material and chronological evidence, so far selected excavations have brought to light mostly remains from the Classical up to the Early Hellenistic period or much later evidence, dating to the Late Roman/Byzantine periods. The results of rescue excavations in the area of Old Sikyon, presented in this volume in the contributions of Konstantinos Kissas as well as Giorgos Giannakopoulos and Zoe Spyranti, point in the same direction.

Hellenistic and Roman Sikyon have been at the centre of archaeological investigations led by Yannis Lolos in various subsequent steps since 1996. His contribution to this volume aims to evaluate critically their research approaches and methods in an effort to reconstruct both the diachronic history of the human presence in the Sikyonian countryside and the layout and settlement history on the Sikyonian plateau, which had become the site of the Hellenistic and Roman asty of Sikyon after the relocation by Demetrios Poliorketes. Given the vast extent of the *chora*, which is estimated at c. 360 km², an extensive regional survey with a coarse resolution proved to be the most efficient approach and resulted in the recording of over 200 archaeological sites. The comparatively low number of Hellenistic and Roman settlement sites in the *chora* is in striking contrast to the growing economic prosperity and political importance of the city after its strategic relocation in the Early Hellenistic period. This major shift in settlement dynamics makes Sikyon a most valuable case in point for the observation that a decrease in mere site numbers of regional surveys is not simply synonymous with decline but needs to be studied in relation to the urban centres and the broader socio-political and economic dynamics.

Lolos goes on to present the methodological approach and most important results of more than ten years of research into the layout and settlement dynamics of Hellenistic and Roman Sikyon. As a large and prosperous asty with a long history up to the Early Byzantine period, the potentials but also the challenges for large-scale archaeological investigations are quite different from the case of Lousoi, which is presented in the following contribution by Christoph Baier and Immo Trinks. This is not only true in terms of the town size, the urban area of both Old Sikyon and Hellenistic Sikyon probably being approximately ten times larger than that of Lousoi. Also, the history, scale and intensity of human activity left quite different traces in the urban landscapes, and different processes of site formation have affected the visibility of remains. Urbanistic investigations at both sites set out from a multi-method approach combining non-invasive surveys with stratified excavations and try to suggest ways to adapt to the unique local affordances of each place. Due to

the fact that Lousoi, in sharp contrast to Sikyon, underwent a drastic process of deurbanisation in the Early Roman imperial period, non-invasive investigations there can be expected to produce a clearer picture of the Hellenistic town structure. In combination with evidence generated through stratigraphic excavations, this allows a more focused view of the dialectical interplay between specifically local parameters (whether building traditions, specific topographical and hydro-geological conditions, or references to local history) and widespread urbanistic and architectural trends of the Hellenistic period.

Also at the site of Aigeira, major urban monumentalisation processes can be traced back above all to the 3rd century BC, as is highlighted by the next two contributions. Alexander Sokolicek and Federica Iannone present the first results of their recent investigation of the historic fortifications of Aigeira. Reviewing the interpretation of an Archaic polygonal fortification wall (Enceinte B) around the acropolis and of a gradual extension of the fortified area, they conclude that the walls of Enceinte B previously classified as an Archaic fortification are not part of a coherent defensive wall but are to be understood as various lines built at different points in time, mostly in the Late Hellenistic period. The most extensive fortification (Enceinte C) that surrounds the entire urban area of Aigeira and must have been connected with Enceinte B was probably also built at some point during the 3rd century BC.

Similarly, as presented in the following paper by Walter Gauß that deals with the stages of urban monumentalisation at Aigeira, on the large theatre terrace, major building activities commenced in the middle of the 3rd century BC, beginning with the theatre and ›Naiskos E‹. However, according to recent research, the Hellenistic development of this important public area did not follow one coherent master plan but was a process lasting over a considerable period of time. Hence, similarly to the example of Lousoi addressed in the contributions by Christoph Baier and Immo Trinks as well as by Christa Schauer, important urbanistic developments seem to coincide chronologically with the time that the poleis were incorporated in the second Achaian League. However, while it is tempting to assume that the poleis had also profited economically from the cooperation and the intraregional relations between the league's members[43], the methodological issue remains that it is difficult to assess the concrete relationship between the urbanisation processes and the influence of the political confederation if we do not know who was responsible for these major urbanistic projects and the ways of financing them, as is the case in the respective examples of Aigeira and Lousoi. As the contribution by Gauß demonstrates, urban monumentalisation at Aigeira was a complex and very site-specific process, fundamentally affected by the history of the place and the geological and topographical characteristics of the locality, and in this sense comparable to Lousoi, albeit on a different scale.

Of course, for our understanding of urban development and the underlying processes of social and economic transformation, it is not enough to merely concentrate on monumental public building programmes, as the next two contributions demonstrate. Konstantinos Kissas presents the copious results of extensive emergency excavations by the Ephorate of Antiquities in Corinth that are of crucial importance for our understanding of the history and settlement topography of pre-Hellenistic Sikyon. In various fields, excavations brought to light extensive remains of houses and workshops, road and water infrastructure, a section of the main road that connected the city with its harbour as well as parts of several necropoleis from different periods, ranging from Geometric to Roman times. Of particular importance are parts of the Classical city's residential areas that have been uncovered in various spots and for the first time shed light on Old Sikyon's domestic architecture as well as the household activities and economy of its inhabitants.

Important parts of the architectural and artefactual evidence of the rescue excavations are presented in detail by Zoe Spyranti and Giorgos Giannakopoulos. Spyranti discusses the most important characteristics and elements of eight courtyard houses whose main phases date to the 5th and 4th centuries BC and hence, similarly to some other Achaian port cities like Aigion and

[43] See Economou 2020, 139–187 on the economic activities of the Achaian League.

Patras, provide evidence for the expansion of the city during the 5th century. It remains to be examined thoroughly whether the old settlement was totally abandoned after the translocation of the city to the plateau in the year 303 BC or if some of the buildings remained in use. The houses are built on rectangular plots with different orientations that have not been laid out in a strict grid plan. The disposition of the three best-preserved examples largely corresponds to the type commonly known as the *pastas* house, i.e. with a roofed porch on one side of the courtyard, which in most cases gave sheltered access to several aligned chambers of the oikos. Generally, the houses are equipped with an array of rooms consistent with good contemporary standards, comparable to other towns in the Peloponnese (Corinth, Argos, Halieis) and beyond (Athens, Eretria, Olynthos). They also included spaces that were clearly associated with the production and storage of agricultural produce, as is illustrated, for example, by multiple installations that most likely served for the pressing of wine. The segmentation of spatial units such as the *andrones*, living rooms, workrooms and shops created the potential for separating activities and individuals. For a holistic impression of the activities of the households' members and the social organisation of the households, the contextual study and evaluation of the finds recovered inside the houses are of crucial importance. As Spyranti points out, more detailed investigations into this group of largely contemporaneous households will provide an exceptional opportunity for investigations into potential patterns of activities and ultimately domestic social behaviour.

Of course, the large amounts of associated pottery also offer intriguing research possibilities for much-needed ceramological studies. Based on the fine ware pottery from one of the houses and selected burial contexts from the rescue excavations, Giannakopoulos in his dissertation project addresses the question of whether a local Sikyonian production already existed in the Classical period. This is a complex matter, the more so as distinguishing the local fabrics and products from the Corinthian wares is an ongoing challenge because of the identical geological background and claybeds. Macroscopically, the Classical fine ware fabrics from pottery assigned to the two cities do not seem to differ noticeably. Based on typology, however, and judging by the criterion of relative abundance, Giannakopoulos suggests attributing three vessel shapes to the Sikyonian pottery production of the Classical period with some degree of certainty, as he demonstrates on the basis of a secondary votive deposit found in the locality of Syriona.

This leads into the final thematic focus of the book: the contextual artefact studies. Sarah James follows up directly on the discussion about the local pottery production of Sikyon, focusing on the Hellenistic and Early Roman periods. In spite of the difficulties caused by regional similarities of fabrics, she points out a number of unique macroscopic fabric features that can help to identify local tablewares. On this basis, James begins to sketch out the dynamics of local production and its relationship to larger trends in regional ceramics against the background of broader historical and economic changes. Especially, but not exclusively, in terms of tablewares, the presented material provides evidence of an accelerated growth of the Sikyonian ceramic industry and an expanding economy from the middle of the 2nd century BC onward, illustrated, for instance, by the appearance of locally made transport amphoras. Beside evidence for regional and supraregional exports, the increased geographical range of imported pottery, which in turn also influenced the local assemblage, also testifies to the new regional importance of the city. As a consequence, the pottery evidence from Hellenistic Sikyon has become not only a major regional reference in terms of chronology, but also a major source to enhance our understanding of cultural transformation on a local level during a period of political, social and economic change.

The distinction of regional pottery production centres as a tool for investigating larger sociopolitical and economic questions is also a key issue in the interdisciplinary study of the Geometric and Archaic pottery from the Sanctuary of Artemis Hemera at Lousoi. The paper by Michael Kerschner, Nora-Miriam Voß and Pamela Fragnoli among others tackles the role of religion for the establishment of a settlement and for the creation and maintenance of communal identities, whether on a local or on a regional level. The closed deposit that was found in the substructions of the upper sanctuary terrace and comprises finds from four centuries (9th–6th cent. BC) provides insight into the beginnings of the cult, its development, the sacrificial and votive practices or

the regional and supraregional importance of the sanctuary. Importantly, the preliminary results suggest a new chronology for the earliest activities: both at the Sanctuary of Artemis and at the second large sanctuary of Lousoi in the Hellenistic public centre, where early stratified evidence for ritual feasting was found, the earliest pottery dates back at least to the 9th century BC. This obviously raises questions regarding in which historical context to consider the establishment of these sacred gathering places. Furthermore, the authors raise for discussion whether a systematic investigation of Azanian pottery production centres and their presence or absence in the material evidence of early Lousoi could help to test Klaus Tausend's tentative suggestion of an assumed special status of Lousoi as a common culture centre of the Azanians.

While the contribution of Kerschner, Voß and Fragnoli has a clear focus on Lousoi in the Geometric and Archaic periods, the subsequent paper by Christa Schauer takes us on a diachronic journey of contextualised analyses of artefact assemblages that cover a large range of different aspects and whose value cannot be overstated in terms of adding many details to the fragmentary picture drawn by the few available written sources. While Schauer on the one hand emphasises the supraregional connectivity of the Sanctuary of Artemis from early on, visible above all in the bronze votive record, on the other, she points to diachronic indications for the existence of local workshops for both architectural terracottas and for pottery, underscoring the significance of the economic self-sufficiency of the polis in this respect. Complementary to what has been said about the Sanctuary of Artemis, she also gives exemplary insights into the religious practices of the community at the above-mentioned second large sanctuary of the polis, located in an area that was to become the public centre of the Hellenistic town. Judging by the votive deposits, the cult activities revolved around aspects that were of fundamental importance for the local community: military security, agricultural supply and the protection of political agreements. Especially during the Hellenistic period, the conscious reference to the community's own local past gained high significance and found striking reflection not only in the archaising layout of a peripteral temple erected during the 3rd century BC but also in the secondary depositions of valued older objects during the Hellenistic period.

Acknowledgments

The research work of the two authors on this introductory chapter was made possible thanks to the FWF-projects P31801-G25 and P34614-G. The Austrian Science Fund also supported the publication and facilitated the printing, thus enabling the open-access publication of all contributions. The editors wish to thank all contributors to the symposium in Athens for their precious input throughout the event, as well as the excavation directors Silke Müth-Frederiksen, Konstantinos Kissas, Yiannis Lolos, and Georg Ladstätter for their highly appreciated help during the organisational process. The realisation of the conference would not have been possible without the support of the Austrian Archaeological Institute at the Austrian Academy of Sciences. We would also like to express our gratitude to the people and institutions that helped us to make this event happen, in particular to the Canadian Institute in Greece, the French School at Athens and the Swiss School of Archaeology in Greece for their kind offer to host some of our speakers during the symposium. Our sincere thanks also go to Diana Breitfeld-von Eickstedt for carefully proofreading the typescripts.

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CONSIDERING THE SPACE OF THE CORINTHIAN GULF

ABSTRACT
This paper reviews approaches to the Corinthian Gulf as the space of, and frame for, the urban development considered in this volume. It responds to the view that of all areas of high maritime connectivity in the Greek world, the Corinthian Gulf comes closest to the Mediterranean as conceived by P. Horden and N. Purcell in »The Corrupting Sea«. The main lines of approach taken in recent work on the gulf are reviewed, with further discussion of the undervalued factor of the sea itself, the nature and significance of physical and social fragmentation, and the impact of violence as one of a number of phenomena liable to affect urban development. The paper concludes with reflections on recent approaches to Greek cities.

The combined gulfs of Corinth and Patras (hereafter the Corinthian Gulf) form the space and frame of the urban development and city life discussed in this volume. The fieldwork described, combined with discoveries made during extensive public works in these and neighbouring areas (notably Aetoloakarnania, the western Peloponnese, and southwest Boeotia)[1], now affords the quantity and variety of archaeological data necessary to think afresh about the nature of urban space in this kind of environment.

Central to this reappraisal is reflection on the idea that of all spaces of high maritime connectivity in the Greek world (such as the Thermaic, Euboean, and Saronic gulfs, and the Ionian and Adriatic seas), the Corinthian Gulf is perhaps closest to the Mediterranean as conceived by Peregrine Horden and Nicholas Purcell in their 2000 »The Corrupting Sea«. The notion of the gulf as a »Mediterranean within a Mediterranean«, similar in its geography and role in communication, has a long history. The sense is clear in Ludwig Salvator's account of his voyage in 1874 from Antirrhion to the Isthmus and back to Rhion[2]. At stake, however, is the nature of connectivity. Horden and Purcell present a Mediterranean characterised by a fragmentation of land- and seascapes into microregions constantly reconfigured through human agency and the instability and unpredictability of environmental conditions. The ideal conditions for mobility and connectivity presented by the central sea offer compensation, making it at once a place of high risk and of opportunity[3]. In these terms, analogy with the Corinthian Gulf is not straightforward. While it is surely correct to counterbalance earlier emphasis on unity with recognition of the region's diversity, differences in scale and granularity are significant.

Scepticism about the analytical utility of the Mediterranean as a concept, let alone »Mediterraneanism« in the sense of common and distinctive regional characteristics, has been expressed from a variety of standpoints ever since the publication of »The Corrupting Sea«[4]. A common focus of objection concerns the scope and substance of comparison between regions. The Mediterranean provides »excuses for everything« (to paraphrase Michael Herzfeld)[5], yet too restrictive

1 Ralli (forthcoming); Vikatou et al. 2018.
2 Salvator 1876, ix.
3 Broodbank 2013 (summarised at 595–610), focused on prehistory.
4 Enumerated in Horden – Purcell 2005, 348 f. no. 1, noting especially Shaw 2001.
5 Herzfeld 2005.

a frame for robust comparative history[6]. Analogous concerns surround the Corinthian Gulf. The uniformly Greek milieu gives a certain definition to intraregional comparison, but leaves regional boundaries weak. This raises the question of whether the gulf was seen in antiquity as a useful means of defining what happened within its confines, or whether it is better approached as a modern analytical frame within which wider processes played out.

Evidence for ancient awareness of the physical space and environment of the gulf ranges from discussion of the effects of natural and anthropogenic processes to military strategy. Thus, rapid coastline change around the Echinades was understood as the result of alluvial deposition from the Acheloos river (Hdt. 2, 10, 3; Thuk. 2, 102, 2–6). Pausanias (8, 24, 11) took the further step of connecting the speed of this change with agrarian history: the Echinades remained separate from the mainland because smaller quantities of mud were washed down by the Acheloos after the Aetolians were driven from their homes and lands (in 167 BC). Among examples of military strategy, Thucydides (2, 83, 1–2; 84, 5) presents knowledge of weather conditions as decisive to the outcome of the naval battle near Patras in 429 BC. The Athenian commander Phormio was able to exploit adverse winds while his Corinthian opponent was not[7]. Whatever one's view of Thucydides' attitude to Corinthian and Athenian naval power, or the plausibility of Corinthian ignorance of gulf conditions[8], Phormio had clearly acquired local knowledge while serving in the northwest (he spent the winter of 430–429 in Naupaktos: Thuk. 2, 69, 1), and had the tactical skill to use it.

It is harder to trace the Corinthian Gulf as an object in the consciousness of the actors engaged with it, or to identify distinctive behaviour or material practice conditioned by it. A rare instance of the latter is the creation in the mid-8th century of Thapsos class pottery, a *koine* style produced in a number of workshops scattered from Corinth along the gulf coasts and up into the northwest (Ithaca and Ambracia included)[9]. Its circulation centred on the gulf and closely connected areas, i.e. the Ionian islands, the Greek northwest, and southern Italy. Thapsos spoke equally to multiple audiences. It overlaps with a series of local decorative styles (including the Corinthian Sacred Spring Group, and Achaian and Ithacan local productions), and represents common communication within the gulf area and with close external partners. Its source(s) of inspiration continue to be debated, but for present purposes the intent to communicate across this specific region is key. During the later 8th and early 7th centuries, ceramic style was commonly used to convey local identity in a way less evident in later periods[10]. Thapsos is clearly a product of this time, and other non-ceramic manifestations are understandably harder to detect. The material manifestation of experience of the gulf space therefore requires careful and nuanced exploration.

Nonetheless, it is important to untangle approaches and assumptions given the fact that much recent work on the gulf acknowledges a debt of some kind to Horden and Purcell. In my view, the spatial frame of the gulf is helpful less as a self-conscious object of reference for ancient actors, and more as an analytical tool to expose angles on phenomena enacted within it (urban development included). Geography matters, but historical and cultural contingency are inextricably entangled. But since there is a spectrum of opinion on the matter, we will begin by considering the main lines of approach in recent work before moving to two currently underrated topics (the sea itself, and the nature and significance of physical and social fragmentation), and a phenomenon (the impact of violence) liable to affect city development, concluding with reflections on the city. The result is neither an exhaustive account of the gulf and its potential nor the close reading of site evidence presented in the following chapters. Rather, it is a sketch of potential opportunities arising from this fresh look at comparative city development.

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6 A prospect raised, e.g., by Abulafia 2005.

7 Morrison et al. 2000, 69–78; Morton 2001, 91–97.

8 McKenzie – Hannah 2013; see also Kallet 2016, 23–26 for wider background.

9 Gadolou 2017a.

10 Snodgrass 1999; Morgan 2003, 165–167.

APPROACHING THE CORINTHIAN GULF

In recent years, three main discussions of the Corinthian Gulf have taken very different approaches. Klaus Freitag's 2001 »Der Golf von Korinth« was a landmark as the first systematic account of the region in antiquity. Although publication followed too soon upon that of »The Corrupting Sea« to take it fully into account, Freitag addressed similar themes and acknowledged similar inspiration, especially from Fernand Braudel's characterisation of »narrow seas« as the »home of history«; as Braudel notes, within these areas »there is hardly a bay … that is not a miniature community, a complex world in itself«[11]. For Freitag, the gulf is both a microcosm of the coastal culture of Greece and the specific physical setting of certain major events. Citing Max Weber's emphasis on local trade as a driver of state growth, he highlights the gulf littoral as a zone of particular connection and pays special attention to the location and nature of harbours and landings[12]. The heart of the book is a site-based survey from the Archaic period to the 1st century BC, with emphasis on the 5th to 3rd centuries reflecting the concentration of textual sources (Freitag's discussion is nonetheless one of the few to engage with Rome). One criticism levelled at Freitag's book is its geographical definition[13]. His gulf is the littoral zone, not the sea or the hinterland, whether conceived as the inland territories and/or networks of individual cities or the western margins in the Ionian islands. The importance of the littoral as a factor in trade and a formative influence on political structures is also asserted rather than subjected to critical assessment[14], although this does not detract from its role when considering the location and development of urban space.

Anton Bonnier's 2014 »Coastal Hinterlands« addressed this latter criticism by re-problematising the Corinthian Gulf as a littoral society. Taking as a starting point Horden and Purcell's emphasis on communication between microregions, Bonnier explores networks within the landscapes bordering the gulf. By contrast with Freitag's straightforwardly historical focus, Bonnier's interests lie in settlement and landscape, in first identifying networks and only then correlating them with regional economic and political trends. Equal weight is thus given to the coast and the hinterland, to the affordance of the physical and/or man-made landscape and the landscape of lived experience – many possibilities may arise from the same setting. Nonetheless, criticism can be levelled. Objections to the artificial nature and large scale of the four ›subregions‹ of the gulf used to structure intraregional comparison were subsequently addressed by Bonnier himself in a finer-grained study centred in eastern Achaia[15]. More seriously, the concept of hinterland is not fully explored. Common definitions include the ›lands behind‹ the coast or a city and/or port; the land claimed by that city or port; the rural area economically tied to an urban catchment; the area served by a port for imports and exports; the area influenced by a major settlement or colony; or the area beyond what is visible or known[16]. All delineate relationships, but not the forces animating them – the processes and social relations that render things and people mobile.

This in turn raises the question of the limits of direct practical and/or political control. It is one thing to note that the success of an upland economy depends on access to lowland markets and ideally to the sea, and to cite material evidence of transfer between zones[17]. Building accounts from Delphi, for example, record the supply of fir wood via agents from Peloponnesian poleis inland (Arkadian Kleitor and the as yet unlocated Ascheion in Achaia)[18], as well as direct purchases (probably of expensive Cypress wood) made in the coastal polis of Sikyon by the architect and

11 Braudel 1972, 108–110 (quotation at 110).
12 Freitag 2000, 1 f.
13 Mackil 2001.
14 Cf. Pearson 1985; Pearson 2006.
15 Bonnier 2016.
16 Oxford English Dictionary s. v. hinterland. See also Horden – Purcell 2000, 112–122.
17 Bonnier 2014, 96–104. See also Olshausen – Sonnabend 1996 for a range of case material; Roy 1999.
18 Bonnier 2016, 83.

naopoioi[19]. Sikyon controlled or had access to extensive wooded uplands and was easy to reach from Delphi. But connections with agents further inland were not just a matter of one-way shipment of upland products to lowland customers – the flow went in both directions. Doliana marble, for example, was used in Archaic Arkadian temples (at Asea and Agios Ilias of Kantrevas) to an extent that may seem surprising until one considers the potential of local relationships to create obligations that eased the way for transport and supply[20]. It is quite another matter to look at the limits of political control or (a distinct but related question) at the control or cooperation necessary for a particular political system to be sustainable. The latter is particularly pertinent to the gulf littoral and the territories immediately inland.

A partial response to such criticism lies in Bonnier's conception of, and emphasis on, central places, which speaks to an ongoing debate about the nature of the early city to which we will return[21]. He recognises central places using a variety of criteria, from relative size to polis status or the nature of material investment (assessed in a contemporary context), and understands them as defining a relationship with the surrounding region via the provision of services of various kinds, some of which may have required built installations or facilities in the hinterland. His approach echoes Horden and Purcell's view that while central places were absolutely embedded in their connectivity, one cannot determine *a priori* the services they provided and thus what they needed to control and how[22]. The challenge is to document this in close detail and to consider diachronic change and variation within and between regions around the gulf.

A third and much briefer discussion of the gulf featured in the concluding chapter of my 2003 »Early Greek States«[23]. This relied upon two observations. First, large settlement centres with associated place identities were widespread in both ethne and poleis, with no clear chronological distinction. Political integration and state politics ebbed and flowed over the dynamics of life in big sites: the two cannot be entirely dissociated but neither were they inextricably linked, and they may not follow the same chronological rhythm. The growing body of new archaeological evidence from Achaia and Aetoloakarnania in particular reinforces this conclusion. Admittedly, the quality of the record is uneven and large-scale new discoveries (like those at Makyneia)[24] relatively rare, but the sheer busyness of the gulf, irrespective of local political organisation, is beyond doubt. Secondly, individuals and groups variously combined multiple, parallel identities which had spatial reach liable to be larger or smaller than the boundaries of the states to which these people belonged. This is now an uncontroversial observation, but in the context of the gulf, it is interesting to consider the shape and impact of different interactions upon the selection and expression of identities (place, regional, or ethnic). In what context, for example, was it relevant for a citizen of Aigeira or Aigion to advertise themselves as such, and when was »Achaios« sufficient? Interlocking circuits within and beyond the gulf connected people, commodities, and practical ideas. Important personal affinities and relationships, including those on which livelihoods depended, did not always map onto city or federal boundaries[25]. But they could become politicised and embedded in the creation of a league or federation (or grow up around new political realities), and they could also help to sustain the ostensibly independent actions and policy decisions of individual cities or communities. Cross-gulf connections are as important here as those around the littoral and with hinterlands. When, for example, the Delphians elected to send their women and children

19 Bourguet 1932, 25 (IIIB). 36; Bousquet 1977, 91–100; Meiggs 1982, 430–433. Also discussed by Freitag 2000, 247–249; Bonnier 2014, 96 f.

20 Morgan 2003, 155–162.

21 Bonnier 2014, 18.

22 Horden – Purcell 2000, 102 f. (92–105 for wider discussion).

23 Morgan 2003, 213–222 (with chap. 2).

24 Saranti 2018; Saranti – Filis 2018; Saranti – Georma 2018.

25 Knappett – Kiriatzi 2016, rightly emphasise the multiplicity of scales on which mobility may be defined. To date, insufficient attention has been paid to the micro scale – the mobilities of daily life.

to Achaia to escape the Persian advance (Hdt. 8, 36), what history of connections led them to believe that this most vulnerable part of their community would be safe there? Their goods were secured in the Corycaean cave, while their men mostly sought refuge on Mount Parnassos or at Lokrian Amphissa.

These three accounts reflect the current state of discussion of the gulf. No single one is fully rounded, but together they delineate a model uniting the dynamics of the littoral, networks extending across land and sea, and human relationships on different scales and of different intensities. Nonetheless, gaps remain, and we turn now to two areas of discussion with direct implications for the development of urban space.

THE SEA

In their emphasis upon the integrity and complexity of the gulf region, all three works discussed so far help to break down persistent geographical and political boundaries[26]. Yet the gulf itself is more than just the water that happens to separate lands profitably considered together. The lack of close attention to the sea is a real omission, if not an unusual one[27]. There are echoes of the approaches to »Atlantic history« which provoked the »ocean turn« (or New Thalassology) of the early 2000s in an attempt to unite the geography and lived experience of the sea with interlinked developments on land[28]. In fairness, none of our three authors or their reviewers ignore the sea. Reviewing Freitag's »Der Golf von Korinth«, Emily Mackil characterises Corinthian trading activity as a »human reaction to the very particular conditions offered by the Gulf«, rather than being »determined by the mere presence of a body of water«[29]. Nonetheless, treatment of the gulf to date rarely reflects its real qualities[30]. Far from being easily navigable, its waters can be tricky, as is clear from the 1880 first edition of the »Mediterranean Pilot« written in the days of sail[31].

Antiquarian writing is revealing, if often overlooked chiefly because of its rarity, at least in the Anglophone world, where the popularity of Pausanias as a travel guide focused attention on land[32]. Edward Dodwell's 1805 voyage along the gulf was unplanned: he arrived in Patras intending to continue by land through Achaia to Corinth, but plague in Corinth forced him to sail on to Galaxidi, *en route* combining observations about navigation and the coastal area as a continuation of his practice during the earlier stages of his journey in the Adriatic and Ionian seas[33]. In 1806 he returned by land through the Peloponnese, describing the Achaian coast from a terrestrial perspective[34]. He thus provides us with the first combination of maritime and terrestrial observations, enriched by the topographical drawings of Simone Pomardi. Pride of place, however, goes to Ludwig Salvator's 1874 voyage down the gulf from west to east, undertaken because »as a sea lane in the heart of Greece, as the common route between East and West, it was the emporium of ancient civilization, with rich cities adorning its shores«[35]. This perspective, which places the sea and the littoral in the same frame, merits further exploration.

While conditions in the gulf are not significantly more difficult than in narrows elsewhere in the Greek world (in the Euboean straits for example), they differ markedly from those in less

26 As emphasised by Mackil 2001 re. Freitag 2000.
27 For analogous observations see Abulafia 2005, 64–67 on the Mediterranean; Ceccarelli 2012 on the Aegean.
28 Horden – Purcell 2006 with bibliography.
29 Mackil 2001.
30 Morton 2001 is the main exception.
31 Mediterranean Pilot III, 320–334.
32 Pretzler 2007, 118–149.
33 Dodwell 1819, I, chap. 4.
34 Dodwell 1819, II, chaps. 8. 12.
35 Salvator 1876, ix.

confined regions and require distinct knowledge to navigate[36]. Tides are strong by Mediterranean standards, with changing currents felt particularly in mid-channel and in the narrows. There are a number of difficult areas (notably around Perachora), but the passage from the outer gulf (of Patras) to the inner Gulf (of Corinth) is especially treacherous due to a combination of tides and seasonal land and sea breezes. Particularly challenging are the winds that funnel down into the confined space of the gulf via the valleys which cut through the mountains on both coasts. Adverse currents can be sufficient to prevent ships large or small from passing through, and winds can act on an eastward current to produce choppy seas, or on a westward one to create a larger swell in the more open waters outside the gulf entrance. This area is difficult even in the summer, when winds are generally lighter and summer storms, requiring ships to shelter, not unusual. These are basic conditions which sailors must have understood, whether they sought to hug the coast, run mid-channel, or enter harbour.

One immediate consequence is the importance of harbour locations[37]. Emphasis has so far been placed on the nature of relationships between harbours and city centres, both in the sense of physical proximity and of harbours as points of entrance to central place networks. But a number of questions remain open. How far could cities rely upon having their ›own‹ harbours; what happened when access was lost even temporarily (though hostility or natural disaster); and what collaborative arrangements might be made? City locations were chosen for a variety of reasons, so there is potential for mismatch[38]. Plenty of locations around the gulf could provide temporary shelter (behind headlands for example, as at Perachora); harbour works could significantly improve conditions; and *in extremis* ships could ground in river mouths or coastal shallows[39]. Yet secure harbours where ships could safely moor for long periods are few. This was surely an important logistical concern when moving large cargoes, especially those targeted at specific locations (movements of men and material during the Peloponnesian war, for example). Naupaktos, with its long outer bay sheltered from westerly winds and its almost completely protected inner harbour, was always a valued haven in the most treacherous part of the gulf. However, its physical development owes more to political assessment of its strategic significance – as a Lokrian colony, a facility to be secured for the Athenians by whatever means, and then an asset as readily attached to the Achaian federation to the south as the Aetolian to the north – an increasingly straightforward judgement as its facilities and proof of utility accumulated[40]. Even brief counterfactual consideration of the possible form and physical epicentre of the Aetolian ethnos under other circumstances makes the point.

Naupaktos is a rare case in the gulf of a city that lived by its harbour and the services it provided. Elsewhere, even attractive harbours had constraints – difficulty of passage through narrow entrances in bad weather (as at Perachora), approaches requiring expert navigation (though the Echinades to reach Astakos and Oiniades, for example), or shallow waters which in some cases demanded transhipment[41]. The importance of coastal shipping and cabotage is often assumed[42], and in areas such as central Achaia, where wide river outlets impede land passage, the sea was probably the easiest route for very local traffic. But this too carried risk. The avoidance of certain currents and the advantage of numerous locations for small ships to beach must be set against the dangers of coastal navigation and threats to security. The problem of piracy is clear in a 5th-century treaty between Oiantheia and Chaleion (modern Galaxidi) (IG IX 1, 333, 1–8)[43] which forbids

36 Mediterranean Pilot III, 95; Morton 2001, 45, 93–97.
37 Freitag 2000, 309–329; cf. Bonnier 2014, 24 f. 29 f. 33. 36 f.
38 Bonnier 2008 addresses the relationship between harbour and city with no presumption of intimacy.
39 Morton 2001, 110 f.; Blackman 1966; Filis 2016/2017.
40 Saranti 2016.
41 Mediterranean Pilot III, 292–300 (Echinades and Astakos). Perachora: Blackman 1966.
42 Morton 2001, 143–159 emphasises that the distinction between coastal and open-sea navigation is often overstated; Bonnier 2014, 75–77.
43 Tod 1946, 34.

the seizure of citizens of either community or any property which they may have seized and protects the ships of strangers while in the harbour of either city (seizure at sea is still allowed). Evidently the safety of local traffic could not be guaranteed. Safety and success required expert knowledge of local conditions and the mitigation of risk by diverse means (cooperations, treaties, coastal defences, or firepower), not all equally visible in the material record. There is, however, a connection between danger, protection, and the placing of sanctuaries and monuments in maritime-facing locations[44]. Hence, for example, the twin sanctuaries of Poseidon on the headlands flanking the straits of Rhion (Strab. 8, 2, 3), both sites of commemoration after the two naval battles in 429 BC (Thuk. 2, 84, 4; 2, 92, 4–5).

As Purcell, among others, has emphasised, »becoming maritime« is a process shaped by a community's need to engage with the sea[45]. All of the communities flanking the gulf were committed to maritime activity to some extent (although this varied in nature and over time), making the maritime foreground as important to their networks as the terrestrial hinterland. The potential economic gain from people and commodities moving to and from the sea was huge[46]. A good starting point for discussion would be assessment of the infrastructure necessary for each community in its own distinctive environment to marshal and deploy the labour, expertise, facilities and materials necessary to support and/or intensify its chosen activities. Immediate needs fluctuated, but it is important to think broadly about the flow of activities across the littoral, from shipbuilding and repair to commodity storage, repacking, porterage, distribution and taxation, accommodation and catering for those entering and leaving, animal holding and fodder, communication and security – the list is potentially long. These activities need not be concentrated in the urban centre, but security, access, and control were surely major concerns. We are only now beginning to understand even in general terms such matters of organisation and local variation. The wealth of information collated by Freitag is a particularly valuable resource when considering pressures on the littoral; to it may be added a number of more recently excavated warehouses and coastal facilities[47]. But Delphi remains a rare case where the question has been posed in a holistic way, with the impact of the sanctuary on the coastal zone (and in relation to the city) seen in terms of port history, facilities to receive and host visitors or secure supplies, the preservation of pasture for sacrificial animals, and political development and control (after the First Sacred War)[48]. While the operation of such a prominent sanctuary plainly had a major impact on the long-term development of the hinterland and littoral alike, detailed comparison with the material development of the territories of other littoral cities would surely be a revealing exercise. The serial configuration of coastal societies around the gulf facilitates this.

FRAGMENTATION AND DIVERSITY

The gulf bears comparison with the Mediterranean of Horden and Purcell in the sense that it was unified by contacts between contrasting places rather than similarities across shores. A close reading therefore requires documentation of the various combinations of environments, affordances, and ecologies (constructed via a range of human choices), and integration of the results into appreciation of urban development and the shaping of political organisation. In western Achaia, for example, extensive, loosely textured settlement at Patras, shading into rural settlements and in time farmsteads scattered over the surrounding plains, attests to a very different process of city

44 Morton 2001, 310–313.
45 Purcell 2013, esp. 98 f.
46 Purcell 2005a.
47 E.g. Saranti – Filis 2018; Filis 2019.
48 Luce 2008, part 4; Rousset 2002; McInerney 1999, esp. 100–108; Howe 2003. Luce 2011 establishes the pre-8th century context.

formation from that in the Corinthia or the northwestern coastal zone[49]. Two unusual (and potentially anomalous) patterns of development have been noted at Delphi and Naupaktos. Elsewhere, certain environments have particular affordances. The lagoons and wetlands of Aetoloakarnania, for example, offered a range of resources from seafood to reeds and salt[50], a navigable but secure location for the naval dockyard at Oiniades (established in the 5th cent.)[51], and a permeable barrier protecting the towns of the interior. Rare resources in particular parts of the gulf include beds of *Pinna nobilis* (providing the »sea silk« used in luxury textiles) near Perachora and Aetolian Chalkis, where a tablet weaving industry is well documented[52]. Taste in imports (at least outside the richer offerings at major sanctuaries) generally ran to what Lin Foxhall has termed semi-luxuries, items with the marginal difference in quality, style, or origin needed to inspire fashion or make life feel better[53]. The flow of local fine pottery styles around the gulf may therefore be less significant than specialist manufactures; recognition of the particular quality of regional products – horses bred at Sikyon (cited by Demosthenes 21, 158 in support of his charge of ostentatious display against Meidias) or the soft woollen cloth of the victors' cloaks from Pellene (Pind. O. 9, 97–98; N. 10, 44); or active engagement in the development and use of vessels which offered practical advantages to trade, like the widely manufactured Corinthian/Adriatic amphorae which dominated the regional carrying industry into the 3rd century BC[54]. The Corinthian Gulf is rich in such manufactures. This focus on the granular also has the merit of exposing potentially significant gaps in knowledge at a local level. Thanks to the major public works of the past decade, these appear less dominant in what once seemed the remote west, and surprisingly common in the territories of the eastern poleis (the Perachora peninsula, for example, merits fresh research).

A further problem is whether the Corinthian Gulf was equally important for all the surrounding cities or states. Those with access to more than one sea faced choices. Corinth and Megara both lay on the Saronic and Corinthian gulfs. In the case of Corinth, the comparison exposes our poor understanding of settlement and networks around the Saronic Gulf[55], but Megara had well-established harbour towns on both coasts (on the Corinthian Gulf, a shrine at modern Alepochori, ancient Pagasae, dates from the late 8th cent.), affording the capacity to adapt to trade flows and specific needs (e.g. to accommodate the triremes of the Athenian navy at Pagasae)[56]. Boeotia, according to Ephoros (cited in Strab. 9, 2, 2), owed its strength to its position on three seas, one being the Corinthian Gulf (specifically the Halcyonic Gulf, which forms its northeastern confine). Such exposure to risks and benefits not only affected individual Boeotian cities but is also reflected in the uneven distribution of interests and/or investments. Dedications at Delphi aside[57], material evidence of engagement in the gulf area is slight. The Halcyonic Gulf is relatively secluded, with poor visual connections, large stretches of mountainous coast, and good anchorages but no secure harbours (Creusis, the main port on the southwest coast, is exposed to southerly gales). Mount Helikon impedes communication with the interior. When, in 366 BC, the Thebans decided to build a fleet of 100 triremes, the site chosen for the main naval base was probably Aulis

49 Patras: Morgan – Hall 1996, 181–186 (with the important addition of Gadolou 2017b); Rizakis – Petropoulos 2005. Corinth: Morgan – Tzonnou 2019. Northwest: Morgan (forthcoming); see e.g. Makyneia (Saranti – Georma 2018); Chalkis (Houby-Nielsen 2020; Dietz – Kolonas 2016).

50 The spring shrine at Mastros (Katsarou – Darlas 2016/2017, 98–100) indicates post-prehistoric exploitation from the 8th cent. onwards (S. Katsarou pers. comm.), although the identity of those involved cannot yet be ascertained. On the value of wetlands see Horden – Purcell 2000, 186–190.

51 Oiniades: Serbeti et al. 2013; Blackman – Rankov 2013, s. v. Oiniades (H. Gerding).

52 Houby-Nielsen 2017.

53 Foxhall 1998.

54 Bonnier 2014, 74–77; see also amphora warehouses at Makyneia (Saranti – Filis 2018) and Trapeza Diakoptou, Aigialeias (Filis 2019).

55 A gap addressed by Kissas – Mattern (forthcoming).

56 Freitag 2018. Shrine: Kyriakou-Zapheiropoulou 2012/2013; Baziotopoulou-Valavani – Vordos 2000.

57 Snapshots of two different periods show the sanctuary as a location for the expression of federal identity: Scott 2016; Larson 2017, 136–142. 145–149.

on the north coast[58]. But while one might doubt the importance of the gulf coast to the Boeotian cities and League[59], for reasons of security, if nothing else, it could not be ignored. In 371 BC, the Spartan army under Kleombrotos surprised the Thebans by using the gulf as a back way into the heart of Boeotia, capturing Siphae and Creusis (Xen. hell. 6, 4, 3–4; Diod. 15, 53, 1); the particular route chosen is not the only one viable[60]. As Anton Bonnier rightly points out[61], there is good reason to believe that the fortifications of Creusis (and probably of Thisbe and Chorsiae) predate this attack, although the earliest fortifications in Boeotia as a whole are not in this area[62].

In short, the sea both connects and isolates. The good things of life are brought over it, but it is also a place of chaos where connections founder, people are separated, and newcomers introduced. In the gulf, the immediate human drama played out over a relatively small geographical area. This in turn reinforces the point that historical contingency is rarely driven by single events. When considering major changes to the environment of gulf cities, from urban relocation to the construction of defences, residential areas, shrines or other facilities, trigger events work on a complex of accumulated experiences and perceptions, enacted in urban space inherited from previous generations and always in development.

THE IMPACT OF VIOLENCE

This leads us to consider the drivers for change in social and physical environments, cities included. We have already noted the relative lack of attention to the mobilities of everyday life and the attendant formation of contingent knowledge[63]. On a larger scale, one might explore the kinds of activity that required the movement of people and unequally distributed resources, while at the same time displaying the power of those commissioning and/or orchestrating them. This is the sense of John K. Davies' work on the economics of temple building as a proxy for the wider but less well documented world of monumental construction, or Elena Partida's study of the network of creators and artisans at Delphi[64]. The long-term formative effects of violence operate on different scales. Construed in the broadest sense, violence encompasses perceived threats to safety managed as part of daily life; natural catastrophes and their human consequences (such as the earthquake which destroyed Helike in 373 BC); warfare as a form of elite status expression (a factor behind supply chains of prestige goods through the ages); and episodes of open conflict focused on the gulf (notably during the Peloponnesian War), giving the region geopolitical significance. Numerous and diverse examples could be cited to illustrate all of these aspects, but I focus on two lines of approach.

First, the conduct of war demanded networks through which to move people and goods, directing or constraining personal mobility and economic activity, and mobilising war materials of all kinds (which had to be stored and available in the right place at the right time). The establishment of sea power in particular demanded domination of the mechanics of interaction and redistribution[65]. Davies' assessment of the implications of Athenian adoption of the trireme therefore spans the diversity of immediate requirements for finance, harbour facilities, sheltered anchorages, and materials for construction and maintenance[66], and considers how the Corinthian Gulf grew in strategic importance for both Athens and Corinth as their naval interests converged and collided,

58 Buckler 1980, 12 f.; Buckler – Beck 2008, 180–210.
59 Bonnier 2014, 113–116 reviews scholarship and takes a more positive view.
60 Buckler 1980, 55–61.
61 Bonnier 2014, 120.
62 Frederiksen 2011, s. v. Chaironeia, Haliartos, Hyettos, Orchomenos, and (based on textual evidence) Thebes.
63 Morgan 2021.
64 Davies 2001; Partida 2011.
65 Horden – Purcell 2000, 24 f.
66 Davies 2007.

to the benefit of some communities over others. Procurement of supplies is one thing. Active intervention to protect, secure, or create facilities another. Political uncertainties, plus the specific needs of triremes for sheltered anchorage and regular dry dock, require us to search beyond city harbours or naval dockyards for (often small) facilities in secure locations[67]. A case in point is the modification of the islet of Agios Dimitrios in the Krissaian Gulf to create facilities for up to three small vessels in a location distant from the shore but in visual contact with both Chaleion and Kirrha[68]. The construction helped to secure the maritime route along the north side of the Corinthian Gulf and up to Delphi, and is dated by Panos Valavanis to the period of Aetolian control in the late 4th to 3rd century (when the port of Chaleion was also fortified)[69]. Against the cost of building such facilities and defences may be counted gains such as the spoils available for public or private projects.

Secondly, maritime connectivity opened new and sometimes unforeseen possibilities for human migration. People could move as commodities (slaves, mercenaries, or marriage partners) or via the voluntary migrations and/or military deployments which afforded leaders freedom to intervene or control, for example by forcing or aiding resettlement for political ends. Examples include the Athenian-directed settlement of Messenian refugees at Naupaktos in the early 450s[70], of Helots and Messenians at Krane on Kephallonia in 421 BC (Thuk. 5, 35, 7), and, based on a similar pattern of alliances, the establishment in c. 225 BC of Aetolian communities at Same on Kephallonia (IG IX 1^2 2)[71]. These actions had major strategic implications. In explaining Philip V's hostility towards Kephallonia during the War of the Allies, Polybius (5, 3–4) emphasised the island's strategic importance for the Aetolians by virtue of its location and because it afforded them a fleet with which to attack Achaia, coastal Epirus, and Akarnania. Assumed rights to control or intervene thus complicate coastal history by changing the composition of communities, and doing so in a way that drew otherwise distant and sometimes terrestrially oriented states into power relationships liable to produce threats and uncertainties from land and sea. Coasts are not the only Janus-faced zones between milieux of connectivity. As Purcell puts it, »there is a sense in which coasts which are sandwiched between a littoral, mountain range or upland edge, and the sea might be said to experience a fasciated coastal history in which there are multiple parallel zones of shared positioning between deep interior and open sea«[72].

URBAN SPACE

It is now clear that the Corinthian Gulf was a densely settled, urbanised environment at least from the 8th century onwards. The idea that larger, tribal, units, especially in the west, were too disparate to develop urban centres before Late Classical times is false[73]. As a result, there is great scope to look afresh at the nature of cityscapes and to document patterns of variation.

The nature and quality of urban life remain topics of intense discussion. Horden and Purcell's contention that town life was not qualitatively different from that in other settlements has been characterised as a »ruralisation« of ancient and medieval history at the expense of towns and cities[74]. Indeed, there is a certain symmetry in the development of approaches to the gulf itself and to the nature of urban space. Braudel sought to define and characterise towns, villages, routes, and

67 Baika 2013.
68 Valavanis 2015. Kirrha: Blackman – Rankov 2013, s. v. Kirrha (D. Blackman – K. Baika); Petrocheilos 2017, 52–54.
69 Lerat 1952, 152–158.
70 Kallet 2016.
71 Randsborg 2002, 31 proposes a location in the newly settled Pylaros valley.
72 Purcell 2013, quotation at 100; Bonnier 2014, 124–129.
73 Morgan (forthcoming); *pace* Osborne – Wallace-Hadrill 2013, 55.
74 Horden – Purcell 2000, chap. 4; Harris 2005a, 29–34.

cities, informed primarily by the circumstances of medieval Europe[75]. Scholarship on antiquity long relied upon idealised later Greek and Roman urban models; even acceptance that the early stages in the genesis of urban forms might have seen variety, false starts and instability was expressed in teleological terms[76]. Until recently, archaeological discussion focused on the supposed social and political significance of built features – the civic centre, religious facilities, and defences[77]. In 1997, James Coulton and I published an article for the Copenhagen Polis Centre in which we questioned (with hindsight perhaps too subtly) the value of this approach and the robustness of conclusions which could be drawn from a diverse and chronologically variable record[78]. A backlash followed. For Horden and Purcell, the city is less a unit of analysis than a central place within one or more networks[79]: Brent Shaw memorably described their conception of urbanisation as the »dynamic process by which cities congeal on the landscape«[80]. In the same vein, Robin Osborne and Andrew Wallace-Hadrill note that many different ways of inhabiting cities are evident from an early date, and even general definitions focused on political/religious and cultural functions are too prescriptive[81]. A common factor is the characterisation of cities as nodes in wider networks: network history is city history.

While largely in agreement, I feel the lack of a distinctive space for the material world of town- and cityscapes – for the social relations and taskscapes folded within them, their sensory impact, and the affect they elict. We observe in the archaeological record a repeated process of creation based on decisions about ownership, use of, and aspirations for, space. Since the resulting structures both enabled and constrained, the key question is how the social and the physical interacted over time. In antiquity towns could be represented as loci of tradition, status, and power, expressed in durable form by monumental construction. For Plato (Kritias 112), orderly and lasting urban structures were a reflection of good order, good government, and the rule of the wise and the good. Yet the processes which created, maintained, and developed them were dynamic[82]. Factors include the landscape of property, defining communal space versus individual rights and interests, and the physical place of the dead; the rhythms of maintenance of different kinds of structure; and families' own needs to adapt their household space. An inherited townscape could be an object of affect, but inheritance was no more sclerotic than planning initiatives were necessarily progressive and/or long-lasting. Furthermore, in a world where redistribution, federation, and out-mobility offered safety and opportunity, unfavourable settlement locations could become obsolete and alternatives sufficiently attractive to merit the complex practical decisions entailed in relocation, synoikism or dioikism. Characterising this as ›failure‹ to be set alongside violent displacement as an external cause of change misses the point[83]. One way to capture this dynamism while recognising that buildings have a durable physical presence may be to think in terms of the half-life of a city: how long did it take for the sum total of change to produce a qualitatively different environment, and how did this then contribute to the picture in the wider region?

In conclusion, our point of departure (the need to locate the urban space currently under investigation within its physical and social environment) and subsequent exploration of the distinctive characteristics of the gulf, lead to two observations. The first concerns the temporal quality of cities. Buildings play a distinctive role as the end point of one kind of discussion and the start of others; they are simultaneously answers and questions, novel and attractive yet outdated and

75 Braudel 1972, I, chap. 5.3–4.
76 Morgan 2003, 47–54. 69–71.
77 For a critique see Morgan – Coulton 1997.
78 Morgan – Coulton 1997.
79 Horden – Purcell 2000, chap. 4 (esp. 90–101).
80 Shaw 2001, 427 f.
81 Osborne – Wallace-Hadrill 2013.
82 Purcell 2004; Purcell 2005b.
83 Mackil 2004 (with discussion of the Achaian poleis of Helike and Aigai); Morgan 2003, 171–176; Purcell 2005b, 255–259.

constraining. Second, the potential of the gulf as a source of complex and ambitious questions for network analysis has barely been tapped[84]. The ease of slippage from the notion that »the history of the Mediterranean in antiquity is a history of the formation and exploitation of networks of cities« to »network history is city history«[85] underscores the way in which cities have been taken for granted as network nodes. Yet as we have seen, their diverse configurations, the potentially vast knowledge flows implicated in city and rural life alike, and the distinctive environment of the gulf, raise the prospect of richer lines of enquiry. The work presented in this volume is a major step towards these ends.

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[84] On the essential role of initial mapping and conceptualisation in network analysis see Collar et al. 2015.
[85] Osborne – Wallace-Hadrill 2013, 49.

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EXPLORING THE ENVIRONMENTAL HISTORY OF THE PELOPONNESIAN POLIS

A REVIEW OF SOURCES, APPROACHES, PROBLEMS AND POSSIBILITIES

ABSTRACT
Despite the common recognition of urban-rural interfaces, encapsulated within the polis, not enough attention has been given to the dynamic impact of Greek urban communities on their surrounding environment over time or to the potential impact of exogenic environmental factors such as climate. In the current chapter, we review the state of the evidence relating to human-environment interactions in the ancient Peloponnese. We discuss the potential frameworks through which we can approach an environmental history of polis communities. By integrating the archaeological and historical record with evidence from pollen records, geoarchaeological investigations and palaeoclimatic reconstructions, we can start to produce more complex and diverse histories of Peloponnesian poleis. The challenge now lies in enhancing the paleoenvironmental record as well as our integrative measures in order to move from simple comparisons of trends observed in the various datasets towards understanding complex patterns of causation.

INTRODUCTION

In the current chapter, we outline the evidence relating to human-environment interactions in the Peloponnese and discuss the potential frameworks through which we can approach an environmental history of the ancient polis. The growth of urban communities controlling defined territories significantly affected landscape trajectories and transformed regional ecologies[1], a fact that demands that we look more closely at how we can approach the polis through its environmental construct. Here we review the current state of evidence for the archaeological and palaeoenvironmental data sources for the period between the Archaic and Early Roman periods (between c. 700 BC and AD 200/2650–1750 BP) when the polis would have been the dominant political unit in the Peloponnese. It is a well-known fact that the polis was constituted both by its urban core and by its surrounding territory[2]. The *chora* provided the fundamental resources for the economic life of the polis and was in most instances the primary place for food production sustaining the community[3]. At the same time, periodic loss of sufficient yields would have been a constant threat and required imports of food staples, depending on trade links that connected urban markets, which allowed for the sale of agricultural surplus under different circumstances[4]. Such relationships are well illustrated by the framework of connectivity presented by Peregrine Horden and Nicholas Purcell (2000) 20 years ago. The authors of »The Corrupting Sea« argued that Mediterranean central places, such as poleis, should not be separated from their microregional or microecological setting[5]. Patterns of connectivity link into a defined environmental context,

1 Weiberg et al. 2016; Post 2017.
2 Hansen – Nielsen 2004, 70–79.
3 Garnsey 1989; Sallares 1991; Isager – Skydsgaard 1992.
4 Garnsey – Morris 1989; Bresson 2016, 381–414.
5 Horden – Purcell 2000, 123.

and with the resources derived from diverse environments often channelled through central place communities. The physical environment should therefore be understood as a significant agent in socio-economic processes occurring on different time scales. In this context, the patterns of connectivity cannot and should not be confined merely to links between different urban markets but should instead be approached through a much more fluid understanding of aggregate ›meshworks‹ of both space and place[6], as is also suggested in »The Corrupting Sea«.

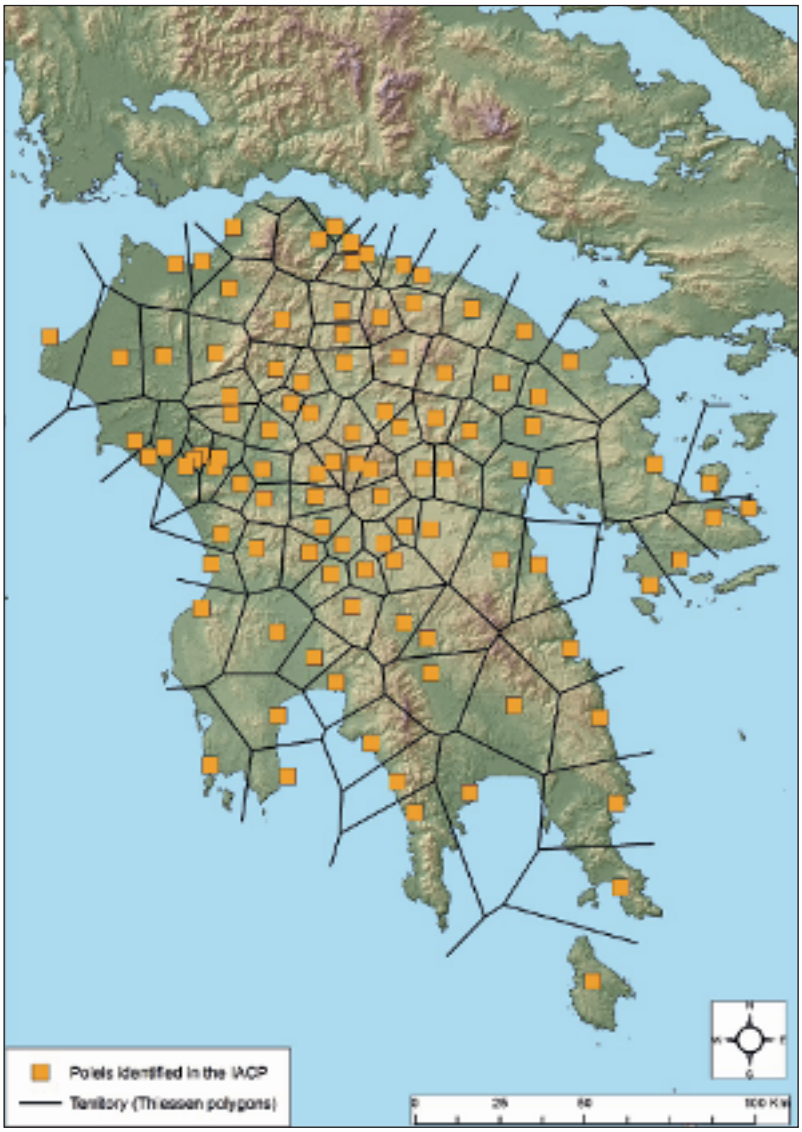
More recently such multiscalar processes in human-environment interactions have been explored and elegantly illustrated by M. Given[7]. He reflects on mobility and the complex and dynamic patterns of relationships and interactions in the landscape, as well as the intertwined practices of humans and their surroundings including animals, plants, soils and water. The various interactions form a dynamic formative aspect highlighting the importance of approaching environmental dynamics through dialectics of multiple human and non-human actors transforming and negotiating the landscapes that would have formed part of the territorial setup of ancient poleis. This demands that we integrate and use a wide range of sources and materials in order to study the environmental history of the ancient Greek polis. An environmental history of the polis requires engaged better communication between scholars working in different disciplines and scientific traditions related to environmental history, as well as integration of multidisciplinary datasets and sources[8]. Here we present an overview of possible data sources and then discuss how these can be integrated in order to examine socio-environmental dynamics within a Peloponnesian context[9].

SETTLEMENT ARCHAEOLOGY AND SURVEY DATA

A spatial overview of the distribution of poleis in the Peloponnese, based on the »Copenhagen Polis Inventory«[10], highlights the dense pattern of poleis in the Peloponnese during the Archaic and Classical periods (fig. 1). Thiessen polygons (a type of ›Voronoi tessellation‹), calculated through the distance between sites, provide a generalised overview of the potential territorial extent established through the distribution of poleis. The dense distribution of settlements identified as poleis illustrates the wide environmental impact that such sites would have had on the region. However, these landscapes would also have contained a large number of second-order settlements, villages and farms that formed part of local settlement hierarchies embedded within the polis territory.

Rural settlement structures can most directly be approached through the spatial distribution of farmsteads identified either through architectural remains and/or material assemblages relating to agricultural production and storage[11]. For this category of evidence, intensive archaeological surface survey has been instrumental in providing the evidence for changing settlement structures and land use dynamics in different regions of the Peloponnese[12]. This does not mean that the use of survey data for regional studies of land use is unproblematic. Within previous research, there has been considerable debate on the meaning of artefact concentrations interpreted as small rural sites regarding whether they reflect the presence of small habitation units and farmsteads[13]. The presence of off-site scatters of ceramic artefacts has further been subject to intense debate, tied

6 We are here deliberately echoing the terminology applied by Ingold 1993.
7 Given 2013.
8 For a discussion on the importance of cross-disciplinary consilience see Izdebski et al. 2016.
9 Izdebski et al. 2016.
10 Hansen – Nielsen 2004.
11 Alcock et al. 1994; Forbes – Foxhall 1995; Pettegrew 2001; Bintliff et al. 2002; Pettegrew 2002; Winther-Jacobsen 2010.
12 For the results of intensive surveys in the Peloponnese see Wright et al. 1990; Jameson et al. 1994; Wells – Runnels 1996; Mee – Forbes 1997; Forsén – Forsén 2003; Casselmann – Maran 2004; Alcock et al. 2005; Davis – Bennet 2017.
13 Alcock et al. 1994; Pettegrew 2001; Bintliff et al. 2002; Pettegrew 2002.



1 Poleis in the Peloponnese together with Thiessen polygons generated in ArcMap (based on the inventory of poleis in Hansen – Nielsen 2004)

to the question of whether such scatters can be linked to agricultural manuring in antiquity[14]. There are also issues of how to compare and integrate different datasets produced through varied field methodologies, emphasising the issue of inconsistencies in field methodologies and material typologies[15]. Keeping such issues in mind, the results from surveys have nevertheless been instrumental in highlighting issues of larger-scale regional landscape dynamics and transformations of rural economies building on comparisons of broader diachronic trends visible in multiple survey datasets[16]. The published survey data from the Peloponnese highlight a number of distinct trends of site fluctuations. Such trends reflect what may be described as ›boom and bust‹ sequences in the landscape[17], where we can observe periods of significantly expanding agricultural land use followed by periods of visible contraction. These cycles of change are commonly interpreted

14 Alcock et al. 1994; Bintliff 2000; Pettegrew 2001; Bintliff et al. 2002; Pettegrew 2002; Forbes 2013.
15 See the various contributions in Alcock – Cherry 2004.
16 See e.g. Alcock 1993; Bintliff 1997; Shipley 2005; Stewart 2013; Weiberg et al. 2016.
17 Bintliff 1997.

within a political framework but would also have had ecological resonance (both motivations and repercussions), emphasising further aspects of land use and overuse to nuance the picture.

A broad expansion of rural settlements in the Classical and Early Hellenistic periods is, for example, visible in several of the surveyed regions of the Peloponnese[18]. Such trends are also mirrored by the site data recorded by the Boiotia survey in central Greece[19]. Here John Bintliff and colleagues have argued that a population increase in the Classical period put substantial pressure on the agricultural soils in the Late Classical and Early Hellenistic periods, which led to a pattern of intensive manuring visible through the distribution of off-site ceramic carpets dating to these periods in the agricultural territories of poleis such as Thespiai and Tanagra[20]. In Boiotia, the fragile nature of such land use is further emphasised by the reduction of both off-site scatters and site numbers in the Late Hellenistic and Early Roman period. Similar patterns of contraction are also visible in different areas of the Peloponnese during the same period. Unfortunately, very little comparable off-site archaeology has been published from the survey projects carried out in the Peloponnese, preventing comparison of off-site fluctuations with recorded site dynamics.

Chronology remains an issue, especially when comparing survey datasets from different areas. It should further be kept in mind that sites may not have been operating in the landscape throughout the full duration of the periods to which the sites have been assigned[21]. Site numbers should instead be understood as ›aggregate‹ representations of settlement structures within a given time frame rather than reflecting ›continuous‹ habitation or activity within the same period. Various measures have been taken to weight site and settlement numbers according to period durations[22]. Recent applications of statistical methods and modelling within archaeology have, for example, utilised aoristic approaches that provide a chronologically weighted representation of the ›boom and bust‹[23].

In terms of land use dynamics and investigations of human-environment interactions, however, fluctuations in site quantities are not enough. New information needs to be extracted from legacy datasets in order to compare settlement trajectories with different classes of palaeoenvironmental data. Digitisation and treatment of site-based datasets in Geographic Information Systems (GIS) allow us to move beyond mere comparisons of site quantities, linking site distributions with land use patterns and use of specific environments over time[24]. In a study utilising survey data from the Berbati-Limnes project, we have used GIS-based Kernel Density Estimation (KDE) in order to produce period-specific heat maps that allow an examination of sequences of land use expansion and contraction[25]. The KDE approach allows us to look specifically at the spatial configuration of possible land use patterns, providing a spatially linked quantification of expansion and contraction compared to the data provided by diachronic site numbers. Figure 2 provides an overview of site inputs and the extent of possible land use produced through GIS-based KDE, using the Berbati-Limnes dataset and a 2.5 km radius input for the analysis[26]. In the Berbati-Limnes area, we can observe that a more nucleated pattern of sites produces a more contracted land use surface compared to a more dispersed pattern of sites, also when comparing periods with near equal site numbers. The KDE approach and similar GIS-based spatial models therefore allow us to produce models of land use dynamics that can subsequently be compared with the data provided by pa-

18 Wright et al. 1990; Jameson et al. 1994; Penttinen 1996; Mee – Forbes 1997; Tartaron et al. 2006; Caraher et al. 2006.

19 Bintliff – Snodgrass 1985; Bintliff – Snodgrass 1988; Bintliff et al. 2007; Bintliff 2012, 273 f.

20 Bintliff et al. 2007; Bintliff 2012, 273–276.

21 The long length of relative ceramic phases creates a more distinct problem in prehistoric periods such as the Neolithic and Early Bronze Age, see Wright 2004.

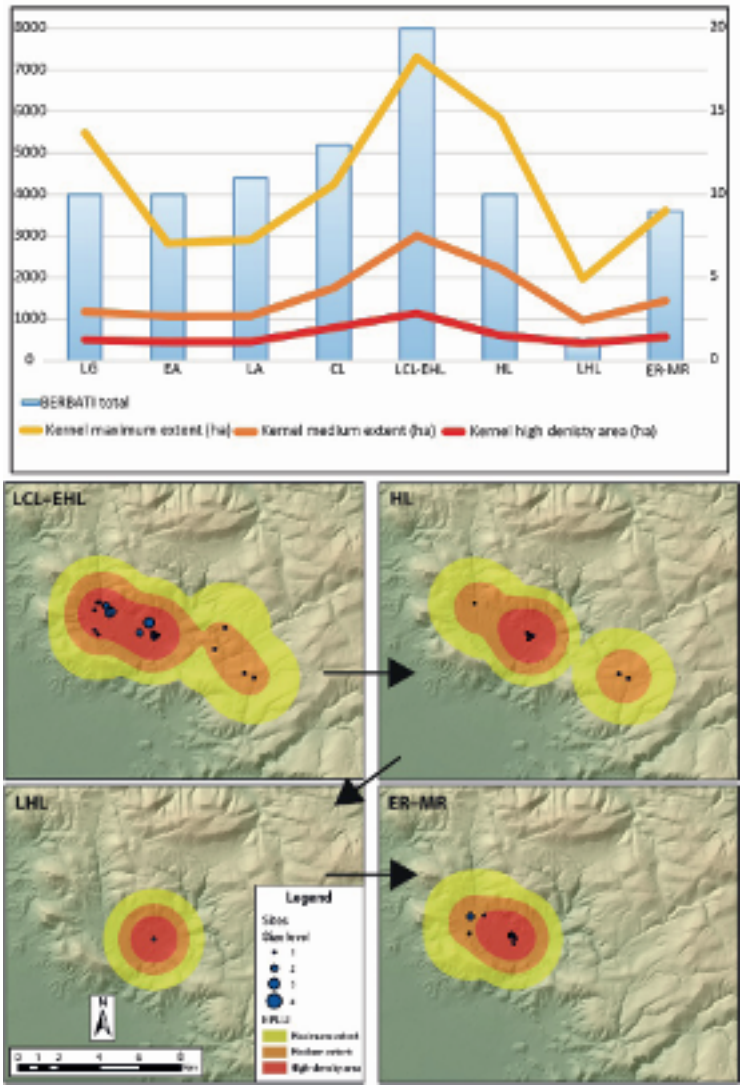
22 Wright 2004.

23 Palmisano et al. 2017; Weiberg et al. 2019a.

24 Witcher 2008; Argyriou et al. 2017; Bonnier et al. 2019.

25 Bonnier et al. 2019.

26 Bintliff 1999; Farinetti 2011, 42–43; Bonnier et al. 2019, 73.



2 Extent of possible land use calculated through GIS-KDE and the site numbers in the Berbati-Limnes region (based on Bonnier et al. 2019, 76 fig. 5). The density levels are related to the configuration of the heat maps based on the site inputs (based on Bonnier et al. 2019, 75 fig. 4). Maximum extent includes the entire density surface. Medium extent includes the two uppermost tiers only and the high-density areas include the hotspot areas only (following the method presented in Bonnier et al. 2019)

laeoenvironmental datasets. Other methods for GIS-based spatial analysis and modelling of land use may, in a similar fashion, contribute to an increased understanding of landscape dynamics[27].

POLLEN DATA

Pollen extracted from sediment cores is a class of evidence with potential to provide a wealth of information on land use dynamics, going beyond the evidence provided by settlement archaeology. Pollen records provide information that can span long periods of time and allow us to track changes in the proportion of different vegetation types, projected according to absolute chronology rather than relative archaeological or historical periods. The variability of different taxa

27 Witcher 2008.

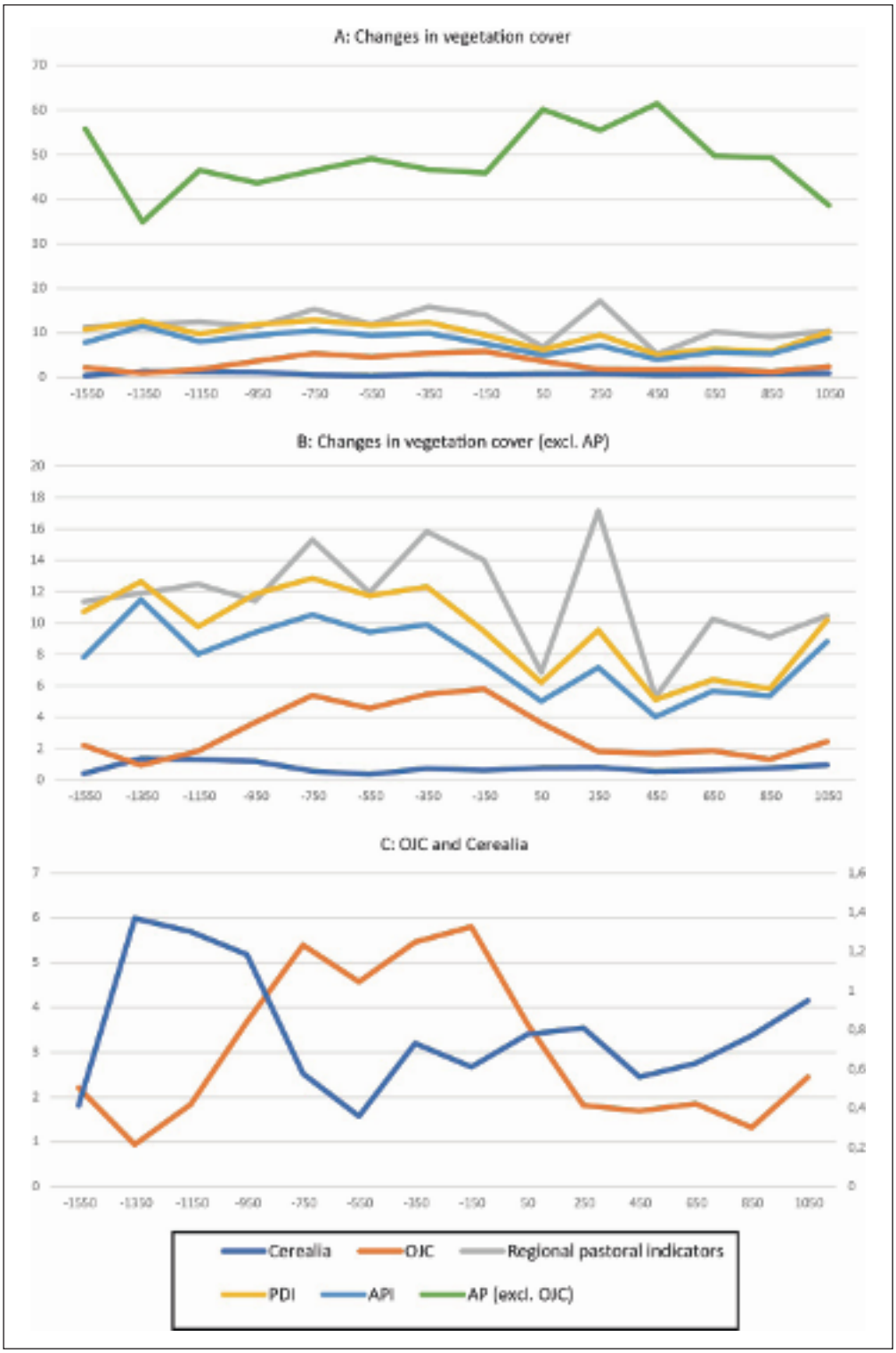
provide indications of vegetation changes that may, for example, be linked to changes in land use patterns and economic practices, specifically in periods with a high anthropogenic pressure on the landscape, or changing climate conditions[28]. The number of pollen records from the Peloponnese area is steadily increasing. These provide good potential for human-environment interaction studies, if controlled for chronological as well as spatial consistency. The radiocarbon-based chronology of pollen sequences generally have chronological uncertainties of ±100–200 years[29], which should be kept in mind when comparing pollen-based studies with the sequences of ›boom and bust‹ phases suggested by the archaeological record. The location of the pollen core is also of interpretive relevance, as the pollen signal in its composition is local and context dependent. A case in point is the differences between the lowland pollen cores in southern Greece, which are solely situated in coastal environments and which potentially provide a different picture compared to future records from inland or upland locations in the Peloponnese. A case in point is the evidence provided by cores in northern Greece that have been extracted in upland environments and exhibit clear differences compared to lowland and coastal records[30]. These issues are especially relevant on a short-term, sub-centennial scale and when comparing the results of single pollen cores with each other or with archaeological records.

Some recent research has instead focused on regional trends for pollen data based on multiple records using cluster analysis, which provides a regional trend for the Peloponnese and central Greece in 200-year time windows[31]. The broader trends in terms of vegetation cover resulting from this study can be linked with further regional economic developments and pressure on land use in the 1st millennium BC (fig. 3). These broad patterns of changes in vegetation cover can be interpreted to suggest a growing significance of cash cropping linked to growth of polis economies in the 1st millennium BC. More well-dated, high-resolution pollen records from different settings would enable better consideration of local circumstances linked to specific poleis. However, consideration of fluctuations in different types of cereals and their relevance for the complexities of ancient polis economies on the basis of the pollen group Cerealia is not without problems. For this perspective, we are dependent on on-site collection of macro-botanical remains to complement the written record.

THE ZOOARCHAEOLOGICAL AND ARCHAEOBOTANICAL RECORD

Assemblages of animal bones and plant remains from archaeological contexts hold great potential for providing a more settlement-specific picture of land use, including both general and detailed indications of food processing, butchery patterns related to specific strategies of animal husbandry and forms of agricultural land use in the surrounding areas. However, studies of faunal and plant remains from domestic settings of the historical periods are few in number and noticeably meagre compared to the available evidence for the prehistoric period[32]. Some sanctuary sites provide larger sets of faunal evidence, from within the sanctuary itself or in close connection to it[33], but given the possible effects of the sites' function on the overall faunal assemblages, such data would clearly benefit from further comparison with assemblages from strictly domestic contexts. Archaeobotanical studies from other areas of the Greek mainland demonstrate the wealth of information that can be gained from systematic sampling and analysis of plant remains at different settlement sites when dealing with the economic history of these periods[34].

28 Weiberg et al. 2019a.
29 Finné – Weiberg 2018.
30 Weiberg et al. 2019a.
31 Weiberg et al. 2019a; for the method see Woodbridge et al. 2018.
32 Dibble 2017; Weiberg et al. 2019b.
33 Forstenpointner 1990; Nobis 1994; Nobis 1997; Forstenpointner – Hofer 2001; Vila 2014.
34 For the type of evidence provided by archaeobotany see Margaritis 2016.



3 Diachronic trends of pollen taxa in southern Greece (based on data provided by Woodbridge et al. 2019; Weiberg et al. 2019a; for description of the various types of taxa and groups see Weiberg et al. 2019a, 745.)

The noticeable lack of archaeobotanical and zooarchaeological datasets for the Archaic to Roman periods in the Peloponnese can to some degree be explained by the reliance on written sources for studies of consumption patterns and land use strategies within ancient Greek subsistence and agriculture[35]. Literary sources provide strands of information that have been used to highlight different strategies of animal husbandry, but an overwhelming part of the evidence is not specific to Peloponnesian contexts and has been used as broader cultural proxies for general husbandry practices in the ancient Greek world and for the ongoing debate on pastoral production strategies[36]. In order to produce local information, we are therefore in need of site-specific archaeological assemblages (consisting of both zooarchaeological and archaeobotanical data) that can provide important contextualised information on diet and land use, based on consumption at specific sites, as well as changes in consumption patterns over time. Such data should preferably be gathered from a variety of contexts and topographical conditions in order to shed light on niche construction and the contexts of trade. The use of some of this data for stable carbon and nitrogen isotope analyses would be an additional desideratum and one that could be crucial for reconstructing agricultural strategies such as manuring or faunal management practices[37].

Given the paucity of archaeobotanical and zooarchaeological analyses from the historic Peloponnese, no comprehensive reconstruction is possible. Archaeological and textual records combined, however, suggest that the basic parameters of land use established already by the first farmers in the Neolithic remained largely the same throughout the historical period, with sheep/goat as the most common taxon, followed by pigs and cattle[38]. What appears to distinguish historical periods (a pattern already set in the Early Iron Age) from prehistoric ones, especially the Mycenaean period, is the spatial heterogeneity of the taxonomic composition, suggesting that different regions specialised based on their different ecological, environmental or other circumstances. As argued by Flint Dibble[39], such heterogeneity may have been a key function in the enhanced commercial environment of the historical period. Additionally, by the mid-1st millennium BC, free-threshing bread wheat had replaced glumed varieties as the main field crop alongside barley[40]. Bread wheat, however, requires better soils and more labour-intensive management[41]. This shift thus provides an additional dimension to the intensification of land use from the Classical period onwards noted from surveys and regional pollen syntheses.

GEOARCHAEOLOGY

Soils are essential for the agricultural economy but can be scarce in the parts of the present-day Peloponnese that are dominated by rocky terrain and steep slopes. Good agricultural soils are currently found on alluvial plains primarily in coastal settings. Our knowledge of ancient soil and its characteristics and location in the past is equally scarce. Yields would have been the sum of soil capabilities and crop characteristics, and our modern appreciations of ancient yields remain guesstimates ranging from c. 400–900 kg per hectare for both wheat and barley[42]. What we can say, however, is that ancient Peloponnesian farmers went to considerable efforts to secure agricultural output, by manuring and terracing for example, although both have proven difficult

35 Gallant 1991; Sallares 1991; Isager – Skydsgaard 1992; Sallares 2007.
36 Hodkinson 1988; Skydsgaard 1988; Chandezon 2003.
37 Vaiglova et al. 2014; Nitsch et al. 2017; Price et al. 2017.
38 Weiberg et al. 2019b.
39 Dibble 2017, 278–295.
40 Kroll 2000; Dibble 2017; Weiberg et al. 2019b.
41 Dibble 2017, 287 f.
42 Jardé 1925; Garnsey 1989; Moreno 2007; Hansen – Allen 2011.

to identify in the historical Peloponnesian landscapes[43]. Indirect evidence for such landscape manipulations may perhaps be found in the sediment histories of certain regions, even though the nature of anthropogenic impact on the sediment record remains elusive. Increasing erosion and sedimentation can be a result of increasing pressure on the landscape, particularly when focused on steeper ground where agricultural activity can destabilise soils, leading to increasing sedimentation. Equally, the abandonment of agricultural land, particularly terraced slopes, may also lead to destabilisation and erosion[44]. Sediment coring in different parts of the Peloponnese has demonstrated a high variability in the rate of sedimentation, within and between regions[45].

In the upper Asopos valley, close to the polis of Phlious, geoarchaeological work demonstrated that extensive sedimentation occurred during the Late Bronze Age and during the Roman period[46]. Both of these periods represent phases of site expansion and heavy land use in the valley, as demonstrated by intensive archaeological surveys in the area[47]. The results of archaeological research at Phlious itself further highlights a period of continuing urban activity from the Hellenistic into the Roman period[48]. In comparison with many other geoarchaeological studies from the Peloponnese, the sediment sequence from Phlious dated using Optically Stimulated Luminescence (OSL) is comparatively well constrained chronologically (average OSL age uncertainty in the interval of interest is approx. ±340 year [2σ])[49]. The short but high amplitude phase of increased sedimentation has been suggested by the authors to occur at the very end of the Bronze Age and may very well be the effect of lapsed upkeep of Mycenaean terraces in the region. It should be noted, however, that this phase of high sedimentation rates occurs only in one of the three very closely located sample sites. The Roman phase, however, is longer, and the peak at one site corresponds to generally high levels in the two other sites, possibly also suggesting overall increased agro-pastoral intensity from the Classical period onwards, though the sites belonging to this period are mostly located within the valley itself and not on the hillsides.

The sedimentation record from the Akte peninsula has a coarser resolution but increased sedimentation seemingly coincided with the settlement contraction phase during the later Hellenistic and Early Roman period[50]. In this case it has been argued that land abandonment after 250 BC led to lapsed upkeep of terraced land previously used for olive cultivation, which, in combination with increased rates of grazing, contributed to the increasing build-up of colluvium[51]. A similar scenario has also been proposed for the *chora* of Stymphalos, where recent investigation has pointed towards increasing rates of erosion in the Roman period[52]. As in the case of the Akte peninsula, and in line with the suggestion for the end of the Late Bronze Age in the Phlious valley, the increased volume of sedimentation was associated with the abandonment of terraced landscapes in the 2nd century AD.

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43 We have seen that manuring was practised already in the Neolithic, although the practice of manuring during historical periods is still debated: Forbes 2013. Similarly, while Mycenaean agricultural terraces have been identified in the region of Kalamianos (Kvapil 2012), the extent to which agricultural terraces were used in Classical antiquity remains a debated topic (Foxhall 1996). That agriculture on sloping lands increases the likelihood of erosion setting in is beyond dispute (Whitelaw 2000), but the written sources are ambiguous when it comes to identifying agricultural terrace constructions, and the terraces that can be encountered in Peloponnesian landscapes are notoriously difficult to date (Foxhall 1996; Foxhall 2007).

44 van Andel et al. 1990; Wells et al. 1990; Whitelaw 2000.

45 Weiberg et al. 2016.

46 Fuchs et al. 2004; Fuchs 2007.

47 Casselmann – Maran 2004.

48 Biers 1971; Alcock 1991.

49 Fuchs et al. 2004.

50 van Andel et al. 1986; van Andel et al. 1990; Jameson et al. 1994.

51 Runnels – van Andel 1987; see also Acheson 1997 for a critique of the »economic explanation«.

52 Brown – Walsh 2017.

PALAEOCLIMATOLOGICAL DATA

The last decade has seen a substantial increase in local climate information from the Peloponnese, drawn from caves and wetlands. Here we review palaeoclimatic information from caves since this data can provide chronologically more constrained information of higher resolution[53]. Speleothems are comparatively abundant in the Peloponnese since the bedrock of the peninsula primarily consists of limestones that contain a large number of caves.

Speleothems (primarily stalagmites) forming under favourable conditions can record and preserve information about the ambient climate over thousands of years[54]. Speleothems form when surface water that chemically weathers limestones and becomes super-saturated enters the cave and deposits calcite. Climate information is stored in different ways in the speleothems and various so-called proxies (indicators) can be analysed[55]. In Mediterranean contexts, the composition of oxygen isotopes ($\delta^{18}O$) in speleothems is the most commonly analysed proxy and is often interpreted to reflect variability in moisture and rainfall[56]. Climate information from speleothems can be chronologically constrained using uranium series dating (U-Th dating)[57]. Under favourable circumstances (high uranium and low detrital input), chronologies for speleothems can be more precise in comparison with radiocarbon dating with uncertainties of around two decades (2σ). Proxy analyses in speleothems can be conducted at sub-millimetre resolution, which depending on the growth rate of the sample, can provide sub-decadal information about climate variability[58].

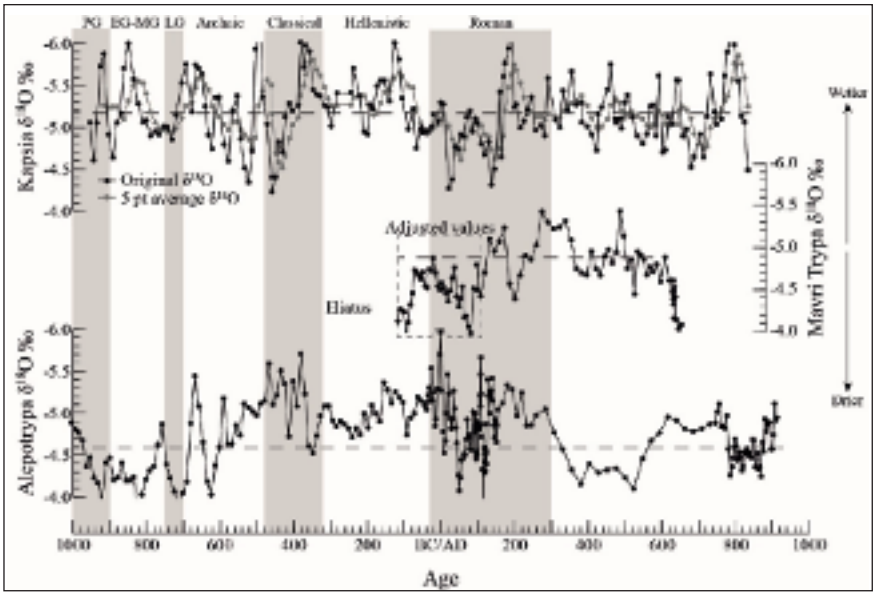
Evidence for climate variability in the 1st millennium BC is principally provided by two speleothem records recovered from the Alepotrypa cave in Laconia and the Kapsia cave in Arcadia (fig. 4). The two records offer broadly similar patterns of climate variability, but with occasionally diverging trends in the short term (fig. 5). Both records seem to indicate prevailing dry conditions throughout most of the Early Iron Age. In the 7th and 6th centuries BC, there are instead fluctuations between dry and increasingly wet phases. Going into the Classical period, we can observe an increasingly wet climate, which continues well into the Hellenistic period. In the Kapsia record, this dry phase is prolonged over centuries and starts around 100 BC. In the Alepotrypa archive, drier conditions seem instead to be present in the 1st and 2nd centuries AD. In addition to these two records, a recently published speleothem from the Mavri Trypa cave on Schiza island (see fig. 4), off the southwestern coast of Messenia, provides some data for the end of the 1st millennium BC. There is a hiatus in the record between the 12th and the 2nd century BC, limiting the available climate data for the 1st millennium BC. The record nonetheless suggests wetter conditions in the Late Hellenistic period but which are replaced by a drying trend in the 1st century AD (see fig. 5), to a certain extent reflecting the trend visible at this time in the Alepotrypa record (though the duration and timing of the dry spell is not identical).

INTEGRATING CULTURAL AND PALAEOENVIRONMENTAL DATASETS

From the above review of data sources, it is clear that several palaeoenvironmental archives from different areas of the Peloponnese are available. This data can help us to examine environmental dynamics in tandem with socio-economic developments from the Archaic period to the Early Roman period in regions of the peninsula dominated by polis communities[59]. Ancient Greek

53 Finné – Weiberg 2018.
54 McDermott 2004; Fairchild et al. 2006.
55 Fairchild et al. 2006; Fairchild – Baker 2012.
56 Bar-Matthews et al. 1997; Bar-Matthews et al. 2003; Drysdale et al. 2006; Verheyden et al. 2008; Finné et al. 2014; Cheng et al. 2015; Finné et al. 2017; Psomiadis et al. 2018.
57 Richards – Dorale 2003.
58 For a local comparison between U-Th dating and radiocarbon dating and a discussion around temporal resolution see Finné – Weiberg 2018.
59 See Weiberg et al. 2016.

4 Location of cave archives and speleothem records in the Peloponnese (illustration A. Bonnier)



5 Changes in the composition of oxygen isotopes ($\delta^{18}O$) between 1000 BC and AD 1000 in the Kapsia, Mavri Trypa and Alepotrypa records (adapted after Bonnier – Finné 2020, fig. 2.; Bonnier 2023, fig. 7, 4)

agriculture was primarily composed of dry farming utilising natural precipitation and moisture in the soils. As such, agricultural activities were highly sensitive to variations in rainfall[60]. Both ancient text and ethnographic analogies demonstrate, however, that farmers in the Greek landscape maintained different buffers against bad crop years resulting from insufficient rainfall and leading, as a consequence, to inadequate food production[61]. Insufficient rainfall would thus have been one of many hazards to affect harvests on a year-to-year basis, resulting in interannual variations in yields and influencing management decisions[62]. Droughts can also be assumed to have had more severe effect in already drier parts of the region, such as in the northeastern Peloponnese. Interannual fluctuations would have been an issue regardless of the overall climatic regime. An important effect of climate change, however, would be an impact on the balance between ›good‹ and ›bad‹ years. A shift towards a drier climate would probably have had a negative impact on overall agricultural productivity, primarily by decreasing the time between substantially decreased or even failed crops as well as the availability of suitable pastureland and cultivated fodder[63]. Equally, more humid periods may have increased overall agricultural yields and the frequency of bumper crops that would allow the conversion of surplus to items beyond subsistence.

With the advent of new palaeoclimatic data from the Peloponnese, it is possible to add new dimensions to our understanding of such socio-environmental dynamics during the Archaic to Early Roman periods. Until very recently, any questions including issues of climate variability could only be pursued by way of analogy or by using far away climate data[64]. Recognition of the spatial heterogeneity of the climate in the Mediterranean, both past and present, highlights the difficulties in using non-local climate information[65]. In combination with other data regarding land use and land cover, we now have an unprecedented possibility to move forward in our knowledge of human-environment interactions in the peninsula. In the following, we will attempt to sketch an integrated view based on the current state of research.

THE ARCHAIC TO EARLY HELLENISTIC PELOPONNESE

Figure 6 provides information from various data sources which can be compared in order to identify points of convergence in the various socio-environmental trajectories in the Peloponnese. The multiple survey projects from the Peloponnese have provided a general picture of rural settlement expansion from the Archaic period and more definitely in the Classical period itself, with site numbers often reaching a maximum in the 4th or early 3rd century BC, possibly reflecting population growth and intensified pressure on landscape resources within a polis framework. Based on available climate reconstructions, it is now possible to suggest that this expansion was supported by generally wetter conditions with improved possibilities for increased yields of bumper crops (given that rainfall came during the right time of year). Although the speleothem records from the Alepotrypa and Kapsia caves provide slightly different signals, a broad trend of an increasingly wet climate in the 5th and 4th centuries BC, followed by fairly stable conditions into the 2nd century BC, can be suggested, which compares well with the expansion of sites in the Classical and Early Hellenistic period (fig. 6 A).

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60 Halstead 1989.

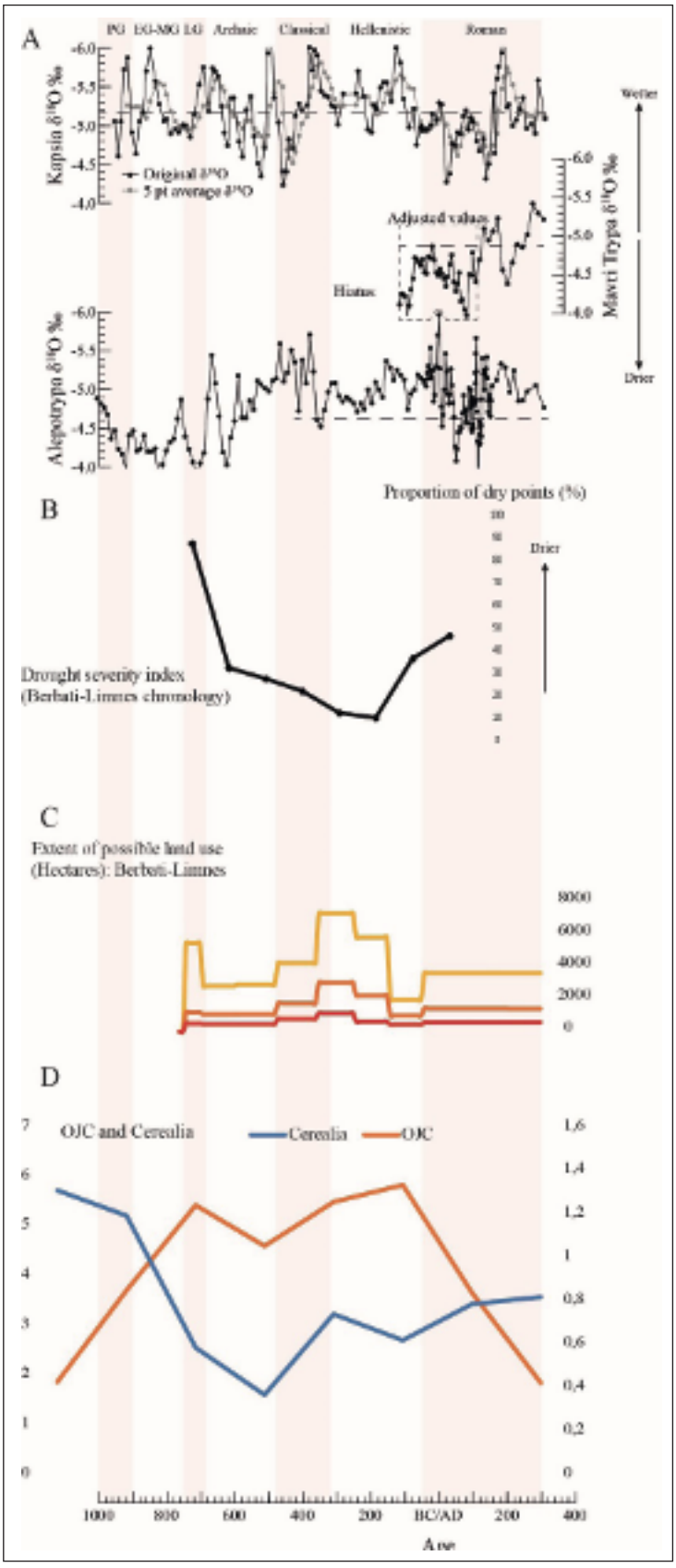
61 Such measures include surplus production for storage, composition of crops and animals and spatial diversification, measures that were designed to spread the risk and ensure at least partially preserved outputs (Halstead – O'Shea 1989; Halstead 2014; Forbes 2017; see also Marston 2011; Marston 2015). Trade was another measure by which the results of bad crop years could be ameliorated, and we know from written sources that grain was acquired outside of the local region in periods of underproduction (Garnsey 1989; Garnsey – Morris 1989; Moreno 2007; Bresson 2016, 393–395).

62 Halstead 2014, 191–199.

63 Roberts 2011.

64 van Andel et al. 1990; Fuchs 2007.

65 Roberts et al. 2011; Finné et al. 2011; Finné et al. 2019.



6 Synchronic trends in A) oxygen isotopes ($\delta^{18}O$), B) drought severity, C) land use and D) OJC and Cerealia for southern Greece (based on data provided by Woodbridge et al. 2019; Weiberg et al. 2019a)

We are, however, faced with issues of chronology and data comparability when using the palaeoclimatic data together with evidence provided by the survey data. The speleothem records provide data according to absolute dates, while the survey data is grouped according to relative archaeological period, corresponding to uneven time frames in absolute years. In this sense the survey data represents aggregate distributions of sites per period. We have therefore created a »drought severity index« based on the number of dry points/years within defined time series, set based on chronological equidistance or relative archaeological and historical periods. This approach was developed by Ingram in a study of drought impact on human societies in the American southwest, where the proportion of dry years was determined based on 200-year time frames[66]. Here we have used the same method to identify the proportion of dry data points in the speleothem record using chronological groups demarked by the relative archaeological periods set by the Berbati-Limnes survey. The results, as shown in figure 6 B, suggest that there is some correspondence between shifts in climate and the patterns of expansion and contraction highlighted by the GIS-based KDE.

Stable wetter conditions could, for example, be argued to play into the expansion of the extent of possible land use. Our reanalysis of the Berbati-Limnes survey data using GIS-based kernel density estimation has shown that in the expansive period between 500 and 150 BC (fig. 6 C), possible land use areas incorporated a higher proportion of marginal land constituted by steeper slopes with thinner soil cover[67]. Archaeological fieldwork in both the southern Argolid and the Stymphalos region also suggest that agricultural land use expanded onto hillsides and steeper slopes in the Classical and Hellenistic periods[68]. Geoarchaeology seems to suggest that this expansion had little effect on landscape stability, emphasising the probable use of agricultural terraces in these environments. Land use would have been sustainable as long as terraces were constructed and maintained. Increased sedimentation thereafter suggests that abandonment had a greater impact on soil stability. From the cluster analysis of available pollen data, the most striking is an expansion in the proportion of cultivated tree pollen (OJC = *Olea*, *Juglans*, *Castanea*) from the 10th century BC onwards (fig. 6 D). This increase is initially combined with a decrease in cereals until a low point in 550 BC, after which it increases slightly again. The increase in OJC concurs with other indicators for human activity/impact, such as general indices for human impact (API = Anthropogenic Pollen Index) and for pastoral activities (PDI = Pollen Disturbance Index)[69]. In the case of these indices, the increase follows upon a brief reduction in values after the end of the Mycenaean period. In southern Greece, both indices are primarily driven by the level of chicory (Cichorieae), a common proxy for pastoral activities (fig. 3)[70]. OJC and the two other indices reach their highest levels between 750 and 150 BC. All in all, the evidence from pollen suggests a strong expansion of human activity in the landscape during the Classical and Early Hellenistic periods. The high proportion of OJC pollen before 150 BC could potentially be connected to the expansion of small rural sites and an increasing use of more marginal soils in the Classical and Early Hellenistic periods.

We can still assume that rural expansion in the Classical period was initially driven by the growth of urban centres in the northeastern Peloponnese, including larger poleis such as Corinth and Argos, as well as smaller urban entities (such as Phlious, Hermion and Halieis to name but a few). A more humid climate may nevertheless have supported an extension of the range and pace of agricultural exploitation, for example through the expansion of cultivation onto more marginal soils. Such land use expansion is very likely to have decreased the sustainability of cultivation in

66 Ingram 2018.
67 Bonnier et al. 2019.
68 Jameson et al. 1994.
69 Mercuri et al. 2013; Kouli 2015.
70 Weiberg et al. 2019a.

these areas, contributing to the initial contraction between 250 and 150 BC[71]. Even before that, the expansion of the agricultural economy likely put a strain on natural as well as human resources, with any crop failure threatening the overall food security. Pressures on food supplies in this period may be seen in terms of grain imports to polis communities. A substantial volume of evidence exists for the transfer of grain from the Black Sea region to Athens in the 4th century BC[72]. While the evidence for imports to Peloponnesian poleis are not as abundant, we also know of instances of grain transfers in the Classical and Early Hellenistic periods[73].

THE LATE HELLENISTIC TO EARLY ROMAN PELOPONNESE

The pattern of spatial contraction visible in several surveys for the Late Hellenistic and Early Roman periods should primarily be linked to changes in land ownership and realignment towards agriculture based on larger estates and an increase in commercial market-oriented farming[74]. A move towards lowland agriculture fits well with the interpretations of site patterns reflecting changes in land ownership due to the diminishing importance of polis institutions and their impact on economic structures in this period. This interpretation is further supported by changes in pollen that after 150 BC highlight a strong decrease in the proportion of tree crops, anthropogenic and pastoral indicators, though the proportion of cereal pollen continues to increase (following a general trend for cereals visible from the Archaic period and onwards; see fig. 3 and fig. 6 D). The decrease in human activity in the uplands is further mirrored in a regeneration of deciduous oak woods (and generally increased levels of arboreal pollen, AP), suggesting a closing of the woodland after 150 BC. Such a pattern would thus compare quite well with the changes in the spatial configuration of land use in the Berbati valley. After 150 BC, the realignment of rural sites towards low gradient land visible both in the Berbati-Limnes region and elsewhere in the northeastern Peloponnese may indicate a greater focus on cereal crops (probably bread wheat intended for market sale), managed through larger estates partly in the hands of non-local landowners.

Given that after 150 BC the climate shifted from predominantly wetter to more arid conditions, there may have been a climatic effect on the agricultural potential that should be considered, specifically for the northeastern Peloponnese. Increasingly dry conditions may in particular be highlighted as a possible factor behind the more limited use of marginal, high-gradient land suggested by the GIS-based KDE analysis carried out for the Berbati-Limnes survey data. The more limited use of marginal land suggests that climate variability may have played into broader landscape dynamics and the spatial shifts in land use, even if these were initially prompted by socio-political factors. Drier climate conditions in this period would have made sloping ground with a thin soil cover undesirable for cultivation, particularly if carried out in the interests of a more restricted group of landowners primarily engaged in commercial farming. The increasing rates of sedimentation in the Late Hellenistic period in the southern Argolid (on the Akte peninsula) were interpreted as being the result of contracting cultivation and lack of terrace upkeep, tying into the broader landscape dynamics and agricultural contraction[75]. In this scenario, increased sedimentation rates would support not only an abandonment of upland areas but also the previous use of agricultural terraces to manage soil in marginal areas. Considering that sedimentation records often have poor chronological resolution and the results provide data for local processes, it is important not to draw any definite overall conclusions based solely on this class of evidence for a regional synthesis. The published data nevertheless adds an interesting dimension to our

71 As in the case of Boiotia see Bintliff et al. 2007.
72 Summarised for example in Moreno 2007.
73 Bresson 2011; Bonnier 2016.
74 For a discussion on land use and regional economies in the Greek mainland during the Roman period see Bintliff 2008; Bintliff 2013; Rizakis 2013; Zoumbaki 2013; Bintliff 2014; Rizakis 2014.
75 Runnels – van Andel 1987; van Andel et al. 1990; Jameson et al. 1994.

regional narratives. High sedimentation rates during the Late Hellenistic to Early Roman period or the Roman period in several areas of the northeastern Peloponnese may strengthen the point of regional land use dynamics affecting soil stability. Landscape instabilities would then have been driven primarily by human land use, or the lack of it, but it is not unlikely that they would have been accentuated by the drier conditions of the period.

MOVING FORWARD

Narratives like this have now been built for many regions around the Mediterranean, based on close collaborations between scholars from different disciplines[76]. Utilising the benefit of having detailed textual accounts, Late Antique and early medieval case studies have been especially successful in illustrating the importance of contextual detail and highlighting the differential outcome of climate and environmental change even within the same community[77]. Where textual records are more limited, archaeological indicators need to be found. Building on previous work by Paul Halstead and others[78], John M. Marston has explored archaeological markers for risk management strategies around the city of Gordion in present-day Turkey[79]. Access to the extraordinary archaeobotanical record from 3000 years of occupation allowed a detailed analysis of the economic strategies employed for different periods, the level of intensity and the risks involved. In this context, it was concluded that the period contemporary to the Classical and Hellenistic periods in Greece constituted a spatially diverse agro-pastoral system with low intensity agriculture based on multiple cereal crops and extensive herding. In the period of Roman rule, the intensity increased through an enhanced use of irrigation and a new focus on monocropping, in particular on bread wheat, a preferred market crop within the Roman Empire[80]. In Gordion, there are also signs of overgrazing by large herds of sheep or goats during the same period. The methods employed by Marston are currently not applicable to mainland Greece due to limitations in the available data, but show the potential of large-scale collections of on-site macro-botanical and faunal remains. As we have seen, however, site densities and spatial patterns of land use, supported by pollen data, present similar trajectories for the Greek mainland as in Gordion from the Classical to the Roman period. However, pollen evidence from mainland Greece does not substantiate an intensification of herding during the Early Roman period, although this could partly be an effect of the origin of pollen data from lowland areas, which will not pick up large-scale herding in higher terrain.

Issues of spatial diversification, specialisation, crop diversity and politico-economic conditions and demands are key for understanding the level of vulnerability on different scales of ancient societies and thus, how well-equipped ancient societies were to handle the effects of climate change. As a result, scholars have most recently attempted to convert modern methods for vulnerability assessments to fit ancient circumstances[81]. Key factors raised are the availability, diversity and health of food resources relative to the size of the population on the one hand, and on the other hand, variables related to the social conditions of the time, such as the patterns of connectivity, mobility and overall access to resources. Such assessments are a move towards streamlining information and a higher degree of quantification to enhance comparability between data sources and contexts.

For comparability, chronology will always be of key concern. Palaeoclimate data is commonly projected according to absolute chronology (in years before present where present is AD 1950),

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76 E.g. the contribution to special issues in »Quaternary Science Reviews« (Gogou et al. 2016) and »The Holocene« (Roberts et al. 2019).

77 Haldon et al. 2014; Izdebski et al. 2018.

78 E.g. Halstead 1989.

79 Marston 2011; Marston 2015.

80 Marston 2011.

81 Nelson et al. 2016; Ingram 2018.

while archaeological survey data is primarily structured according to relative ceramic phases spanning several centuries. The timing, pace and duration of land use changes within these relative chronological periods is difficult to assess given the temporal resolution of the data. Recorded site patterns usually represent aggregate site presence for a defined time frame in the examined landscape, impeding the identification and establishment of any causal links between climate and socio-economic developments. A recent synthesis of pollen, archaeological site data and summed probability distributions (SPD) for a number of Mediterranean regions employed previously defined 200-year time frames that also allowed statistical testing of the degree of correlation between different time series[82]. Another way to do it is to adapt to the lowest resolution of archaeological data series, as has been done in our adaptation of the palaeoclimatic data according to relative archaeological periods (see fig. 6 B).

CONCLUSION – A WISH LIST

As we have seen, the Peloponnese offers a rich collection of evidence that can be used to examine the impact of polis communities on their surrounding environments as well as the consequence of environmental changes on polis structures and socio-economic developments. The current state of the evidence allows us to engage in a discussion primarily concerned with human-environment interactions on a regional level, where we can identify synchronicity in the different cultural and palaeoenvironmental datasets using various measures of diachronic comparison. This will not now, nor likely ever, constitute a final narrative, as new data is still needed and new perspectives will emerge. We need, in particular, to engage in further investigation of multiscalar dynamics, moving from a regional level to a microregional one, or even site-based contexts, and to strengthen the identification of cause and effect in human-environment interactions. In order to produce such analyses, new high-resolution data will be crucial, but increasing attention from active field archaeologists to such questions and the environmental data will also be necessary. Here we thus present a wish list for archaeologists working in the Peloponnese of things that would improve the potential for future research considerably[83]:

- Archaeologist should incorporate environmental perspectives and the recovery of environmental data in archaeological project design. In particular, it is crucial that excavators include strategies for archaeobotanical and zooarchaeological sampling. An improved diachronic record stemming from multiple sites will improve our understanding of production and consumption patterns over time and their relationship with broader environmental trajectories.
- Within environmental sampling programmes, excavators should consider utilising stable isotope analyses for reconstruction of agricultural production strategies, such as use of manuring and irrigation as well as the seasonal mobility of herds (a potential key for new evidence concerning transhumance).
- When planning new projects, make sure to include environmental archaeologists and specialists at an early stage in order to define ways to produce data that can assist in the study and interpretation of human-environment dynamics.
- If possible, archaeologists should also consider including palynological analysis in both regional survey projects and excavation. We need new high-resolution pollen records in order to produce better data for changes in regional and microregional vegetation cover. We are currently hampered by the fact that all of the pollen archives in the southern

[82] Weiberg et al. 2019a.

[83] This paper includes data and publications until 2019. The field of human-environmental interaction is one that is fast moving both in its interdisciplinary and disciplinary dimensions. It is therefore important to always seek the latest publications (cf. Weiberg – Finné 2022; Bonnier 2023).

Greek mainland come from coastal locations. New cores from inland and upland locations would potentially provide different trajectories in terms of vegetation cover. The extraction of pollen from such areas is unfortunately problematic due to the lack of suitable wetland contexts; archaeobotanical sampling during excavation would go some way to make up for the dearth of pollen data from such contexts.

- We also need more data from sites beyond the principal urban settlements. Intensive surface survey has been instrumental in providing evidence of rural settlement structures and associated land use but cannot provide the full range of environmental evidence that we can gain from excavated contexts. Ideally, rural settlements should therefore be excavated so that we can retrieve archaeobotanical and zooarchaeological remains that ultimately would allow for a comparison of production and consumption strategies between the urban contexts and the *chora*.
- Given the importance of establishing chronological synchronicity between the cultural and palaeoenvironmental datasets, any attempt to improve the chronological resolution of the archaeological record would be most welcome in terms of human-environment interaction studies. This could include improvements in ceramic chronologies of datasets from both survey projects and archaeological excavation, radiocarbon sampling and restudy of ceramic datasets from older excavations and surveys in order to produce more exact time series.

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Katharina Rusch – Harald Stümpel – Wolfgang Rabbel

GEOPHYSICAL PROSPECTION OF NORTHERN PELOPONNESE POLEIS

CHALLENGES, SOLUTIONS, AND OPEN QUESTIONS – A SHORT TALK SUMMARY[1]

ABSTRACT
The uplift of the northern Peloponnese, sea level changes and erosion over the last couple of hundred thousand years have shaped the morphology of the northern Peloponnese as we know it today. Terraces of marl capped with regionally different materials covered by different thicknesses of sediment are the setting of the geophysical prospection of ancient poleis in the northern Peloponnese. The different sediment covers result in different depths of archaeological remains. The non-magnetic soils combined with non-magnetic building material mean that the magnetometry is not able to resolve all structures. This is exacerbated by the human utilisation of the area. Thus, other methods like GPR, ERT and seismics are more successful at detecting archaeological structures, and they are needed to distinguish possible anthropogenic from geological features. The prospection conditions characteristic for areas such as the northern Peloponnese are demonstrated by geophysical findings acquired along a representative profile leading from the acropolis of Aigeira to the coastal plain of Sikyon. These are especially: 1) a fortification wall and building foundations at a depth of 0.4–1.2 m on a plateau near the acropolis of Aigeira found by 400 MHz GPR; 2) honeycomb-shaped patterns of magnetic anomalies suggesting cavities, which could be identified as a weathering pattern of conglomerate rocks; 3) rock basement and remains of an enclosing wall of the Aigeira theatre area found by shear wave refraction measurements at a depth of 2.3 m, deeper than the GPR range; 4) remains of walls, possibly representing a segment of the city wall of ancient Sikyon with adjacent house constructions, from combined 3D ERT and magnetic mapping; and 5) a silted-up depression in the sediments of the coastal plain near Sikyon located through Love wave measurement, which could be evidence of a silted harbour or navigable riverbed.

INTRODUCTION

A series of important ancient poleis are situated on the northern Peloponnese along the southern shore of the Gulf of Corinth, where the ancient cities of Aigeira and Sikyon are currently being investigated archaeologically. The geophysical surveys, which are part of these studies, are the subject of the present article. It deals with prospection challenges, which are (mainly) caused by the geological setting of the area of the Gulf of Corinth. The prospection problems and potential solutions presented here can be seen as exemplary cases, which can be transferred to other regions of a similar geological character. After a short characterisation of the geological setting, the related challenges of geophysical prospecting are discussed. The solutions implemented are presented by means of examples in separate chapters.

GEOLOGICAL SETTING

The Gulf of Corinth is an area of ongoing highly active tectonics, which has not only created

[1] The content of this article is part of the dissertation of K. Rusch (Rusch 2021). A more extensive overwiew is also given by Rusch et al. 2020.

the morphological conditions for the foundation and evolution of the ancient settlements, but also the present multiform environment, in which the archaeological remains are embedded. The extensional deformation leading to the subsidence of the gulf is accompanied by an uplift of the northern Peloponnese, and has been connected with sea level changes, erosion and sedimentation towards the gulf over the last couple of hundred thousand years. This process created a stack of marl terraces, which are interlayered and capped with different sedimentary rocks of variable thickness. In the areas of Aigeira and Sikyon, this layer sequence consists of a set of marine terraces of marl with mostly conglomerate cap rock[2]. The conglomerate formed the building material of the ancient houses. Their ruins are covered by the erosive products of the same marl and conglomerates, which have been washed down the coastal mountain range and deposited in the coastal plain, thereby creating a sedimentary cover of up to several metres.

CHALLENGES OF GEOPHYSICAL PROSPECTION

With regard to geophysical surveying, this seismically active geological setting causes the following challenges:

- only small to vanishing magnetic contrast between ancient construction material and surrounding soils and rocks, reducing the significance of magnetic mapping;
- pronounced heterogeneity of near-surface rocks on top and along the flanks of the mountain range on spatial scales comparable to anthropogenic structures;
- complex tectonically initiated weathering forms, which may resemble man-made structures;
- up to several metres of sedimentary cover in the coastal plain, under which construction remains and possibly a silted-up harbour basin or waterways may be hidden.

Besides the geological conditions, the human utilisation of the investigation area causes further prospection problems, which are, however, typical for modern urban and agricultural areas, such as drainage and irrigation tubes, subsurface cables and wires, rubbish of all sorts and traffic noise.

SOLUTIONS

The following examples from geophysical surveys performed in Aigeira and Sikyon show how these problems can be overcome to a certain extent[3]:

No magnetic contrast

On one of the lower terraces northwest of Aigeira's acropolis some stone blocks, which might be connected to a fortification wall, are visible at the break-off edges. Geophysical investigations were supposed to answer the question of whether they can be tracked further below the surface. The magnetometry survey (fig. 1 a), however, showed no hints of the supposed wall or any other clear indications of building remains on the plateau. Consequently an additional GPR survey was conducted and was able to identify a wall around the terrace (fig. 1 b) as well as building remains in the entire area (fig. 1 c).

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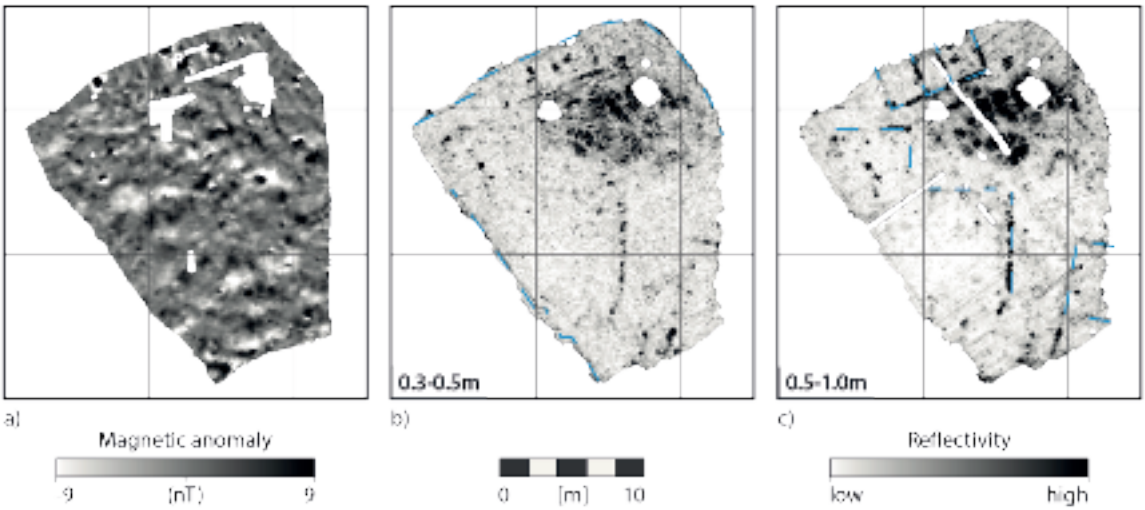
2 Rohais et al. 2007; Hayward 2003.

3 Geophysical equipment used: magnetometry: handcart of 4-6 Foerster fluxgate gradiometer; ground-penetrating radar (GPR): 400 MHz antenna and a SIR20/SIR4000 by GSSI; electric resistivity tomography (ERT): RESECS multi-electrode registration unit by Geoserve; seismics: sledgehammer source, geodes by Geometrics and 4.5 Hz geophones; georeferencing: 1200 DGPS by Leic.



1 The magnetic map (a) shows no clearly archaeological structures. The GPR survey shows a surrounding wall around the plateau at a depth of 0.3–0.5 m (b). Additionally, at a depth of 0.5–1.0 m (c) building structures are found (© K. Rusch, IfG Kiel)

Weathering and erosion

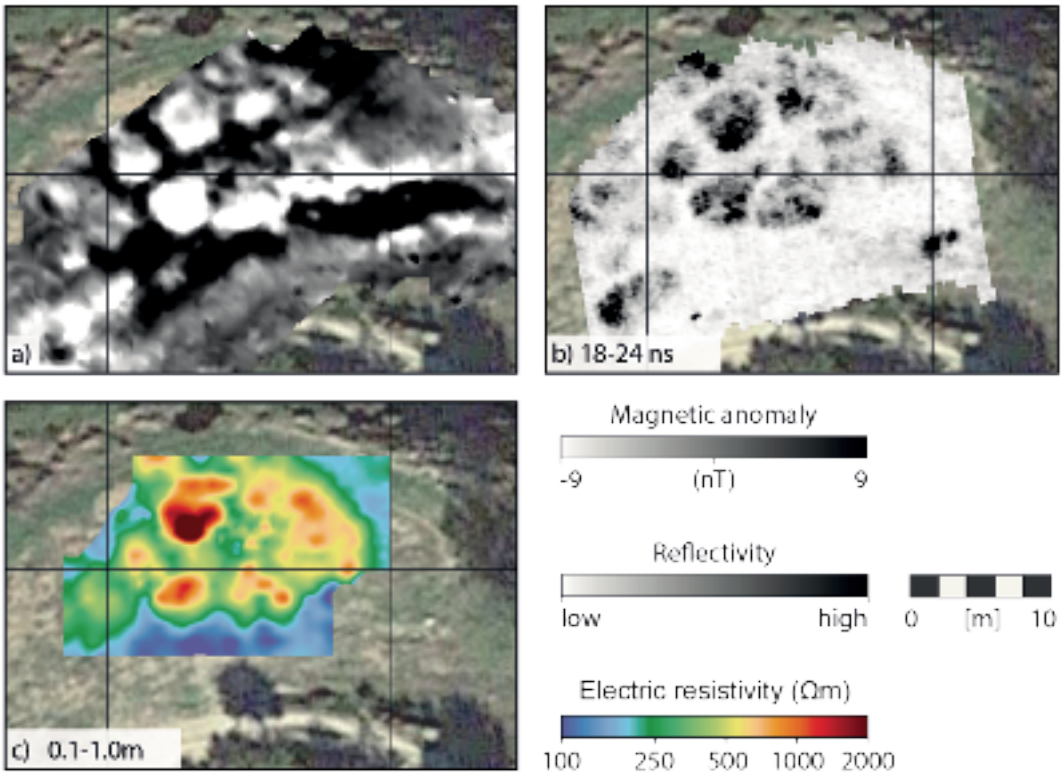
One terrace lower to the northwest, the magnetometry survey showed a pattern of several low magnetised honeycomb-shaped areas surrounded by highly magnetised material (fig. 2 a). This pattern resembled a system of Mycenaean graves, so that additional investigations were conducted. The GPR survey showed the pattern with highly reflective material surrounded by highly absorbing material (fig. 2 b). The ERT survey resulted in high electric resistivity surrounded by material with low resistivity values (fig. 2 c). The comparative measurements show that the measurements cannot be explained by open cavities, but a purely qualitative data assessment is not sufficient to distinguish whether the geophysical structures are caused by a system of collapsed cavities (graves) or by a structure of weathered conglomerate. The conglomerate might have broken into blocks due to tectonic processes or when the underlying marl was washed away by erosion. The edges of these blocks were then weathered further by erosion and the resulting gaps between the blocks refilled by marl and soil that has eroded from higher ground. To solve this question, a quantitative data interpretation based on numerical modelling can bring progress, or an assessment by drilling has to be performed[4].

Sediment cover on the terraces

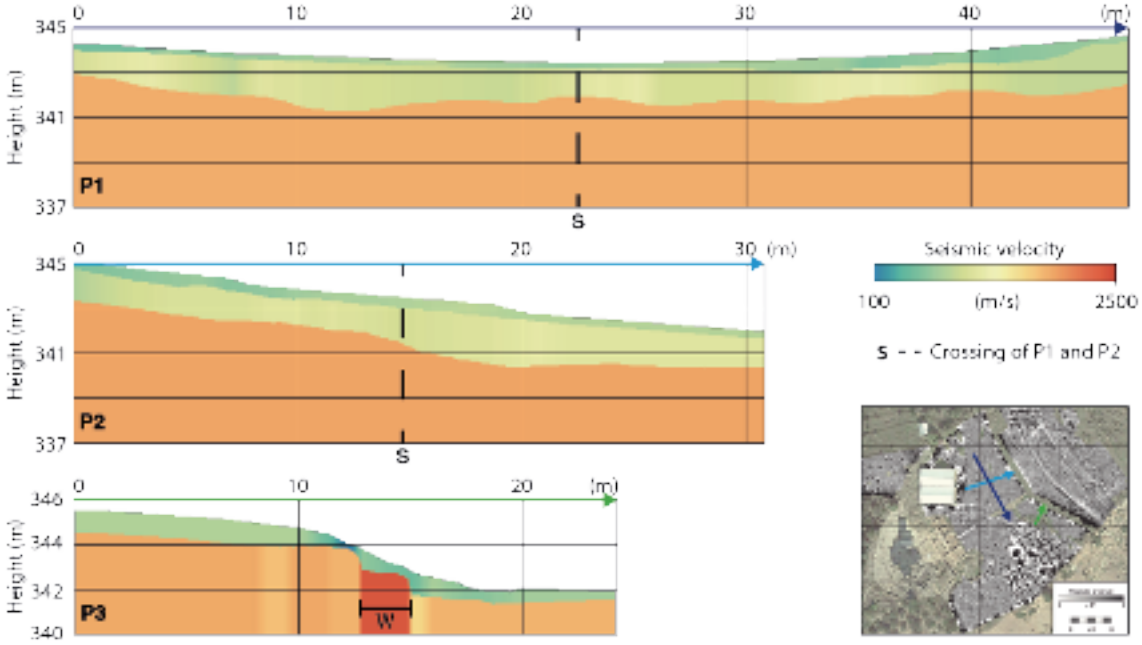
In relation to the theatre area of Aigeira, the aim was to find the answers to different questions through geophysical investigations. One was the question of how thick the sediment cover on top of the basement might be. To answer this question, two crossing seismic profiles were measured. The refraction analysis results in a depth section in terms of shear wave velocities, which are specific for different types of sediments. This depth section (fig. 3 P1. P2) shows velocity values of 100–200 m/s in the upper layer, representing unconsolidated soil, and a second layer with a velocity of 2000 m/s at a depth of about 2–2.5 m/s, representing solid bedrock.

Walls have a mechanical stiffness similar to that of solid rocks. Therefore, the seismic method is also able to detect walls. An example is the profile over a steep slope (fig. 3 P3) that shows an

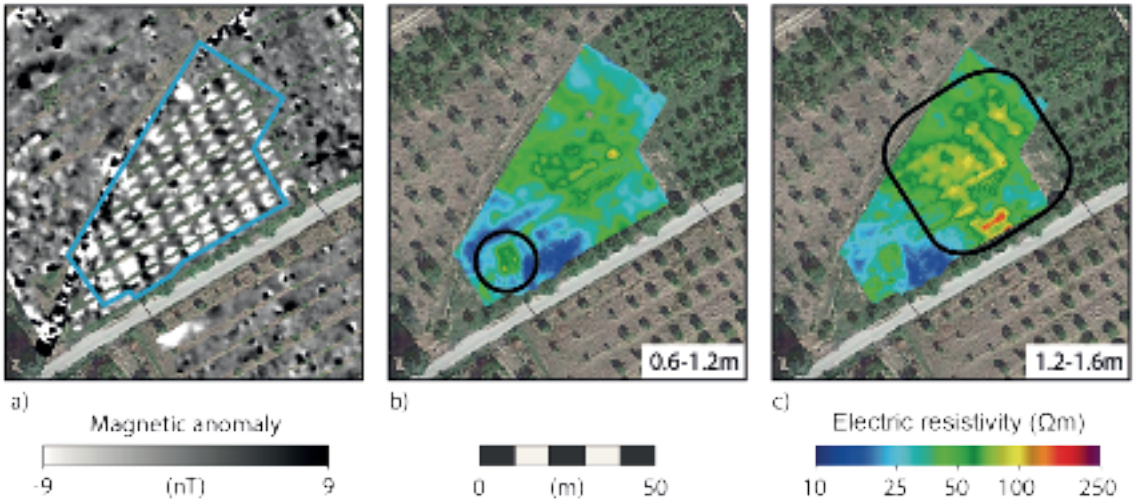
4 In the case presented, recent drillings verified that the geophysical structures indeed represent a weathering pattern of the conglomerate country rock. Rusch et al. 2022.



2 A honeycomb-shaped pattern can be found in the results of different geophysical methods: magnetic map (a), GPR (b), and ERT (c) (© K. Rusch, IfG Kiel)



3 Shear wave velocity distribution after refraction analysis of two crossing profiles (P1 and P2). The shear wave velocity distribution of the profile (P3) with geophone spacing of 0.25 m shows an increase in shear wave velocity that can be interpreted as a wall (W) (© K. Rusch, IfG Kiel)



4 Hidden iron spikes of the irrigation system disrupt the magnetic map (a). The results of the ERT survey show anomalies at different depths (b–c) (© K. Rusch, IfG Kiel)

increase in shear wave velocity underneath. The location of this anomaly in the seismic velocities correlates with an extrapolation of a structure in the GPR survey in the lower area.

Human cultivation

The first example of Sikyon shows another reason why magnetic surveys do not always result in archaeologically interpretable maps. The magnetic map shown in figure 4 a is overlain by disturbing signals caused by irrigation systems in the orchards with their often hidden metal spikes. Since the alluvial sediments of the plain of Sikyon are electrically highly conductive, the GPR does not reach the depth of the archaeological targets, but ERT could be applied successfully. Two electric resistivity anomalies can be seen in the depth-slices of 0.6–1.2 m (fig. 4 b) and 1.2–1.6 m (fig. 4 c), which can be interpreted as two walls of a building in the southwest[5] and a large building complex in the northeast.

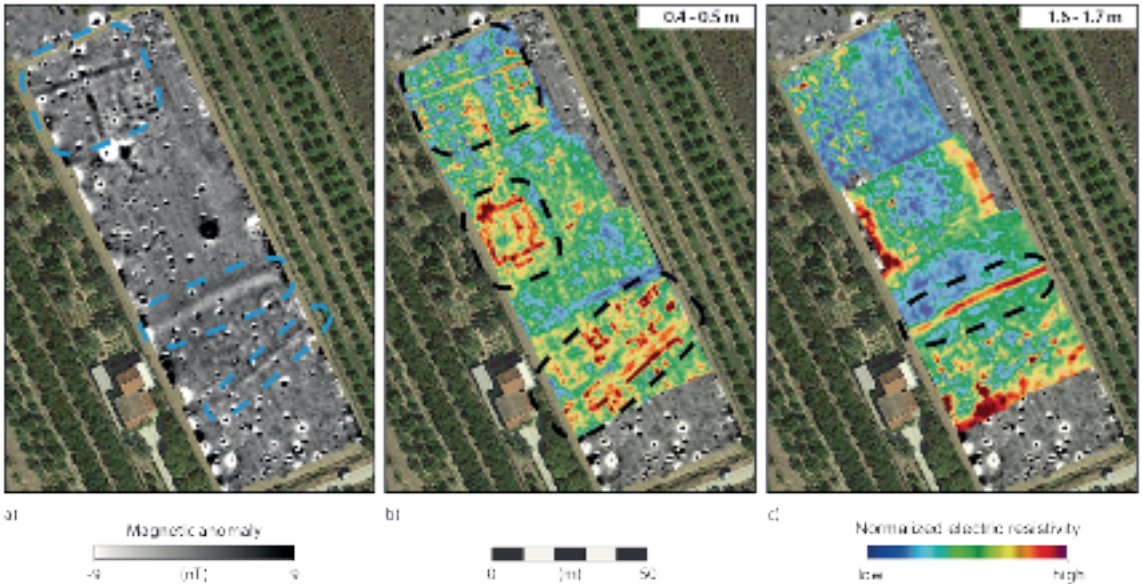
Insufficient magnetic contrast

The magnetic map of one of the few barren fields in the plain of Old Sikyon shows several anomalies that are of archaeological interest (fig. 5 a). In the north, two crossing lineaments of high magnetisation indicate a cross-roads. In the south, a wide lineament of low magnetisation and an adjacent second thin line of low magnetisation indicate additional building remains, but in a different alignment than the other anomalies.

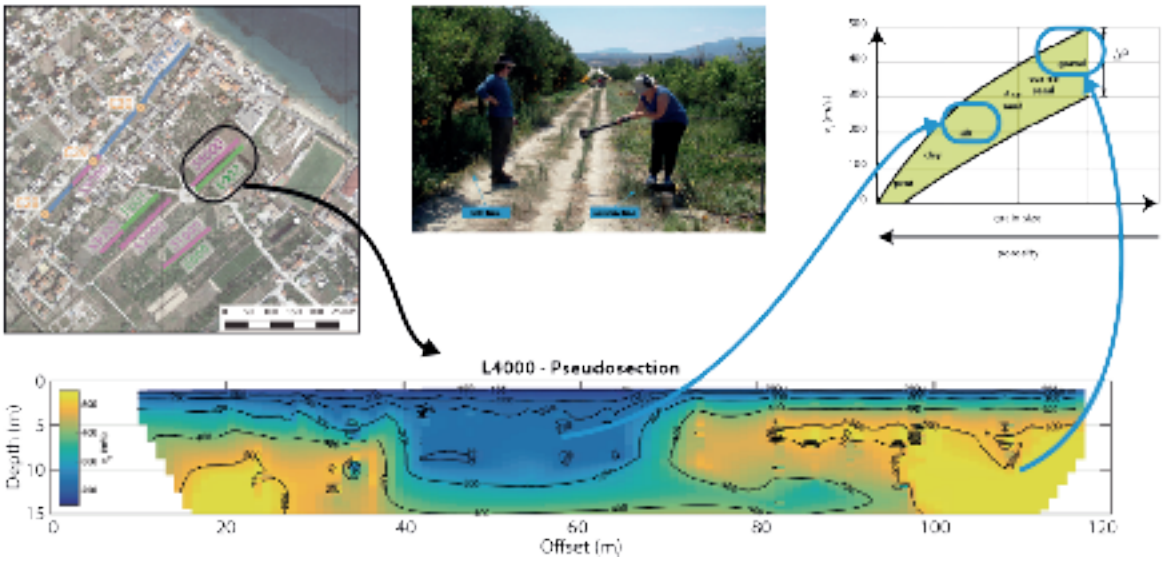
An intensive ERT survey of the entire area (fig. 5 b) revealed several additional building structures in the magnetically quiet areas in between. Several smaller buildings surround the cross-roads, whereas a large possible public building can be seen in the west of the area. In the south, a building complex was detected which correlates with the thinner of the magnetic lineaments. The wide magnetic anomaly correlates with higher resistivity values at greater depths (fig. 5 c) and divides the areas of differently aligned buildings, so that this might indicate the buried foundation of the former city wall[6].

5 Excavations in 2017 showed that the two walls are different in character and most likely do not belong to the same building, or at least not the same phase.

6 Excavations in 2018 showed no traces of a former city wall, but alternating layers of clay and gravel.



5 The magnetic map (a) shows some anomalies. The ERT survey (b) shows many additional building remains in great details. (c) At a greater depth, a structure of higher resistivity values can be found (© K. Rusch, IfG Kiel)



6 Result of the Love wave analysis of one seismic profile in the harbour area of Old Sikyon. The pseudo-section (z = λ/4) of the seismic velocity shows a channel of about 30 m in width (© K. Rusch, IfG Kiel)

Silted-up harbour in the modern urban area

To find the silted-up harbour of Old Sikyon, several ERT and seismic profiles were conducted in the few open areas on the outskirts of modern Kiato (fig. 6). Due to strong anthropogenic noise, it was not possible to use the first arrival times to get information about the deeper subsurface. However, by analysing the dispersion of the recorded surface waves (Love waves in this case), a pseudo-depth section of shear wave velocities could be derived (fig. 6). This velocity-depth section shows values of about 400–500 m/s at a depth of 2–5 m, indicating gravel or consolidated material. An about 30 m-wide channel-shaped depression with shear wave velocities of about 230–300 m/s cuts this layer apart. The velocities of this channel indicate silty material that might only have been deposited in slowly flowing waters such as a former lagoon or harbour basin.

CONCLUSIONS

The location of the archaeological sites of Aigeira and Sikyon on the southern rim of the Corinth rift has created a geological setting which strongly reduces the significance of magnetic mapping, usually regarded as the standard tool of archaeological prospecting. The examples presented show that combined approaches including areal GPR and ERT measurements and less commonly applied methods, such as shear wave seismics, are necessary to locate remains of ancient architecture and infrastructure at depth levels down to several metres. For locating wall remains down to 2 m in depth, our experience has shown that the use of GPR is preferable in the rocky environment of the top and flanks of the coastal mountains, whereas 3D ERT brought the most reliable results in the fine-grained sediments of the coastal plain. Shear wave seismics can be applied successfully to locate deeper structures such as ancient waterways or possible harbour basins. Also major walls may be located at depth levels deeper than the radar and geoelectric detection ranges. Using Love wave analysis, a silted depression was found along a seismic profile near the modern shoreline, which may be regarded as evidence of a former harbour or of other navigable infrastructure of Sikyon. However, due to the urban setting, this sedimentary structure could not be tracked over a larger area using active seismic measurements. As an alternative, passive seismic measurements may be applied in the future, using the ambient seismic noise of the city to investigate the subsurface layering.

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Silke Müth – Konstantinos Kissas – Wieke de Neef – Jamieson C. Donati – Chris Hayward – Wolfgang Rabbel – Katharina Rusch – Harald Stümpel – Burkart Ullrich – Kristina Winther-Jacobsen

FINDING OLD SIKYON

THE APPLICATION OF GEOPHYSICAL, REMOTE SENSING, SURVEY AND EXCAVATION METHODS AND THEIR RESULTS IN THE FIELD SEASONS 2015–2017

ABSTRACT
The ancient polis of Sikyon is well known from literary sources as a famous centre of arts and crafts, particularly in Archaic and Classical times. In 303 BC the city was destroyed by Demetrios Poliorketes, who re-established it on a nearby plateau. Our collaborative project by the National Museum of Denmark, the Ephorate of Antiquities in Corinth and the Danish Institute at Athens was started in 2015 to explore the site of the old city, its material culture and its urbanistic development. This paper presents the various methods of geophysical investigation, remote sensing, archaeological survey and excavation applied in the first three years with regard to their benefits and results. The non-invasive methods helped to define the precise location of Old Sikyon and its approximate borders and provided first information about its inner structure, single buildings and extra-urban areas. The excavations started in summer 2017 shed new light on some of these structures and gave first insights into the chronological development and material culture of the city.

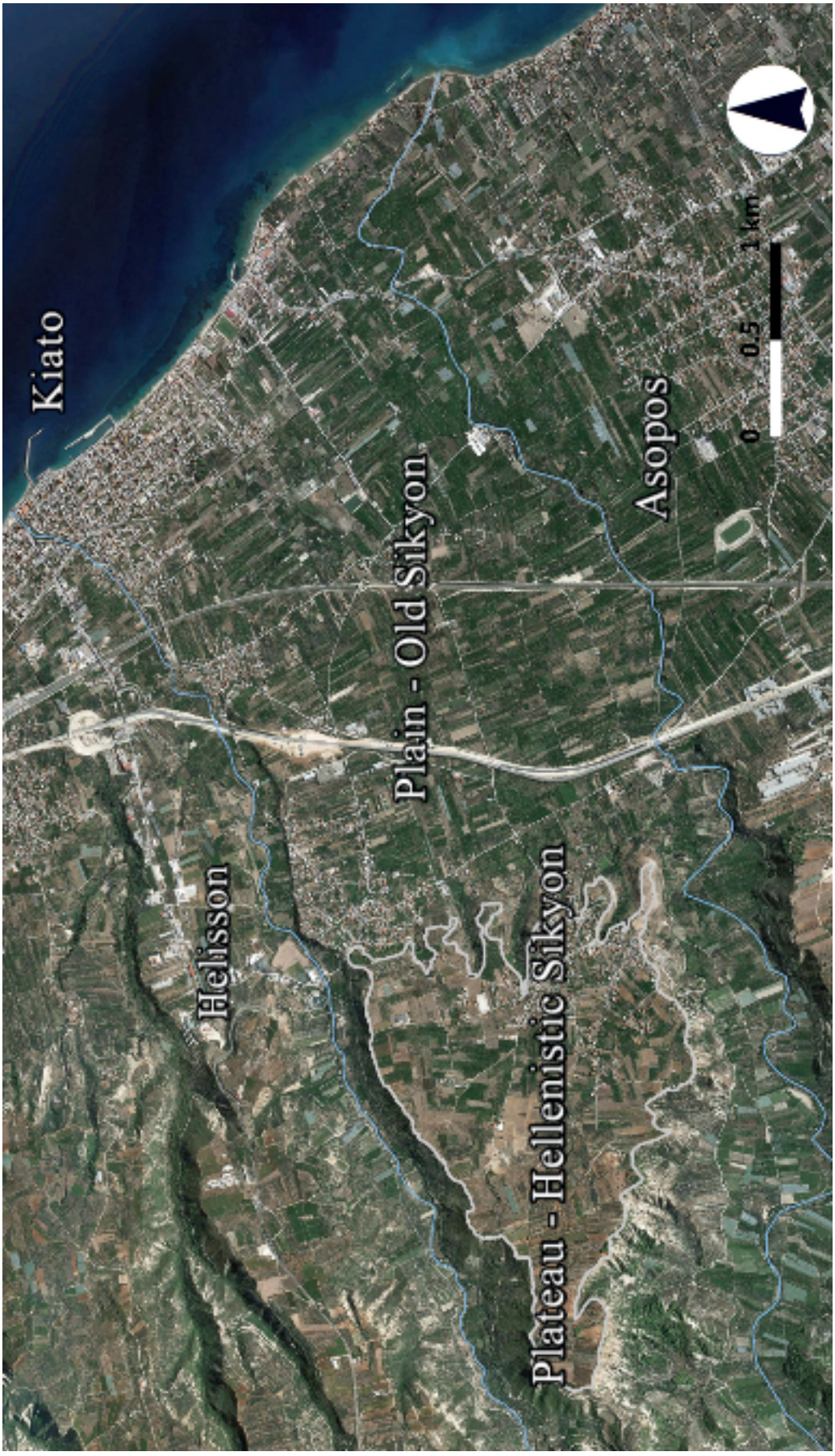
Archaic-Classical Sikyon, the northwestern neighbour of Corinth on the northeastern Peloponnesian coast, ranks among the large and important poleis of the Peloponnese[1]. Its military strength can be measured by its high contributions of troops and ships to wars or larger conflicts, its economic role by the fact that it is one among only six poleis that started minting coins already in the Archaic period, when coinage had just begun, and its general importance by the fact that it is one among only three securely known poleis that had treasuries in Delphi as well as Olympia[2]. As for the internal political history of Sikyon, the tyranny of the Orthagorids, who ruled from around the middle of the 7th to the middle of the 6th century BC, and among them Kleisthenes[3], who was the grandfather of the Athenian reformer and a tyrant in the first quarter of the 6th century BC, were most prominent. After them followed an oligarchy for the second half of the 6th century and most of the Classical period, apart from another, if short, tyrannical intermezzo under Euphron in the 360s[4]. In antiquity, the city was most famous for its arts and crafts: in particular, its schools of

[1] We would like to express our cordial thanks to the organisers of the symposium and the editors of this volume for their kind invitation to participate in both. – This article reflects the state of research after the project's excavation season 2017, while there were conducted two more excavation seasons in 2018 and 2019, a preliminary report of which can be found in Kissas et al. 2022. The final results of the Old Sikyon Project's research will soon be published in two major works of the series »Monographs of the Danish Institute at Athens«: K. Kissas – S. Müth– R. Frederiksen – K. Winther-Jacobsen (eds.), Finding Old Sikyon. The Surveys; K. Kissas – S. Müth (eds.), Excavating Old Sikyon. The field work of the Old Sikyon Project 2017–2019.

[2] Hansen – Nielsen 2004, 468–470; Nielsen 2017.

[3] See Hdt. 6, 126–130 for a characterisation of Kleisthenes.

[4] See Griffin 1982, 34–81 on the history of Sikyon in Archaic and Classical times.



1 The location of Old Sikyon and Hellenistic Sikyon (G. Giannakopoulos)

painters and sculptors were renowned throughout the Greek world, Pausias and Lysippos being among the most famous of the city's offspring, but also poetry, literature and music were cultivated to a high standard[5].

Until recently, only little was known about the actual site of Archaic-Classical Sikyon, the city having been destroyed by Demetrios Poliorketes in 303 BC and having been relocated to the plateau west of the modern city of Kiato (fig. 1)[6]. This new, Hellenistic-Roman city, on the other hand, has been known for a long time and has been well studied for many years[7]. The historical sources offer some basic information on a few features of Old Sikyon's topography: from the account by Diodoros (20, 102, 2) of the capture and relocation of the city, it can be concluded that the old city was fortified at this time[8], that the site of the new city was laid out on the site of the acropolis of the old city, that there was some space (how much is not described) between the acropolis and the houses of the old city, and that the old city was located closer to the harbour than the new one. From Frontinus (strat. 3, 2, 10), we learn that the harbour town was separately fortified at least in the 360s BC[9]. The best site to fit the clues about the location of Old Sikyon itself is the plain east of the plateau, between the rivers Asopos and Helisson and the sea, where the acropolis of the old town was located and where the new town was laid out, and it is also there that in past years various rescue excavations by the Ephorate of Antiquities at Corinth have uncovered some Classical and earlier remains[10], a situation that called for further investigation.

So our project on this Archaic-Classical city of Sikyon started in 2015 as a collaboration by the National Museum of Denmark, the Ephorate of Antiquities at Corinth, the Danish Institute at Athens and the Institute for Geosciences at the University of Kiel and is generously funded by the Carlsberg Foundation in Denmark. As its title already reveals, the primary aim of this project was to actually find the old city of Sikyon, i.e. to identify its precise location and extent, including its harbour, which is also mentioned in ancient sources. Another aim is to investigate the urban fabric and the material culture of Old Sikyon, and in this context also to compare the archaeological picture with the accounts of the written sources on this very active centre of art and culture. Thirdly, we want to verify whether life in the old town really did come to a total end in 303 BC. Beyond these goals, we hope to reveal a good case study for the development of Archaic and Classical urbanism, because it is rare that an ancient town was left at a certain date and was never substantially overbuilt afterwards.

In our first two years of research 2015 and 2016, we applied mostly non-invasive methods: an archaeological survey was directed by Kristina Winther-Jacobsen; large-scale geophysical investigations were carried out by the Institute of Geosciences of the University of Kiel under the direction of Wolfgang Rabbel and by the company Eastern Atlas from Berlin under the direction of Burkart Ullrich; geoarchaeological investigation included augering conducted by Wieke de Neef from Groningen University and accompanying resistivity measurements by Burkart Ullrich from Eastern Atlas; remote sensing was done by Jamieson Donati from the Institute of Mediterranean Studies on Crete; and the historical and epigraphical consultant of the project is Thomas Heine Nielsen from the Saxo Institute of the University of Copenhagen[11]. In the summer of 2017, the second investigation phase of the project began, including large-scale excavations, some final geophysical investigations by the team from Kiel University concluded in 2017 and a geoarchaeological survey scheduled from 2017–2019 by the geologist Chris Hayward from Edinburgh

5 For an introduction to the different branches of art and culture in Sikyon cf. Griffin 1982, 92–164. On the capture and relocation of the city by Demetrios, cf. Diod. 20, 102, 2; Polyain. 4, 7, 3.

6 Today the village of Archaia Sikyona (formerly Vasiliko) is situated on this plateau.

7 On this Hellenistic-Roman city, see Lolos 2011, particularly 6. 274–287, and Y. Lolos in this volume.

8 This is also attested to by Polyainos (4, 7, 3), who mentions the walls in general and the gates facing Pellene.

9 Cf. also Polyain. 5, 16, 3; Xen. hell. 7, 3, 1–7; 4, 1.

10 For an overview, see Lolos 2011, 272–274; Papathanasiou 2013; Maragoudaki 2013.

11 The publication of the non-invasive research methods of the first two project years is currently in preparation. For a preliminary report on the first research season of 2015, cf. Frederiksen et al. 2017.

University, the objectives of which were the identification of stone material used in Old Sikyon, and the search for quarries and clay deposits. Moreover, there are four PhD dissertations being written within the framework of the project and incorporating material from both older rescue excavations and excavations that have taken place within our project: Giorgos Giannakopoulos is writing about »Classical Pottery from Sikyon: The Fine Wares« (University of Rethymno, Greece), Zoe Spyranti about »Architecture and Design of Private Space in Classical Sikyon« (University of Rethymno, Greece), Nadia Maria Kristensen about »An analysis of depositional processes and pottery from Ancient Sikyon« (University of Copenhagen, Denmark) and Kyriaki Tsirtsi about »Cooking Wares, Storage Vessels and Dietary Habits in Classical Sikyon« (The Cyprus Institute, Nicosia, Cyprus)[12].

The research area of our project extends over the whole plain between the two rivers, the plateau and the sea (fig. 1). As for the different branches of investigation used in the first three years of the project, the various methods, the advantages and challenges of their use as well as their results will be addressed.

Concerning the results of the remote sensing, in 2015 attention focused on a zone of major interest of slightly less than 1 km² in size, based on a high-resolution satellite image from 2014 as well as four aerial photographs from 1945–1987, on which several feature enhancement indices were used. A large number of surface anomalies probably relate to palaeochannels, while very few appear to be caused by other features, which is probably due to the density of trees and orchards[13]. One rectilinear anomaly in the form of an ›L‹, measuring 70 × 25 m was identified in Chtiri, but this unfortunately now lies partly under the new national road. It appears to belong either to a large building or a road network[14]. By investigating the larger area of the Sikyonian plain in 2016, the most exciting discovery was two round anomalies close to the southwestern border of Kiato, with a diameter of c. 7 m each and a distance from each other of roughly 12 m (fig. 2). These would be ideal dimensions for a gate that would have led into the harbour town, which had its own fortification, as was mentioned before. This theory would, however, need further investigation to be proved or disproved[15].

Next, the geoarchaeological survey conducted in the course of one week in April 2016 is to be described as its outcome influences the interpretation of the results from other methods as well. Its main aim was to reconstruct landscape formation processes, such as soil erosion and accumulation, and to investigate soil properties and sediment thicknesses in the area of interest. All in all, 47[16] cores were produced by manual augering. This method was preferred over mechanical techniques because of certain soil conditions in the coastal plain. The augerings were performed along several transects (fig. 3): a long one running approximately from west to east through the plain, some shorter transects perpendicular to this, and a transect through the supposed harbour area. Additionally, single cores were drilled in locations where major anomalies had been mapped by geophysical investigation in 2015. Along the transects, 15 resistivity profiles were measured[17].

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12 The latter two PhD theses were delivered and defended at these institutions in 2021 and 2022 respectively. Another PhD thesis using research material from the Old Sikyon Project was written by Katharina Rusch about »Geophysical Prospection of Archaeological Sites on the Northern Peloponnese, Greece – Geological and Urban Challenges« and defended at the Institute for Geosciences of the Christian Albrechts University of Kiel in 2022.

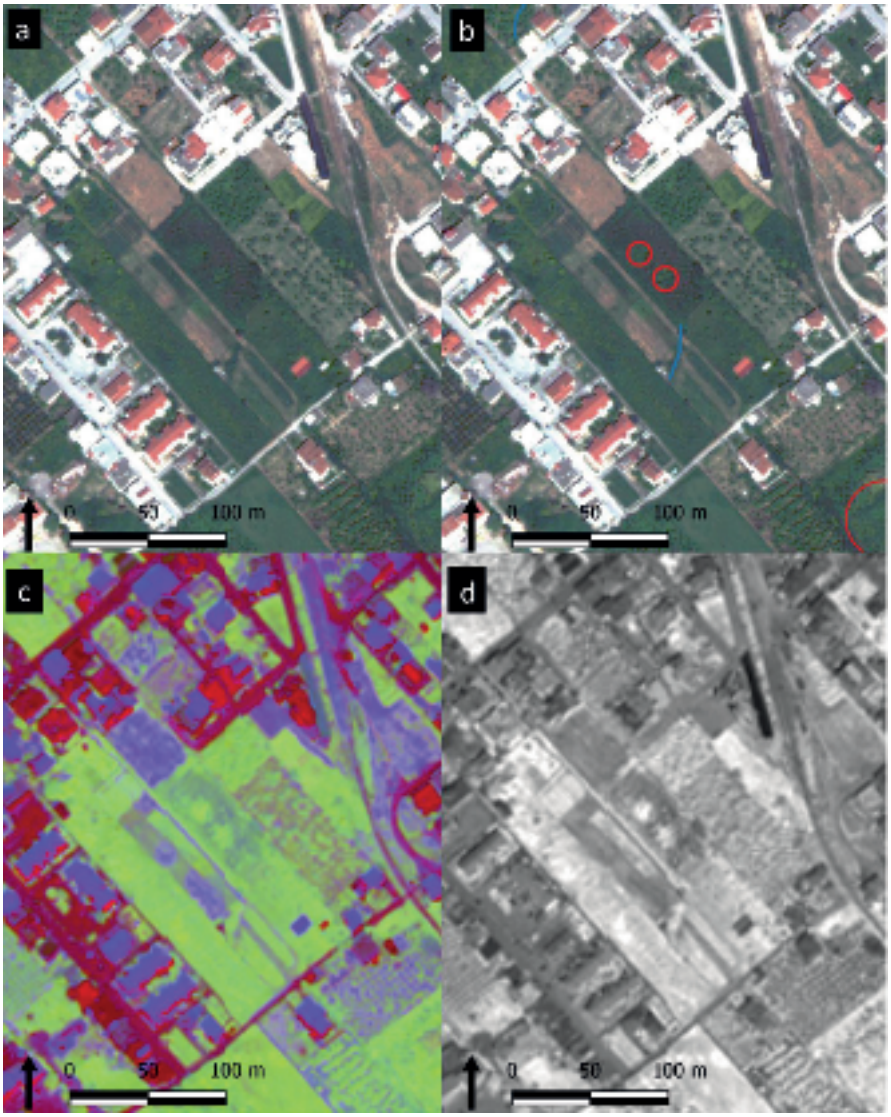
13 Cf. Frederiksen et al. 2017, 320 fig. 20.

14 Cf. Frederiksen et al. 2017, 321 fig. 21.

15 In 2018, part of the field containing these anomalies was cleared of dense bushes, but as no ancient finds at all could be discovered on the surface, no further investigation has been conducted yet.

16 For these cores, an Edelman manual screw auger with a standard borehead of 7 cm in diameter was used. Theoretically, depths up to around 10 m can be reached with this method, conditions permitting. Because of the extreme dryness and hardness of the soils in April 2016, however, the maximum depth reached in the plain of Old Sikyon was 4.75 m.

17 As these measurements were focused on the main geological and lithological units in the area, a high electrode distance of 2 m was used.

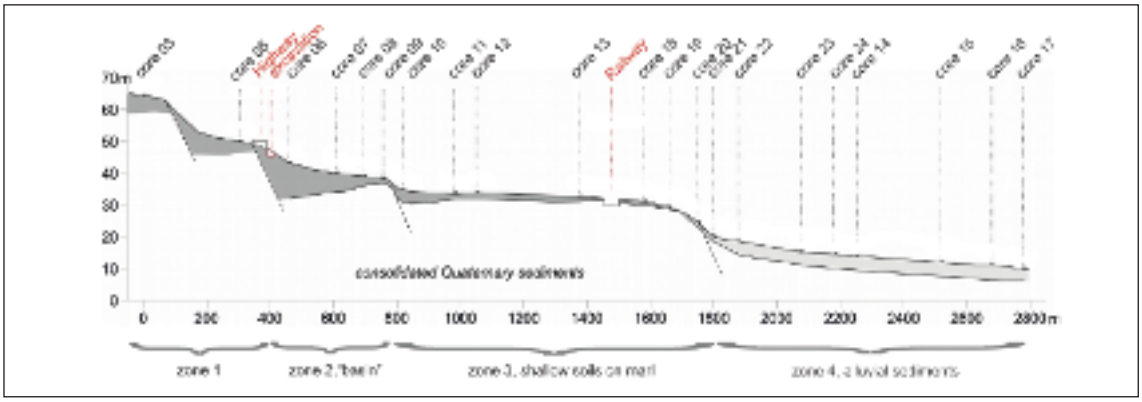


2 Round anomalies close to the south-western border of Kiato. RGB of WorldView-2 from April 11, 2014 (a), with anomalies marked (b); MSR of WorldView-2 from April 11, 2014 (c) and PCA of WorldView-2 from April 11, 2014 (d) (J. Donati)

As a result, a landscape section model of different zones showing the thickness of soil sediments on the natural rock surface as well as erosion effects at the slopes and layers of accumulated material was created (fig. 4). The gentle slopes of the plain consist of a series of gradual steps known as marine terraces. These terraces were formed by regional uplift of the northern Peloponnese combined with faulting and changes in relative sea level related to glacial and interglacial periods during approximately the last half million years[18]. The terraces have undergone deposition and erosion in the shallow marine and subsequently terrestrial environments. The result is a complex landscape, affected by erosion along the terrace slopes, soil accumulation at the terrace bases, and sediment transport through the rivers. On the upper marine terraces (zones 1–2) archaeological strata in depths ranging from 80 cm to more than 3 m were mapped, including pottery related to the settlement phases of Old Sikyon. Moreover, indications of an ancient lake were found associated with prehistoric artefacts. In the centre of the research area in zone 3, however, very shallow,

18 Keraudren – Sorel 1987.

3 Map of augerings and resistivity profiles in April 2016 (W. de Neef; Eastern Atlas)



4 Landscape section based on augerings and resistivity survey (W. de Neef; Eastern Atlas)

strongly eroded soils were mapped without traces of human activity. The lower terraces nearest to the modern town of Kiato (zone 4) again yielded deeper soils with indications of human presence. Furthermore, a first attempt at locating the ancient harbour of Sikyon was made, which is to be looked for at a distance of around 100 m inland from the modern coastline because of the continuous uplift of the southern coast of the Corinthian Gulf[19]. Three augerings along a transect towards the coastline (C28–C30) yielded indications of a small, shallow marine inlet. While the two outer cores ended in hard conglomerate deposits within a depth of 1.5 m, the centre one showed fine marine sediments with pebble layers, such as can be expected in coastal situations, at a depth of 2.8 m.

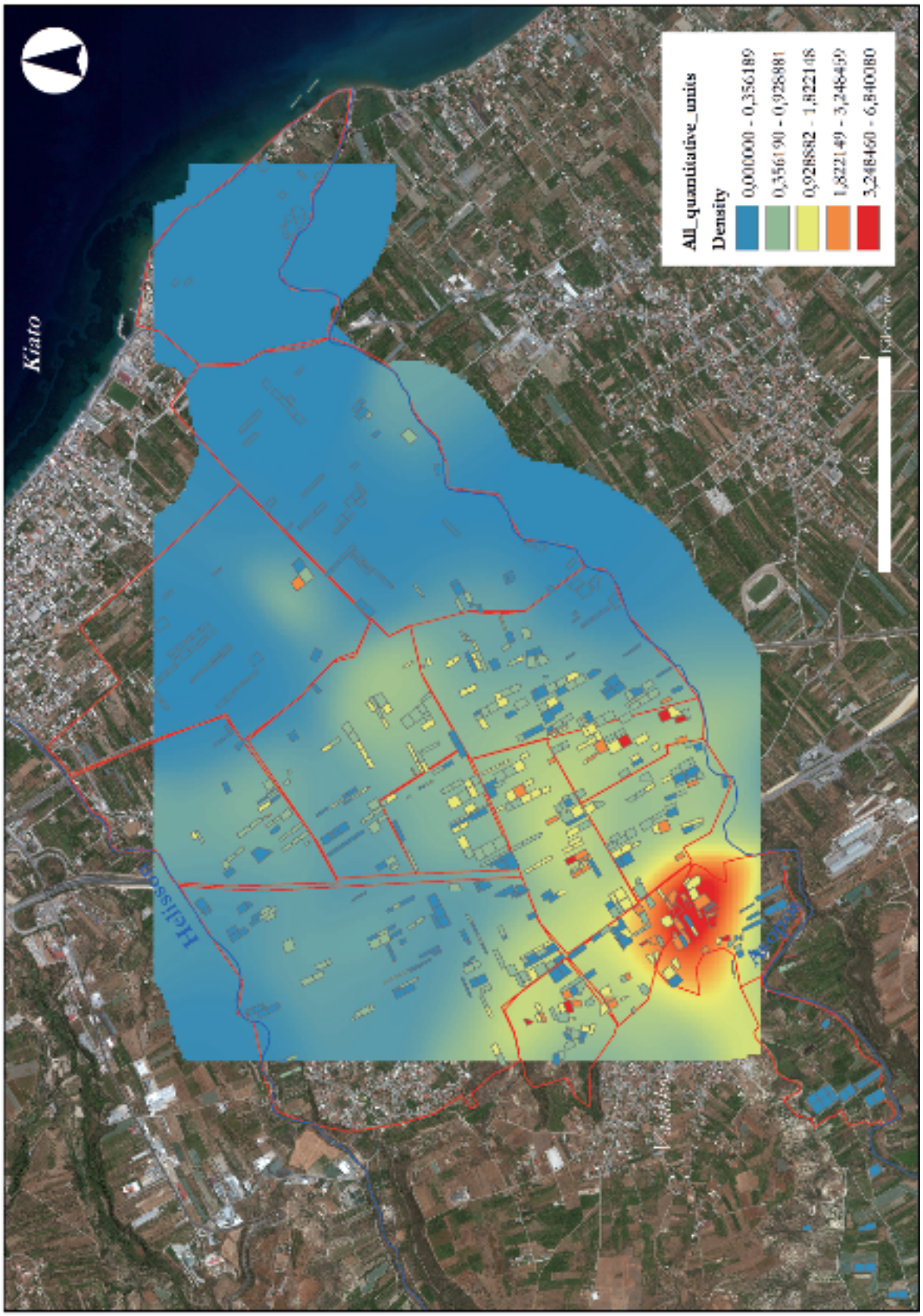
These geoarchaeological investigations contribute considerably to our understanding of the ancient landscape of Old Sikyon. Moreover, they are crucial for the interpretation of the results of the archaeological survey. Some caution is nevertheless required while applying the described landscape model, because it is based on only one long section perpendicular to the coastline, which is not even complete, and a few short cross-sections. Originally, twice as many cores were planned in order to get a more general picture, but because of the exceptionally dry spring in 2016, manual augering was much more difficult and much slower than expected and could not always reach as far down as intended. Such unpredictable natural conditions are, of course, a challenge and may have considerable influence on the obtainable results.

5 Locations of quarry traces in the area south of the modern village of Palaiochori (C. Hayward on the basis of Google Earth)

The one-week geoarchaeological survey by Chris Hayward in June 2017 comprised: 1) identification of stone types used in ancient Sikyonian architecture; 2) identification of quarries within these lithologies; 3) searches for quarries in oolitic limestone, a relatively high-quality stone exploited extensively in the Corinthia[20], and common within ancient Sikyonian architecture.

Extensive quarrying of soft bio-oosparrite within the 60 ka[21] marine terrace slope occurred in the southern part of the plain, south of Palaiochori (fig. 5). The eroded quarry faces display traces of monumental ashlar block extraction.

19 Hayward 2003, 16 f.
20 Hayward 2003, 18.
21 ka – *kilo annum*, a kilo earth year (= 1000 years).



6 Interpretative extrapolated distribution map of finds in the archaeological survey 2015–2016: raw counts per square metre (K. Winther-Jacobsen – G. Giannakopoulos)

They total approximately 600 m in length and occur over 60,000 m² and have been affected by post-antique activities. The limestone exploited here has yet to be identified in the region's ancient architectural remains.

An approximately 1000 m² area of quarrying of monumental ashlar conglomerate blocks on the southern edge of the 216 ka marine terrace was identified 1 km to the west-northwest of the village of Moulki.

Oolitic limestone (fine- to medium-grained, thinly-bedded, laminated oosparrite) was extensively utilised in the architecture of Old Sikyon and its Hellenistic successor in ashlar masonry, and in various carved architectural members such as triglyphs, capitals and column drums. Large quarries in this stone are located within the Corinthia on the 238 ka marine terrace from Kenchreai in the east to within 2 km of the Sikyonian border[22]. Knowing whether this important stone was quarried within Sikyonian territory or imported from Corinthian quarries will help illuminate aspects of the region's stone exploitation, including economics and labour resources. Initial searches for oolite quarries at the far eastern edge of the Sikyonia revealed the presence of exploitable units of oolite, but no visible traces of ancient quarries.

The identification of stone varieties used in the architectural remains in the recent trenches of the rescue excavations west of the new Athens-Patras national road yielded a wide range of lithologies, often within individual structures. Much of the masonry comprised reused blocks. Over 370 blocks and unshaped boulders were examined, these representing nine separate lithological types. The lithologies in cut or partially shaped blocks were conglomerates (162 blocks) and oolitic limestone and local calcarenite (81 each). Rubble walling employed reused blocks and rounded, river-worn boulders of conglomerate and crystalline limestone. A pile of 18 blocks adjacent to the chapel of Agia Varvara was examined. Most blocks were of oolitic limestone, with slightly less abundant local calcarenite, and the least abundant stone being conglomerate, this also likely of local origin. Adjacent exposures of calcarenite and conglomerates at the southeastern edge of the Hellenistic city's »lower plateau«[23] were studied. Their eroded and weathered condition prevented conclusive identification of any traces of quarrying that may have existed.

This geoarchaeological survey has already provided many details about stone resources used in Old Sikyon and their distances to the city, which vary considerably. A broader and more detailed picture will emerge following subsequent fieldwork[24].

In the archaeological survey of 2015 and 2016, three different methods were employed to achieve two levels of data collection: A) a fully quantitative, intensive survey with total collection at 10 m intervals; B) the same method as A, but including raking (this method being applied on fields with poor visibility), and C) a qualitative survey method collecting diagnostic sherds over the entire surface in areas of special interest. Random finds outside of the transect lines considered significant, such as diagnostic sherds, architectural fragments or other structures, were recorded qualitatively as »Places of Special Interest« (short: POSIs) with coordinates. The survey area included most parts of the plain not covered by modern settlement, which makes a total of approximately 8 km², of which roughly 10 % were surveyed. As for the results of this survey, the overall distribution pattern (fig. 6) shows that the highest densities are found in the southwestern part of the survey area, east of the southern spur of the plateau (an area called Ayios Konstantinos). From here the densities drop consistently towards the north, north-east and east, and even further towards the borders of the surveyed area and south of the plateau. Also along the rivers, densities are all low, which suggests that few sites were located there or their remains have been washed away long ago. The slopes immediately east of the plateau also yielded the largest and

22 Hayward 2003, 19–29.

23 Lolos 2011.

24 From 2018, the study included also a survey for and study of Sikyonian clay resources.

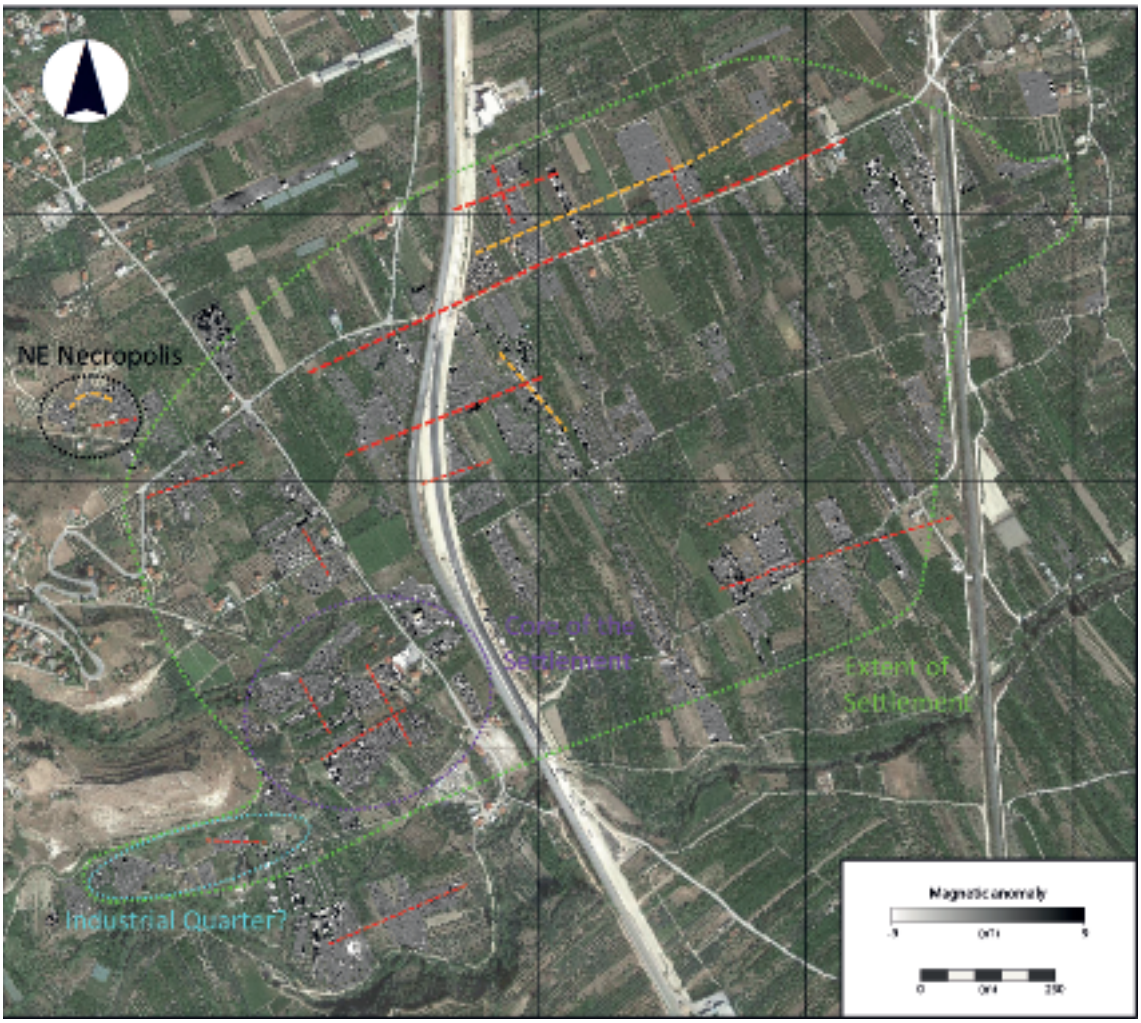
7 Map of the magnetometry survey in the south-western part of the plain 2015–2017 (Institute of Geosciences, CAU Kiel on the basis of Google Earth)

best-preserved fragments, which indicates that the buried structures must be rather well-preserved here. In this area, the finds date from the Bronze Age to the present day, but finds of the Classical period are clearly predominant[25].

The interpretation of the survey finds and their densities depend on many different factors like the impact of natural processes over many centuries and human activities in the past and present, including cultivation as an important part. Different methods, first and foremost the geoarchaeological survey, were applied to understand these processes and to interpret the survey finds accordingly, but it is not always possible to grasp them perfectly in all their details, which represents another challenge.

Concerning the geophysical investigations, five different methods were applied: magnetic prospection, electrical resistivity tomography (ERT), ground-penetrating radar (GPR), seismic

25 The raw densities suggest a more heterogeneous settlement pattern, while when calibrated for visibility, the density maps show a significant flattening of the dataset. Correcting for visibilities nevertheless does not affect the overall distribution pattern of high versus low densities.



8 Extent of settlement traces, different quarters and indications for streets and fortifications in the area of Old Sikyon (S. Müth; Institute of Geosciences, CAU Kiel on the basis of Google Earth)

measurements and electromagnetic induction (EMI)[26]. Geophysical research mostly focused on the southwestern part of the plain close to the plateau, as this area was judged most promising for the location of the old town, being close to its acropolis and having yielded Classical structures in rescue excavations.

Regarding the overall magnetic map (fig. 7), where positive anomalies (i.e. deviations of the natural magnetic field of the earth) are shown in dark and negative anomalies in light greyscale, one can clearly see the difference between the zone densely packed with dipole anomalies resulting in high black-and-white contrasts in Ayios Konstantinos directly east of the southern part of the plateau; the adjacent areas to the north, north-east and east, where anomalies get significantly less dense; and nearly totally calm areas on the north, east and south margins of this second zone. This general picture matches perfectly with the results of the archaeological survey and offers us very good indications for the borders of the town. If we draw the approximate limit of the area with traces of settlement activity, we arrive at a size of around 170 ha (fig. 8). This includes

[26] Magnetic prospection was carried out by the teams from Kiel University and Berlin, while the other geophysical methods were exclusively performed by the team from Kiel. On geophysical prospection methods in archaeology, see Garrison 2016.

9 The harbour area of Old Sikyon with the location of the artificial hill, the Byzantine basilica and the water inlet or channel found by augering and seismic investigations (S. Müth on the basis of Google Earth)

10 Fields of intensive multi-method investigations 2015–2017 (S. Müth on the basis of Google Earth)

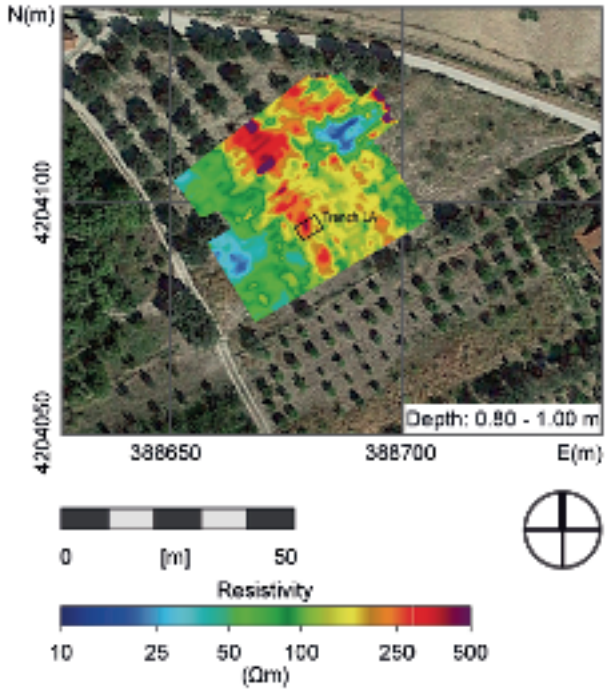
not only densely settled quarters, however, but also loosely occupied areas, with the core of the settlement being clearly in the south-east. The picture of the overall settlement structure that we gain from the archaeological, geoarchaeological and geophysical surveys shows some more or less empty spaces between areas of denser occupation, so the settlement pattern of Old Sikyon might perhaps have been a bit loose, consisting of different nodes with some space in between, as is also suspected for Archaic Corinth and definitely known for the case of Sparta[27]. Around the settlement, we found indications in the magnetic data of an expanded necropolis in the north-west

[27] Corinth: Morgan 1994, 122; Sparta: G. Shipley in: Hansen – Nielsen 2004, 592; Hansen 1997, 34 f.

and of what could have been an industrial quarter in the south-west (fig. 8), with indications for a loose occupation in the magnetic map and potential traces of iron processing in natural slope profiles recently created by landslip.

Furthermore, one can clearly observe various linear magnetic anomalies, some of which can be followed over several fields (figs. 7. 8). Particularly if they are close to the borders of the town, such anomalies may point to the course of fortification walls; in the inner areas they might represent streets. The different potential indications for streets taken together might look like a roughly rectangular pattern with similar orientations throughout the whole city. Some caution is recommended with such interpretation, however, for several reasons: firstly, there are also deviations from such a regular pattern; secondly, some of the geophysical indications might represent something other than streets; and finally, a regular street network is not to be expected throughout a continuously growing city like Sikyon. The second street from the north running east-west might have run through to the ancient harbour, along the nearly straight track of a road still used today (figs. 8. 9)[28]. As already mentioned, the ancient harbour is to be expected around 100 m inland from the modern coastline. A larger area in the southeastern outskirts of Kiato (fig. 9) has long been considered as the location of the ancient harbour because of an artificial hill and a monumental Late Antique basilica, which evoke parallels to the harbour of Lechaion[29]. In support of the augerings, seismic measurements were conducted in this area in 2016 and 2017, which indicate a former marine inlet or channel of around 25–30 m in width that was probably related to the ancient harbour[30].

All in all, the magnetic prospection yielded a lot of highly valuable results, although there are also many gaps in the magnetic map, where fields could not be investigated because of densely packed fruit trees or other sorts of obstructive vegetation. Moreover, there are often metal objects on the fields like fences, irrigation systems or rubbish lying around that hamper or even prevent the research, as they would interfere strongly with the results because of their high magnetic amplitude. Challenges on the level of interpretation of magnetic measurements are that the quality of preservation of the archaeological remains strongly influences the picture and that no clear information on their depth can be gained through this method, so remains from different layers cannot be told apart.



11 Results of the resistivity survey and location of Trench 1A in Field 1 (Institute of Geosciences, CAU Kiel; S. Müth on the basis of Google Earth)

The results of the other geophysical survey methods will now be discussed in relation to seven individual fields where they were applied together with excavations and architectural studies (fig. 10). On Field 1 in Ayios Konstantinos, resistivity measurements in 2015 and 2016 revealed two parallel ›lines‹ of high resistivity values running over roughly 40 m in a north-west to south-east direction at a distance of around 20 m from each other and

28 This had already been suspected by Lolos 2011, 114 f.

29 Lolos 2011, 284–286.

30 One of several seismic profiles obtained in 2016 indicated this former water inlet or canal and in 2017, passive seismic measurements that use the ambient noise of the city (Horizontal-to-Vertical Spectral Ratio seismic method) were conducted to investigate the inlet further.

12 Drone photograph of Trench 1A (S. Müth)

at a depth of between 80 cm and 1.20 m (fig. 11). A possible interpretation of these lines was that they represented two parallel walls, in which case their various irregularities in width could be due to the fact that they had collapsed. A zone of medium resistivity in between these lines might represent a floor. As an alternative interpretation, altogether these anomalies could represent natural bedrock. As the former interpretation, if correct, could have indicated a stoa-like building, a trial trench of 3 × 5 m was opened across the southwestern anomaly (fig. 11), which unfortunately showed that it was indeed natural bedrock that had caused these anomalies (fig. 12). The upper strata of this trench contained only a short part of a rubble wall of probably Late Classical date without clear function, and several cuts and fills of Late Classical/Early Hellenistic date, but dug down into the bedrock, a Late Geometric or Early Archaic grave was uncovered[31]. This leads us to the conclusion that the settlement did not extend to this place during these periods.

Field 2 is also located in Ayios Konstantinos, c. 200 m west of Field 1 (fig. 10). Here, two features discovered in a drone photograph from 2015, a large anomaly on an upper (western) terrace and a small one on a lower (eastern) terrace, were the background for two trial trenches (fig. 13). As for practical reasons it was only possible to excavate on the lower terrace of the field, we could only try to reach the large anomaly in Trench 2A (5 × 7 m). A Byzantine wall running in an east-west direction was unearthed in the southern corner of the trench (fig. 14), but most probably is not connected with the observed anomaly. A pit in the eastern corner containing large potsherds and mixed building material is also of Byzantine date. A Late Roman or Byzantine wall runs in a south-west to north-east direction through nearly the whole width of the trench. Beneath this wall, we discovered part of a Late Classical mortar floor containing white, blue and grey pebbles. It shows a high mortar profile around its edges and part of it protrudes to the south-east, maybe

[31] The first indications for this grave were found in the very last days of the 2017 excavation season in the form of layered blocks that seemed to form a crooked wall; therefore it was interpreted then as a piece of Late Geometric/Early Archaic architecture. The dating was derived from the pottery found in what was thought to be its foundation trench. In the 2018 excavation season, when this trench was extended, it turned out, however, that the blocks formed the cover of a grave.

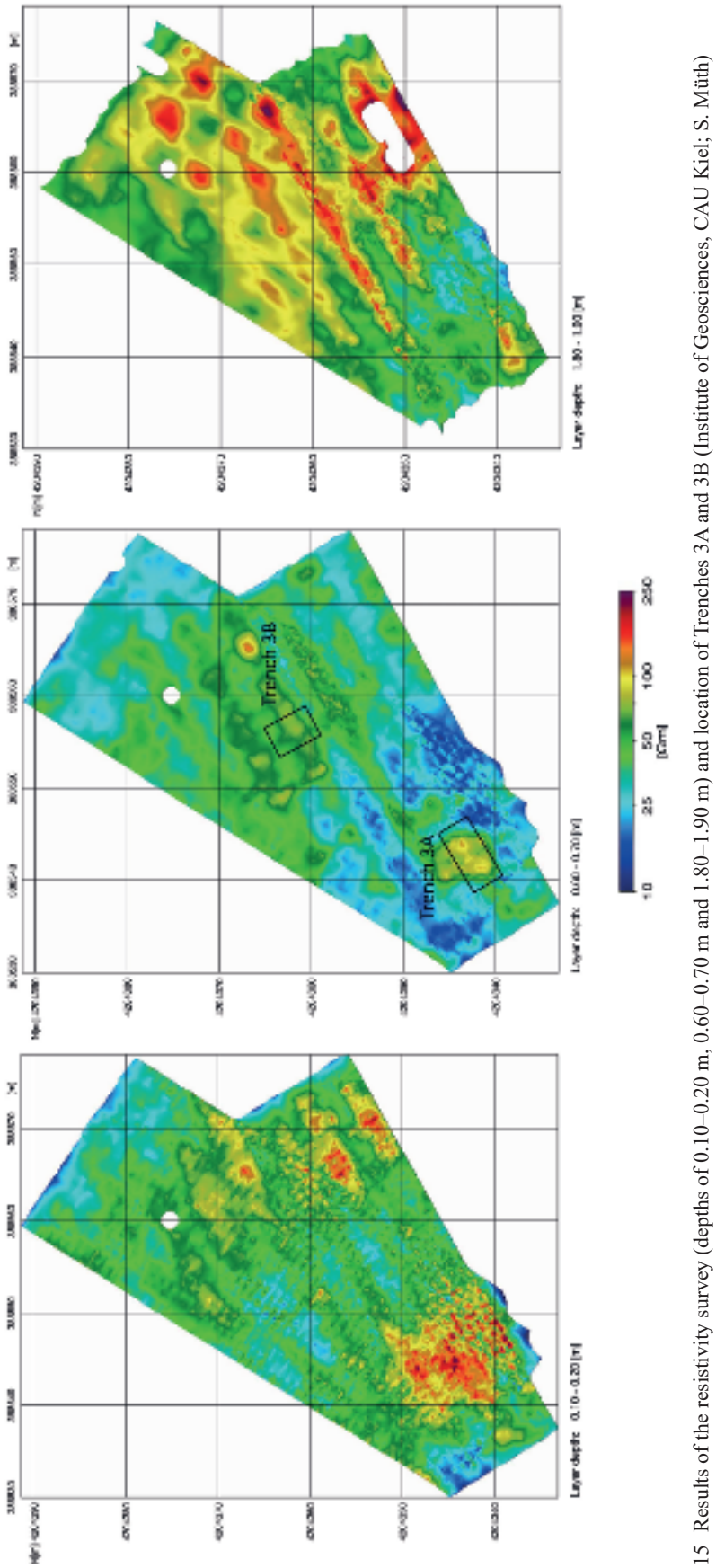
13 Rectangular anomalies (lying within the red rectangles) on Field 2 and the location of Trenches 2A and 2B (R. Frederiksen – S. Müth)

to form a threshold. In order to judge to which sort of building it belonged, it would be necessary to further explore its context by extending the trench.

In Trench 2B (3 × 4 m), part of another Byzantine wall appeared, which could account for the smaller anomaly. Below it, bedrock emerged, so there was no sign of Classical or earlier building activity in this place.

Field 3, of triangular shape, is located in an area now called Ayios Nikolaos (fig. 10) and is cultivated with small citrus trees in a regular pattern. Here, resistivity measurements showed a series of parallel and equidistant linear anomalies just below the surface, then, at a depth of between 40 cm and 1.60 m, a large rectangular structure emerged in the northeastern area and a smaller, roughly rectangular structure in the southwestern area of the field (fig. 15). Finally, parallel linear anomalies appear again at a greater depth, but this time they are lying exactly in between the former ones, closer to the surface. Compared to the tree grid of this field, the upper lines are all located between the trees, while the lower ones correspond to the rows of trees. This suggests that these regular linear anomalies are connected to modern cultivation rather than to ancient remains. We opened two trial trenches on this field in the 2017 season, Trench 3A lying across the southwestern, smaller rectangular anomaly and Trench 3B across the southern part of the larger anomaly in the north-east (fig. 15). In

14 Drone photograph of Trench 2A (S. Müth)



15 Results of the resistivity survey (depths of 0.10–0.20 m, 0.60–0.70 m and 1.80–1.90 m) and location of Trenches 3A and 3B (Institute of Geosciences, CAU Kiel; S. Müth)

16 Drone photograph of Trench 3A (S. Müth)

Trench 3A, measuring 3 × 7 m, two parallel walls were discovered, and also in the location the resistivity investigations suggested, but they differ considerably from each other in character (fig. 16): The south-west wall is constructed of only roughly hewn and irregularly placed limestone and conglomerate stones, while the north-east wall is made of monumental, finely dressed limestone blocks, which are 75 cm long, 44 cm wide and more than 60 cm high – at this level, excavation stopped at the end of the 2017 season[32]. The pottery suggests any date before the end of the 4th century BC for this wall. It appears highly unlikely that the two walls belong to the same phase of one structure. While the north-east wall indicates some important building of the public or cultic sphere, the south-west wall on the contrary points to a less representative structure or – if both belong to the same building – a later phase of repair and use in a less important functional context.

Trench 3B (5.2 × 3.3 m) yielded part of a wall running in a north-west to south-east direction from the late 4th century BC or earlier, which actually coincides with a slight anomaly in the resistivity picture. Another line of partly reused blocks forming a potential wall came out in the lower layers and corresponds with the southern side of the rectangular anomaly itself. At this stage it is impossible to draw more information from these walls.

Field 4 is located in the southeastern part of our area of interest, in a region called Merkouri (fig. 10). This field was the subject of rescue excavations by the Ephorate of Antiquities in Corinth in the past, which revealed remains of Late Classical and Early Hellenistic times interpreted as parts of private buildings or workshops[33]. In the magnetic data, one can observe a most prominent positive linear anomaly running through several fields on both sides of Field 4 and showing a bulge in the western part of this field (fig. 17 a). This positive anomaly is flanked on both sides by negative anomalies, the northern one changing course at the top of the bulge, running from there in a straight line towards the north-east. In the results of the resistivity measurements, the lines of the magnetic maximum and the upper minimum can be recognised as zones with high resistivity, but in addition to this, a pattern of other resistivity anomalies appears (fig. 17 b). The interpretation of a seismic profile over the described magnetic anomalies combined with the results of

32 When excavated to the ground in 2018, the height of these blocks proved to be c. 80 cm.
33 Papathanasiou 2001–2004, 152–154.

the ERT survey show a ditch filled by highly resistive material. The flanks of this ditch correlate with the magnetic minima, whereas the highly resistive filling correlates with the location of the magnetic maximum. These results made us hope that we had found a part of the southern city wall here.

We excavated two trenches in this field. In Trench 4A (2.5 × 10 m), on the western edge of the field, cutting highly resistive anomalies south of the linear magnetic maximum and its accompanying minima (fig. 17 b), two parallel walls at a distance of roughly 4 m appeared, the northern wall consisting of large conglomerate and limestone blocks, while the middle wall shows some slab-like blocks combined with rubble (fig. 18 a)[34]. Between these two walls, a layer with a high concentration of pebbles was discovered, which can best be interpreted as a road surface. On the southeastern edge of the trench, two potential graves were discovered in the very last days of the 2017 season[35]. On top of one of them, a broken but almost complete bowl was uncovered, which could have been a grave offering.

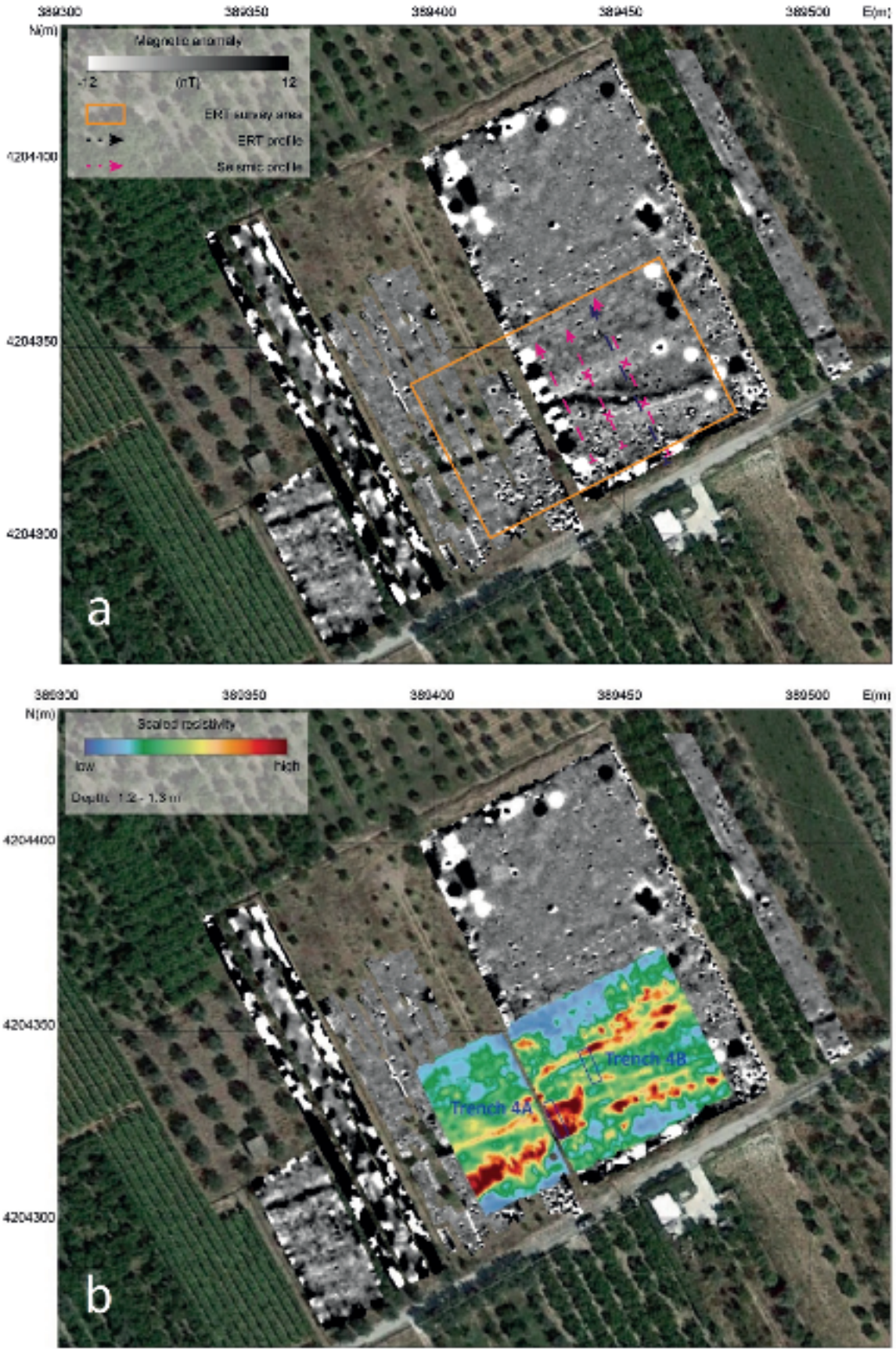
Trench 4B (3 × 10 m) was laid out some 15 m to the north-east of Trench 4A so that it cut the linear magnetic anomalies and three ERT anomalies (fig. 17 b). It yielded two walls diverging towards the east, again of different building material and masonry forms and starting on different levels (fig. 18 b), so they might not belong to the same building. In the area between the two walls, a large amount of pottery, terracotta figurine and tile fragments, loom weights and lamps from the late 4th century BC were found in contexts containing a lot of charcoal and dissolved mudbrick, which suggests an interpretation as a filling or a destruction layer of this time, the latter interpretation resting more or less on the possibility of the two walls having been used in one and the same building, which seems rather unlikely at the moment. South of the southern wall, where the magnetic maximum crosses the trench, a compact layer containing many pebbles was found. Far from indicating a part of the city wall, this could rather represent a road surface.

As the described structures in Field 4 are not completely excavated yet, it is not possible at this stage to provide a clear chronology for them, although Classical material represents the largest part of the finds in the investigated layers and points towards the second half of the 4th century BC for most of them. The southern wall in Trench 4B obviously corresponds with the magnetic minimum bordering the large maximum on its southern side, while the northern wall in Trench 4B seems to correlate with the continuation of the northern minimum accompanying the large maximum after it has left the course of the maximum north-east of the latter's bulge (figs. 17. 18). Because of its length, the maximum itself – if not representing a fortification – should best be interpreted as a road, which seems to be bordered on both sides by walls. It would be somewhat curious, however, that a road should form such an odd bulge. Looking at the resistivity data, there are indications for the anomaly corresponding with the large magnetic maximum west and east of the bulge running through in a straight line instead of bulging northwards, so the original road could also have continued here in a straight line, while at some later point the course of this road could have bulged northwards to avoid some kind of obstacle. This would perfectly match the excavated situation in Trench 4A, because the anomaly running straight corresponds with the probable road surface unearthed there, which can be seen as confirmation for interpreting the large magnetic maximum as a road. All in all, it is quite obvious that in Field 4 we are dealing with a border area of Old Sikyon, with a road leading out of the city in the direction of its harbour and graves in its vicinity.

A trial trench was placed in Field 5 (fig. 10) because the whole field forms a long mound in otherwise totally flat surroundings, which most probably indicates some man-made remains underneath. The trench yielded a lot of very interesting finds, e.g. coins, obsidian and flint fragments, pottery sherds from Late Geometric through to Middle Hellenistic times and

[34] When further excavated in 2018, this ›wall‹ proved to have originally been a masoned canal with smooth inner sides that was later filled up with earth and covered with slabs.

[35] This theory was confirmed when these graves were excavated in 2018.



17 Results of the magnetometry (a) and resistivity (b) surveys and location of Trenches 4A and 4B (b) in Field 4 (Institute of Geosciences, CAU Kiel; S. Müth on the basis of Google Earth)

18 Drone photograph of Trenches 4A (a) and 4B (b) (S. Müth)

fragments of mortar, stucco and mosaic floors, which bear witness to building activity, although no part of an architectural structure could be found. The finds from this trench nevertheless show that this area was also used to a certain degree after the removal of the town to the plateau in 303 BC, probably by single houses or farmsteads, which represents a precious piece of information.

Field 6 is located in the very south-west of our research area, directly south of the chapel of Ayia Varvara, which is clearly outside the area of the ancient settlement. Here, we investigated a large heap of ancient blocks, which was created from the building material of the former Byzantine church of Ayia Varvara, when it was torn down and a new church was built in the 1970s. In our 2017 season, the heap was almost stripped to the ground and the blocks were documented and arranged in a large *lapidarium* (fig. 19). The architectural members in this pile belong to at least two or three different ancient buildings: they include parts of Doric friezes of different size, column drums and masses of other ancient worked blocks. The fact that these blocks come from a Byzantine church at this spot is suspicious and raises the question of whether it could have been erected on the site of an ancient sanctuary. To approach this problem, we applied some georadar north and south of the church. While the georadar results of the field north of the church are void of any anomalies that could possibly be caused by ancient structures, there were three parallel zones of higher reflection amplitude discovered to the south of the church, running perpendicular to its south wall, which call for further investigation (fig. 20)[36].

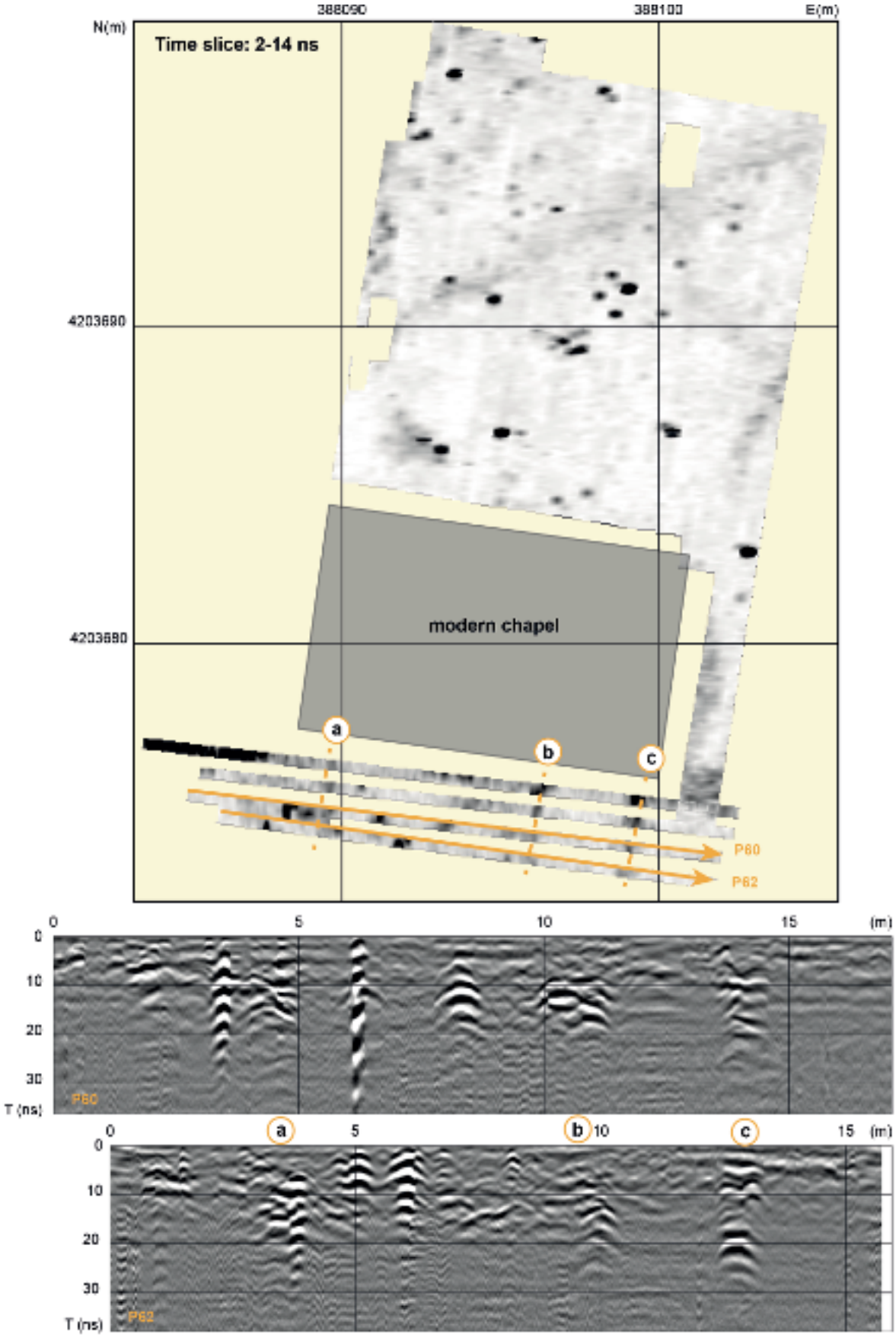
The last field to be presented here, Field 7, lies in the area of the northern edge of the town in the modern area of Zogeri. Here, the magnetic prospection yielded two positive linear anomalies in the northern part of the field, probably representing an ancient crossroads and some further linear anomalies in the southern half, particularly a broad minimum crossing the field (fig. 21 a). To investigate these structures further, we decided to apply large-scale resistivity measurements to this field, which yielded quite astounding results (fig. 21 b): in the area of the assumed crossroads, densely arranged potential building structures emerge quite close to the surface (around 30–70 cm deep). South-east of the ›crossroads‹ even the details of a building seem recognisable, for instance a gap that looks like a door in the south wall of a building. These structures could very well represent private houses. In the western part of the middle of the field, what seems to be a huge square building complex measuring 18 × 20 m with a small extension on its southern side appeared. One would think of a public building like a gymnasium or bath, but appearances might also be deceiving and the structure could be composed of individual smaller units. South of this complex of structures a cross structure of low resistivity values appears, corresponding with the broad magnetic minimum, which shows a higher resistivity only in its deeper parts (1.5–1.7 m). The depth profile of this feature points to a ditch of 2.5–3 m in width, filled with resistive material in its lower part. As another linear magnetic minimum at a distance of c. 500 m towards the north-east might be the continuation of this anomaly, it was interpreted as a possible indication for the northern fortification wall of Old Sikyon, which – apart from the foundations, which would represent the resistive material at a greater depth – would have been torn down at some point[37].

Between this rather conductive linear anomaly and the large square complex the ERT depth slice shows no high-resistivity values in a zone of c. 20 m in length reaching throughout the whole width of the field. The character of the anomalies in this area, however, resembles those in the northern part of the field connected to private houses. In the remaining part, the

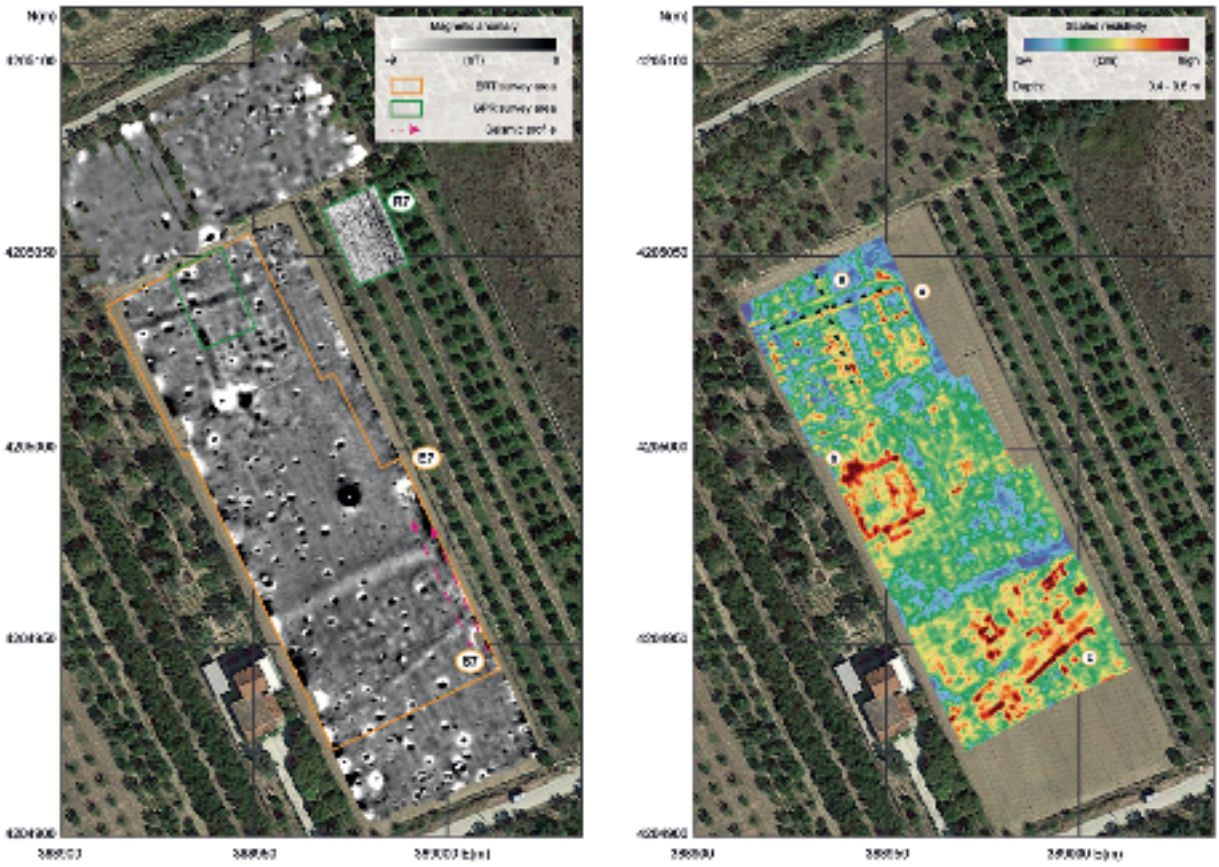
[36] In a first trial trench laid out over the two easternmost of these anomalies, they indeed turned out to be walls, although of a Byzantine building with some manufacturing purpose. It has not yet been possible to determine whether there are traces of earlier building activity beneath.

[37] This theory was disproved, however, by a trial trench laid out over this anomaly in 2018.

19 Drone photograph of the area around the church of Ayia Varvara (a) with the rest of the pile of ancient blocks (left) and the *lapidarium* (below), a Doric frieze block (b) and a triglyph (c) from the pile (S. Müth)



20 Results of georadar measurements around the church of Ayia Varvara (Institute of Geosciences, CAU Kiel)



21 Results of the magnetometry and radar (a) and of the resistivity surveys (b) in Field 7 (Institute of Geosciences, CAU Kiel on the basis of Google Earth)

field south of this linear anomaly, however, as far as it has been investigated with ERT measurements, is again covered by a pattern of parallel linear structures, which indicate building activity. However, this pattern shows an orientation that is clearly different from that of the supposed house structures in the northern part[38]. The southern pattern also continues in deeper levels than the northern one, which could indicate that the structures that caused it are of slightly older date.

All in all, there are many gains from the application of geophysical methods and we have gathered very much valuable information on Old Sikyon by applying them, but there are also difficulties of terrain and – not least – challenges of interpretation to be mastered: as an archaeologist, one is often tempted to interpret geophysical data rather according to one's wishes, although geophysicists also point to other possibilities, so one can be met by surprises when excavating something different than expected. When resisting these temptations, one will find a close correspondence between geophysical and excavation results, as in the described examples, and learn from them for the interpretation of further prospection results. In any case, it is paramount to use different kinds of geophysical methods to narrow down potential interpretations and to check them by excavation wherever possible.

To draw a conclusion, the broad range of methods applied for the investigation of Old Sikyon within the framework of our project clearly proved beneficial, and through this approach we are

38 An excavation trench laid out over one of the high-resistivity structures in the southwestern part of the field in 2018 uncovered the front of a Late Classical or Early Hellenistic grave monument, so this area rather does not contain any habitation quarters – at least not from the time the grave monument was erected.

able to draw a topographical outline of the city of Old Sikyon, including its borders, its internal structure and its harbour, after the first three years of research, and important information has already been collected about some of its buildings and quarters and about its material culture. To gather more detailed information about various features and investigate the chronological developments further, however, continuation of the excavations over several years is of paramount importance. With this, we hope that we will soon be able to provide an amplified picture of Old Sikyon, its urbanism, its structures and its art and culture and to help answer more general questions on Archaic and Classical Greek urbanism.

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Yannis Lolos

THE SIKYON PROJECT

SOME THOUGHTS AFTER TWO DECADES OF FIELDWORK IN THE CITY AND ITS COUNTRYSIDE

ABSTRACT
Archaeological work in Sikyon since 1996 entailed an extensive regional survey, followed by an intensive urban survey and more recently, by a large-scale excavation at the centre of the city. The analysis of the evidence allowed us to review our approaches and methods, and evaluate their success or failure in our effort to reconstruct Sikyonian history and culture.

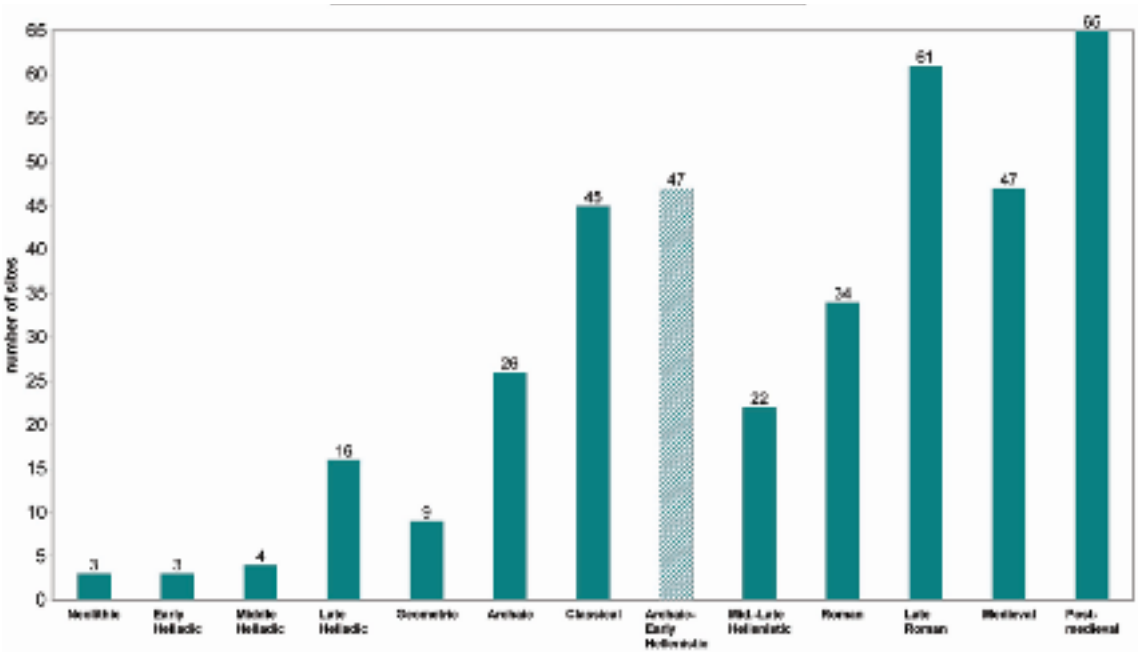
Archaeological work in Sikyon since 1996 entailed an extensive regional survey, followed by an intensive urban survey and more recently, by large-scale excavations at the centre of the city. The analysis of the evidence allowed us to review our approaches and methods, and evaluate their successes and failures in our effort to reconstruct Sikyonian history and culture.

The archaeological exploration of Sikyon dates back to the late 19th century with the objective of bringing to light the city's big public monuments, especially the theatre and those mentioned by Pausanias. The Sikyonian example was no different than that of many ancient cities of the Greek world, which were also treated in a partial and myopic manner by the early excavators. These were no stratigraphic excavations, and the few, isolated finds that were kept were not contextualised[1]. The Sikyonian countryside was likewise barely known: E. Meyer's »Peloponnesische Wanderungen« in the 1930s and N. Pharaklas's rather hasty investigations in the late 1960s as part of Doxiadis's »Ancient Greek Cities« initiative were the state of the research when I started working in this area in 1996[2].

A landscape approach to Sikyon was in order, seeking to address a number of questions: the extent of the chora of Sikyon; its settlement pattern, roads and passes, defensive installations, sanctuaries and traces of economic activities; and ultimately the history of the human presence in the Sikyonian countryside over the centuries. The extent of Sikyonia is estimated at c. 360 km², of diverse topography and geology, from the mountainous areas to the southwest (alt. 700+ m above sea level) and the semi-mountainous areas spread over geological terraces in the central part, to the coastal plain. The first question was how to approach an area of this size. Should we target a few, limited sectors based on topographical and geological criteria in order to conduct an intensive survey, or do a surface reconnaissance of as much of the total area as possible in an extensive manner? The former would risk missing important sites located in areas not included in the sample; the latter would result in a much coarser resolution[3]. Given that the land of Sikyon was very much a *terra incognita*, I chose to conduct an extensive regional survey.

Considering the size of the area under investigation and that it was for the most part a solo effort, this survey could not have been but site-oriented, leaving off-site areas unexplored. Consequently, the sites themselves were not contextualised, since only intensive survey over more

1 On the history of archaeological research in Sikyon see Lolos 2021, 7–11.
2 Meyer 1939; Pharaklas 1971.
3 This dilemma is nicely summarised by Fentress 2000.



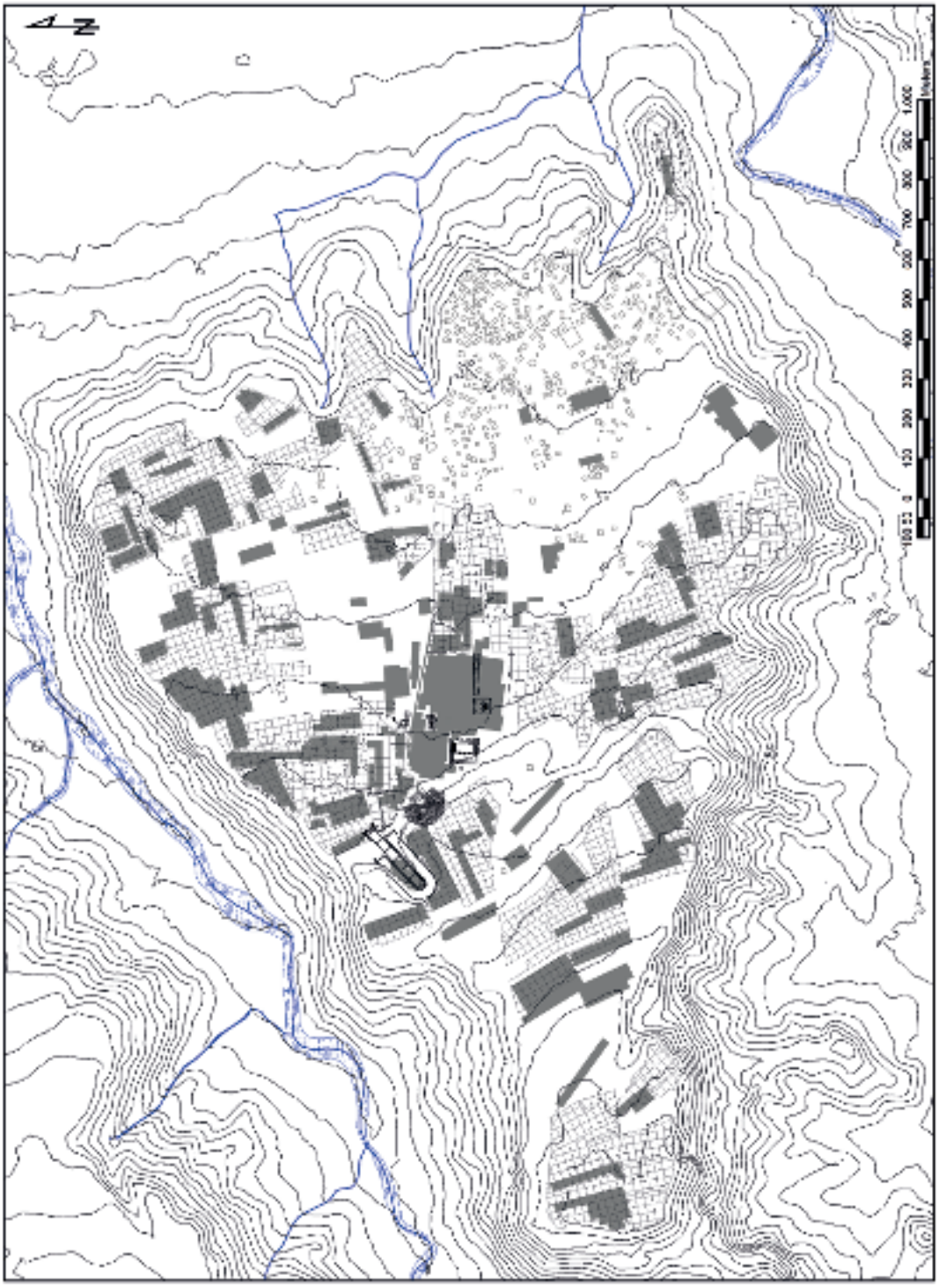
1 Chart of habitation sites in Sikyonia per period (based on the extensive regional survey) (© Y. Lolos)

limited geographical areas could have achieved this. The location and size of the sites, like any architectural features, were recorded with a handheld GPS; their chronological range was mostly noted on an absence/presence basis, although an effort was made to distinguish the predominant phase(s), but we did not quantify the finds (typically ceramics) by period or category. Information on the density, kind and preservation of ceramics was of a descriptive nature (dense, light, concentrated or scattered, type of ceramic ware, in good or worn condition, etc.). This was done in the interests of time, but in retrospect we should have taken the time to count the sherds, which would have allowed more ›objective‹ data across the board, and would have enabled us to compare our data to the data from other projects.

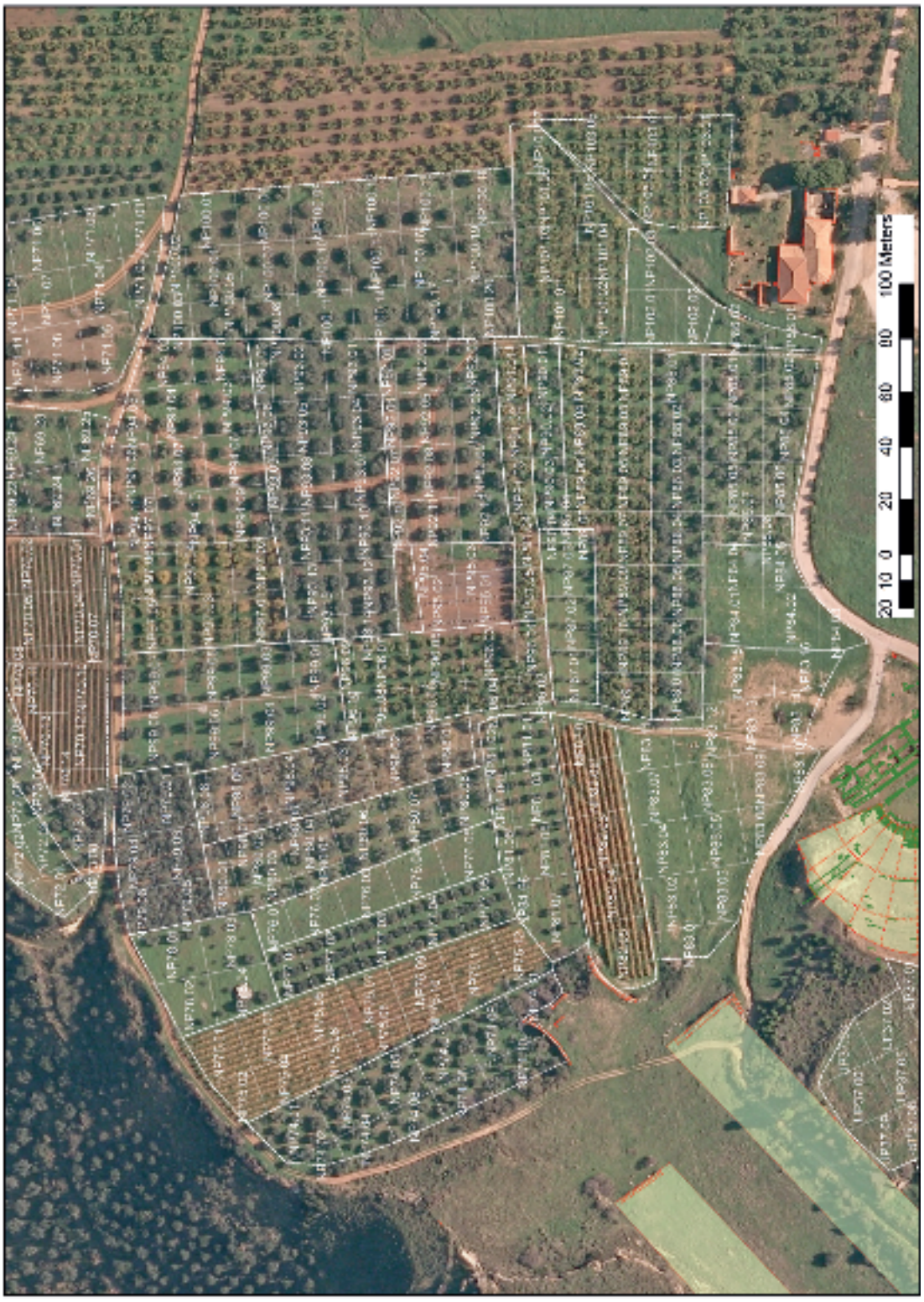
Well over 200 archaeological sites of different natures were mapped and recorded at this resolution: mostly settlements, but also forts, towers, traces of roads, quarries, agricultural terraces, cisterns and aqueducts, ancient shrines, Byzantine and post-Byzantine churches, etc.[4]. They allow us to reconstruct a history of human occupation in this corner of the Greek world, albeit in broad terms and chronological periods: thus, 4000 years of the Neolithic are lumped together, as are the three centuries of the Hellenistic, the four centuries of Roman and the eight centuries of the Byzantine era. Obviously a more nuanced picture is desirable, but in order to obtain it, an intensive survey is needed.

In this historical trajectory that we have tried to follow, even at this coarse resolution, the Hellenistic, and to a lesser extent, the Roman periods stand out in relation to the periods that precede and succeed them due to their low number of settlement sites (fig. 1). Yet, these were periods of prosperity for Sikyon – particularly the Hellenistic era if we are to trust our written historical sources. We soon realised that the city itself may hold the key for explaining this phenomenon: the city of that period was founded on a sizeable plateau, some 230 ha in surface area. Intensive survey was the obvious way to approach such a vast area, so little known archaeologically (fig. 2).

4 The register of sites includes 148 habitation sites, 31 special-purpose sites, 24 road sites and 18 defensive sites: Lolos 2011, 419–547.



2 The plateau of Sikyon with the intensively surveyed squares (outlined in grey) and the fields investigated with geophysical methods (shaded grey areas) marked; monuments of the civic centre are in black, Vasiliko is in the southeastern corner, contour lines are 10 m (© Y. Lolos)



3 Example of the division of survey tracts into squares on the lower plateau of Sikyon (© Y. Lolos)

Our collection and recording strategies were based on a flexible grid applied to the agricultural fields that occupy most of the plateau today and were our designated survey tracts. The grid consisted of squares, in principle 20 × 20 m, into which every tract was subdivided (fig. 3). A five-member team walked each square, with the surveyors spaced 4 m apart, counting separately sherds and tiles (by using two ›clickers‹) and collecting ›diagnostics‹ as well as other artefacts[5]. This ensured an average ground coverage of 50 % since a surveyor has an effective visual range of 1–2 m to either side of his or her walking lane, depending on ground conditions. A closer spacing between walkers would have run the risk of producing duplicate counts of the same artefacts. Every fifth square within a tract underwent total collection of artefacts, either across the whole square or along two lanes meeting at the centre of the square in a cross-like pattern, depending on the number of sherds. In squares littered with ceramics, cross-sampling was a pragmatic choice, producing adequate numbers of sherds for functional and fabric analyses[6].

The size of the squares was meant to cope with the effects of ploughing and cultivation, most notably the lateral displacement of artefacts caused by these activities[7]. This size tends to prevail in Mediterranean urban surveys and following it would facilitate intra-survey comparison in the future[8]. In retrospect, as far as Sikyon is concerned, was it appropriate? Were there instances where small artefact concentrations, i.e. smaller than 400 m², were encountered but ›lost‹ within their larger squares? It depends on the area and the ground conditions, but the answer is basically negative, with very few exceptions. The opposite was more often the case: there were many instances where low densities and limited numbers of diagnostic sherds did not allow functional and chronological differentiations between adjacent squares to be drawn. This fact became evident when trying to recognise and map remains of urban activities on the plateau. In a few cases we were able to identify differences from one square to the next, but in many more cases, differences were only identified on a larger scale[9].

The impact of ground visibility on artefact recovery was expectedly strong, and an effort was made to measure this impact by resurveying a few fields under better ground conditions. Sadly the data from 63 resurveyed squares revealed no measurable correlation between the increase in visibility and that of sherd or tile counts but simply demonstrated that artefact numbers generally increase with better ground visibility[10]. Therefore we have not been able to come up with a data-sensitive formula to correct for visibility, and consequently we have mostly based our various analyses on the actual artefact density counts rather than on projected counts from squares calibrated for visibility[11].

Squares with low visibility, which comprises 41 % of our 2858 surveyed squares, would seldom yield enough diagnostic artefacts to allow any valid interpretations as to their chronological range or the density and kind of activities that would have taken place therein[12]. For the same reason, the comparison of these poor visibility squares to other squares lying close by or further afield, was neither easy nor legitimate. Were such squares then worth surveying intensively? If

5 On the grid and our survey methodology see Lolos et al. 2007; Stewart 2021.

6 The majority of the c. 90,000 sherds used by Conor Trainor in his fabric analysis come from total collection squares: Trainor – Kiriatzi 2021.

7 For a summary of the discussion of these artefact-generating processes see Taylor 2000, 23 f. (with further references).

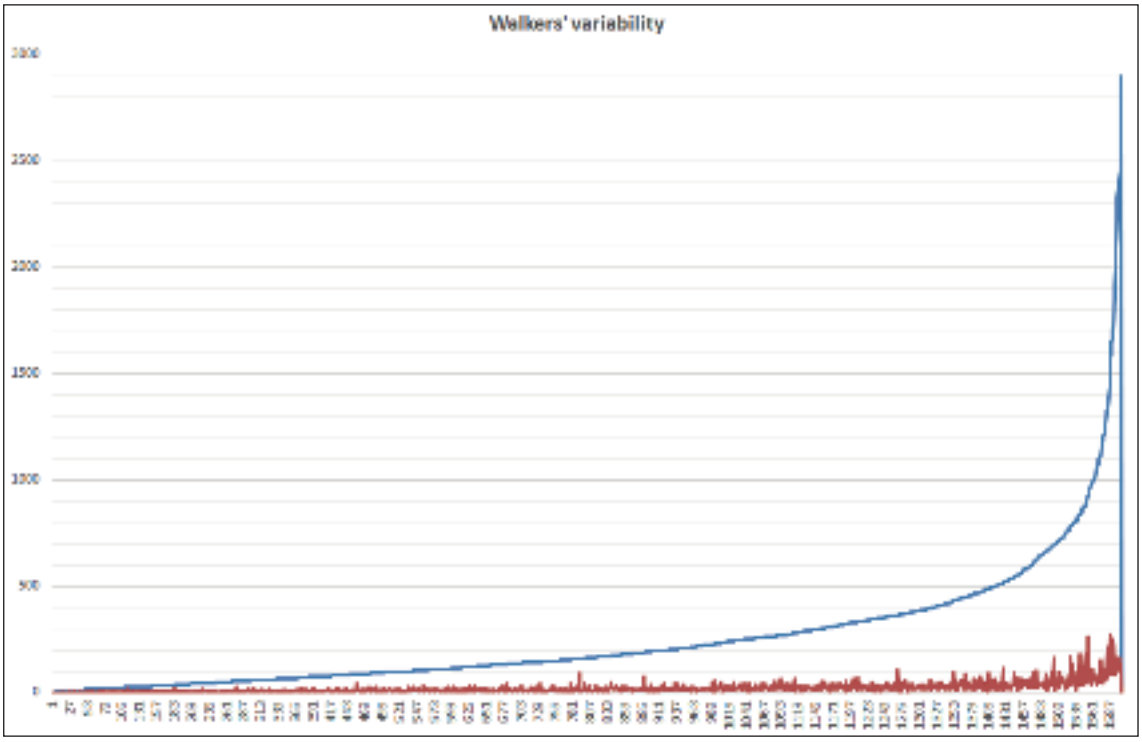
8 See our review of methodologies employed in urban surveys in Lolos et al. 2007, 268–271.

9 See Lolos 2021, 535–539.

10 See Lolos 2021, 521–527. Our survey is definitely not the only one to experience this lack of correlation. For example, in one of the recent surveys that has included revisits of certain surveyed areas into its core design and has implemented a number of them, namely the »Pyla-Koutsopetria Archaeological Project«, the surveyors observed that the count of artefacts varied most greatly between episodes of resurvey. See Pettegrew 2014, 67.

11 As, for example, the Boeotia surveyors do by mechanically multiplying their pottery counts for an extrapolated 100 % visibility. See Bintliff et al. 2007, 21.

12 Whitelaw (2013, 78–85) suggests that an absolute minimum of 20 sherds per square is required in order to build an argument based on ceramic distributions.



4 Chart of the standard deviation among the counts of individual walkers; x-axis shows the number of survey squares, y-axis the total number of sherds collected in each square (blue line) and the standard deviation from the mean value (brown line) (© Y. Lolos)

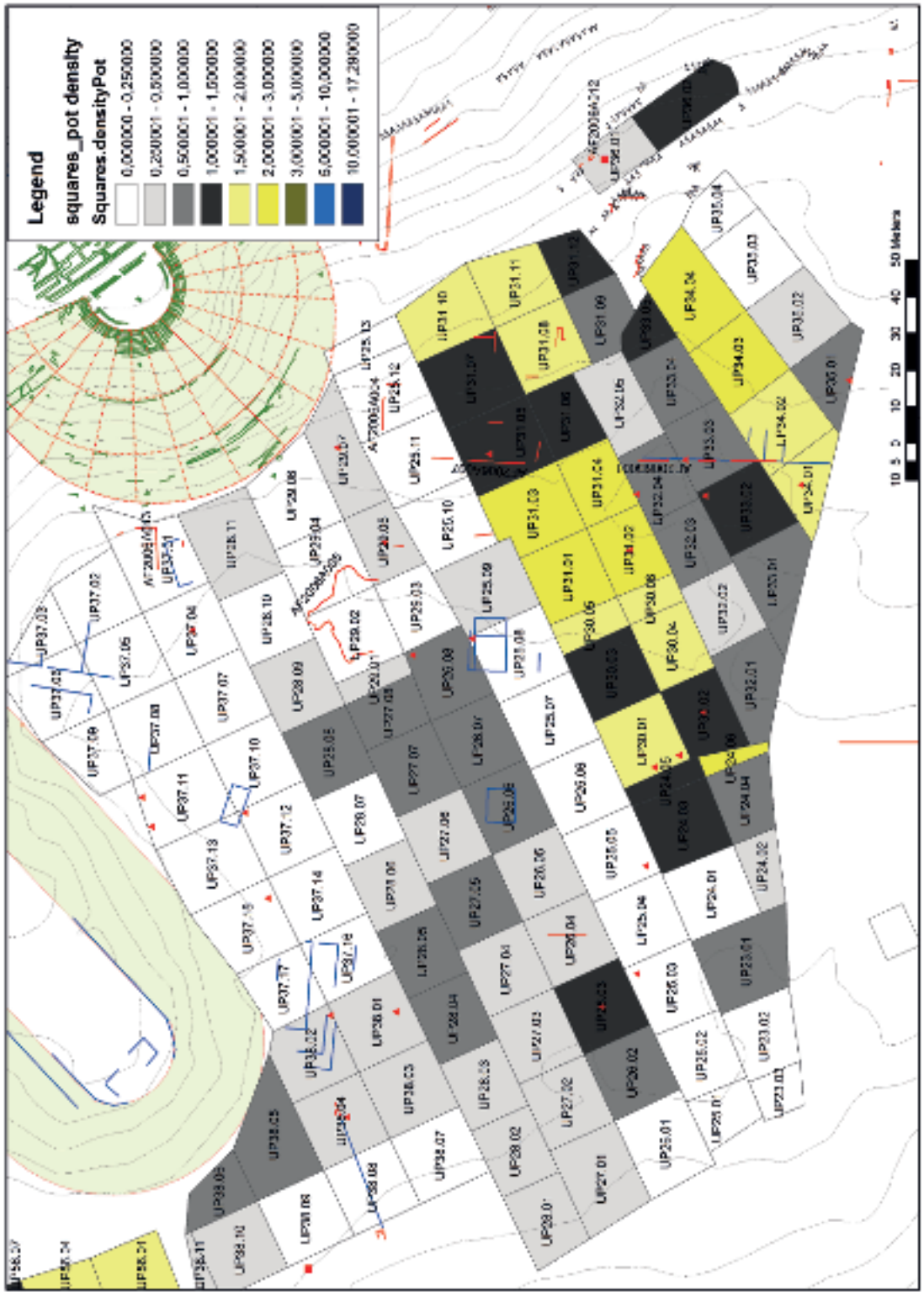
a rigorous resurvey policy is to follow over a number of years, then probably yes, since some of these squares would find themselves in a better surface condition visibility-wise (through cultivation of the land), therefore producing much needed comparative data. If a limited resurvey is to follow, as was the case at Sikyon, then surveying the majority of these low visibility squares is ultimately counterproductive. Granted, their exclusion from survey would have resulted in more ›patchy‹ maps of area coverage, since such squares and survey tracts are normally scattered in the midst of higher visibility tracts, but it would have allowed us to turn our attention to other areas of the plateau in order to survey fields offering better ground visibility[13].

Besides ground visibility, the erratic observation capacity of the actual surveyors also has direct, and at times quite serious consequences on the results[14]. Some of our walkers were more observant than others, resulting in higher counts, occasionally twice as many sherds from one walking lane to the next[15]. We were able to monitor this because team leaders recorded on the margins of the record forms filled in for each square the numbers of sherds and tiles taken by each walker. Quite expectedly, denser artefact scatters yielded greater discrepancies between adjacent lanes, resulting in significant standard deviations among the counts (fig. 4). We tried to deal with this problem by rotating walkers between the two five-member teams that were deployed in the field and by creating ample density categories in our GIS-generated ceramic distributions with breaklines at 0.25, 0.50, 1, 1.5, 2, 3, 5, 10 and over 10 sherds/m² (fig. 5). The higher the number

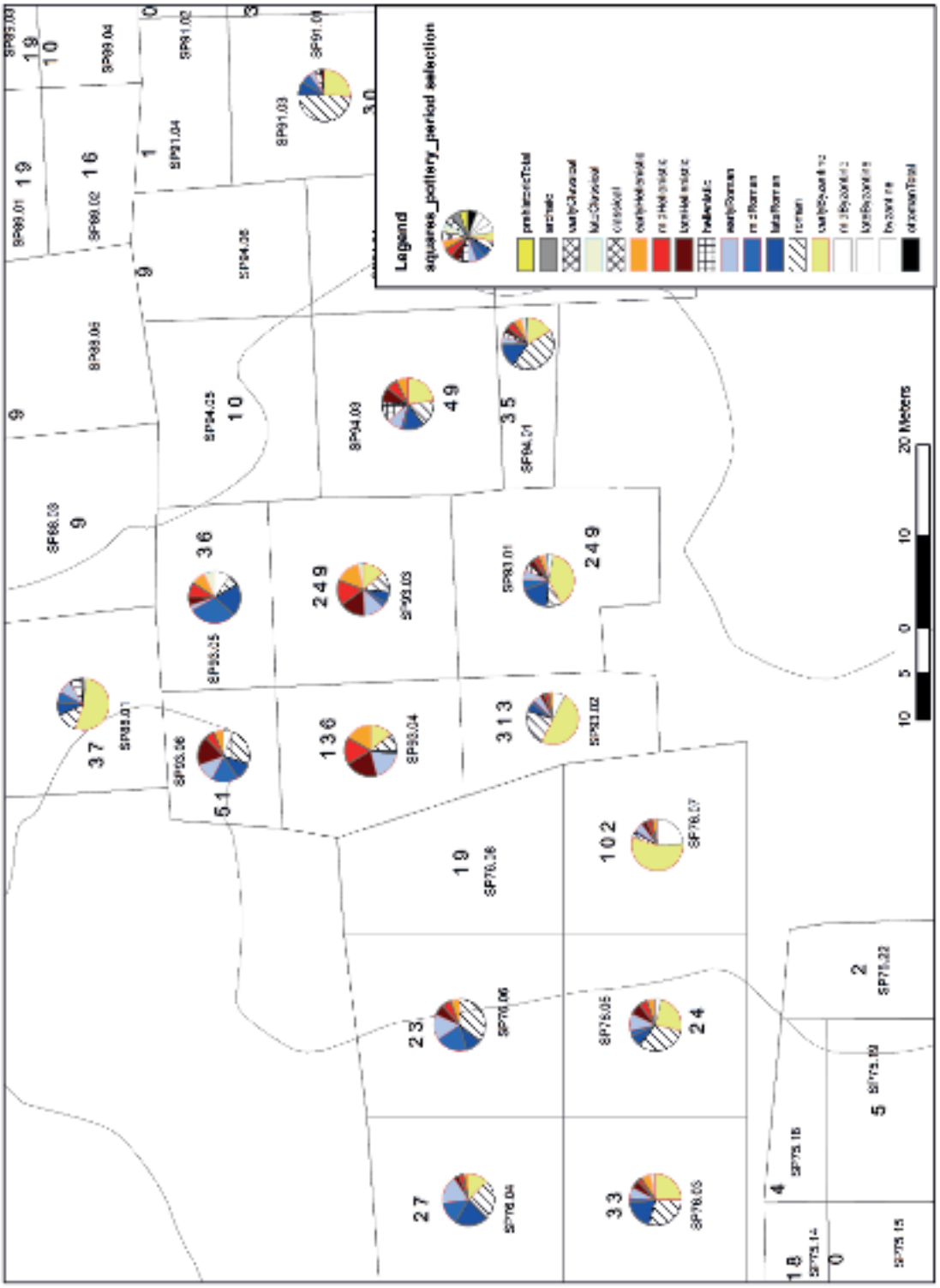
13 This is the approach taken by Kostas Vouzaxakis while surveying around the Neolithic sites of the Almyros plain in Thessaly. Vouzaxakis (2008, 218–222) chose to survey along transects that offered good ground visibility, and the results fully justified this choice.

14 This problem of survey archaeology was recognised early on and various methods have been suggested to deal with it: Plog et al. 1978, 413–415; Haselgrove 1985, 21–25.

15 Lolos 2021, 530.



5 Pottery density of the squares surveyed above the theatre and the stadium (© Y. Lolos)



6 Example of quantification of survey pottery by chronological categories (the numbers of diagnostic sherds [per square] appear in a larger font size) (© Y. Lolos)

of ceramic counts, the ampler the density categories become, so that they can absorb increasing deviations among walkers' counts.

There is a further reason for creating large groups of densities on the digital map, and this is in order to limit the number of sherd and tile density categories, in Sikyon's case to nine, so that the map is easy to read and comprehend. Indeed, one of the biggest challenges in processing material from an artefact-rich urban landscape (in Sikyon some 740,000 sherds were counted during the survey), is being able to visualise it appropriately. In surveying within the boundaries of an ancient city or of any large site for that matter, we seldom have artefact concentrations against a more or less empty background, as is often the case in regional surveys. Instead, we are dealing with a carpet of ceramics, where individual cluster boundaries are rarely detectable in the field, i.e. while surveying, but only in post-processing stages. This is also due to the fact that in a small survey universe, as an urban area is, there is a risk that post-depositional processes will mask the boundaries between individual concentrations of artefacts[16]. In other words, properly visualising the data is not only important with respect to publication but more so with respect to their analysis and interpretation. In order to do so, we had to make a number of groupings and standardisations (by using drop-down menus), both with respect to chronological periods (fig. 6) and the functional categories (fig. 7). In the end, it all came down to clarity versus detail: showing everything would have cluttered the map and made it incomprehensible.

Architectural remains, from whole masonries to individual stones, either *in situ* or scattered, were measured with differential GPS units so that they could be plotted with a fair degree of accuracy. In recording their dimensions, we made sure to note whether we were dealing with original, preserved or visible dimensions, which has helped us to establish the more or less typical sizes of ashlars or column drums observed around the plateau and, following this, to identify the cases that stand out and plot their spatial distribution[17]. Showing, for example, the spatial distribution of ashlar blocks (both *in situ* and scattered) that measure more than 1 m in length can be of some significance, since such stones are likely to originate from substantial structures, possibly of public or sacred character (fig. 8).

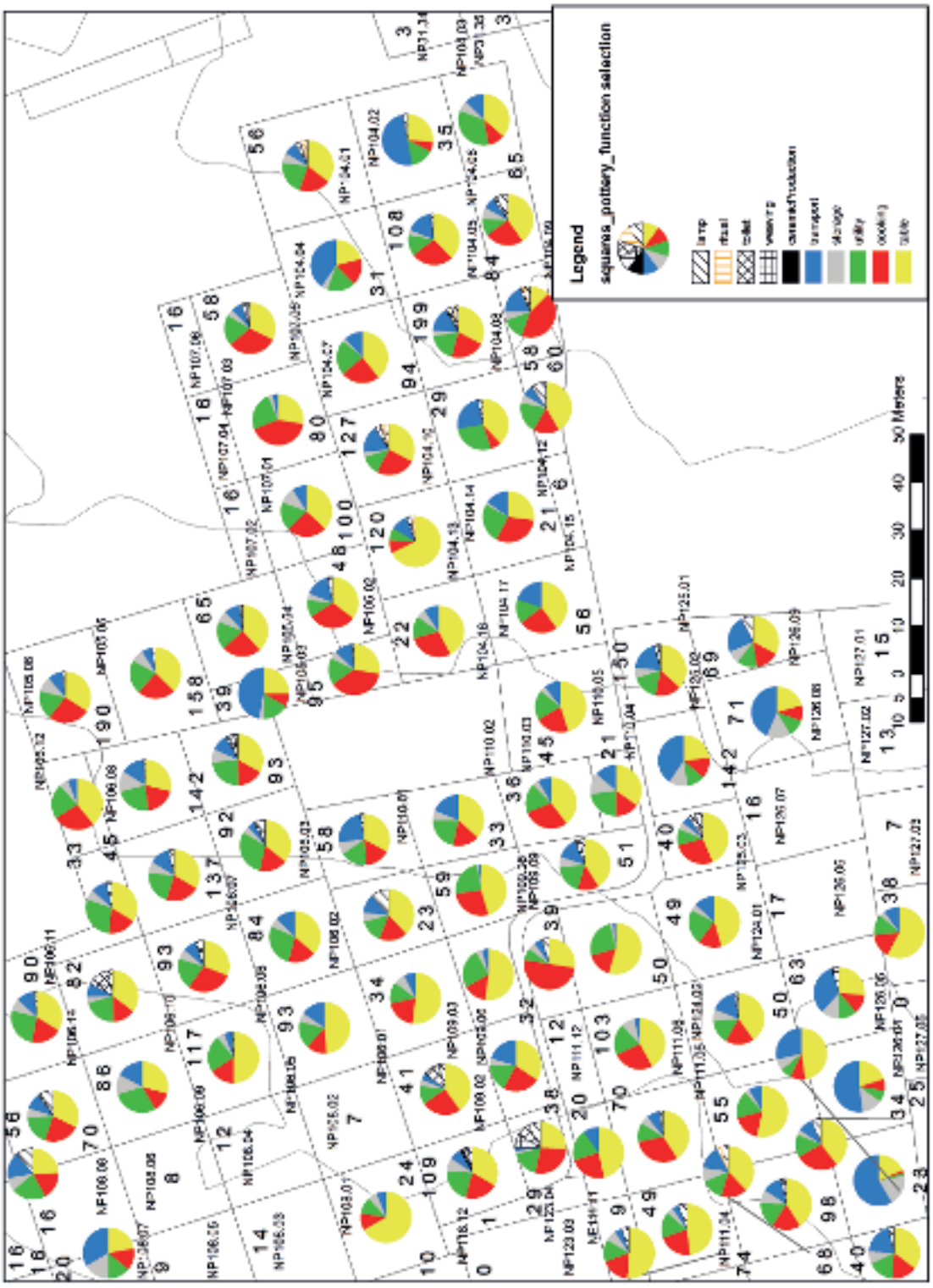
Our architectural harvest was enriched and complemented by our recording of spolia within the modern village of Vasiliko, which occupies the southeastern sector of the plateau. This survey for spolia was done in a more or less systematic manner as long as we were able to have access to the properties[18]. We recorded over 400 spolia, mostly ashlar blocks but also parts of columns and a number of non-architectural members. Despite the fact that we have not been able to visit all properties within the village, actually far from it, this search for spolia was well worth the time and effort. As a matter of fact, we found more Doric capitals in the village than in the entire plateau, as well as the only Ionic capital of the entire survey. The contribution of the spolia survey was even greater in the domain of ancient domestic equipment, represented by the number of stone washtubs, troughs and mortars. Almost all of these were found in the courtyard of the houses of Vasiliko, the majority being reused as late as the middle of the 20th century. This study was also revealing as to the attitudes of the modern residents of Vasiliko towards the surrounding antiquities. It appears that practical considerations prevailed, much more than aesthetic, symbolic or other ones.

Our surface survey data were complemented by geophysical data following the original design of the project. In the first two years (2004 and 2005), different geophysical methods were used, namely magnetic and soil resistance techniques including electrical resistivity tomography (ERT), as well as electromagnetic methods with the use of the ground-penetrating radar (GPR),

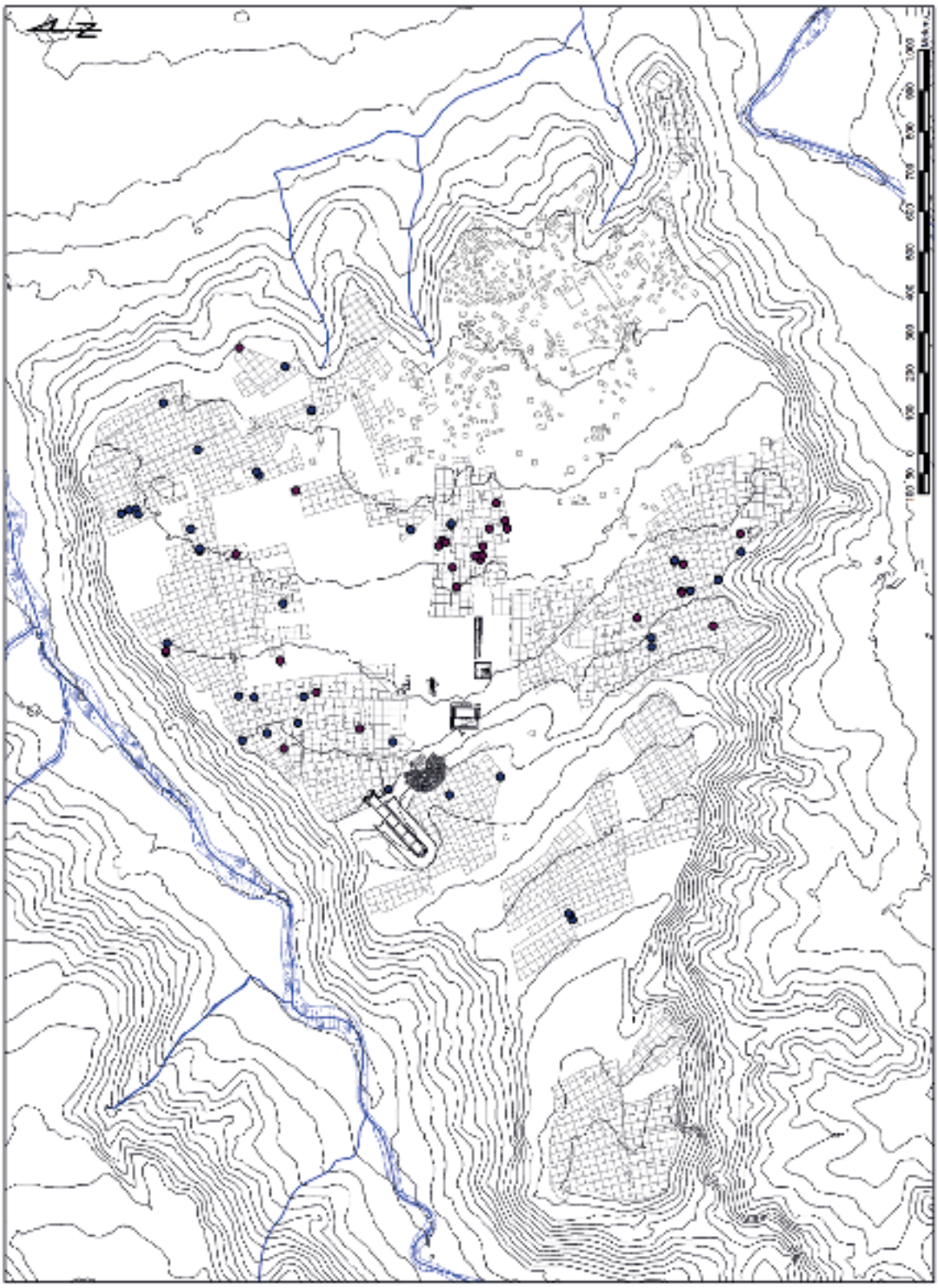
16 On the difficulty in defining cluster boundaries in an urban context see Bevan – Conolly 2002–2004, 130 f.

17 See Lolos 2021, 174 f. Generally speaking, in publications of archaeological surveys, architecture has received less attention than it deserves.

18 Lolos 2021, 181–186.

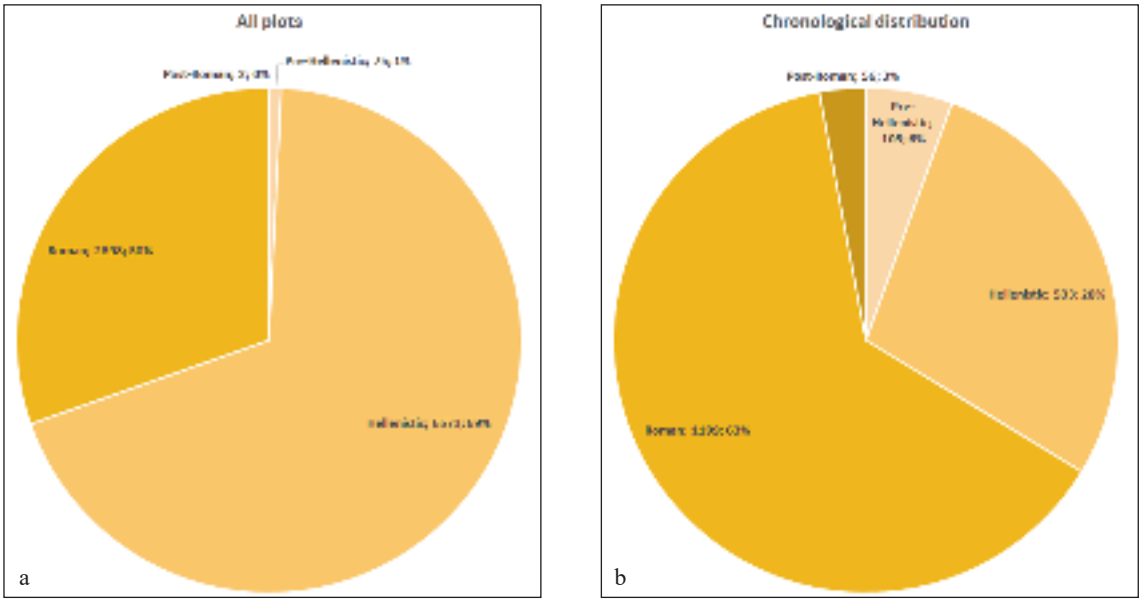


7 Example of quantification of survey pottery by functional categories (the numbers of diagnostic sherds [per square] appear in a larger font size) (© Y. Lolos)



8 Map of the plateau showing the find spots of ashlar blocks that exceed 1 m in length (© Y. Lolos)

9 The location of the five rescue excavations selected for study within the designated northeastern quadrant of the lower plateau (© Y. Lolos)

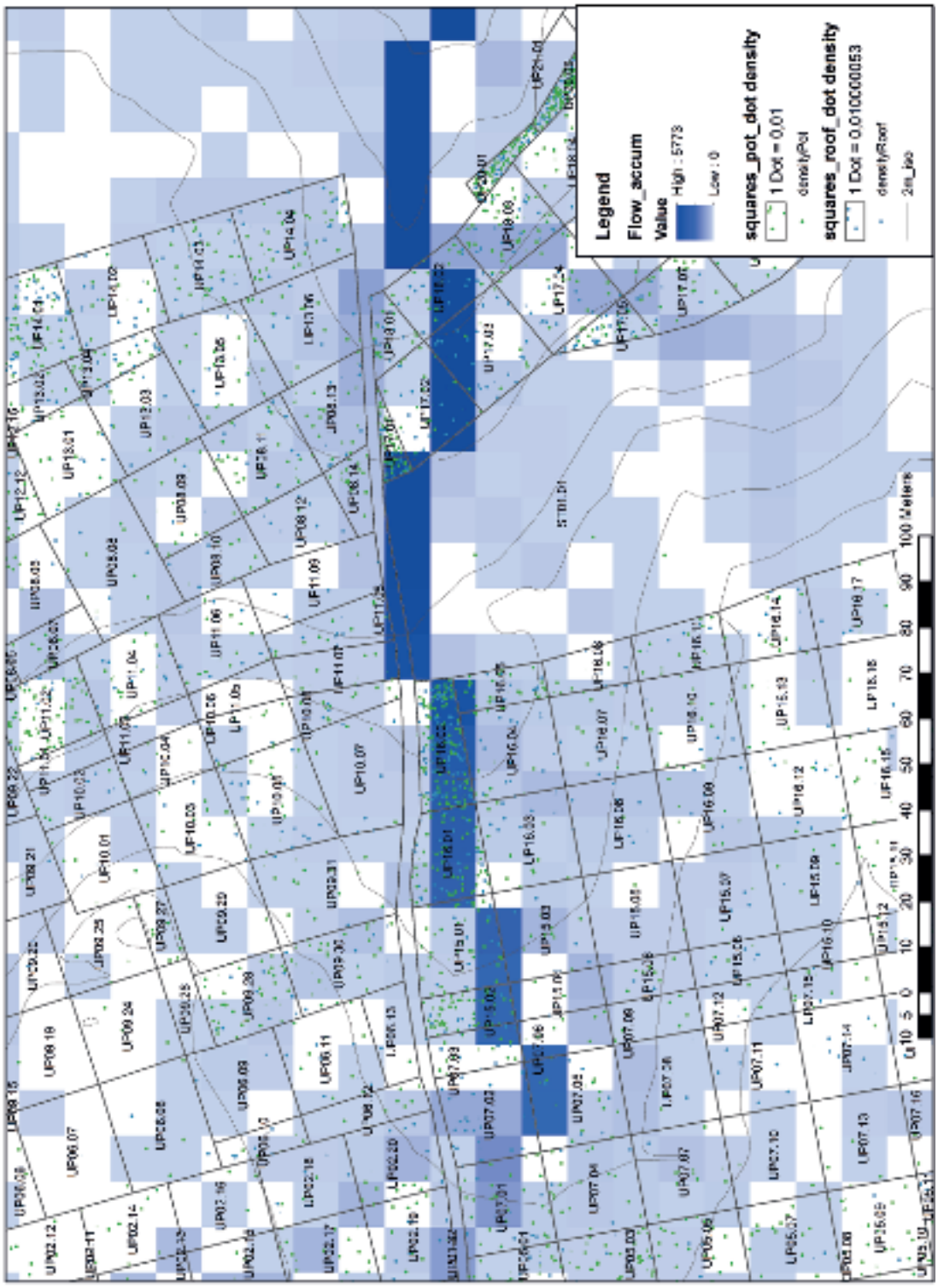


10 a) Chart comparing the chronological breakdown of pottery sherds studied from all five rescue excavations, b) chart comparing the chronological breakdown of pottery sherds identified from the surface assemblage of the northeastern quadrant of the lower plateau (© Y. Lolos)

so that we could assess their efficacy in Sikyonian soil[19]. Survey with a fluxgate gradiometer was proven to be quite successful given its speed and despite its inability to produce three-dimensional data. We therefore used it heavily in subsequent seasons (2006–2009) in order to cover geophysically as many of the intensively surveyed fields as possible. Geophysical survey was pivotal for detecting anthropogenic features not preserved on the surface, even in fields where, due to poor ground visibility or soil condition, surface finds were limited. Thanks to this evidence, we were able to reconstruct the ancient city grid but also to detect various activity sites – notably ceramic production areas[20]. On the other hand, there were areas where surface remains, including architectural ones, abounded, and yet survey with a gradiometer failed to produce significant results[21]. Ideally, we should have revisited these areas to survey them with soil resistance techniques, which are not affected by the magnetic properties of soils.

Successful or not, geophysical surveys cannot generate data on the chronology of the buried structures. This is the notorious problem of representation that survey archaeology is facing: to what extent what is present on the surface represents what is buried in terms of size, function and chronology[22]? To address this problem, some survey projects have excavated trial trenches in fields previously surveyed. We chose to include the evidence from rescue excavations conducted by the local Ephoreia of Antiquities (fig. 9). There are problems in working with these excavations: a) they were not conducted in fields previously surveyed, b) they tend to cluster around the village of Vasiliko, i.e. around the southeast sector of the plateau, c) their recording methodology is not homogeneous. Still, they do provide much-needed stratigraphic information and often massive data which allow us to perform various analyses. Dimitris Grigoropoulos compared Roman and post-Roman ceramics from topsoil and subsurface deposits of four rescue excavations to discover that Middle and Late Roman pottery tends to be more represented on the surface than Early

19 Sarris et al. 2008; Sarris et al. 2021.
20 Lolos – Gourley 2012.
21 I discuss this issue in Lolos 2021, 532 f.
22 See the discussion in Millett 2000.



11 Chart of sherd and tile density against flow accumulation pattern around tract UP16 in the western quadrant of the upper plateau (© Y. Lolos)

Roman pottery, which is not the case in deeper levels[23]. Similarly, the comparison of surface to stratified data, both located within our ›northeast quadrant‹ of the plateau, showed a clear predominance of Roman versus Hellenistic pottery in the surface assemblages and exactly the opposite in the stratified deposits (fig. 10 a. b)[24]. Clearly the Hellenistic is underrepresented on the surface, and this was more or less expected. What was not expected is the stronger presence of fine wares in the survey assemblage given the low survival expectancy of such ceramic types on the surface.

Taphonomic and other post-depositional factors (notably soil treatment) certainly underlie the underrepresentation of earlier chronological horizons on the surface. We have tried to address this problem in three ways: a) by calculating erosion-sensitive zones through spatial analyses in GIS (our topographical map was quite detailed, having been generated from stereoscopic images and the use of the »ERDAS Imagine« software). The hydrological models were particularly helpful since water is the most important factor in erosion at the Sikyonian plateau (fig. 11); b) by producing three-dimensional geophysical data through ERT and GPR techniques, thanks to which we were able to measure the depth of archaeological horizons in specific areas (fig. 12); and c) by studying the stratigraphy of excavated sites, both from planned excavations within and around the agora of the city and from rescue excavations further afield. Yet, the information on the depositional history of the Sikyonian plateau that we gained via these means was definitely localised. For a broader picture, geomorphological research concentrating on site-formation processes was needed, but the geoarchaeological survey conducted by Chris Hayward, which looked into stone quarrying areas across the plateau and the reconstruction of the palaeotopography around the centre of the ancient city, did not address that aspect[25].

Knowledge of the depositional history of the plateau over the last two millennia is important for one more reason, which is the choice of sites for future excavation. A substantial layer of post-antique depositions is bound to protect the archaeological horizons from the effects of erosion and human-caused disturbance. Having completed the survey and processed the evidence, we singled out a few areas that we deemed important archaeologically on the basis of the surface finds and the geophysical results. The density of artefacts, the chronological range suggested by the ceramics, the preservation of *in situ* architecture in combination with the detection of significant architectural remains under the surface were taken heavily into consideration when choosing these sites. Eventually, realistic problems (mainly the unavailability of the privately-owned fields in question and issues of site management since these fields are not close to the museum and the fenced archaeological site) drove us away from these targets. Instead we chose to concentrate our efforts in the designated archaeological site, which essentially encompasses the entire ancient agora and some of its immediate surroundings. Our large-scale excavations there since 2013 exemplify how different stratigraphy can be even within a 300-m radius and the need for micromorphological analyses accompanying future archaeological fieldwork[26].

These excavations, which covered an overall surface of some 2000 m², targeted different kinds of monuments and structures, so that they shed light on different activities that had taken place around the agora. On the northwest side of the agora, a temple and a commercial stoa, both from the Hellenistic period, were later eradicated for the erection of a massive Pi-shaped monument that likely remained unfinished[27]. To the southeast of the agora, we exposed part of a one-aisled stoa, as well as an industrial complex of the Roman and Late Roman periods dedicated to pottery

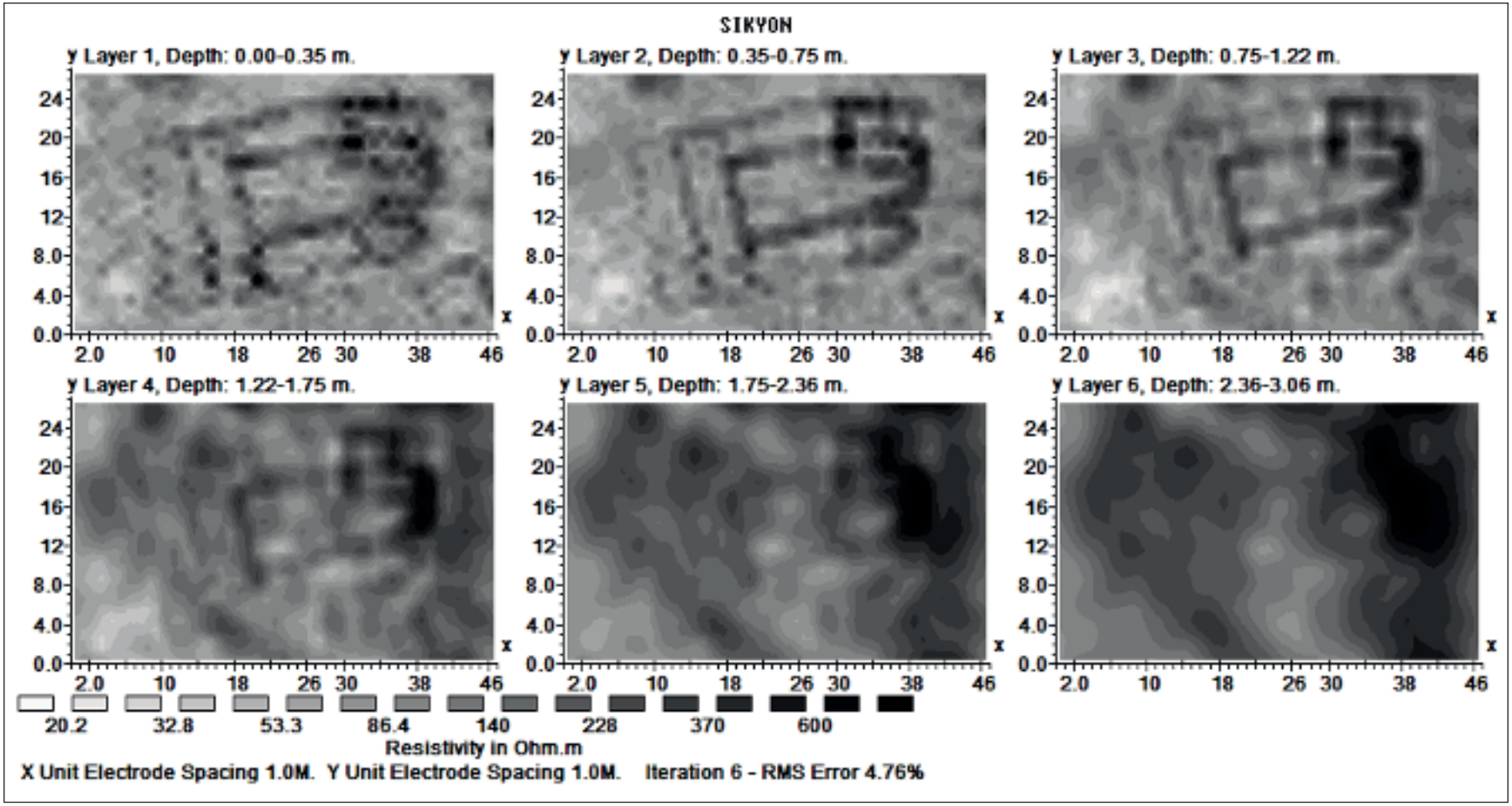
23 Grigoropoulos 2021, 430–434.

24 Lolos 2021, 533.

25 Hayward 2021.

26 Thus, whereas the stylobate of the Southeast Stoa lies over a metre below ground level (Lolos 2016, 112–117), the rim of the well found in one of the rooms of the West Stoa lies just a few centimetres below modern ground (Lolos 2019, 138–143).

27 See the excavation reports in Lolos 2016, 117–128; Lolos 2017, 163–173; Lolos 2018, 197–202; Lolos 2020a, 93–97 and Lolos 2020b.



12 3D resistivity model of the basilica detected within the agora, resulting from the 3D inversion of the dipole-dipole parallel tomographies carried out with Syscal Pro ERT unit (© Sarris et al. 2021)

making[28]. A substantial part of our finds dates from the Late Roman period, which was more or less expected on the basis of the survey evidence. Had we based our understanding of the city on the results of these excavations, we would have thought that Sikyon was robust during the Late Roman period. Thanks to the survey evidence though, we know that it is just the city's centre that hosted the settlement at that time and that beyond it, Late Roman material is almost non-existent[29]. In other words, the Sikyonian experiment shows that in order to understand the archaeology and the history of a sizeable city, a combination of survey and excavation is needed.

Publication of the excavation results is the next big challenge that lies ahead and is a two-fold operation: preparation of manuscripts on the one hand (to be submitted to the series of the Archaeological Society of Athens), and on the other hand, digital publication of the data, namely of the spatial data (through a WebGIS platform), the database and the finds with their associated documentation and illustration. In this way, our data will be available to everyone for consultation, scrutiny and comparison. This is how we proceeded with our survey archive, by depositing the data (databases, spatial data, photographs) within »Zenodo« and »Github« to ensure it is open and accessible into the future[30]. Part of our effort to communicate with other projects is also our online ceramic reference collection, which includes characteristic ceramics found in both the survey and the excavation (see <http://extras.ha.uth.gr/sikyon/en/crc.php>). In this way, we hope to initiate an on-going dialogue with colleagues working within Corinthia and beyond, to the mutual benefit of our research projects.

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[28] See the excavation reports in Lolos 2015, 119–133. 142–143; Lolos 2016, 103–116; Lolos 2017, 139–160; Lolos 2018, 185–197; Lolos 2019, 111–135.

[29] See Tzavella 2021, 283–286; Lolos 2021, 583 f.

[30] »Zenodo« is a data repository for research data that was commissioned by the European Commission and is hosted by CERN. »Github« is an open source software repository that can host code and data and is fully integrated with Zenodo. See Charno et al. 2021, 596–597.

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HELLENISTIC LOUSOI

A LOCAL PERSPECTIVE ON THE ADAPTATION OF STANDARDS IN ARCHITECTURE AND TOWN PLANNING[1]

ABSTRACT
The main aim of recent urbanistic studies in Lousoi is to gain insight into its urban fabric during the Hellenistic period and to understand it within its particular geographic, sociopolitical and economic contexts. This paper presents the first results of new excavations in the public centre, which was fundamentally restructured between the late 4th and the 2nd century BC. In combination with the outcome of earlier excavations and new evidence supplied by geophysical and architectural surveys, the new results provide insight into how town planning and architecture of this mountain town responded to both the distinctive affordances of the place and to the supralocal design concepts circulating in the Hellenistic oecumene.

INTRODUCTION

In appraising ancient Greek urban culture, consideration of metropoleis such as Athens, Corinth, and Miletos or the monumental capital cities of the Hellenistic period is extremely important due to their political, economic and cultural significance. However, the urban layout and development of these ›supercities‹ do not represent a universal benchmark. Rather, the ancient Hellenic world, and above all the geographically fragmented Greek mainland, was predominantly characterised by small-scale urbanism[2]. Even if our knowledge of numerous aspects of ancient Greek urbanism has expanded considerably during the last years[3], and even if the importance of modestly sized towns has been increasingly stressed by scholarly studies in the last four decades[4], many publications have repeatedly deplored the fact that the number of reliable archaeological analyses of the urban layout and development of individual sites is still small.

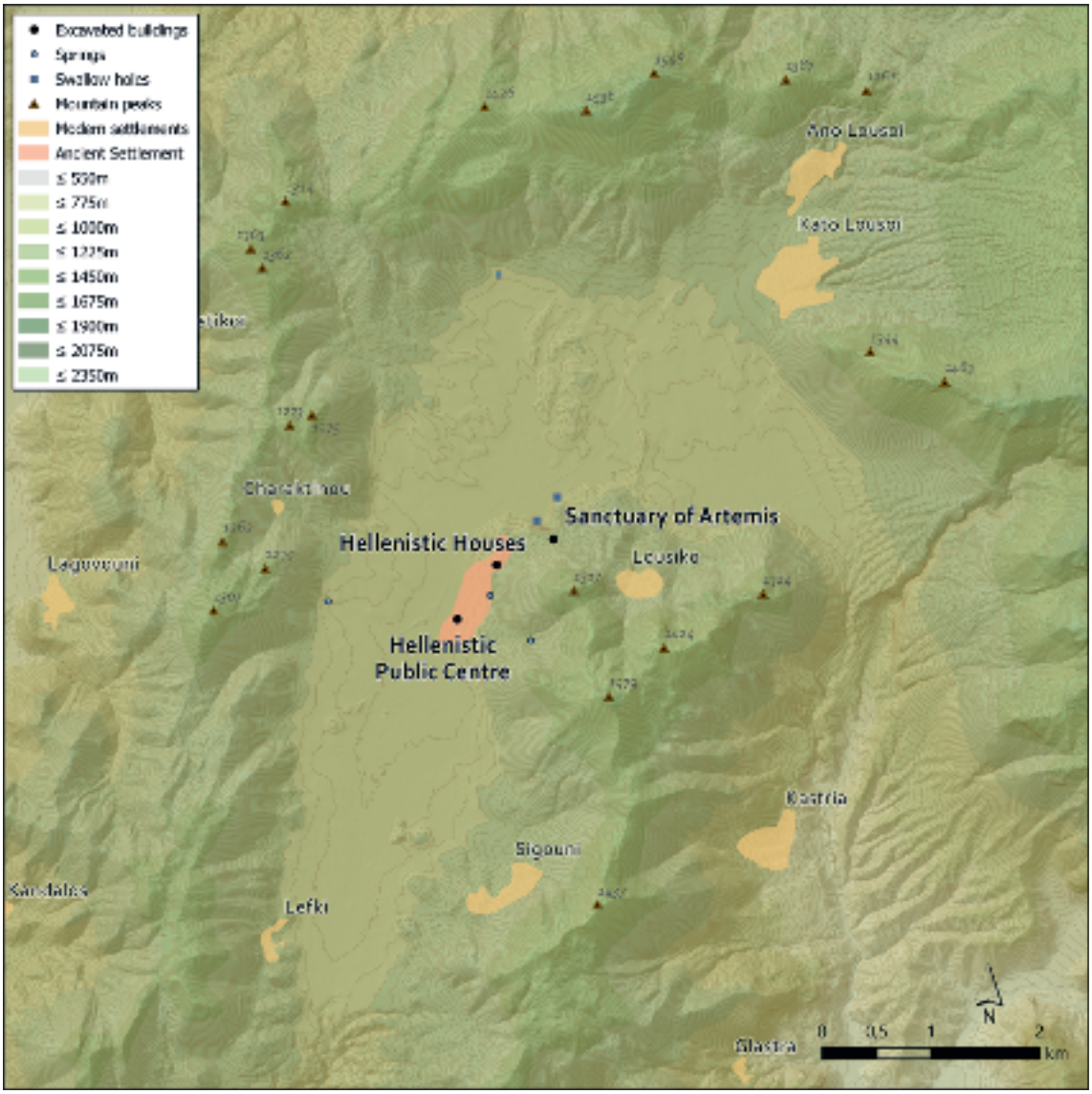
The polis of Lousoi is situated in the mountainous landscape of the northern Peloponnese on the fertile karst plain of Soudena, the highest of all in ancient Arkadia. At 965–1100 m above sea level, the ancient settlement covers the foothills of Mount Profitis Ilias that borders the high plain on its eastern side (fig. 1). From the perspective of a small mountain town, Lousoi can

1 This paper is the result of the earliest phase of a project on »The Urban Structure of Hellenistic Lousoi (Greece)« funded by the Austrian Science Fund (FWF): P 31801-G25. For further results that were published after the completion of the present manuscript see Baier et al. 2021. The authors would like to thank the Ephorate of Antiquities of Achaia for their permission and ongoing support for research at the site. We are equally grateful to the former director of the Austrian Archaeological Institute, Sabine Ladstätter (†), to the excavation director and former head of the institute's Athens Branch, Georg Ladstätter, and to the current head of the Athens Branch, Birgitta Eder, for their support and advice.

2 Cf. Kolb 1984, esp. 75–90; Hansen – Nielsen 2004, esp. 77–78. 1319–1327; Price 2011, 19 f.

3 For the Archaic and Classical periods see the »Acts Series« and the »Papers Series« of The Copenhagen Polis Centre. For Arkadia cf. Nielsen – Roy 1999. On Greek urbanism in the Hellenistic period see the series »Die hellenistische Polis als Lebensform 1–5«, esp. Matthaei – Zimmermann 2009; Matthaei – Zimmermann 2015.

4 The integration of smaller settlements and towns into discussions of ancient urbanism was suggested by Boyd – Jameson 1981; Gehrke 1986. More generally on the historiography of ancient Greek and Roman urbanism see e.g. Castagnoli 1971, 2–7; Martin 1974, 13–47; Greco – Torelli 1983, 17–35; Hoepfner – Schwandner 1994; Donati 2014.



1 General map of the high plain of Soudena/Lousoi (© OeAW-OeAI/C. Kurtze)

contribute to the emerging debate about the impact of localism on the development of Greek polis culture, which especially from an archaeological point of view, has so far been little studied. The still largely unexploited potential of the Peloponnese to rewrite traditional narratives of ancient Greek urbanism has been stressed only quite recently in a series of papers by Jamieson Donati with particular respect to regular town layouts[5] and to the development of commercial and civic space[6]. With special regard to ancient Arkadia, new fieldwork conducted over the last two decades has pointed out that the still prevalent idea of the region being underdeveloped from an urbanistic perspective needs to be reconsidered[7].

5 Cf. Donati 2014, esp. 274–279; Donati 2015; Donati – Sarris 2016, 392.

6 See e.g. Donati 2015, esp. 179–181. 184. While the general layout of urban centres of large Peloponnesian cities like Megalopolis (Lauter 2005; Lauter-Bufe – Lauter 2011), Mantineia (Winter 1987; Karapanagiotou 2015, 69–97), Messene (Müth 2007, 42–79; Themelis 2010; Themelis 2016) and Elis (Donati 2011, 104–106) has been studied, at present »… Argos and Corinth are the only Peloponnesian cities where the archaeological material permits… an extensive exploration [sc. of agorai] over a wide time span« (Donati 2015, 185).

7 During the two decades, pioneering works in ancient Stymphalos (Williams 2005; Williams 2013) were followed

2 The Sanctuary of Artemis Hemera and the terraces below, drone photo facing east (© OeAW-OeAI/C. Kurtze; editing C. Baier)

Against this background, new comprehensive investigations into the overall layout of Lousoi and into the spatial and functional configuration of its public centre started in 2015 and will be outlined in this paper. They respond to a plea for a ›local turn‹ in urban studies dealing with the Greek polis that has been raised by Hans Beck and other scholars[8]. While an ever-growing number of recent scholarly attempts to historicise globalisation phenomena have stressed the impact of transregional networks and exchange on the development of the ancient Greek society, Beck and others have pointed out that heterogeneous local solutions in architecture, arts, crafts, or customary forms of behaviour have not received due attention so far. Research into this dialectical relationship between local parameters (topography, cultural traditions, production and building techniques), regional factors (political and economic networks) and supraregional urbanistic and architectural trends is at the core of our recent investigations into the urban layout of Lousoi.

The interrelation of deeply rooted local traditions and interregional contacts within the Peloponnese is indeed a crucial aspect to consider when studying the material culture of Lousoi. This is illustrated by the results of archaeological research at the site that was initiated by the Austrian Archaeological Institute in 1898/1899 and has been resumed from 1980 onwards. Arguably, in antiquity one of the most important factors for the movement of people to Lousoi, for the exchange of commodities and ideas, but also for the urban development was the Sanctuary of Artemis Hemera (fig. 2)[9]. Situated on an imposing cliff terrace on the northwestern slope of Mount Profitis

to varying extents by urban studies on the sites of Tegea (Ødegård 2005; Ødegård 2010; Ødegård – Klempe 2014), Theisoa (Mattern 2013b; Mattern 2014), Pheneos (Kissas 2011; Giannakopoulos et al. 2012; Kissas 2013), Kyparissia (Karapanagiotou 2010), Heraia (Papadopoulos et al. 2015), and Mantineia (Donati – Sarris 2016, esp. 365–384).

8 Pointing out the importance of studying the local horizon of ancient Greek poleis as sources of meaning and orientation see e.g. Beck 2020; Beck 2017; Zimmermann 2015, esp. 400 f.; Donati 2015.

9 For the early excavations conducted in 1898/1899 see Reichel – Wilhelm 1901.

3 The Hellenistic houses and the terraces of the supposed residential quarters, drone photo facing east (© OeAW-OeAI/C. Kurtze; editing C. Baier)

Ilias, this sanctuary was extensively frequented by visitors probably from the 9th century BC up to the Augustean period. From early on, it played a prominent transregional role, as can be deduced especially from bronze votives of excellent quality, which were found during the 19th century in the course of unauthorised excavations at the sanctuary and possibly also at other places nearby. This finds as well as other groups of votive offerings shed further light on the important, yet not exhaustively examined role of the site for the study of ancient cultural landscapes in the northern Peloponnese[10]. The cult flourished especially during the Hellenistic period, when a monumental temple and other buildings on a terrace below the temple were erected. The building type of the temple, a Doric prostylos with two symmetrically adjoined porticoes, is unique for Greek sacred architecture and seems to have been designed specifically according to the local ritual needs[11]. At the same time, the formal and stylistic vocabulary of the building decoration corresponds to broader contemporary tendencies. The supraregional significance of the sanctuary was further increased by its widely recognized status as a sacred place of refuge and by festivals in honour of the goddess[12]. The Hemerasia are epigraphically attested for the period between the 3rd century BC and the 1st century AD and had a remarkable radiance, attracting athletes from distant regions such as Pamphylia and the Troad[13].

10 One the small finds, the most important of which are now to be found in various international museums and private collections, see Reichel – Wilhelm 1901, 8. 78–84; Sinn 1980; Voyatzis 2990, esp. 255; Mitsopoulos-Leon 2012, esp. 62–64. 196–198; Schauer 2014b. On the early pottery see the paper by Michael Kerschner, Nora Voß and Pamela Fragnoli in this volume.

11 On the peculiar architecture of the temple see Ladstätter 2001, esp. 148–153.

12 Cf. Sinn 1992; Pretzler 1999, 75; Mitsopoulos-Leon 2007, 191–193; Mitsopoulos-Leon 2012, 42 f.

13 Cf. Pretzler 1999, 74 f. 79 f.; Perlman 2000, 159 f.

4 The Hellenistic public centre and the terraces below the Vetellino spring, drone photo facing south (© OeAW-OeAI/C. Kurtze; editing C. Baier)

The prosperity and significance of the sanctuary is also reflected by the archaeological evidence from the settlement that started to develop in its immediate vicinity during the Geometric period and experienced a period of particularly accelerated growth between the late 4th and the 2nd century BC. Aside from the peri-urban Sanctuary of Artemis, two different areas have been partially excavated so far. Two terraces with houses were unearthed 500 m southwest of the Sanctuary of Artemis and testify that the residential quarters of Lousoi developed rapidly between the 3rd and 1st centuries BC (fig. 3)[14]. Featuring many of the canonic elements of Hellenistic domestic culture, the houses provide essential information on the history of housing and household activities in Arkadia and the Peloponnese[15], a topic barely studied to date[16]. The houses were modified and used until the late 1st century AD, when they were destroyed. On top of the ruins, dwellings of more modest character were built in the late 2nd or early 3rd century AD and inhabited until the 4th century.

More recently, excavations in the lower parts of the settlement area at a distance of about 1.1 km southwest of the Temple of Artemis have uncovered more evidence that the town indeed experienced a booming development during the Hellenistic period and an obvious decline in the Early Imperial era (fig. 4). A two-aisled stoa and an urban sanctuary whose nucleus consisted of a peripteral temple and a small oikos with an altar illustrate that the civic heart of the polis was

14 On the results see Mitsopoulos-Leon 2017; Mitsopoulos-Leon 2010.

15 In particular, the house on the upper terrace, which from the 2nd or early 1st cent. BC onward featured a Doric peristyle courtyard and an exedra, illustrates that the canonic standards of Hellenistic domestic culture had also been adopted by the citizens of Lousoi.

16 On Late Classical houses in the city of Halieis in the Argolid cf. Ault 2005. So far, evidence for city blocks with residential units in the Peloponnese is known from the cities of Halieis, Stymphalos, Kyparissia, Messene, and Sikyon (cf. Donati – Sarris 2016, 395).

fundamentally reshaped by public building programmes in the 3rd and 2nd centuries BC[17]. Moreover, important information on the earlier history of the settlement was brought to light by the excavations in the public centre as well. The site of the urban sanctuary in particular is characterised by a remarkable sequence of building activities throughout the centuries. Two apsidal houses dating to the Late Geometric or Early Archaic period have been partially revealed underneath the peripteros and represent the earliest known buildings of the settlement. Based on current evidence, the function of the houses cannot be established with certainty, but pottery deposits and a particular spectrum of associated animal bones found in the layers underneath the apsidal buildings indicate that communal feasting and possibly also sacrifices took place at this site already as early as in the Geometric period[18]. In the immediate vicinity, during the late 6th or early 5th century BC, an oblong building was erected and might represent a predecessor to the Hellenistic peripteros[19]. Furthermore, a small cult building of the Classical or Late Classical period to the west of the temple can be identified as a predecessor to the small Hellenistic oikos[20]. The character of the early gatherings, the remarkable diachronic sequence of the site and its evolution into the central urban sanctuary might make us think that we are dealing here with an example of a sacred and political gathering place that played a crucial role in the formation of the polis, maybe following the model of other sacred gathering sites such as the Sanctuary of Apollon Daphnephoros in Eretria[21]. Undoubtedly, further research is needed to shed light on this question.

Already in the 6th century BC, the settlement of Lousoi may have developed into a polis, as is indicated by Pausanias' remark that a certain Agesilas, winner of the horse race at the 11th Pythian Games in 546 BC, was from Lousoi[22]. A series of documents from the 5th century BC points to a similar conclusion. An inscription which has been dated to the first quarter of the 5th century probably attests that Lousoi concluded a treaty with an Achaian community[23]. Moreover, proxeny grants on a Lousiatan bronze disc of unknown origin[24] and on four bronze decrees, which were found in the south pteron of the peripteral temple in the urban sanctuary[25], illustrate that the community of Lousoi was part of a supraregional network of political interaction by the 5th century BC and granted certain privileges, notably including *asylia*, to foreign citizens (*proxenoi* and – probably from the 4th century onward – *thearodokoi*)[26]. That status of a polis is explicitly proven by a series of bronze decrees, which were found in the so-called Propylon of the Sanctuary of Artemis and date to the late 4th or 3rd century BC[27]. These documents also testify that at different times during the Hellenistic period, the polis was governed by

17 For preliminary excavation reports cf. Jahresberichte 2002–2015. The archaeological data produced by the previous excavations are currently being edited by Christa Schauer (pottery and small finds) and Georg Ladstätter (architecture of the urban sanctuary) in order to prepare the final publications.

18 On the finds from the Geometric period see Schauer 2018, 585–588; Jahresbericht 2011, 91. Also compare the papers of Michael Kerschner et al. and Christa Schauer, respectively, in the present volume. On Early Iron Age single-unit houses with curvilinear ends in mainland Greece see Mazarakis Ainian 1997.

19 Cf. Jahresbericht 2010, 71 f.

20 Cf. Jahresbericht 2005, 360; Jahresbericht 2006, 432.

21 For Eretria see Verdan 2013, esp. 173–198.

22 Paus. 8, 18, 8. Also cf. Morgan 1999, 418. On the political status of Lousoi during the Archaic and Classical periods see Nielsen 2002, esp. 95. 191. 195 f. 212 f.

23 Nomima I, 57 = IG V 2, 410.

24 On the bronze disc see Reichel – Wilhelm 1901, 78–80 no. 12 fig. 156; Mack 2015, 326 f.

25 On the decrees see the preliminary comments in: Jahresbericht 2002, 330.

26 On the foreign relations of Lousoi from the 4th cent. onward see Perlman 2000, esp. 158–160. Also cf. IG V 2, 387. More generally, on grants of proxeny as tools of foreign policy see Mack 2015; for Arkadian poleis also compare Thür – Taeuber 1994, 341–348; Nielsen 2002, 502–504. On the institution of the *theorodokia* in the Peloponnese see Perlman 2000, esp. 158–160 on Lousoi; Nielsen 2002, 41 f. 311 f. with further references. On the importance of religious festivals and of awarding of honours for establishing and strengthening bonds among poleis see Kralli 2017, 399–488 esp. 455 f. on Lousoi.

27 IG V 2, 389–396. See Reichel – Wilhelm 1901, 64–77; Pretzler 1999, 67; Nielsen 2002, 461 f. 473.

two different boards of magistrates, the *damiorgoi* and the *hieromnamones*[28]. For the beginning of the 4th century BC, Lousoi is attested as Arkadian in Xenophon's »Anabasis«[29]. Still, both the archaeological record[30] and the epigraphic[31] and literary[32] sources testify that the Lousiatai maintained especially close contacts with the cities of Achaia and the Corinthia[33]. By the end of the 3rd century BC, Lousoi was politically allied with the Achaian League[34]. Nonetheless, in an inscription from Magnesia on the Maeander, which has been dated to the very end of the 3rd century BC, the polis is still identified as Arkadian[35].

THE URBAN STRUCTURE OF HELLENISTIC LOUSOI: FIRST RESULTS

In order to gain more insight into the overall town layout of Lousoi and to understand the dynamics of its urban development within its particular geographic, socio-political and economic contexts, a new research project was initiated in 2015. Following a multi-stage research strategy, it integrates a variety of non-invasive and invasive investigation methods and has two main focuses: to study the wider urban layout of Lousoi and to shed more light onto the spatial configuration and functional history of the public centre. As is underlined by the available evidence mentioned above, the preserved remains predominantly shed light on the Hellenistic phases of development, which seem to have been altered only to a small degree by later building activities. However, as illustrated by the previous results, the intensification of fieldwork in the public centre also holds out good prospects to gain valuable insights into the long-term history of the site.

The urban layout

The settlement area of ancient Lousoi is located on the eastern side of an enclosed karst basin (polje), on the northwestern slopes of the mountain Profitis Ilias and the northern summit of Kyklaki. In order to gain insight into the physical extent, housing density and spatial organisation

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28 On the *damiourgoi* as an ancient office in many Peloponnesian communities see Sizov 2017, esp. 12–15. The fragmentary evidence on the political institutions of Lousoi during the Late Archaic, Classical and Hellenistic periods is discussed by Nielsen 2002, 217 f. 471–474.

29 Cf. Xen. an. 4, 2, 21; 7, 6, 40.

30 Important cultural contacts to Achaia and the Corinthia become manifest, for example, in the local temple architecture. The peripteral temple in the public centre of Lousoi shows close typological parallels to the Archaic temple of Apollo at Corinth (cf. Jahresbericht 2003, 387; Jahresbericht 2006, 433; Jahresbericht 2007, 432). The Late Archaic peripteral temple of Gremoulias near modern Kalavryta (cf. Jahresbericht 2008, 35 f.; Jahresbericht 2009, 35 f.) shows close parallels to the Late Archaic Temple of Athena at Alipheira in western Arkadia (cf. Orlandos 1968), but also to a temple at Keryneia near modern Diakopto in Achaia (cf. Kanellopoulos – Kolia 2011, 142–156).

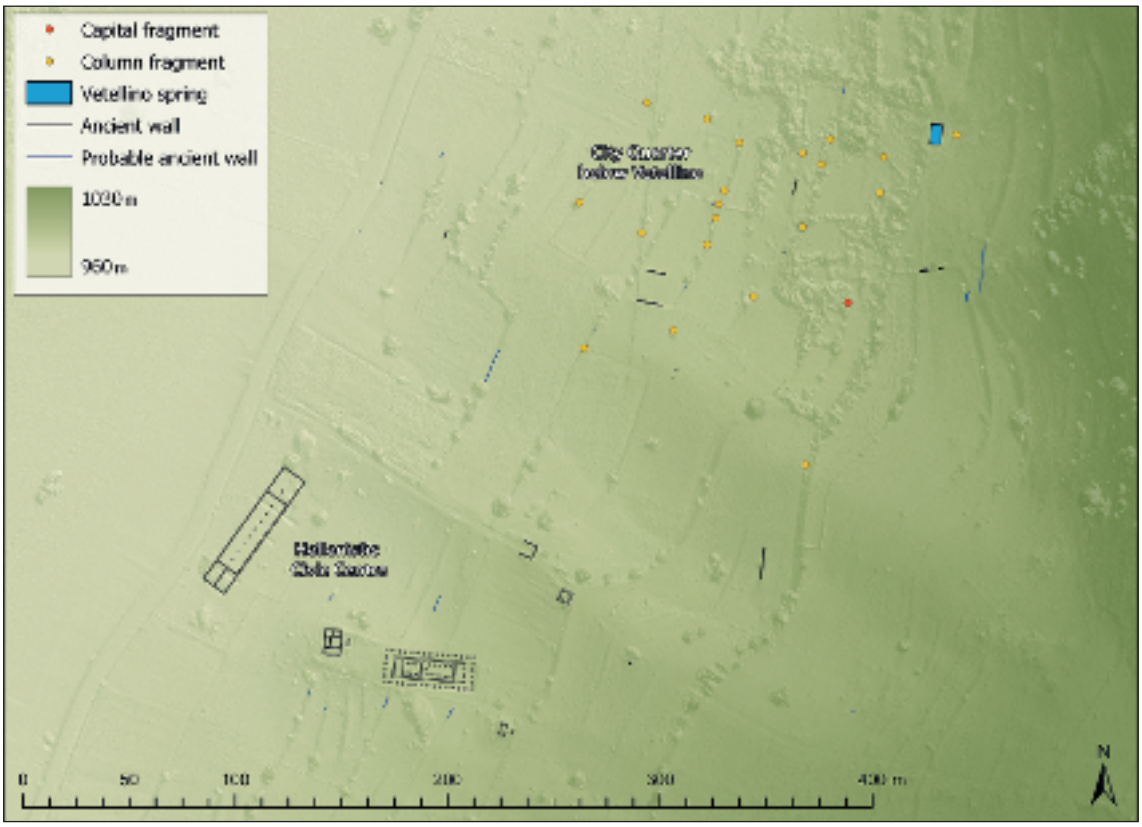
31 A Lousiatan inscription from the beginning of the 5th cent. BC records a treaty – probably with an Achaian community – which is in the Achaian script, but in the Arkadian dialect (Nomima I, 57 = IG V 2, 410). Also cf. Nielsen 2002, 95. 191. 195.

32 Bakchyl. 11, 110–117 claims that the cult of Artemis Hemera at Lousoi was brought to Metapontum by Achaian colonists. On Bacchylides' eleventh ode and the foundation of Metapontum see Cairns 2005, esp. 36–38.

33 More generally, Morgan 2009, 160, and Voyatzis 1999, 136, refer to the fact that the chronology of Lousoi's monumental development is closer to that of coastal Achaia than to that of Arkadia.

34 Cf. DNP VII (1999) 517 s. v. Lusoi (Y. Lafond); Rizakis 2019, 226–229. Two lists that record the *nomographoi* of the Achaian League include citizens of Lousoi. IG IV I² 73 (= SEG 1, 74 lines 23–24) is a document from Epidauros probably dated to the period between 229–197 BC. SEG 58, 417 is from Aigion, dated to 182–146 BC. On the *nomographoi* cf. also Mitsopoulos-Leon 2012, 42. Moreover, a small number of bronze coins of the Achaian League and a silver coin on display in the British Museum (1920,0515.67) are inscribed ΑΧΑΙΩΝ ΛΟΥΣΙΑΤΑΝ or ΑΧ ΛΟΥ, respectively. Cf. BMC Greek (Peloponnesus) 14 no. 165; BCD Peloponnesos 1446; Mitsopoulos-Leon 2012, 41.

35 IMagn 38. On the inscription see Roy 2003. The same is true for the neighbouring poleis of Kynaitha and Kleitor, which around the year 220 BC were politically allied with the Achaian League according to Polyb. 4, 17, 3–5; 4, 19, 2.

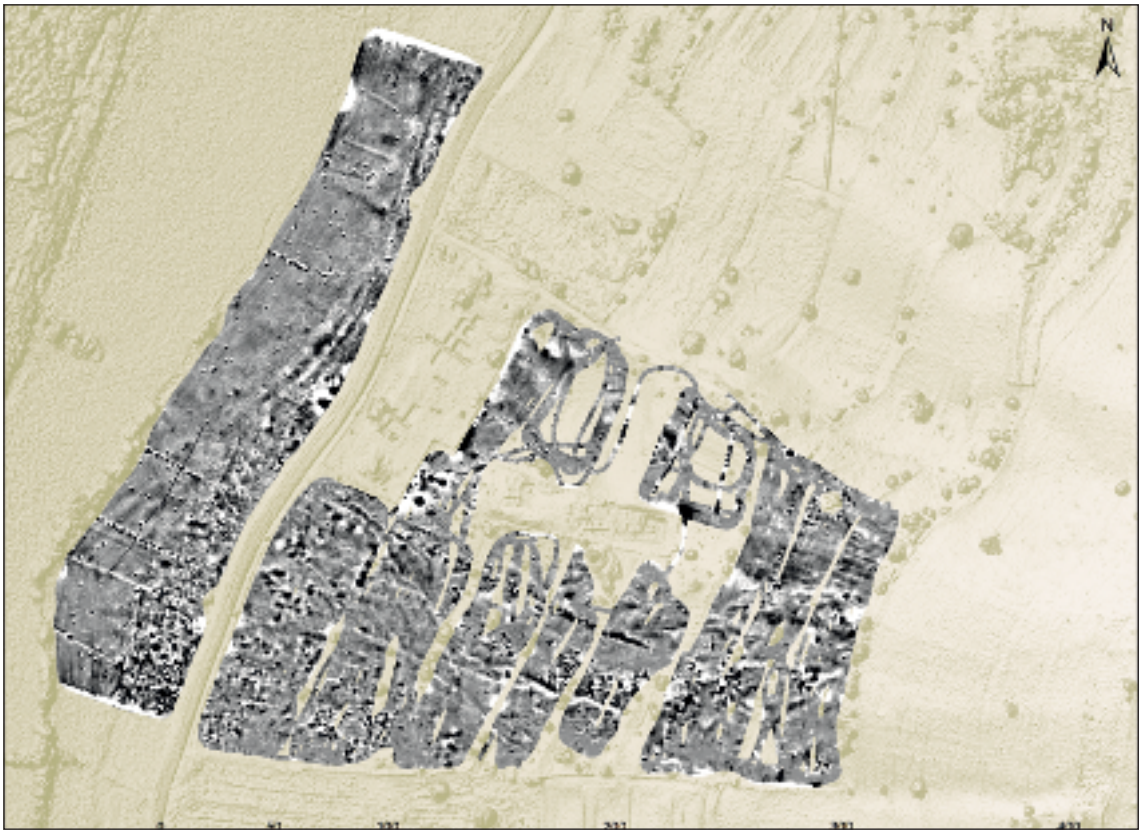


5 Mapping of verisimilar ancient wall remains in the northern part of Lousoi (© OeAW-OeAI/C. Kurtze, C. Baier)

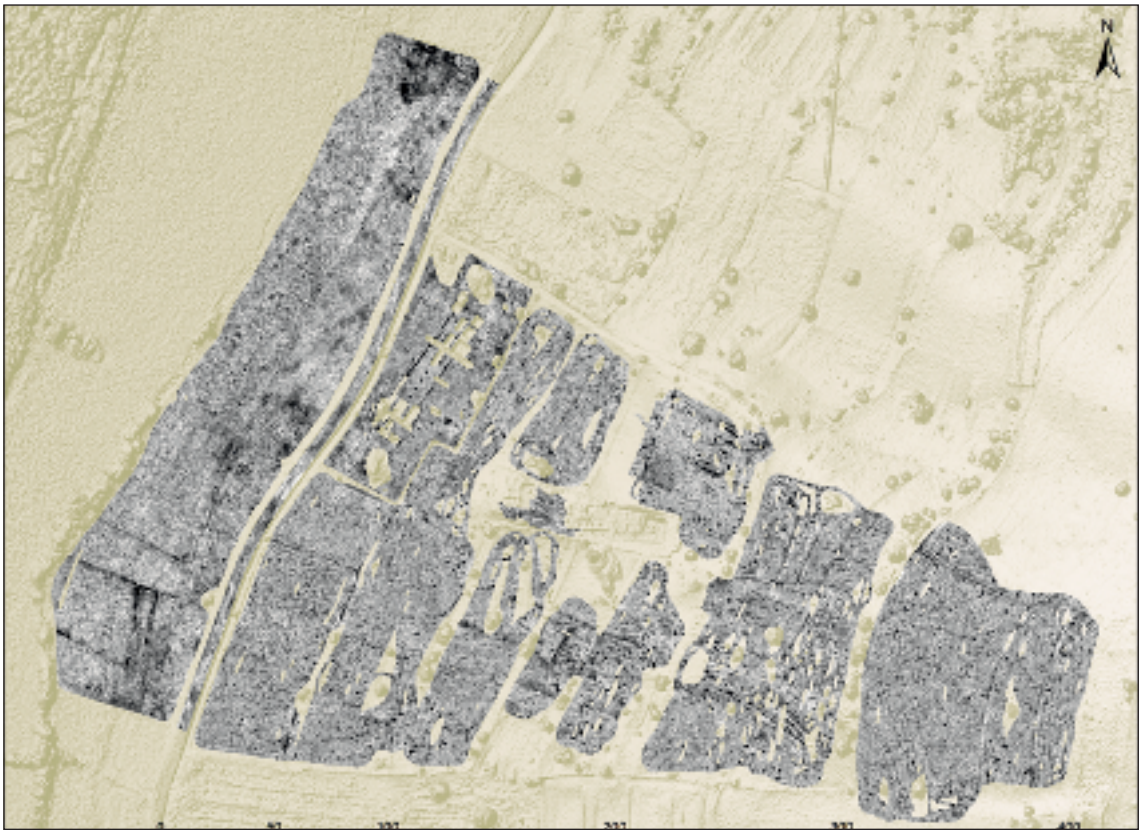
of the inhabited area, in 2016 and 2017 a systematic survey of all architectural surface features was conducted. The survey covered an area of more than 50 ha from the Sanctuary of Artemis Hemera on the northern periphery of the town to the terraces south of the public centre. Based on a digital topographical map and on a high-resolution orthophoto, all architectural remains visible above ground, including detached architectural members and concentrations of building debris, were recorded with the help of the mobile ArcGIS Collector application, integrating these features in real time into a geographic information system. Evaluating the masonry techniques, the *in situ* walls were roughly classified as being of (plausible) ancient or post-ancient origin (figs. 5. 9).

As a next step, during an 8-day pilot study carried out in 2017, geophysical archaeological prospection surveys were conducted in the area of the public centre and its surroundings using motorised magnetometry as well as manual and motorised ground-penetrating radar measurements[36]. Covering a total area of 6 ha, the purpose of this study was to test the potential of these methods for the large-scale exploration and mapping of the spatial organisation of the Hellenistic settlement (figs. 6. 7). As will be discussed in more detail below, the combination of the two near-surface geophysical prospection methods was successful in identifying substantial architectural remains, among which a large potential public building in the area of the public centre stands out. Indicating buried architecture of minor buildings and debris concentrations, as well as potential traces of roads and drainage systems in the zones south, east and west of the public centre, the geophysical data provides essential information on the occupation density of this town area and on its eastern and western borders (fig. 8).

[36] The geophysical archaeological prospection campaign of 2017 at Lousoi was undertaken by Immo Trinks, Klaus Löcker, Roland Filzwieser and Ralf Totschnig (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology in collaboration with the Central Institute for Meteorology and Geodynamics Vienna).



6 Magnetometer data as a greyscale plot of 254 grey shades, research area of 2017 (© LBI ArchPro/I. Trinks)



7 GPR depth slice at 0.5–1.0 m, research area of 2017 (© LBI ArchPro/I. Trinks)

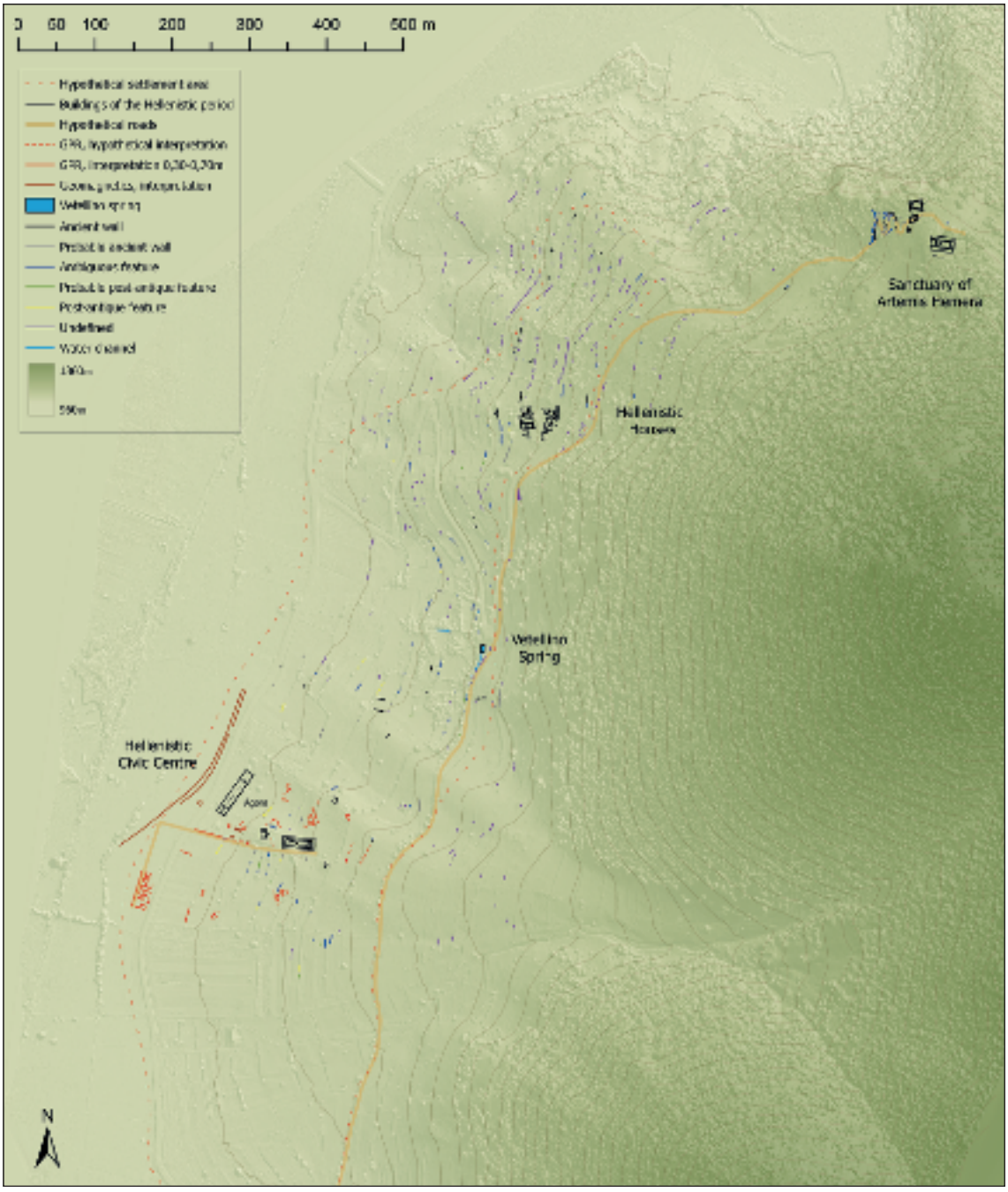
8 Interpretation of geophysical anomalies within the research area of 2017 (© LBI ArchPro/I. Trinks)

In combination with the results of previous excavations, these surveys are a first step towards a comprehensive town map of ancient Lousoi[37]. Based on a spatial analysis of the *in situ* walls that were classified as plausibly being ancient, it can be determined that the extent of the urban area did not exceed 25–35 ha (fig. 9). Most interestingly, the evidence available to date clearly suggests that the inhabited settlement had never been surrounded by city walls[38]. The only fortified site close to the town area is a small isolated hilltop fortification on a summit called Kyklaki (Kouklaki), towering some 240 m above the Sanctuary of Artemis and c. 350 m above the public centre. That elongated rectangular fortification was equipped at the southwest, northwest and northeast corners with towers projecting as three-quarter circles, but no traces of any intra-mural structures are visible. Judging by its polygonal masonry, Michalis Petropoulos has tentatively suggested that the fortification dates to the 4th century BC[39]. Even if there is not enough evidence available for a conclusive historical analysis, the small size of only c. 0.25 ha and the isolated location might indicate that the small fortress was not built as a refuge for the non-combatant population of Lousoi. Rather, the characteristics suggest a look-out that might

37 After the completion of the present manuscript, near surface geophysical prospections have covered almost all areas where ancient features have been identified by field walking and aerial archaeology. Complementary satellite remote sensing has been applied for the entire high plain of Soudena in order to detect subsurface features. For the most important results see Baier et al. 2021.

38 On other Arkadian poleis with fortified hilltops and unfortified habitation areas cf. Maher 2012, esp. 16. 587–589. On the unfortified town areas of Delphi and Elis see Nielsen 2002, 319; Hansen – Nielsen 2004, 135. 416. 498. For fortified *akrai* with unfortified *kato* poleis in Thessaly and Boeotia cf. Rönnlund 2018, 84. 153. 200 f. 252–255.

39 Cf. Petropoulos 1985, 67–73; Petropoulos 2017, 64 f. The short comment in Nielsen 2002, 565 refers to this fortification. For a very small number of Hellenistic pottery sherds found in a small test trench in the eastern part of the fortification see Alexopoulou 2021, 193–195.



9 Town map of ancient Lousoi, as at 12/2017 (© OeAW-OeAI/C. Kurtze, C. Baier, I. Trinks)

have been appropriate for the installation of a small garrison, which, however, is not attested in the written sources[40].

According to the evidence recorded in 2016 and 2017, unlike other Peloponnesian towns of the Classical and Hellenistic periods[41], the layout of Lousoi did not conform to a comprehensive

40 See Rönnlund 2018, 47 f. 104 for general remarks on garrisons of foreign powers installed on *akrai* and *akropoleis*. On Macedonian garrisons in Peloponnesian cities during the last third of the 4th and the early 3rd cent. BC see Kralli 2017, passim esp. 23. 89. 95–100. 104; Chaniotis 2005, 88–93. Also cf. Chaniotis 2002 on foreign garrisons as an instrument of control and subordination.

41 On planned Peloponnesian cities see Donati – Sarris 2016, 392–395.

and coherent orthogonal grid system but largely followed the natural topography. At its northern edge, the built-up area ended at a deep valley that divided the settlement from the peri-urban Sanctuary of Artemis. An ancient road is clearly traceable in the area right below the sanctuary thanks to cuttings into the bedrock, traces of rough cobble paving and sections of retaining walls (fig. 2). Traces of its trail can still be observed further down the hill and correspond with a path, which up to the time when the modern asphalt street was built, gently followed the downward slope of the hill and connected the sanctuary area with the Hellenistic public centre and with the southeastern parts of the high plain. Both the visible settlement remains and the geophysical results around the public centre indicate that this road marked the eastern edge of the settlement area. To the southeast of the public centre, the trail seems to follow a marked edge in the terrain that runs in a straight line and does not respect the natural topography (figs. 4. 9). Short visible sections of a terrace wall are of uncertain date, even if some large and roughly dressed limestone blocks are similar to those found in the domestic architecture of ancient Lousoi. Further geophysical prospections and archaeological fieldwork is needed to find out whether the long terrace wall and the road could have also marked the southeastern border of the ancient settlement area.

On the northern edge of the settlement, towards the Sanctuary of Artemis, the rugged terrain is divided by two valleys that were too steep to be used for housing and hence most probably remained unbuilt area, as is suggested by the results of the architectural survey (figs. 3. 9). Also the lower parts on the northwestern flank of the hill probably were unsuitable for settlement activities in antiquity due to water being discharged through the small valleys in winter and spring after snowmelt or rainfall[42]. According to the visible architectural remains, the northern zone of the ancient settlement thus was an arrangement of rather small-sized terraces that are situated on the upper parts of the hill-slope above the small valleys and largely respect the natural terrain. The excavated houses there indicate that during the Hellenistic and Early Imperial periods, this was one of the main residential areas of Lousoi, with the houses also being used for production activities[43].

By contrast, the southern parts of the settlement area are characterised by more gentle topography that allowed for the construction of larger terraces (fig. 4). Especially to the north and northwest of the public centre, visible remains of terrace walls that consist of roughly regular courses of large limestone blocks can be plausibly classified as being of ancient origin. This part of the settlement is located in close proximity to the natural spring of Vetelino, which in all likelihood was already an important water source in antiquity. The excavated stoa in the lowermost part of the public centre attests that the southern part of the ancient settlement area extended down to the slope toe, which today is lined by the modern asphalt road. Approximately 130 m to the southwest of the stoa, the settlement area extended beyond the line of the modern road, as is indicated by an agglomeration of rectangular building remains visible in both geomagnetic and georadar data images. To the north of these buildings but still west of the modern road, a curvilinear magnetic feature is also detected that appears like a long lineament alongside the western border of the town. It might be related to the ancient water management system of Lousoi and interpreted as a drainage channel. To the west of this anomaly, no traces of settlement activity are visible in the prospection data. Given the hydrogeological characteristics of the karst basin, which is discharged through two sinkholes situated in the northern part of the plain just north of the cliff face on top of which the Sanctuary of Artemis was built, it seems plausible that in antiquity the lowermost part of the basin was not suitable for settlement activities, possibly due to seasonal or periodic water-level fluctuations. Historical travel reports from the 19th century attest to a lake covering the basin

[42] The integration of palaeo-environmental research with the explicit aim of assessing the relationship between the marshland of the basin, its drainage system, the supply of spring water, the settlement and agricultural activities in the high plain of Soudena remains a desideratum. For similar research in the plain of Stymphalos cf. Walsh et al. 2017.

[43] Cf. Mitsopoulos Leon 2017, 36 f. 155–158. 179 f.

floor[44], and still today the lowermost part of the polje comprises wetlands that are known to flood if the influx exceeds the capacity of the sinkholes. The maximum extent of the ancient settlement to the west, thus, was most likely defined by the extent of the wetland area and the possible periodic karst lake in the basin.

As far as the interior lines of communication between the different areas of the town are concerned, so far there is only little evidence. The rough terrain of the northern parts of the town was clearly not suited for any orthogonal arrangement of streets. However, to the southwest of the public centre, similarities in the alignment of the above-mentioned agglomeration of rectangular structures and at least two long linear georadar features nearby might indicate that planned grid-like arrangements did exist in some of the urban zones with a flat topography. More extensive geophysical archaeological prospection surveys are needed to reveal the outlines of streets and the connection of the various town quarters to the north and south of the public centre[45].

The public centre

One of the key areas for a detailed study on the urban flowering of Lousoi during the Hellenistic period and on the adaption of widespread architectural and urbanistic trends to the peculiarities of the local situation is the public centre[46]. In all probability, it can be located in an area with a fairly gentle topographical relief going by the field name »Στάδιο«. Excavations conducted by Veronika Mitsopoulos-Leon and Georg Ladstätter between 2000 and 2010 have uncovered a two-aisled stoa and important parts of a nearby sanctuary, and have thus brought to light revealing evidence on some of the town's most important political and sacred facilities. As briefly outlined above, the unveiled evidence also provides valid information on the long history of the site from the 9th century BC up until the early 2nd century AD. The results point to a major urban monumentalisation during the Hellenistic period, yet the overall spatial and functional configuration of this town zone, its urban context as well as its precise chronology and the socio-political factors determining its development, still pose many unanswered questions.

Against this background, surveys and targeted excavations in the public centre have been resumed since 2016. The results of the geophysical prospections conducted in 2017 and the architectural survey of 2016 provide new insight into the general organisation of the public buildings and open public space that probably constituted the heart of the Hellenistic polis. In combination with the available excavation results, it is now possible to detect the basic structure of an ensemble of buildings arranged on different levels around open space (figs. 10. 11).

The lowermost western part of the public centre is given spatial definition by a two-aisled stoa that was excavated between 2000 and 2004. Limited additional excavations were conducted in 2017 and 2018[47]. The large building measures approximately 65.25 × 12.50 m and was erected on top of an artificial terrace, setting the stoa off the westernmost fringe of the town that was already close to the wetland zone of the high plain (fig. 12)[48]. The backfill of the terrace in the southern part of the stoa was at least 1.00 m high and contained large quantities of Archaic pottery, consisting of tableware, storage vessels and cooking pots, and architectural terracotta, as well as single pieces from the Geometric period, indicating that nearby areas of the settlement had already been occupied before the Hellenistic period[49]. Furthermore, several kiln spacers and remains of kiln debris recovered from the fillings in the southern part of the terrace provide fair indication for the local production of ceramics somewhere near the stoa during the Archaic period, as already

44 Cf. Baier et al. 2021, 17–19. 36; Harter-Uibopuu 1999, 122 f. 125 f.; Reichel – Wilhelm 1901, 11.

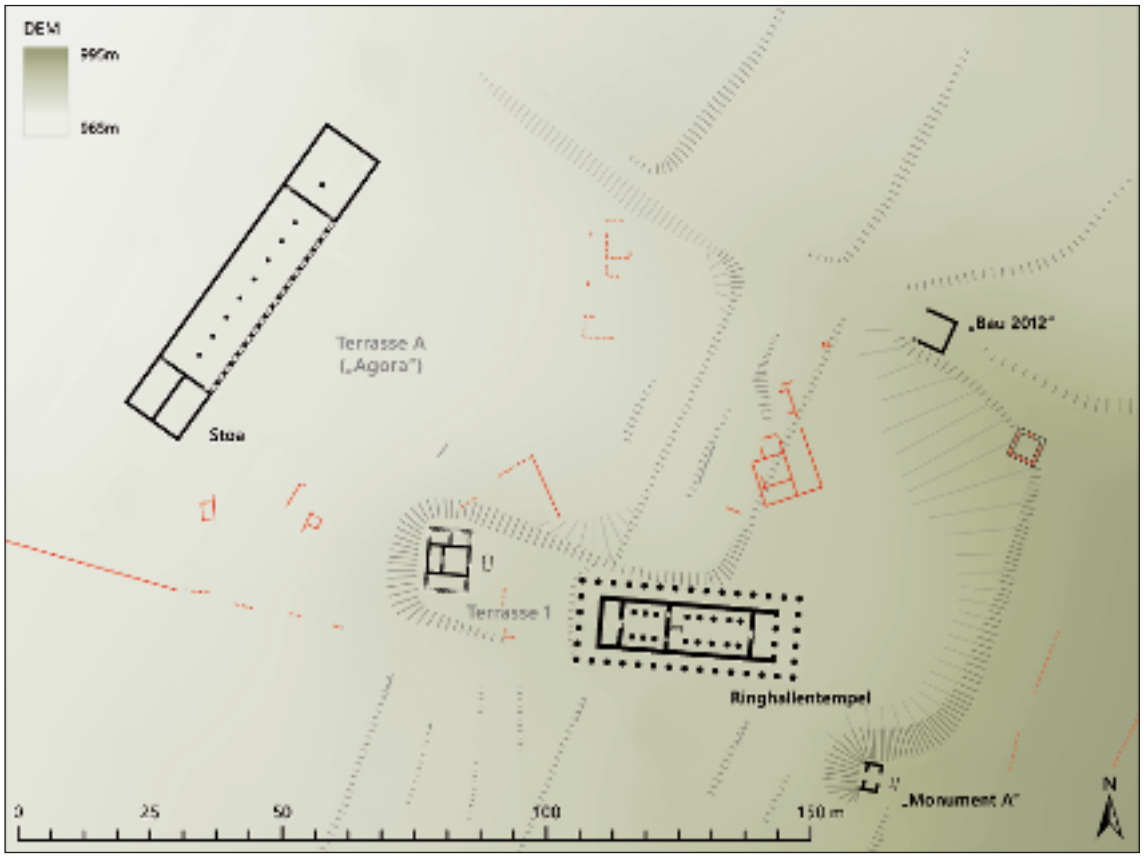
45 See Baier et al. 2021, esp. 36–52 on this matter.

46 For a similar approach at ancient Kleonai cf. Mattern 2013a. On the formation of local identities from an archaeological perspective see e.g. Goldhill 2010; Zimmermann 2015.

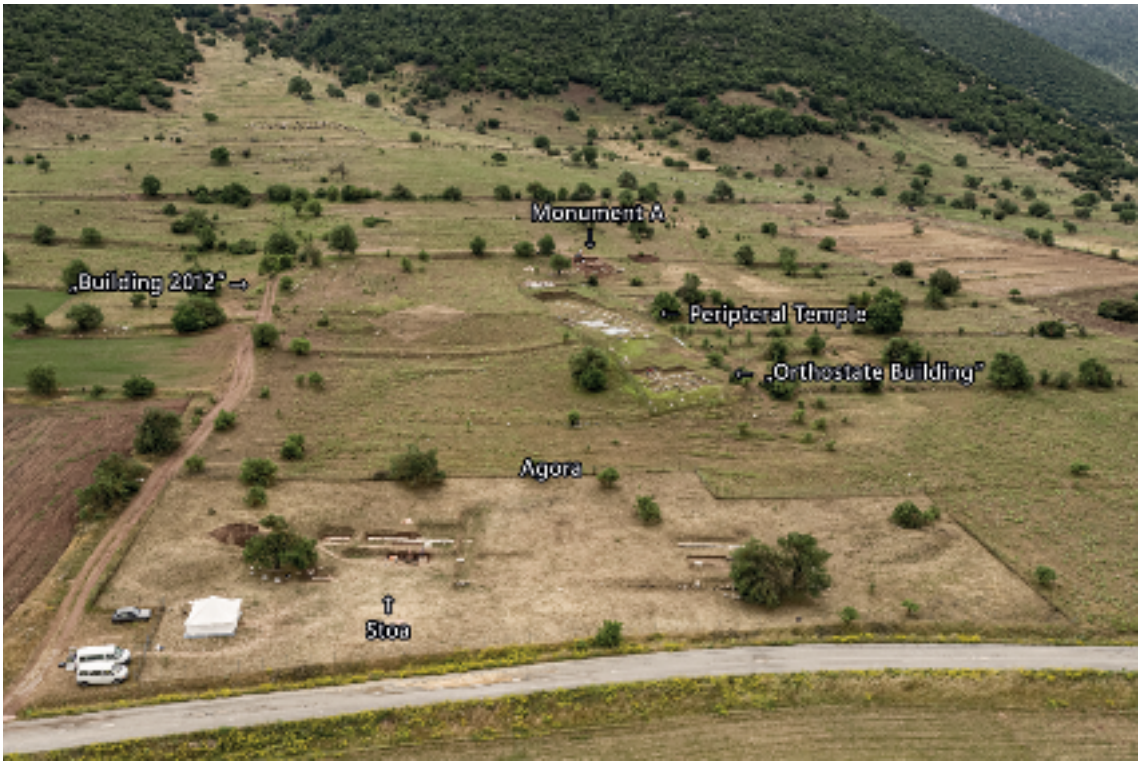
47 See Baier et al. 2018, 36–44.

48 Currently, the stoa foundations are approx. 4 m above the lowermost points of the high plain.

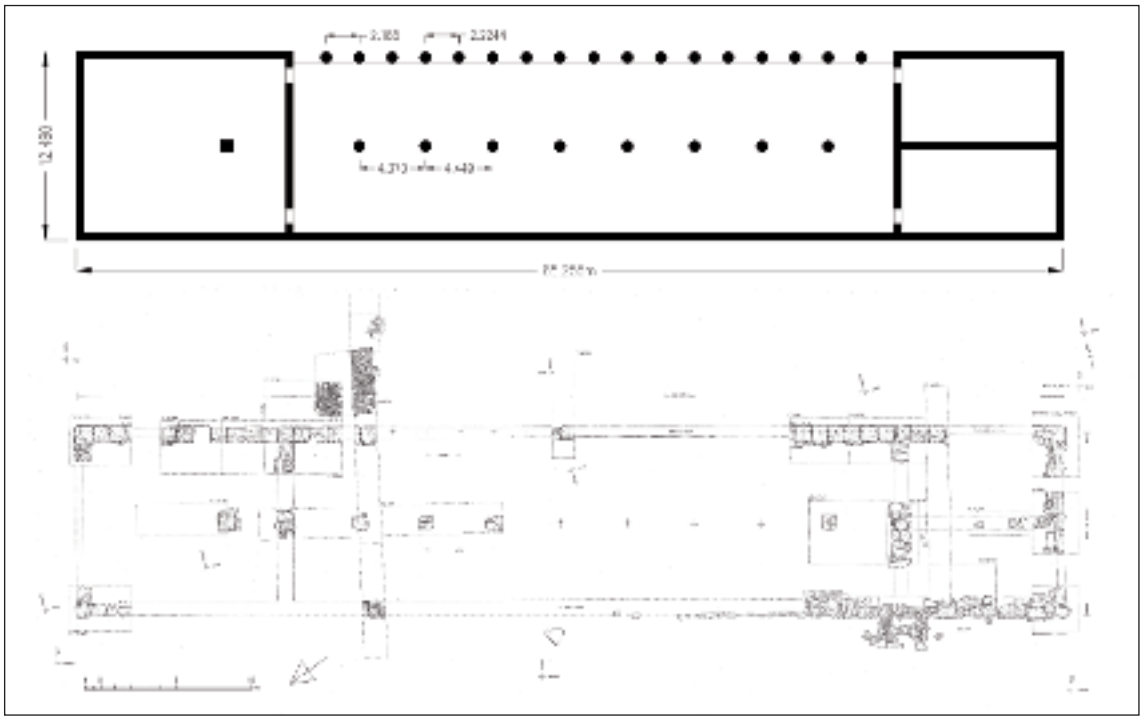
49 Already see Jahresbericht 2014, 88 f.



10 Public centre of Hellenistic Lousoi, generalised plan of excavated and prospected buildings, as at 12/2017 (© OeAW-OeAI/C. Baier, G. Ladstätter, I. Trinks)



11 Public centre of Lousoi, as at 7/2018, drone photo facing east (© OeAW-OeAI/N. Gail; editing C. Baier)



12 Two-aisled stoa west of the agora, plan of building remains and reconstructed ground plan (© OeAW-OeAI/ C. Baier, G. Ladstätter)

pointed out by Christa Schauer. However, so far no pre-Hellenistic building remains have been uncovered underneath the stoa, and the spatial configuration of the area before the 3rd century BC remains unknown.

Interestingly, with reference to the construction date of the stoa, the amount of chronologically significant pottery recovered from the filling underneath the Hellenistic walking horizon is exiguous. Pointing to this problem, Schauer suggested a date during the 3rd century BC based on the evidence of the 2000–2004 excavations[50]. One single fragment of a rolled rim plate that was found in 2018 in an earth filling underneath the beaten earth floor of the stoa could suggest a slightly later date not before the early 2nd century[51]. However, considering that this suggestion is based on only one pottery fragment it seems adviseable to remain cautious with regard to the exact chronological classification of the stoa. Of the Hellenistic building, only the foundations and three orthostates have survived. All other building members had been removed in the Early Imperial period, when the stoa was deprived of its function and a probable pottery workshop appears to have been installed just northeast of it[52]. Still, the architectural record of the stoa allows for a reconstruction of the ground plan (fig. 12) and also gives some basic indications on its elevation[53]. The two-aisled central part of the building most probably had a colonnade of 17 columns at its eastern façade and an internal row of eight columns axially aligned with every second front column. While in stoa design the double spacing of the inner colonnade had become » … almost universal in the fourth century and thereafter … «[54], a highly unusual feature of the stoa at Lousoi is the way the two-aisled main hall is flanked by closed rooms at each short end. At the southern

50 Cf. Jahresbericht 2014, 88, also pointing to the difficulties in gaining reliable chronological information from the pottery stratigraphically associated with the erection of the stoa.

51 See Baier et al. 2018, 42 fig. 20. Also cf. James 2018, 110. 119 f.

52 Cf. Jahresbericht 2003, 387; Jahresbericht 2004, 367.

53 A more detailed description and interpretation of the architectural remains is given in Baier et al. 2018, 37–41.

54 Coulton 1976, 77.

end, two elongated rooms of the same approximate size of 10.20 × 5.50 m can be reconstructed. By contrast, the northern short end is occupied by a single almost square hall with large dimensions of approximately 13.40 × 11.50 m.

While porticos with returning walls at the front ends and hence partially closed façades were particularly popular in northwestern Greece and northern Asia Minor[55], an elongated stoa of 110.15 × 11.45 m in the Amphiareion of Oropos[56] dated to c. 360 BC by James J. Coulton and an almost equally large stoa below the Sanctuary of Athena in Pergamon[57] dated to the second half of the 4th century BC by Klaus Rheidt currently seem to be the only other similar examples of two-aisled stoas with end rooms at both sides. A similar but much smaller stoa might be identified in the town of Typaneai in the Tryphilian mountains of the western Peloponnese[58]. The building, of approximately 41 × 10 m, borders the Hellenistic agora of Typaneai on its southern side but has so far not been studied in detail. Dated to the 4th century BC, the small northeastern portico in the Sanctuary of Argive Hera at the mouth of the River Sele north of Poseidonia has end rooms similar to those of the stoas mentioned above but no interior row of columns[59]. The two-aisled stoa at Lousoi thus belongs to a very small group of Late Classical and Hellenistic stoai with closed rooms at both short ends, appearing in both secular and sacred contexts. Both the stoa at Typaneai and especially the large stoa at Pergamon, which may have bordered the Early Hellenistic agora of the town according to Rheidt, have recently been interpreted as buildings for political and civic assemblies of various kinds and hence also as a symbolic display of the authority of the polis institutions[60].

Given its large dimensions, it seems very likely that the hall at the northern end of the stoa at Lousoi was also used for assemblies. A single spot foundation of 0.83 m depth that is located close to the entrance side in the long axis probably carried a pillar or a column with a base measuring approximately 0.80 × 0.80 m. Even if there is no further physical evidence of the components of the roof and of its peripheral bearing system, the location of the spot foundation suggests that the northern end of the stoa had a hipped roof with its hip rafters meeting the roof's ridge right above the pillar in question. The axial distance of the support to the northern wall of the stoa is c. 9.50 m, while the distance to the interior corners can be reconstructed as being c. 10.70–11.10 m[61]. Given the ground plan of the stoa, a similar construction with slightly longer diagonal beams may possibly have covered the two rooms at the southern end of the building. In comparison to a gable roof, this type of construction was surely more complex because a workable solution to the problem of how to bring the rafters from the peripheral bearing system to the diagonal ridge had to be found. However, it also had the considerable advantage of adding longitudinal rigidity to the roof construction, and not least, it also made sure that no further support that would have obstructed both view and movement inside of the large hall was needed. That similar hip roofs were indeed used for Hellenistic stoai was paradigmatically suggested by Manolis Korres for the Stoa of Eumenes II in Athens, pointing especially to the fact that the end intercolumnations of this stoa are much larger than the standard intercolumnations[62].

As mentioned above, the stoa at Lousoi was open at its eastern side, opening up to an area where the modern terrain is comparatively flat, rising only slightly towards the east. As no substantial building remains are traceable in the georadar depth-slice images and magnetograms, most probably this area was open space, and according to the urban context, possibly can be iden-

55 Cf. Coulton 1976, 81.

56 Cf. Coulton 1976, 269 figs. 22; 29 c; 98, 1; Coulton 1968.

57 Cf. Schrammen 1906, 89 f. pl. 21; Rheidt 1992, 261–263 fig. 8 pl. 38, 1; Rheidt 2015, 301 f. 310–312.

58 Cf. Rheidt 2015, 307. Also cf. Heiden – Rohn 2015, 339 f. for some general remarks on the agora of Typaneai.

59 Cf. Greco 1995, 21 f.; Zancani Montuoro – Zanotti Bianco 1951, 41–46.

60 Cf. Rheidt 2015, 310–312. Not identifying the area as the early Hellenistic agora of Pergamon, Bielfeldt 2010, 171 f.

61 The surface finishing of the toichobate blocks does not exclude the possibility that the corners of the stoa, which had to bear the greatest stress caused by the supposed hip roof, were reinforced at their interior sides.

62 Cf. Korres 2014, fig. B6.2. Also cf. Bachmann 2011, esp. 176 fig. 5, reconstructing a hip roof on top of an elongated Hellenistic storehouse on Mount Karasis.

tified as the agora. The eastern boundary of the flat area is marked by a row of scattered stones that is visible above ground at a distance of approximately 40 m from the two-aisled stoa, running roughly parallel to it. Faint georadar anomalies east of this line, however, do not provide a clear picture of the eastern boundary of the potential agora[63], and only future excavations can shed light on the arrangement of buildings at the eastern boundary of this open space.

That at least parts of the area on the eastern side of the possible agora were indeed built on, can be concluded from faint georadar anomalies that indicate a building of unknown total size and purpose at the north-eastern fringe of the open space. The anomalies roughly follow the orientation of the central urban sanctuary of the Hellenistic period that is situated on a terrain ridge to the southeast of the agora. There, in an elevated position more than 10 m above the stoa, two sacred buildings are arranged on two neighbouring terraces and further illustrate that large parts of the public centre were monumentalised during the Hellenistic period. Between 2004 and 2010, excavations brought to light a small oikos (»Orthostate building«) with an altar on the western terrace (»Terrace I«) and a large peripteral temple on the slightly higher eastern terrace[64]. Based on an analysis of the stratified find material, the peripteral temple was probably erected during the second half of the 3rd century BC[65]. As has been hypothetically suggested by the excavator Georg Ladstätter, the temple and the oikos may have been part of one coherent building programme, as appears to be indicated by the parallel orientation of the buildings and by the fact that the south wall of the oikos is in line with the northern colonnade of the temple[66]. Interestingly, as has been pointed out by Ladstätter, the architecture of the Hellenistic temple shows close typological parallels to the Archaic Temple of Apollo at Corinth[67]. Bearing in mind the aforementioned evidence that communal feasts of a sacred character at the site of the peripteros can be traced back to the Geometric period, and that partial remains suggest the existence of an important Late-Archaic building, it seems reasonable to assume that the archaising temple of Hellenistic date was understood as a conscious reference to the long history of the gathering place and the religious identity of the site. What is more, an Archaic or Classical iron sword, a bronze spear-foot and an arrowhead from the 5th century BC, that had been redeposited around the Hellenistic base of the cult image in the peripteros suggest that the major among a group of divinities honoured in the sanctuary was associated with military protection or warfare, and that the cult activities for this deity went back to the 5th century BC at least[68]. Furthermore, the sanctuary must have had a pronounced political character, perhaps associated with the same deity. This is not only illustrated by its location in the immediate vicinity of the agora, but is also testified to by a series of four bronze proxeny decrees from the 5th century BC that had been reattached to the southern exterior of the Hellenistic naos and were found in the southern pteron[69]. Public decrees and law codes which were put on display in urban sanctuaries are also attested, for instance, at the Sanctuary of Apollo Lykeios at the agora of Argos[70] and at the Temple of Apollo near the agora of Corinth[71].

While the altar of the peripteral temple has not yet been found, the remnants of a rectangular building measuring c. 21.5 × 12.0 m have been revealed further north on the same terrace by magnetometry and ground-penetrating radar survey (fig. 13). A marked terrain edge running in a north-south direction across the ancient ruins does not seem to represent the ancient topography of the area. The geophysical anomalies indicate an arrangement of a large elongated room at the eastern side lying in

63 Also see Baier et al. 2021, 38.
64 Cf. esp. Jahresbericht 2008, 37; Jahresbericht 2009, 37; Jahresbericht 2010, 71.
65 Cf. Jahresbericht 2016, 94.
66 See Jahresbericht 2010, 71 suggesting a coherent building programme that included both the peripteros and the »orthostate building«.
67 Cf. Jahresbericht 2003, 387; Jahresbericht 2006, 433; Jahresbericht 2007, 432.
68 Cf. Jahresbericht 2015, 91 f.
69 Cf. Jahresbericht 2002, 330; Schauer 2018, 585 f.
70 Cf. Donati 2015, 189 f.
71 Cf. Bookidis – Stroud 2004, 410.

13 GPR depth slice at 0.3–0.7 m, area north of the urban sanctuary (© LBI ArchPro/I. Trinks)

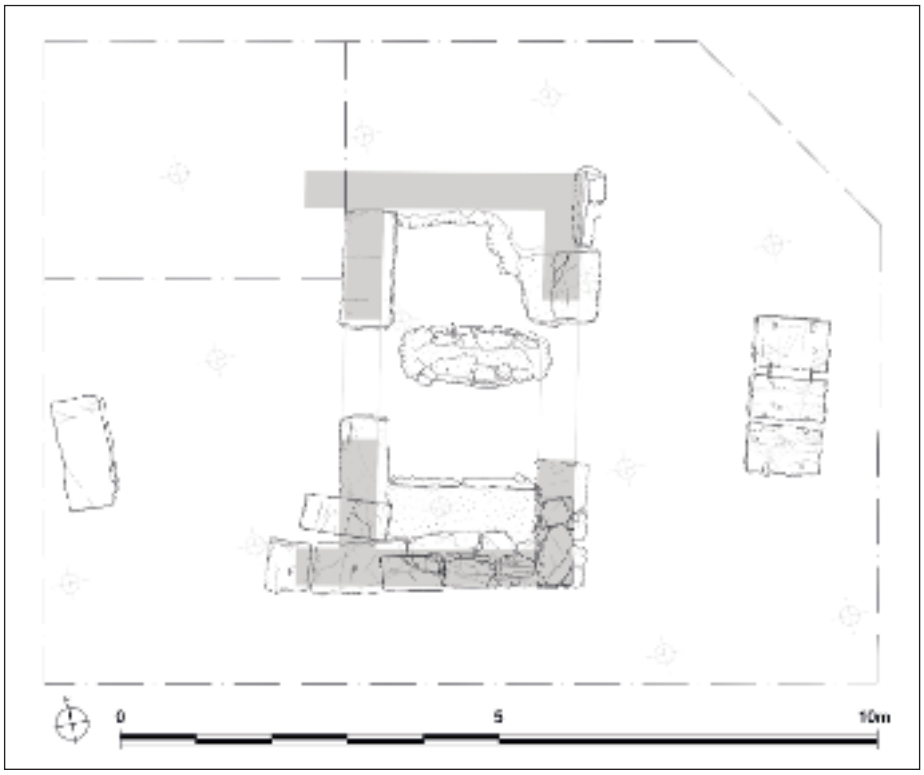
front of a row of rooms arranged in a paratactic manner to the west, three of which can be identified on the data images. The northwestern corner of the building is located outside of the surveyed area because the modern terrain was too steep for motorised measurements. The georadar results and a few blocks that are visible on the surface indicate that the building is located on the same level as the peripteral temple. The revealed ground plan shows resemblances to Classical and Hellenistic banquet buildings, such as the houses southeast of the Aphaia Sanctuary on Aigina[72]. Whatever the purpose of the prospected building, its orientation, which is conspicuously different from the temple and the stoa, may be explained by the natural topography of the area. The gentle rise of the terrain towards the northeast would potentially allow for simple wooden constructions for spectators watching ritual activities. It will be up to future excavations to test the current hypotheses regarding the plan, function and chronology of the prospected remains north of the peripteral temple[73].

While the configuration and character of the transition space between these buildings is still to be clarified, important pieces of information on the structural definition alongside the upper terrace of the public centre have been revealed by further excavations and prospections. At least three monuments or small buildings in elevated positions embrace the upper eastern terrace of the public centre at its northern and eastern borders. Some 25 m to the northeast of the hypothetical banquet building, the rubble foundation and limestone socle of a rectangular building (»Bau 2012«) with dimensions of at least 7.2 × 4.5 m were uncovered in a rescue excavation in 2012[74]. Given the limited possibilities for investigation, the total dimensions and function of the building remain to be elucidated. Approximately 20 m further southeast, the results of the georadar survey

72 Cf. Leypold 2008, 18–22 pl. 6.

73 New excavations conducted between 2019 and 2021 and hence after the present contribution had been written, confirmed that the anomalies belong to a series of buildings on top of each other, which were probably related to feasting activities at the sanctuary (see Jahresbericht 2020; Jahresbericht 2021, 82). Earlier assumptions (cf. Jahresbericht 2019, 56 f.) that the building might be interpreted as the stage building of a simple theatre with wooden or rock-cut seats have been proven wrong.

74 Cf. Jahresbericht 2012, 84.



14 Monument A, ground plan of architectural remains and generalised reconstruction on top (© OeAW-OeAI/C. Baier)

indicate the existence of a structure of c. 6 × 6 m. The visible upper sides of some large limestone blocks and the data retrieved by the georadar measurements suggest that the remains are located just underneath the surface. The building is situated in an elevated position that marks the north-eastern limit of the upper terrace of the public centre. It is also located at the northern end of a marked edge in the modern terrain that separates the terrace of the peripteral temple from the next, higher terrace to the east.

Approximately 20 m to the southeast of the peripteros and 6 m above it, Monument A is situated on top of a natural projection of this superior terrace and towers above the public centre like an inner-urban landmark[75]. Two excavation campaigns conducted in 2017 and 2018 have brought to light remains of the foundations and of the orthostate zone of a rectangular building of c. 5.50 × 3.65 m that had two projecting antae at each corner of its western façade (figs. 14. 15). Interestingly, according to the foundation remains, both long sides of the monument were equipped with wide openings that might even have offered a view through the building. The fragment of a threshold that was found in the debris covering the building and that possibly belongs to the monument, judging by its dimensions, has neither a carved door stop nor a door socket. No architectural decorations were found except for an orthostate block with four simple vertical grooves that can be identified as the southern jamb of the opening in the eastern façade. A badly preserved coin found inside of the walking horizon in use at the time of construction of Monument A is probably to be identified as a tetrachalkon issued in Megara in the late 3rd or early 2nd century BC[76]. According to a preliminary analysis, the diagnostic pottery recovered from the subsequent layers of use also points to the second half of the 3rd or the first half of the 2nd century BC.

75 Also see Baier et al. 2018, 44–54 for a preliminary discussion of the evidence associated with Monument A.

76 See Baier et al. 2018, fig. 24 a and BCD Peloponnesos 29. We would like to thank Nikolaus Schindel (OeAW-OeAI) and Georgia Alexopoulou (Ephorate of Antiquities of Achaia) for the preliminary numismatic analysis in 2017 and 2018. For the interpretation of the coin in question, we are also grateful to Giorgios Papamichelakis.

15 Monument A, drone photo facing southeast (© OeAW-OeAI/N. Gail)

While the natural terrain projection on which Monument A was built slopes steeply to the west and north, the area east of the monument was a fairly flat terrace in antiquity. In front of the eastern façade, at a distance of c. 2.10–2.25 m, a strip foundation measuring 2.05 × 0.95 m was uncovered. A sequence of thin layers with ashes and charcoal that was documented in the area between the strip foundation and the monument provides further evidence that the strip foundation had most probably served as support for an altar. At each short side of the foundation, two holes with diameters of approximately 10 cm were cut into the walking horizon (fig. 16). They indicate that objects might have been stuck into the ground on both sides of the altar and fastened by tile wedges that were documented *in situ*. The spectrum of recovered pottery associated with the use of the building and the presumed altar identify the monument as a place of worship. Fragments of unguentaria, lamps and pyxides, as well as tableware and cooking ware, attest to the offering of votives and communal dining and show parallels to Hellenistic votive deposits at the site of the so-called Orthostate building on Terrace I of the neighbouring sanctuary[77]. Further crucial information about the character of the cult is to be expected from the detailed analysis of botanical macro remains recovered from the ashy layers around the altar foundations. According to preliminary results, charred remains of free-threshing wheat and other cereals, fragments of figs and grape berries figure importantly in the layers (fig. 17)[78].

77 Cf. Schauer 2014a, esp. 670–673 on a votive ensemble from the late 2nd or early 1st cent. BC that has been found deposited in a clay floor of a repair phase inside of the Hellenistic Orthostate building. We would like to thank Christa Schauer and Georg Ladstätter for sharing and discussing their results and thoughts with us.

78 We are grateful to Andreas G. Heiss for allowing us to include his preliminary results in this paper. A detailed account of the archaeobotanical evidence will be given in the final publication of Monument A.

16 Monument A, foundation blocks of the altar facing west (© OeAW-OeAI/E. Baudouin)

While it is in line with the central axis of Monument A, the orientation of the altar foundation differs slightly from the monument. Most interestingly, it is parallel to the oblong building underneath the peripteral temple that potentially could represent a Late Archaic or Classical predecessor to the Hellenistic temple[79]. Considering the stratigraphical evidence, it cannot be excluded that the altar was erected even before Monument A was built. It thus seems possible that at the time of its erection, the altar still referred to an orientation system of pre-Hellenistic date, which lost its importance for the structuring of the surrounding urban space only when the peripteral temple was erected during the second half of the 3rd century.

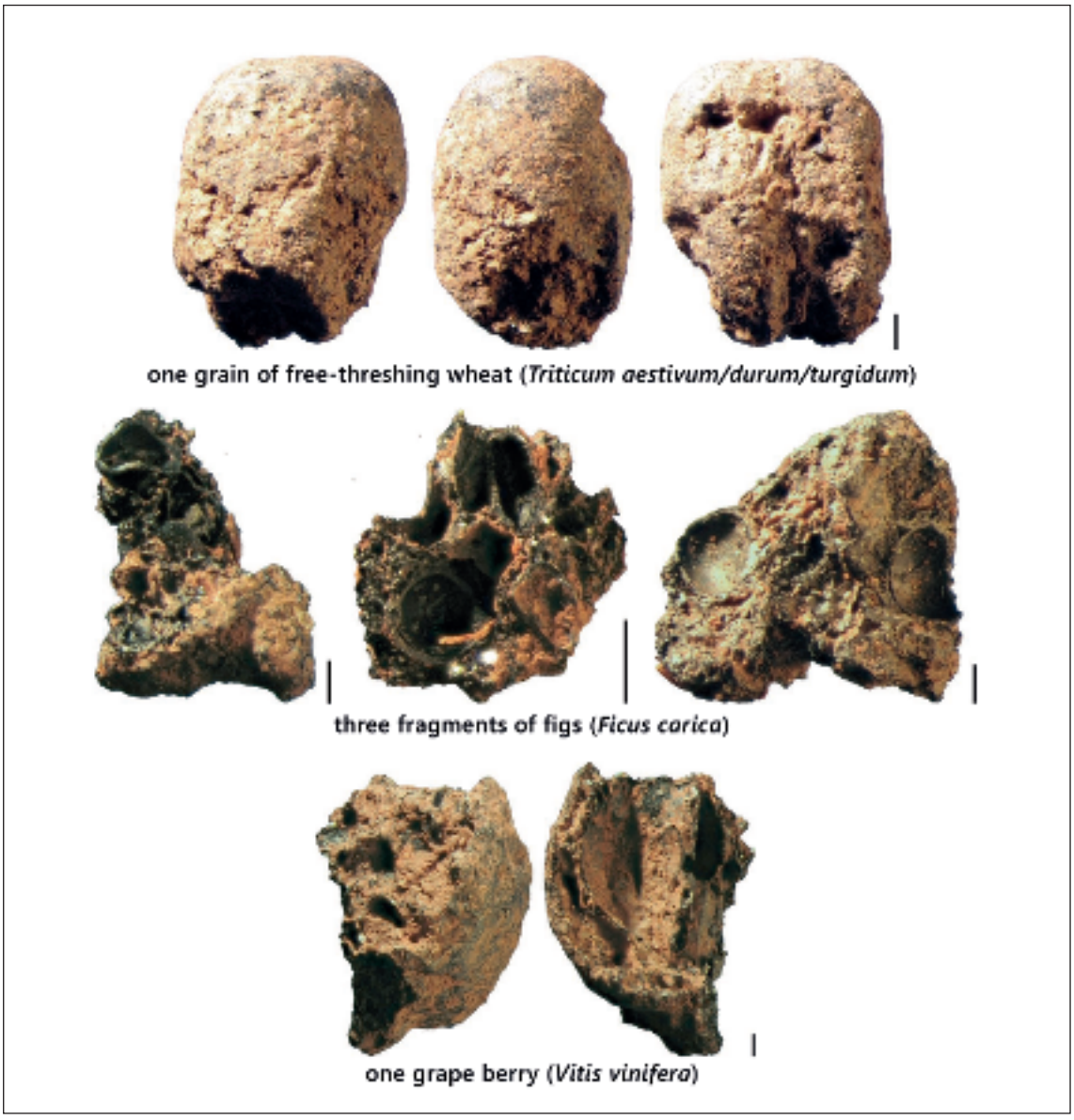
The building type of Monument A sheds further light on its function and meaning. Architecturally, the oblong chamber with two ante-like pillars framing the western façade recalls the ground plan of the Pi-shaped grave monument K1 at Messene[80], dated to the early 2nd century BC, and of a grave monument at Keryneia dated to the second half of the 3rd century BC[81]. However, the large openings on both long sides of Monument A at Lousoi differ fundamentally from the architecture of the sepulchral buildings at Messene and Keryneia. Two partly robbed graves with several burials that were found inside of Monument A do not date back to the Hellenistic period but to the 5th and 6th centuries AD, as is attested by two belt buckles found inside the southern grave and by the radiocarbon dates of the skeletal remains[82].

79 We are grateful to the excavator Georg Ladstätter for generously sharing unpublished information on this building with us.

80 Cf. Themelis 2000, 114–119 figs. 99–104; Müth 2007, 110–112 figs. 39. 49.

81 Cf. Dekoulakou 1994, esp. 66–81.

82 We would like to thank Yannis Maniatis (NCSR Demokritos, Athens), Sarah Talamo (Max Planck Institute for Evolutionary Anthropology, Leipzig) and Ronny Friedrich (Curt-Engelhorn-Zentrum Archaeometrie GmbH, Mannheim) for the radiocarbon dating. A more detailed account of the evidence related to the Late Roman tombs is given in Baier et al. 2022. On the belt buckles see preliminarily Baier et al. 2018, 50 fig. 26.



17 Charred archaeobotanical macro remains found in the ash layers surrounding the altar foundation east of Monument A (© OeAW-OeAI/A. G. Heiss)

Moreover, it is important also to consider the wider environment of Monument A. In its exposed position above the public centre, the building marks the upper southeastern boundary of the large urban sanctuary. On the same terrace to the south of Monument A and in close proximity to it, four fragmented limestone stelae and fragments of four sculpted bases of stelae with hypopodia on their front sides were found. While no traces of inscriptions or reliefs are visible, typological comparisons from the Peloponnese and Aetolia suggest that they were used for funerary or votive purposes. Other small stone fragments that might have belonged to similar stone monuments are still visible on the ground. Judging by the stelae and by the flat topography of the terrain just northeast and southeast of the monument, it appears highly likely that the building was situated next to at least one road, if not a crossroads. With regard to the urban context of the monument, hence, it seems legitimate to speak of a liminal position alongside a road at the boundary of the sanctuary, and perhaps even at a boundary between the world of the living and that of the dead,

if the stelae were indeed grave markers[83]. The sacrificial rituals described would also be suitable for transitional festivals. Besides, one wonders whether the two opposed door openings of Monument A might at least symbolically be understood as a reference to the transitional space possibly marked by the building.

Hence, at first sight, the overall evidence in the given context seems to point to ritual practices that had a close connection to the harvest and fertility, and maybe also to the cycle of death and newly emerging life. The character of such festivals in Lousoi is tellingly illustrated by a terracotta stamp that was found in one of the two excavated Hellenistic houses and depicts religious motifs that clearly relate to festivals of harvest and agricultural fertility, among them torches, the branch of a palm tree, grains and fruits, various vessels and other symbols. Veronika Mitsopoulos-Leon has suggested that the stamp was used to decorate bread or cakes offered at bloodless sacrifices[84], and it seems plausible that rituals of a similar kind were practised at Monument A. Given these characteristics, it is certainly attractive to associate the spheres of the goddesses Demeter (goddess of the harvest as well as the bringer of divine order and unwritten law in her quality as Thesmophoros), Persephone (in her quality of spring growth and the underworld) and Hekate (in her quality as goddess of liminal points and boundaries as well as protectress of roads) with Monument A, albeit a definite identification of a specific deity is not possible based on the available evidence.

In concordance with the evidence documented at the urban sanctuary of the public centre, the cult activities stopped in the late 1st or early 2nd century AD when the altar was removed and its foundation covered with a thick layer containing burnt material and a considerable quantity of redeposited pottery fragments. Two bronze coins of the same series give the reign of Domitian as a *terminus post quem* for the deposition of the layer[85]. This evidence is in general concordance with the excavation results at the urban sanctuary on the terrace below Monument A. The small cult building at its eastern end[86] and maybe also the central and eastern parts of the temple sekos[87] remained active places of worship and ceremonial gatherings until the reign of Trajan. In contrast, the western stoa on the lower terrace of the public centre had already been dismantled at the end of the Hellenistic period or at the beginning of the Imperial era[88]. After the dismantling, a small workshop for ceramics was probably installed immediately east of the northern end of the former stoa. It thus becomes obvious that by the beginning of the 2nd century AD, the heart of the Hellenistic polis had stopped beating and had entirely lost its former significance. Quite similarly, the evidence connected to the peri-urban Sanctuary of Artemis Hemera[89] and that recorded at the sites of two excavated houses in the northern part of the town[90] is also reflective of the steady decline of Lousoi until the end of the 1st century AD. Even if Pausanias' statement that not even the ruins of Lousoi had remained until his days, might be exaggerated[91] and patchy archaeological evidence indicates ongoing or revived settlement activities until the Late Roman or Early Byzantine period, the comprehensive deurbanisation and regression of the settlement during the Early Imperial period is openly manifest in the archaeological record.

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83 Most recent surveys in the area to the south of Monument A, conducted in 2021 and hence after the present contribution had been written, indeed point to the existence of a necropolis. See Baier et al. 2021.

84 Cf. Mitsopoulos-Leon 2008; Mitsopoulos-Leon 2017, 151–153 cat. 277.

85 Find numbers LSMA18-1060/1135.1159. Cf. BCD Korinth 555.

86 Cf. Schauer 2014a, esp. 673 f.

87 Cf. Jahresbericht 2016, 94–96.

88 Cf. Jahresbericht 2004, 367; Jahresbericht 2014, 89.

89 Cf. Schauer 2005, 352.

90 Cf. Mitsopoulos-Leon 2017, esp. 17–20; Schauer 2005.

91 Paus. 8, 18, 8; cf. Schauer 2005; Mitsopoulos-Leon 2010.

CONCLUSION

It is thus predominantly for the Hellenistic period that the archaeological evidence on town planning and architecture at Lousoi sheds light on the processes of fusing local parameters and more widely spread influences and trends into unique built expressions of Greek polis culture. As a case study of how urban space was structured in a small mountain polis, of how the Lousiatai organised their spatial and material environments as a result of their local agendas, cultural traditions and socio-political needs, this local perspective can add to our general conception of ancient Greek urbanism. Given the scarce amount of written sources, for Lousoi we have to rely on new archaeological data if we want to gain an appreciation of the dialectical relationship between localism and connectivity and its impact on architectural design and urban planning.

It has been noted before that the chronological development of the polis of Lousoi was closer to that of coastal Achaia than to that of Arkadia[92]. This assessment seems to be confirmed by the available evidence on the monumentalisation of the Hellenistic public centre during the second half of the 3rd and the early 2nd centuries BC, illustrated by the erection of the two-aisled stoa, the peripteral temple and Monument A. Roughly at the same time, the residential district in the northern part of the town was being developed[93]. Also in coastal eastern Achaia, many monumental public buildings were erected during the 3rd century BC[94], as is illustrated, for example, by the building programme around the theatre of Aigeira that was probably implemented during the first half of the 3rd century BC[95]. This is relatively late in comparison to other parts of the Peloponnese that experienced a remarkable urban take-off already during the 4th century BC, as reflected by refoundations of older cities like Mantinea and Sikyon, as well as new foundations such as Megalopolis and Messene[96]. At the current state of excavation it would be premature, however, to draw too far-reaching conclusions concerning the urban development of Lousoi, above all because Classical or Late Classical building activities are recorded on Terrace I of the urban sanctuary[97].

How the emerging picture of the Hellenistic urban development of Lousoi fits into the overall settlement dynamics that we can reconstruct for the Peloponnese of course remains to be studied in more detail[98]. At this point it can be stated that the monumentalisation of Lousoi seems to follow wider regional and supraregional evolutions linked to a series of political, social and economic factors[99]. As stated above, by the last third of the 3rd century BC at the latest, Lousoi had become a member state of the Achaian koinon. In the absence of epigraphical evidence, the chronological framework provided by the diagnostic pottery from the relevant excavation contexts of the public centre currently does not allow us to securely define the extent to which the urbanistic flowering was supported by the political alliance to influential Hellenistic confederacies[100]. However, the new excavation results at the sites of the stoa and Monument A

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92 Cf. Morgan 2009, 160. Also see Voyatzis 1999, 136 pointing to the important role that Achaia may have played in the development of Lousoi.

93 Cf. Mitsopoulos-Leon 2017, 17. 179.

94 Cf. Morgan 2009, 161. 165–167. Also see Bintliff 1997, 12. 14 on survey results indicating a general rise in population in Achaia during the Hellenistic period.

95 Cf. Gauß 2022; also see Morgan 2009, 167.

96 Cf. Donati – Sarris 2016, 392–395; Morgan 2009, 162–165 on poleis in Arkadia.

97 Cf. Jahresbericht 2005, 360; Jahresbericht 2006, 432. For more recent evidence for building activities during the 4th cent. BC in the public centre see Jahresbericht 2019, 56; Jahresbericht 2021, 82.

98 Also cf. e.g. Bintliff 2008.

99 Generally on the enormous expansion of Greek urbanism in the Hellenistic period see e.g. Lauter 1986, 64–92; Cohen 1995; Billows 2003, 196–215; Zimmermann 2009, esp. 17. For the Peloponnese see Donati 2015, 205 f. More recent studies on the enormous expansion of Greek urbanism in the Hellenistic period have been conducted by a research association dedicated to »The Hellenistic Polis as a Living Space«. The most important results have been published in the series »Die hellenistische Polis als Lebensform 1–5«.

100 For instance, Mitsopoulos-Leon 2012, 42 assumes that joining the Achaian League was crucial for the increase in

tend to the assumption that the erection of these buildings coincided roughly with the time when Lousoi was incorporated in the Achaian League. According to the available data, the combination of buildings of political, administrative, religious and commercial purposes in the Hellenistic town centre of Lousoi reflects the usual civic needs of a Hellenistic polis and can similarly be found on many Hellenistic agorai, in line with supraregional standards and trends found throughout the Greek oikumene: while the stoa may have housed public assemblies of polis institutions and may have also served commercial functions, the ensemble of sacred buildings nearby not only represents the religious needs of the Lousiatai but also the strong political role of religion and cult in the life of the polis[101]. The evidence available to date suggests that at the site of the peripteral temple it may even be possible to trace back the religious needs and customs of the polis to a sacred gathering place that likely played a crucial role in the consolidation of an Early or Middle Geometric community and subsequently came to be at the core of urban and institutional growth of the polis up until the Hellenistic period.

On the other hand, specifically local parameters are deeply impressed into both the architectural design of the excavated Hellenistic buildings and the spatial configuration of the public centre and of the entire town. The archaising design of the peripteral temple that might have referred to the centuries-old tradition of sacred activities and to the particular historical development of this town area is an apt illustration of this phenomenon. The peculiar building type of another cultic building, Monument A, seems to be without exact parallel. On the lowermost terrace of the public centre, the peculiar design of the two-aisled stoa with closed rooms at both ends may have referred to traditional meeting places at agorai (Sparta) and in sanctuaries (Olympia), as has been suggested for similar stoai[102]. If this is accepted, the stoa might be interpreted as a symbolic reference to the past as well. Irrespective of that, it seems plausible that the design of the unusual rooms of the stoa at each end and especially the spacious northern hall responded to the specific local requirements of giving room to the polis institutions. Furthermore, with regard to building technique, the blocks of the euthynteria course of the stoa and of the altar for Monument A are separated by gaps of several centimetres, while still being fastened together by iron clamps (fig. 16). Hence, rather than using standard Hellenistic building practice with joints cut very precisely, the stonemasons building the foundations seem to have followed a simpler local building tradition. Finally, the necessary adaption to the local conditions becomes quite obvious in the overall spatial configuration of the town and of some of its areas. To a large extent, the urban layout had to adapt to the local terrain relief and to the particular hydro-geological situation. This is illustrated by the small terraces in the northern residential area of the town but also, for instance, by the rather loose organisation of buildings in the public centre. The assumed tangential road alongside the eastern border of the town that led to the Sanctuary of Artemis may serve as an example of the important role of topography and long-lasting traditions in shaping the town throughout its history. Still, the potential existence of regularly planned districts in the zones around the public centre remind us of the fact that more fieldwork will be needed to gain a better understanding of the heterogeneous processes which determined the creation of urban space in the polis of Lousoi. It is in this sense that the concept of localism used as a research perspective may help us in describing and interpreting local processes of developing and defining Greek urban culture.

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prosperity and for the booming development of the settlement. On the very complex relationship between urbanisation processes and the influence of political confederations during the Hellenistic period see Freitag 2009, esp. 162–164 on Arkadia.

101 On the deep-rooted connection between the Greek agora and religion see Dickenson 2017, 97–109.

102 On the debated functions of these stoai cf. Rheidt 2015, 310 f., also pointing to the polis of Samikon that may have intended to represent its long history by using traditional architectural types for the Hellenistic public centre.

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Alexander Sokolicek – Federica Iannone

THE FORTIFICATIONS OF AIGEIRA

PRELIMINARY RESULTS*

ABSTRACT
The project on the »Fortifications of Aigeira« follows a diachronic approach to study Aigeira's defence systems from Archaic to Late Antique times. Aigeira has four enceintes (A–D) of mostly uncertain dates; one from Mycenaean times (A), and a possible Archaic (B), a possible Hellenistic (C), and a Late Roman/post-antique fortification (D). To date, only a preliminary survey of the historic fortifications and a rough study of the remains have been undertaken. The Mycenaean fortifications are part of W. Gauß' studies. The preconditions of Aigeira offer a rich set of data for an excellent case study: the architectural remains of the fortifications, the dramatic landscape, and the historical sources connected with the political history (mainly on military attacks and on a *synoikismos*). Aigeira's topography is favourable for a good fortification: the urban area is dominated by a double acropolis in the south, and steep cliffs on the west and the east sides border gentle terraces ascending from the acropolis. A narrow isthmus in the south links Aigeira to its hinterland. A series of small forts and towers in Aigeira's neighbourhood, identified in recent surveys by the Italian School at Athens, play an important role for Aigeira's defence and communication system.

The city of Aigeira is one of the most important and one of the best-preserved poleis of eastern Achaia, situated on the southern coast of the Gulf of Corinth. Historical sources as well as the variety and monumentality of the archaeological remains attest to the major role of Aigeira in Achaia from the Mycenaean period onwards[1]. The importance of Aigeira is also mirrored in a series of fortifications built subsequently between the Mycenaean age and Late Antiquity. A archaeological project, funded by the Austrian Science Fund (FWF) since 2018[2], focuses on the historical fortifications aiming at providing a new chronological and contextual analysis. This paper presents the first results of the excavations of the walls carried out in the southwestern areas of the city[3].

The settlement of Aigeira sprawls on the terraces of a triangular-shaped, isolated hill about 400 m above sea level (fig. 1). Steep and insurmountable slopes delimit the urban area (fig. 2), which, according to Polybius[4], formed a natural defence already in antiquity[5]. An acropolis surmounts these terraces in the south of the city, which belongs to the ›upper town‹. The northern urban areas form the ›lower town‹. The geological soil of Aigeira consists of soft, unstable marl

* The contribution was written in 2019 and presents the results of the first excavation at Aigeira. Later research results from 2020 to 2023 could not be included in this article.

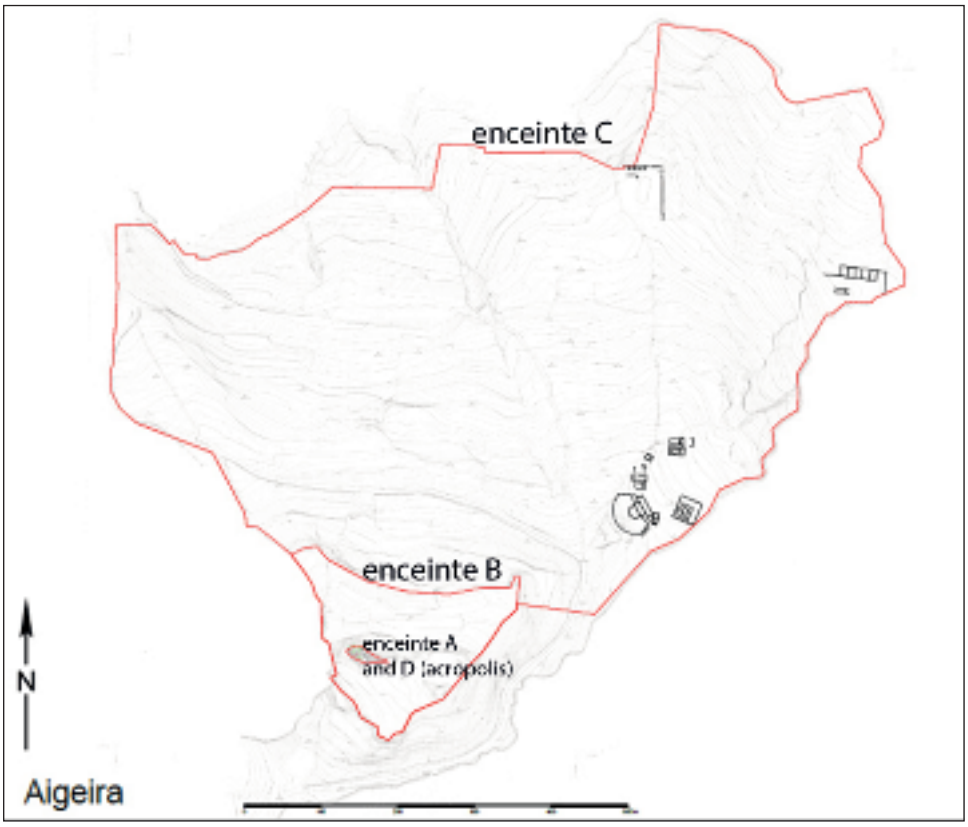
1 Gauß 2015.

2 The project is being conducted by Alexander Sokolicek (University of Salzburg) and Federica Iannone (OeAW-OeAI/Athens Branch); FWF-Project P30886. The authors express their deep thanks to the excavation director W. Gauß for his continuous support, as well as to the directors of the institute, G. Ladstätter and B. Eder. The project benefits from the support and the keen interest in our studies from G. Alexopoulou and C. Katsarou from the Ephorate of Antiquities of Achaia, whom we thank warmly for their help in administrative and scientific matters.

3 Earlier reports and discussions are published in Sokolicek 2018; Sokolicek – Iannone 2019; Sokolicek (in preparation).

4 Pol. 4, 57.

5 Sokolicek – Iannone 2019, 267; Sokolicek 2018, 558.



1 Plan of Aigeira and the four enceintes (© OeAW-OeAI/W. Gauß in: Sokolicek 2018, 565)

that is soluble in water, and of a very hard conglomerate. The different characteristics of the geological strata not only produced the steep cliffs, but also shaped the urban landscape. A large part of the ›lower town‹ is dominated by marl with inclusions of conglomerate, which led to a continuous erosion of the town's edges; the acropolis, however, and the hill on which the theatre stands are well preserved as they stand on compact conglomerate[6]. The dramatic landscape, the archaeological remains of the fortification walls, and the historical sources connected with its political history make Aigeira the perfect scenario for the study of the interdependency of landscape and history on military architecture as part of a community-building process[7].

The archaeological investigations of Aigeira have been under the auspices of the Austrian Archaeological Institute of Athens since the beginning of the 20th century. The – often interrupted – excavations have revealed a Mycenaean settlement at the top of the acropolis; a large public Hellenistic building in the western area of the acropolis (»Solon«); two Archaic temples; a Hellenistic theatre with a series of *naiskoi* and other buildings in the western part of the lower city; a large structure in the Koupina and the Palati area in the northeast, and a series of stretches of the fortifications in various parts of the city[8].

Previous studies on the fortifications of Aigeira have been very limited and – with the exception of the Mycenaean walls on the acropolis[9] – they have played a minor role in scientific discussion. In a short report, Otto Walter, the first excavator of Aigeira, described and

6 Rusch et al. 2015, 28; on the geology of the Aigeira region see Fouache et al. 2016, 107 f.
7 Sokolicek 2018, 562 f.
8 For a general bibliography of the history of studies and excavations see Gauß 2019, 32–34; Gauß 2022; Gauß (in preparation); Sokolicek – Iannone 2019; Rizakis 2008, 225–245; Rizakis 1995; Kolia 2008.
9 On the Mycenaean fortifications see Gauß 2009; Gauß 2015.

2 Western slopes of the urban area (© A. Sokolicek)

documented the existing structures, which were then (1915) better preserved than now. His accounts, though very short, contain valuable information for the reconstruction of the enceintes, particularly because they illustrate the industrial state of Aigeira, when intensive cultivation of olive trees and grapes covered most of the ancient site. These plants have disappeared in most parts of the city, but they have left deep traces in the historical strata in the areas of our interest. It is also crucial to understand the later history of the site, especially for the interpretation of the excavated stratigraphical sequences. The industrial cultivation of plants also had positive effects as it left the ancient site mostly free of macchia. As a result, Walter was able to identify sections of a double-faced wall, 1.5 m wide, and four towers in the northwest section without any excavation[10]. Meanwhile, the areas which Walter was able to access easily are now covered under heavy vegetation, and therefore none of the mentioned towers remains visible. Drawing from historical sources, Walter dated the fortification system to Hellenistic times[11]. The status quo of the walls at the beginning of the 21st century was documented in a survey, carried out in 2000 and 2001 by Michael Weißl, who successfully identified 17 spots where the city walls have been preserved. He denied any evident possibilities for openings[12]. The walls were documented under the direction of Georg Ladstätter in a series of drawings and photographs, also taken in 2000 and 2001[13]. Except for the Mycenaean fortifications, the walls have never been studied in archaeological excavations[14].

THE FORTIFICATIONS

At least four walls surround the city from the Mycenaean age to the Late Antique period. Their interpretation, date, and historical and urban context have so far been based on historical sources and general considerations only[15]. In the following section, the fortifications are briefly described.

10 Walter 1919, 11.
11 Walter 1919, 11–20.
12 The results of this study remained unpublished; reports in the archive of the Athens branch of the OeAI.
13 The drawings are archived in the Athens branch of the OeAI.
14 For the Mycenaean walls and settlement see Alram-Stern 2020; Gauß 2015, 149–152; Gauß 2009, esp. 169; Bammer 1998, 201; Alram-Stern – Deger-Jalkotzy 1985, 424–426; in general see Alram-Stern – Deger-Jalkotzy 2006.
15 Alzinger 1985; Bammer 1998; Gauß 2015, 149 f.

3 Acropolis of Aigeira (© OeAW-OeAI)

Enceinte A (Mycenaean; figs. 1. 3. 4)

The Mycenaean settlement reached from the acropolis to the plateaus below, sprawling over an area of about 12,000 m². The acropolis provides a good natural defence; the settlement burned down in a catastrophe in LH III C (12th cent. BC) and prompted the erection of a new fortification wall[16]. The enceinte is of huge historical significance as it is the only post-palatial fortification wall on the Greek mainland. Excavation results and the topographical conditions suggest a c. 155 m-long wall and a fortified area of about 800 m². The wall has no towers and it was at least 3 m high[17]. It cannot be ruled out that the wall was still in use in the historical periods of Aigeira, like the Mycenaean walls on the Athenian acropolis in later periods[18].

Enceinte B (figs. 1. 5–9)

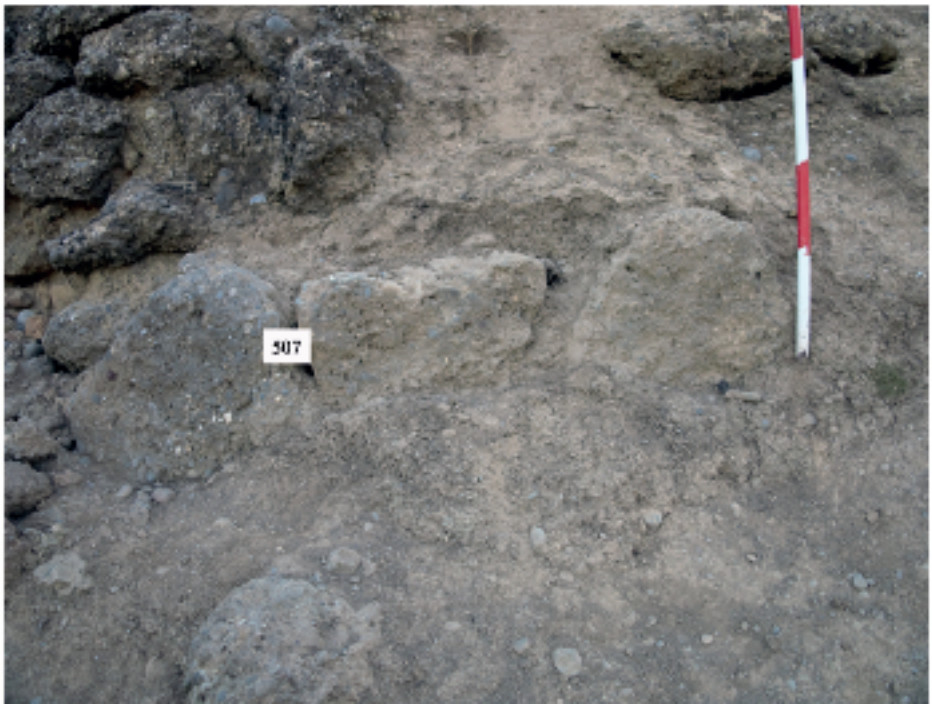
Enceinte B describes a set of walls that encircle the acropolis. Its term goes back to a previous classification of the fortification system of Aigeira assuming that Enceinte B is a coherent defensive wall. Although this view has changed (see below), the term remains for the description.

16 Gauß 2015, 151.
17 Gauß et al. 2013.
18 W. Gauß studies the walls using them as an example for the post-palatial importance of Aigeira, see Gauß et al. 2013; Gauß 2015. For Athens, see Hurwit 1999, 76. 80. 348 n. 25; Iakovides 1983, 21. 209.

4 Plan of the acropolis (from: Alzinger 1985)

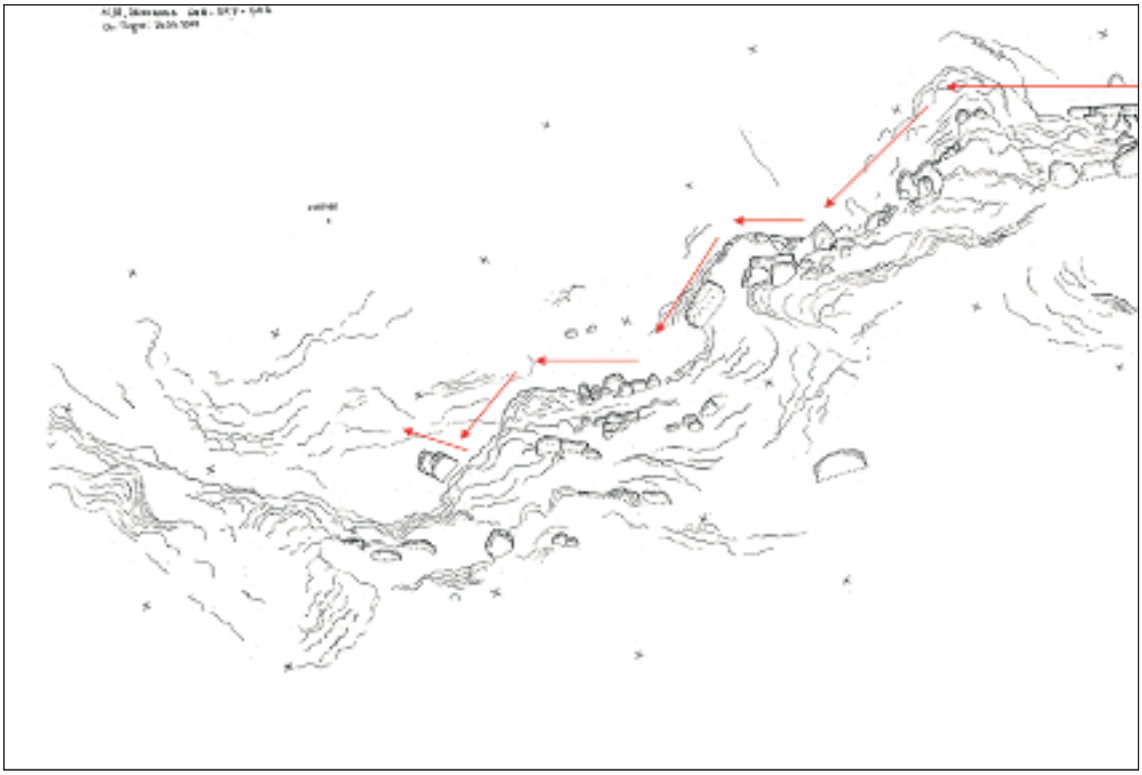
5 Section of the Enceinte B (© OeAW-OeAI)

a

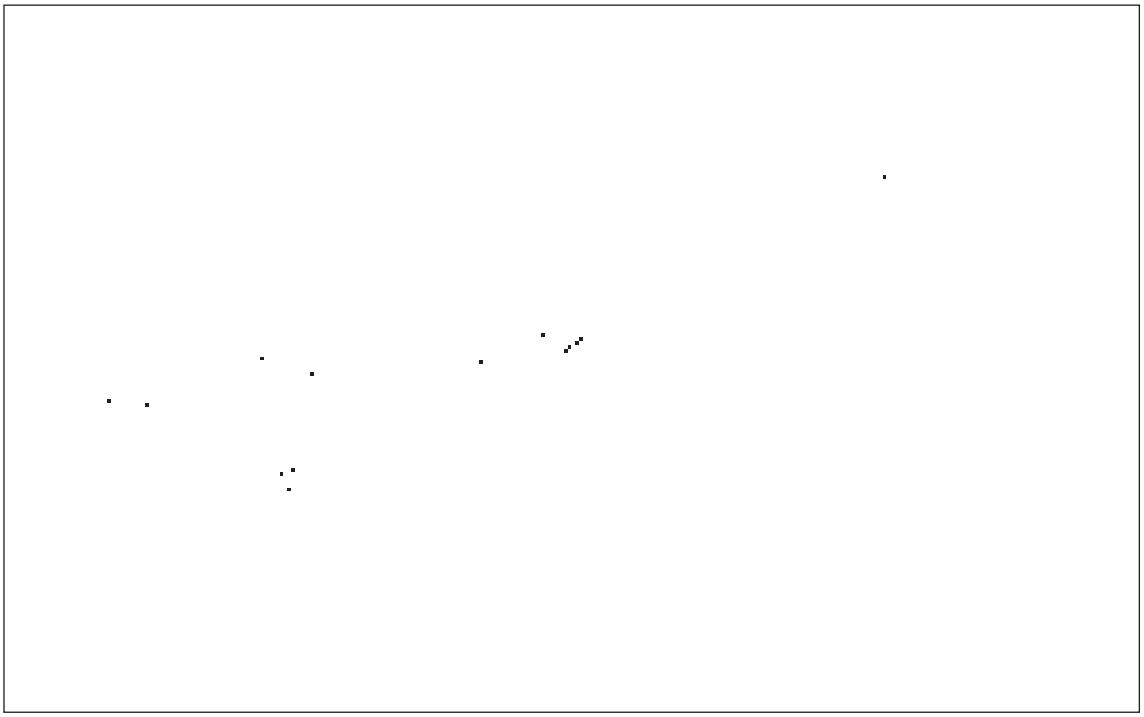


b

6 a. b The polygonal wall on the south slopes of the acropolis (© OeAW-OeAI)



7 The southern section of the fortification walls on the acropolis (© OeAW-OeAI/C. Regner)



8 Trench S2018-002 (© OeAW-OeAI/C. Regner)

9 Trench S2018-001 (© OeAW-OeAI/C. Regner)

The existence of partially double-faced polygonal and pseudo- to rough-polygonal walls[19] in this area (figs. 5. 8) led previous studies to the conclusion that the Archaic fortifications of Aigeira had been identified[20]. In point of fact, some stretches in the north, the west, and in the east sides of the acropolis are built using different manners of polygonal masonry, and even more so, these segments continue more or less on the same contour line (385–400 m above sea level). These seemingly clear conformities fuelled assumptions leading to reconstruction of an Archaic, c. 900 m-long defensive wall around the entire acropolis, fortifying an area of c. 35,000 m². Another reason for interpreting the wall as part of the Archaic fortification system goes back to the theory that the Archaic settlement developed on the ›upper town‹ around the sanctuary on the acropolis; this discussion was influenced by the quest for Archaic settlements in Achaia[21]. A famous story, told by Pausanias[22], seemed to support this idea[23]: the Archaic settlement of Aigeira, then Hyperesia, defended itself against the Sicyonians who were about to invade the territory of Aigeira around 688 BC. In anticipation of the attack, the citizens tied torches to the horns of their goats, simulating a large regiment, which eventually chased away the Sicyonians. The inhabitants of the city, in memory of this episode, are said to have changed the name of the settlement from Hyperesia to Aigeira, from *aix*, *aigòs*, »goat«. Consequently, this episode was associated with the construction of the existing fortification wall, and it was a logical conclusion that it was a fortification of Archaic age, also due to the pseudo-polygonal construction technique[24].

The interpretation of the existing ›polygonal‹ walls as a means of defence (rather than e.g. terrace walls) cannot be denied, but their chronological sequence has been fundamentally changed after recent excavations (see below, trenches S2018-01 and S2018-02). A closer look at the masonry techniques[25] as well shows the lack of uniformity claimed in earlier studies. So far, we can

19 The term »polygonal« describes the shape of the stones used to build a wall. Determinant is the angle of the corners below or over 90°, not the number of sides (for further discussion and literature see Brasse – Müth 2016, 84–86. 96).

20 Bammer 1998; Sokolicek – Iannone 2019, 270. Notebooks from 2000 and 2001 by M. Weißl.

21 Gauß et al. 2013.

22 Paus. 7, 26, 2–3.

23 See Alzinger 1985, 393; Rizakis 1995, 216 f.; Morgan – Hall 2004, 479 with bibliography.

24 In general it is considered very risky to relate an etiological tale to an architectural structure without fully investigating its archaeological context; furthermore, pseudo-polygonal masonry cannot be dated to a specific period, see below and Brasse – Müth 2016, 84–86.

25 »Masonry technique« is preferred here against »masonry style«, a term that should not be used in this context. The appearance and distribution of polygonal walls in general has been discussed by Lugli 1957, 51–165, whose classification was widely accepted in literature, see Orlandos 1966, 132–139; Winter 1971a, 80–100. Polygonal walls have often been taken as a sure sign of an Archaic date, but examples of Hellenistic and Roman polygonal walls (Adam 1982, 23–26; Garlan 1986, 16 f.) have changed the view fundamentally, see Brasse – Müth 2016, 84 f. 96 with further literature.

discern four different sections around the acropolis: in the northeast (not excavated), two walls in the south (partially excavated; trench S2018-02), and one in the northwest (excavated; trench S2018-01).

The northeast part runs along a natural topographical step (preserved length c. 10 m; fig. 5) and consists of more or less carefully cut polygonal stones of medium-sized conglomerate (0.30 × 0.50–0.50 × 0.70 m); the edges are hewn and the joints between the stones are narrow. A similar, but even more carefully laid set of polygonal stones in a fine-grained conglomerate, is preserved south of the acropolis (no. USM507; fig. 6). Although only three stones of this wall are visible (cleaned, but not excavated), it is clear that they remain *in situ*. This small section is the finest example of polygonal walling in Aigeira, but there is no evidence of absolute dating. A later defensive wall (fig. 6) overbuilt the older polygonal wall and provides a *terminus ante quem*. This later wall is more complicated in structure and walling techniques. In general, it is not well preserved, but the extant remains make it clear that it contains two main lines: a double-faced, roughly polygonal wall in the back, and a single row of blocks which run parallel for a distance of about 2 m in front of the double-faced wall, probably a *proteichisma* (see figs. 16–18). This wall has a total depth of 3.70 m and can be traced alongside a topographical step at the south of the acropolis for a length of c. 200 m. The area is steeply ascending below a flat plateau. There are no towers, but there are jogs in the eastern sector of the wall (poorly preserved) that are reminiscent of indented trace (fig. 7)[26]. An excavation (trench S2018-02) in the central part of the south stretch revealed no Archaic finds at all, but seems to suggest a Hellenistic date[27].

The northwestern part of Enceinte B is located below a terrace called »Solon«, where a spectacular public mansion was excavated in previous years[28]. The wall is preserved to a height of about 2 m and is set against a steep cliff (fig. 9); it bends smoothly around a natural formation running from an east-west section to a north-south section. The wall is built with material that was apparently simply available rather than carefully selected, as it contains mainly reused blocks from an earlier building, among them a well-preserved threshold with a pivot hole. Many blocks are not dressed; there are virtually no joints but rather large gaps between the stones. For a distance of about 1.5 m at the back of the wall there is another row of blocks, built simultaneously with the front wall but very poorly preserved. The concept of the structure with two parallel walls is reminiscent of the southern section, even if it is built in a much more careless manner. A first analysis of the pottery points toward a Late Hellenistic date; there are no Archaic finds in the stratigraphy[29].

Enceinte C (figs. 1. 2. 10–12)

The most extensive fortification surrounds an area of about 50 ha, which is the entire urban area of Aigeira (fig. 1). The term »Enceinte C« was chosen in a previous classification[30] assuming a coherent wall. Recent studies have not contradicted the theory, but they have added substantial new information on the layout and chronology.

The walled area of Enceinte C includes the terraces of the ›lower town‹ north of the acropolis. There must have been a connection with Enceinte B and the area south of the acropolis, as it would be hard to imagine that the city did not have a contemporaneous, closed fortification system including the southern area. Because the terms chosen for the different enceintes is of

26 Winter 1971b.

27 The pottery is being studied by R. Smetana and F. Iannone. Dates of the pottery are preliminary, and the publication of the material is being prepared for the final publication of the walls.

28 For current research on the Solon area see <https://www.oeaw.ac.at/oeai/forschung/projekte-in-publikationsvorbereitung/aigeira-gaestehaus/> (29.06.2020).

29 The pottery is being studied by R. Smetana and F. Iannone. Dates of the pottery are preliminary; the publication of the material is being prepared for the final publication of the walls.

30 Sokolicek 2018; Sokolicek – Iannone 2019.

10 Enceinte C (© OeAW-OeAI Athens, archive)

11 Trench S2019-001 (© OeAW-OeAI)

topographical rather than chronological nature, the Hellenistic phase of Enceinte B is not included in this paragraph.

Enceinte C is the least-well-preserved wall and can only be identified in some areas in the east, north, and west. The steep rock falls on the west and the east sides, limiting the settlement by natural means; traces of the city wall are visible on the edges and indicate a rough outline of the walled terrain. The north side, sloping more or less gently downwards, also has traces of a

12 Trench S2019-002 (© OeAW-OeAI)

fortification wall, but numerous terrace walls running in an east-west direction make the original trace of the fortification difficult to understand. It is also the only area where towers can be detected according to O. Walter's observations.

As far as is known from the preserved areas, the walls of Enceinte C consist of a 2.10 m-wide, double shell wall with an *emplekton*, executed in an isodomic and a pseudoisodomic layer arrangement (see below, trench S2019-01; fig. 11). The tallest parts have four layers of stones, which form the base for a mud-brick wall (see below, trench S2019-02; fig. 12).

In an attempt to interpret these walls, modern scholars have referred to several episodes in Aigeira's history. According to Strabo, citizens of the nearby city of Aigai joined Aigeira in a *synoikismos* in the mid-4th century BC, and he reports that the Aigaians moved to Aigeira, however still retaining their ethnic identity[31]. Pausanias attests that the ›weakness‹ of Aigai's inhabitants made them abandon their city[32], which could be seen as a result of the devastating earth- and seaquake of 373 BC that destroyed nearby Helike and damaged many sites of the Corinthian Gulf[33]. This date would coincide with the estimated date of the *synoikismos* shortly after 370 BC[34]. Aigeira must have had the capacity to host the Aigaians in its territory and does not seem to have suffered much from the sea- and earthquake of 373 BC. A *synoikismos*, in any case, does not necessarily produce a political reorganisation, but it does indicate a territorial reorganisation that could affect both the city and chora[35]. The spacious terraces of Aigeira's ›lower city‹ would have been a good place for the Aigaians to settle, but it is also possible that they spread out over the wider territory of Aigeira.

31 Strab. 8, 7, 4.

32 Paus. 7, 25, 12. Aigai was a member of the Achaian Confederacy, as were the cities of Olenos and Rhypes, which were also abandoned in that period, see Pol. 2, 38–44. The phenomenon of abandoned cities and *synoikismoi* in the 4th cent. is a widespread phenomenon, see Freitag 2008, 11; Hansen 2004, 115–119.

33 The date is given by Paus. 7, 7, 2 and Strab. 7, 7, 5; see on the Helike-project Katsonopoulou et al. 1998 with bibliography; Cooper 1996, 157 and n. 49.

34 Morgan – Hall 2004, 479 on account of a *terminus post quem* from Ps.-Skylax's list of Achaian poleis dating to c. 370 BC (Ps.-Skyl. 42), which contains Aigai. Also Aigai's coinage ceased around that time, Head HN², 412–417.

35 Walser 2009, 138 esp. n. 13 with bibliography.

A methodological problem occurs when the monumentalisation of the polis and the construction of Enceinte C is associated with the participation of Aigeira in the (second) Achaean League in the first quarter of the 3rd century BC[36]. It might be tempting to make a connection between the participation in the League and an urban reorganisation in the same chronological period, but it is difficult to prove it due to a lack of clear archaeological evidence (except for the theatre, built in the first half of the 3rd cent. BC).

The construction of Enceinte C cannot of course be set in direct, unfiltered relation with any of these events, but historical sources help us to establish a *terminus ante quem* for the construction of one fortification wall. Famously, the Aitolians attacked Aigeira in 219/218 BC during the War of the Allies between the Achaean and the Aitolian leagues[37], leading to an invasion by the Aitolians, who took advantage both of a weak part of the water system and of the treason of an Aigeiratan. The remaining men of Aigeira gathered at the acropolis. Polybios' report refers to an »ateichistos akra«[38], where they started a counter-attack. The term »ateichistos« is subject to discussion[39], but it seems very unlikely that Polybios had an acropolis in mind that lacked any kind of visible wall, as the architectural history of the acropolis can be traced back to Mycenaean times at least. Even if these walls had been demolished, and the Archaic temple on the acropolis no longer there, one might assume that the acropolis remained part of the urban fabric. What was there may have been in ruins or not viable for a proper defence. However, this problem will not be discussed further here; what it is important to state is that in 219/218 BC at least, Aigeira did have a defensive wall.

Recent excavations (trench S2019-01) have revealed a short stretch of Enceinte C below the terrace of Solon (see below for a more detailed description of the excavation). This area was investigated with georadar, showing a clear trace of a double-faced wall. The excavated wall is about 2 m wide, has two faces built of ashlar blocks of local conglomerate, of which two rows are preserved. The wall filling consists of mud/marl and stones, including one reused block from an unidentified older building. The wall blocks support a mud-brick wall, the melted remains of which were unearthed next to the wall (trench S2019-01; see below). A very similar construction is preserved in a short stretch of Enceinte C further north (trench S2019-02; see below).

Enceinte D (figs. 1. 3. 4. 13. 14)

On the top of the western hill of the acropolis, a circular wall stands out compared to the other walls on the acropolis because of its use of reused ashlars, bricks, and mortar (fig. 13)[40]. The stone-mortar wall encloses an area of c. 50 × 18 m (c. 900 m²) following the natural character of the mound and of the pre-existing buildings. The wall rises above all the other architectural remains and is partially built over them. At the time of the building of Enceinte D, most of the older buildings – especially the Mycenaean buildings – were covered[41]. No tower or platform can be identified, only in the east of Enceinte D do cuttings in the bedrock seem to indicate a tower or platform-like structure that belonged to this fortification rather than to the prehistoric buildings, which did not extend into this area. The east side is the only possible area where an entrance to the enclosure would be possible due to the steepness of the terrain on the other sides; hence, it would be reasonable to propose a tower – or platform-enhanced entry in the outlined area (figs. 4. 13). The wall of Enceinte D, 1–1.5 m thick, consists of a double-shell wall, which is best preserved

36 Pol. 4, 57, 1–5 reports that Aigeira was part of the League, probably from the 70s of the 3rd cent. BC on; see Walbank 1984, 244: shortly after 275 BC; DNP I (1999) 66 s. v. Achaioi, Achaia (Y. Lafond): in 274 BC.

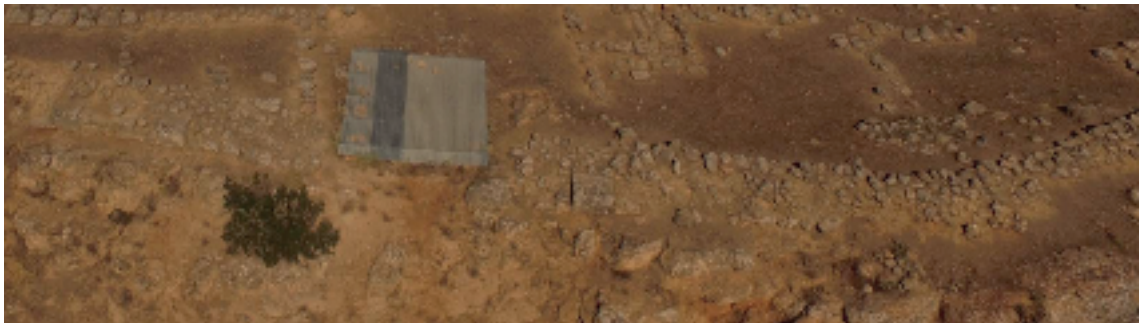
37 Pol. 4, 57, 5–58; 11; Grainger 1999, 244–296.

38 Pol. 4, 58, 7.

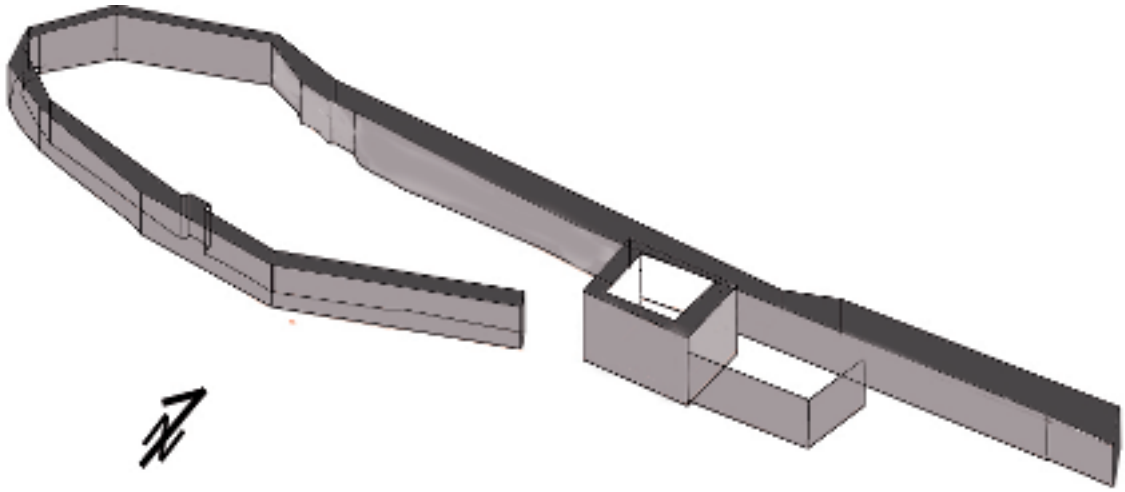
39 The usage of »ateichistos« is currently under debate and will not be discussed further here; in general see Frederiksen 2011, 25 f. 30. 117 f.

40 Late walls mentioned by Walter 1919, 19; Alzinger 1985, 450.

41 Alram-Stern 2020.



13 Enceinte D (© OeAW-OeAI/C. Kurtze)



14 Reconstruction of Enceinte D (© A. Sokolicek)

on the south and the west sides of the acropolis. The north side lacks a continuous line, which is mainly due to erosion and excavation (figs. 3. 4)[42].

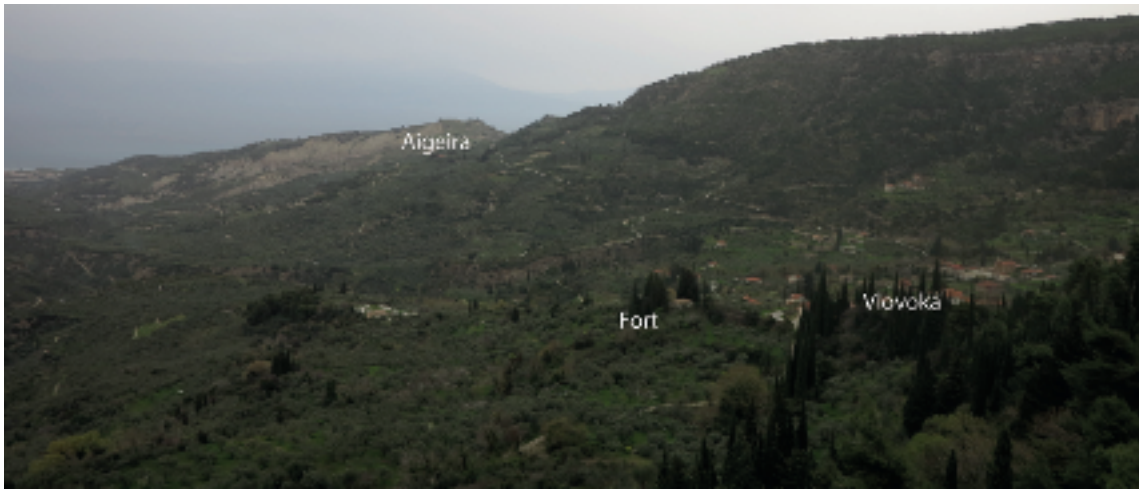
The walling technique is characterised by the extensive use of spolia, rubble, bricks, and mortar and clearly identifies the wall as Roman, late antique or of later date. It is quite striking that the material used for construction has been carefully chosen and aesthetically arranged: neatly dressed limestone blocks (0.50 × 0.80 × 0.30 m) are laid out in the exterior shell as headers (short sides to the front of the wall); the gaps between the blocks are filled with rubble stones, brick and mortar. The interior shell of the wall consists mainly of rubble, a few broken bricks and some prehistoric grain rubbers[43]. The lime mortar used for construction is finely tempered, has few inclusions of pebbles and is generally of high quality.

Two aspects stand out: the high quality of the construction and the use of spolia. As Enceinte D is obviously the only building at the acropolis built in this manner, one can assume that it was a free-standing hilltop fort for a garrison that was well organised. The finds of large amounts of amphorae from the 5th and 6th centuries AD[44] make a connection with the fort and this deposit possible. Although no other pottery was found in connection with this wall, a date close to or earlier than the amphorae seems reasonable to assume, as it is hard to imagine that the amphorae were used without any structure in the vicinity.

42 Alram-Stern 2020.

43 We thank C. Regner, who is preparing a general study of the material in Aigeira, for the interpretation of the grinding stones.

44 The amphorae have been studied by E. Tzavella, see Tzavella (in preparation).



15 a View of Vlovoka from the south (© A. Sokolicek)

The other important aspect concerns the reused material, which most probably comes from nearby buildings. The most likely candidates for determining the origin of the finely dressed blocks in the exterior wall are the religious building(s) on the acropolis, which Wilhelm Alzinger identified as the foundations of the so-called Temple B[45], which, however, cannot be reconstructed in the proposed form[46]. Final proof of origin is therefore still lacking. The rubble stones in the interior face and the filling of the wall resemble the blocks from the Mycenaean architecture. As the construction of the wall did have an impact on the previous buildings, it is most likely that the rubble masonry was taken from the Mycenaean buildings.

As a result, it seems most probable that the wall is part of a hilltop fortification of the 5th or 6th centuries overlooking the Corinthian Gulf[47]. The wall on the acropolis seems to stand on its own, and according to the results from previous excavations, no Late Antique or post-Antique settlement structures are known in the acropolis area[48]. A first analysis of the post-Antique finds from the acropolis shows that the hilltop was frequented until at least the 14th century[49].

Rural fortifications (figs. 15 a. b)

In addition to the city walls, a series of small fortifications identified in the »EGIALEA survey«, conducted in the nearby Krios valley by the Italian Archaeological School of Athens and the University of Salerno, shows the dominant role of Aigeira in the

15 b The fort of Vlovoka (© F. Iannone)

45 Alzinger 1985, 431–450.

46 We thank G. Ladstätter and W. Gauß for discussions of the blocks.

47 Late Antique fortified hilltop settlements become common from the 6th/7th cent. onward see Chavarría – Lewit 2004, 34 with extensive bibliography.

48 Only loose finds from post-Antique and medieval times testify to some kind of presence; however, a more definite identification cannot be offered.

49 See Gauß (in preparation) and Tzavella (in preparation).

region, making the polis and neighbouring communities a place that was difficult to conquer and easy to defend. Two fortifications in Vlovoka, as well as other small towers in the Krios valley, seem to play a vital role in the defensive system of Aigeira and contribute to the control of the Krios valley that leads to the nearby village of Phelloe[50].

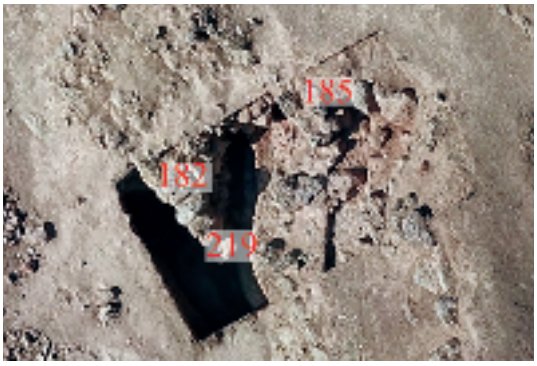
Alexander Sokolicek

THE NEW EXCAVATIONS OF THE FORTIFICATION WALLS OF AIGEIRA

The excavations of the historic fortifications started in 2018 with two trenches (S2018-001 and S2018-002) focused on the understanding of Enceinte B. Trench S2018-002 (fig. 16) is located in the central part of the southern side of the fortification. The trench was placed in this area because of a misalignment of the route of the walls in this section, visible from aerial photos and earlier drawings[51]. The first assumption was to interpret it as a tower or an entry/gate. The general condition of the area is very complicated to understand because it was subject to seismic events that have disturbed the area on several occasions over time. In fact, the excavation has returned a highly compromised stratigraphy.

The most interesting data comes from the southern part of the trench (figs. 16. 17). Here, a wall (USM182) was brought to light in an advanced position in relation to the fortification wall (USM185). This wall consisted of a façade of three medium/large-sized, east-west conglomerate blocks, which rested on a layer of tiles and a lime and pebble floor (USM216). This layer covered a wall (USM219), oriented exactly like the previous one, which is preserved for about three rows and constructed directly on the rock. The last block of the lower row is well worked, probably reused[52]. We can discern at least four phases in this area: the wall, of which three rows are preserved; the layer with floor and tiles; the wall with the three blocks and finally the collapse of the structure.

The presence of this wall in an advanced position with respect to the fortification wall has proved to be a constant throughout the entire southern part: in fact, the fortification seems not to consist only of a double-faced wall, but of a set of two lines: a double-shell back wall and a *proteichisma*. From the autopsy analysis of the seven segments still standing in this part of the circuit, we have noticed that the fortification system seems to be composed of an inner wall made of a double curtain wall and a wall in a more advanced position (fig. 18). The inner wall was made with a rougher technique, with small and medium-sized blocks roughly cut and filled with gravel. The external wall, on the other hand, as can be seen in Sector 4, had roughly cut blocks in a fairly regular shape, albeit of different sizes[53].



16 Trench 2018-002 (© OeAW-OeAI)

17 Trench 2018-002: USM182. 216. 219 (© OeAW-OeAI)

50 Pontrandolfo et al. 2016.
51 Drawings by G. Ladstätter and M. Weißl in the archive of the Athens branch of the OeAI.
52 Sokolicek – Iannone 2019, 270 f.
53 Sokolicek – Iannone 2019, 271.

The enceinte does not seem to follow the slope with a circular course but the change of direction in some parts suggests a circuit with indented traces. The presence of transversal walls between the two curtains may indicate the use of bridles to stabilise the structure.

The type of construction points to monuments dating to Hellenistic rather than Archaic times[54]. It is only in Sector 5, USM507, where there is an east-west wall of which three large blocks of the first row are preserved, that it would seem to pertain to an earlier phase of the enclosure (fig. 6). The blocks, in fact, have an almost polygonal shape and the conglomerate from which they were excavated seems finer than that of the other blocks of the walls recognised in this area.

The northwest of Enceinte B, trench S2018-001 was laid out to define a chronology for this stretch of wall in order to rule out or verify the theory of an Archaic enceinte around the acropolis (see fig. 9). Excavation revealed a double curtain wall, similar in structure to the wall of the southern stretch excavated in trench S2018-001. Below the inner face, there are remains of an older wall which could not be identified. The filling of the wall consists of small and medium-sized stones, tiles of various types and ceramic fragments. The materials under study seem to refer to a chronological horizon of Late Hellenistic times. At this point, an Archaic date cannot be proved[55].

The excavations of 2019 focused on the western part of the fortifications (figs. 1. 11). The purpose was to define the course of the wall in this part of the city and to obtain clues to its architectural design and dating. Trench S2019-001 was located in the plateau under the Solon structure in the area used as a parking space, regularly used for summer tourism events. This segment of the wall was identified by geophysical analysis in 2018. The excavation was particularly difficult because the soil was extremely compact due to cars parking there and, as a result, was extremely hard to dig out.

The excavation activities were concentrated on a trench of 5 × 4 m[56]. After removing a layer of humus (SU 443) and a *colluvium* layer (SU 447), it was clear that the fortification wall was built with two shells (*emplekton*) consisting of an exterior wall in the west (SU 446), orientated north-south, the filling (SU 451), and of an interior wall on the east side (SU 455). Furthermore, in the northern part of the trench, the fortification wall curved in a direction from northwest to southeast, forming a 120° angle (figs. 11. 19).

The walls consist of large conglomerate blocks (1 × 0.8 m to 2 × 0.8 m) arranged in an orthogonal masonry, of which two rows of the exterior wall and two rows of the interior wall are preserved. The foundation of the exterior wall is higher than the interior wall, which is due to the natural slope of the terrain. The wall filling consists of large blocks in conglomerate, one carefully cut from limestone (reused from an older building, not identified), small stones, a large quantity of tiles, and some sherds. The uppermost blocks do not constitute the original height of the wall, but it is unclear whether further rows are missing or whether the structure was built in mud-bricks. On top of the uppermost blocks, a series of tiles were uncovered; whether they belong to a later phase of repair, reuse or any other context is not clear.

A striking find of two large postholes (SU 532 and SU 535) near the interior wall might explain the construction technique of the wall (fig. 20). These holes – used to hold wooden poles, not preserved – relate to a crane used for lifting heavy blocks. The discovery of this worksite area is very important because only a few archaeologically excavated examples attest to the use of cranes, such as in Phaistos (Crete)[57] or at the Temple of Poseidon at Isthmia. Nevertheless, the extensive use of machinery to build heavy architecture is well known from various sources[58].

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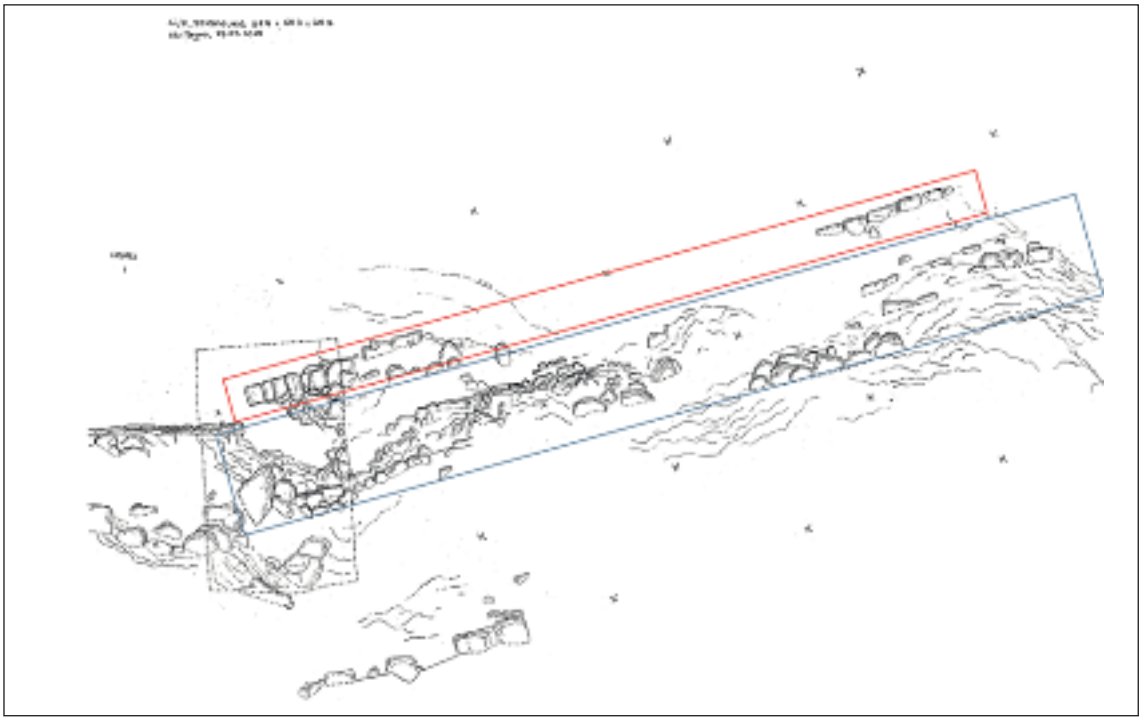
54 See von Gerkan 1935; Bisbee 1937; Martin 1947/1948; Winter 1971b, 423 f.; Coutsinas 2013, 72–74.

55 Sokolicek – Iannone 2019, 271.

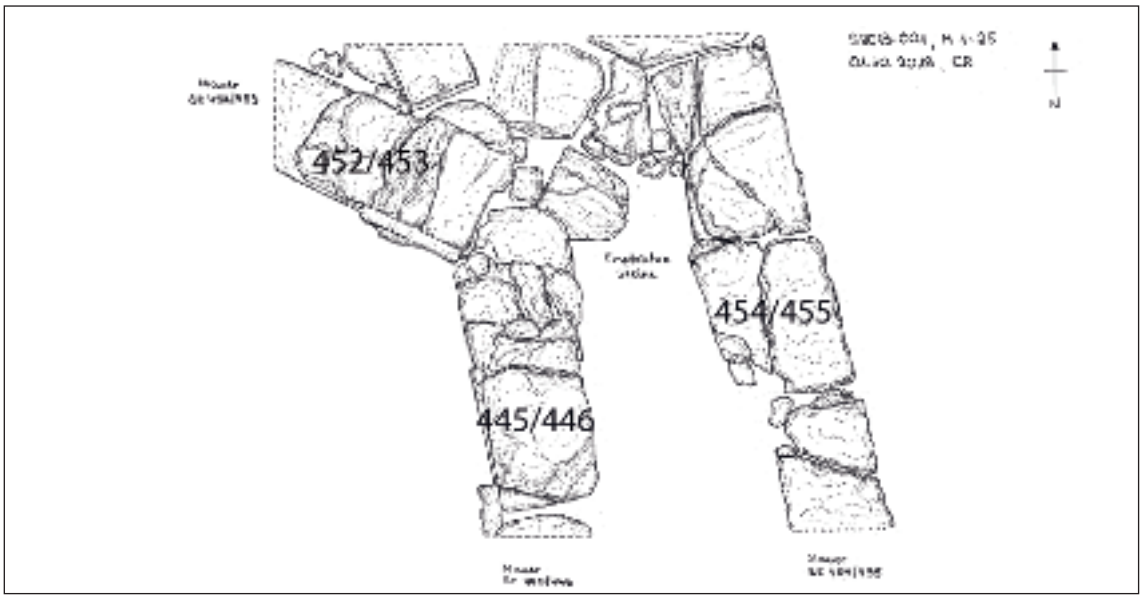
56 The trench was first laid out as 3 × 2 m and was later extended to the west and the east.

57 Longo 2017, 505 f.

58 Wilson 2008.



18 The fortification wall and its *proteichisma* (© OeAW-OeAI/C. Regner)



19 Trench 2019-001 (© OeAW-OeAI/C. Regner)

In the west extension, outside of the city, at a depth of 0.6 m, a silty sand layer (SU 469), with light-brownish friable soil, was identified. In the southwest corner of this layer, two vases, a feeder and an almost entirely preserved unguentarium were found. After digging a further 0.3 m, we were able to reach part of a tomb (SU 502 and SU 507), which has a difficult stratigraphy. It is seriously invaded by roots and its original setting is in disarray; the cause of demolition cannot be identified clearly but may be connected with the theft of stones from the city wall nearby (the removal of blocks in a later phase) or with construction work associated with the modern parking area. In fact,

20 The postholes near the interior wall (© OeAW-OeAI/C. Regner)

21 The rest of the burial (© OeAW-OeAI)

22 Trench 2019-002 (© OeAW-OeAI)

only fragments of a skull from a presumed skeleton were preserved, but the vases – definitely to be interpreted as grave goods – are almost intact (figs. 21. 22). The stratigraphy and the material from the grave have allowed us to conclude that the tomb can indeed be dated later than the foundation of the wall. The discovery of this grave site is extremely important, not only to comprehend the urbanistic organisation of Aigeira, but also for our understanding of the entire polis of Aigeira. This is the very first historic tomb of the city ever to be excavated. It adds significant new information to Otto Walter's (archaeologically unsupported) discussion of a necropolis on the western side of Aigeira[59]. A preliminary study of the pottery from the tomb (SU 469, 502) dated the newly found grave in the first half of the 2nd century BC. The material from the filling (SUs 451, 547, 555, 559, 564, 566, 568) is dated in the 3rd century BC, as is the pottery from the east extension. In the west extension, the pottery from layers above the grave dates to the 2nd to 1st century BC.

A second trench (S2019-002) next to the road from Aiges to Vlovoka revealed a c. 5 m-long stretch of the fortification wall, which was cut during the construction of the modern road (figs. 12. 23). The visible stretch, 3 m wide, consists of an *emplekton* wall (SU 573 and SU 578) with two shells of up to three rows of orthogonal blocks and a filling (SU 582) of conglomerate blocks,

59 Walter 1919, 11 f. refers to »ancient tombs« found in the west part of Aigeira, discussing the uncertain borders of the town: »Die Stadtmauer, deren Lauf sich noch fast durchwegs sicher feststellen läßt (Abb. 7), schließt ein Gebiet von ungefähr einem halben Quadratkilometer ein, wobei es vielleicht fraglich ist, ob der ganze westliche Teil, wo jetzt die Weinberge liegen, bewohnt war. Nach Aussage der Besitzer finden sich dort antike Gräber; ist die Angabe richtig, so wären die Grenzen der eigentlichen Stadt enger als die des aus fortifikatorischen Gründen ummauerten Gebietes. Die Mauer hat eine Breite von ungefähr 1,50 m und besteht aus zwei Zügen isodomen Quaderwerkes mit Zwischenfüllung aus Erde.« As the nature and date of the »ancient tombs« is not clear, further interpretation of O. Walter's account is so far not possible.

tiles, and a few sherds. Traces of mud-bricks, visible in the profile (not excavated), allow for a reconstruction of a base wall of two to three rows of blocks only, and an upper part completely made of mud-bricks. The preliminary study of the pottery from this trench dated the wall to the Hellenistic period, probably in the 3rd century BC.

Federica Iannone

CONCLUSION

According to the current state of our knowledge, it seems that there was no gradual extension of the fortified area. Enceinte B protects an area of 3.5 ha, while Enceinte C encloses an area of about 50 ha. Recent excavation has proved that Enceinte B is not a coherent Archaic structure but consists instead of various lines built in different periods of time, most of it in Late Hellenistic times. So far it has not been possible to date the few examples of fine polygonal masonry (USM507) which do not belong to the Hellenistic Enceinte B.

The structure on the southern slopes, built after the polygonal wall USM507, seems to have required a huge construction effort with a double-faced wall and perhaps a *proteichisma*[60], which could in fact represent the southernmost part of the Hellenistic fortification, thus forming a single system with Enceinte C. The pottery points toward the first half of the 2nd century BC for a construction date of the southern part of Enceinte B, whereas the parts of Enceinte C in the western section of the city (excavated in 2019) had already been constructed in the 3rd century BC.

Up to the current stage of the project, we can assume that in the Hellenistic era the fortification wall had several phases of construction or reconstruction. The trenches planned for future excavations, in the northern part of the city, will hopefully help us to understand the circuit and the chronology of the fortification enclosure, the identification of its various phases and its development in relation to the urban space.

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[60] Winter 1971a, 120; Lawrence 1979, 275–301; Theocharaki 2011, 124.

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Walter Gauss

OBSERVATIONS ON MONUMENTALISATION AND THE CHOICE OF SPACE AT AIGEIRA

ABSTRACT
The ancient site of Aigeira is located in the region of ancient and modern Achaia, on the southern shore of the Corinthian Gulf, halfway between modern Corinth and Patras. In this paper observations on the monumentalisation of space between the 7th century BC and the 1st century AD are discussed. In the first section, various aspects of monumentalisation are analysed, and in this regard, the term »demonumentalisation« is introduced, e.g. the deliberate undoing or repurposing of monumentalised spaces. The second part of the contribution focuses on three distinct areas that were monumentalised at different periods in time – the acropolis area in Archaic times, the so-called Solon area since the late 4th century BC and the theatre area from the 3rd century BC to the 1st century AD.

Presented in this paper are observations on the monumentalisation of space at Aigeira, a site on the southern shore of the Corinthian Gulf (Peloponnese/Greece) in the region of modern eastern Achaia[1]. Aigeira is one of the few places in this region with natural landscape conditions (geological and topographical) suitable for enduring habitation, despite its location along one of the most active seismic fault lines in the Mediterranean[2]. Some advantages of the site are its stable bedrock and control of coastal and inland routes. Some obvious disadvantages are its steep slope, requiring extensive terracing (apart from a few areas), which resulted in a massive anthropogenic rearrangement of the landscape, and its almost complete lack of a natural water supply, which necessitated water management that included the construction of major hydraulic installations.

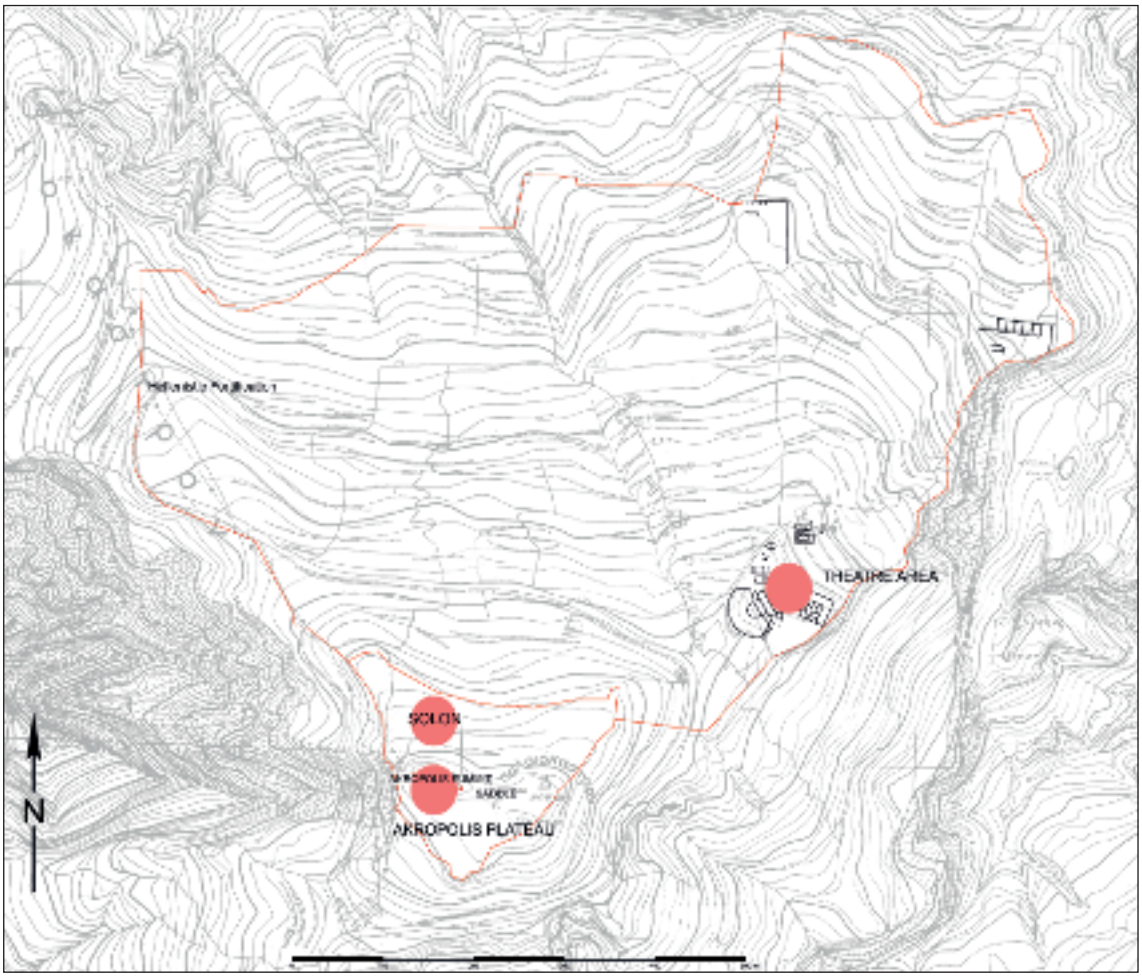
We believe that the complex terrain of Aigeira favoured the development of monumentalised spaces in certain areas that were then occupied with public buildings. Moreover, it seems as if these spaces were monumentalised in different periods. Several stages of monumentalisation as well as episodes of »demonumentalisation« (see below) can be observed at the summit of the acropolis, the ›Solon‹ building, and the theatre area (fig. 1). However, the historical background that led to the monumentalisation of these spaces can only be assumed due to the sparse ancient written sources.

In this paper we focus on the time span between the 7th century BC and the 1st century AD, the historical periods archaeologically best known at Aigeira. Before doing so, it should be emphasised that monumentalised spaces existed before and after the period discussed here, e.g. in the mid-12th century BC, with the construction of the Mycenaean fortification wall. Furthermore the three areas mentioned above represent the best-known monumentalised spaces explored so far, but others may have existed as well, particularly north of the Hellenistic theatre in the areas today known as Koupina and Palati[3]. For these spaces, adequate archaeological evidence is not yet available, but it is hoped that this gap will be filled by the ongoing

1 I would like to thank C. Baier, G. Ladstätter, F. Ruppenstein and D. Scahill for stimulating discussions on this topic. Research work on this topic was in part made possible by the FWF-funded project P34614-G. The historical development of Aigeira was more recently dealt with by e.g. Morgan – Hall 2004, 479 f.; Gauß 2022b; Gauß (in preparation) a; Gauß – Ruppenstein 2024.

2 Beckers et al. 2015; Koukouvelas et al. 2017; Kolaiti et al. 2019.

3 Bammer 2001; Morgan – Hall 2004; Gauß 2022b.



1 Plan of Aigeira with monumentalised areas (© OeAW-OeAI/W. Gauß)

collaboration between the Greek Antiquities Service at Patras and the Austrian Archaeological Institute, which has a particular focus on the urban development of Hellenistic and Roman Aigeira[4].

MONUMENTALISATION

Monumentalisation commonly refers to the process of making something exceptionally large and enduring, especially with regard to public architecture, or to creating an enduring memorial[5]. However, »absolute judgements are not possible« and explicit and practical criteria for assessing

[4] The 2019–2022 collaboration was led by A. Koumousi, the director of the Antiquities Service of Achaia (Patras) and by B. Eder, director of the Athens branch of the Austrian Archaeological Institute. Since 2023, research has continued under the direction of A. Koumousi and the Department of Antiquities in Patras, and with the collaboration of the author and his team. Work at Aigeira is conducted by Ch. Katsarou (Antiquities Service of Achaia) and the author, together with D. Scahill. Apart from the institutions mentioned above, research is also partly funded by the Austrian Science Fund (FWF) project P 34614-G.

[5] See e.g. Assmann – Harth 1991, 14; Alcock 2002, 28; Bradley 2002, 82. 84; Hansen 2004, 140 n. 48; Thomas 2007, 1–14; Meyers 2012, 6–14; Brunke et al. 2016, 250–252; Levenson 2019; Buccellati 2019; Gleiter 2019.

monumentality in terms of function, scale, material, and cost[6] »must be assessed in context, via direct comparison with contemporary evidence«, particularly in times of rapid change[7]. Thus, monumentalisation at Aigeira must be considered with a holistic view in mind that encompasses its site-specific, local, regional, chronological, and historical contexts.

In this paper we follow John Ma's rather broad definition of monumentalisation as »the deliberate creation of places, buildings, artistic works, that themselves make memory, thus reaffirming identity in the present, and pass it on to the future«[8]. Therefore, monumental space at Aigeira may be defined as a place occupied by buildings and art of such scale and elaboration that they »exceed the requirements of any practical functions«[9]. Ideologically, we see monumentalisation as a practical choice to communicate power and organisation[10] that also reaffirms identity[11] or indicates institutionalisation[12]. The case of Aigeira, furthermore, also makes clear that discussions of monumentalisation must consider the deliberate undoing or repurposing of such spaces, i.e. simple abandonment or active dismantling[13], and even the loss of memory[14]. This aspect has not yet been sufficiently considered in other discussions of monumentalisation, and until it is comprehensively defined, we would like to use the term »demonumentalisation« as an umbrella term[15]. Scheduled for the future, but due to limitations of space not possible here, is a discussion of the stages between monumentalisation and potential »demonumentalisation«, e.g. repairs, renovations, or upgrades that may constitute major building programmes in their own right.

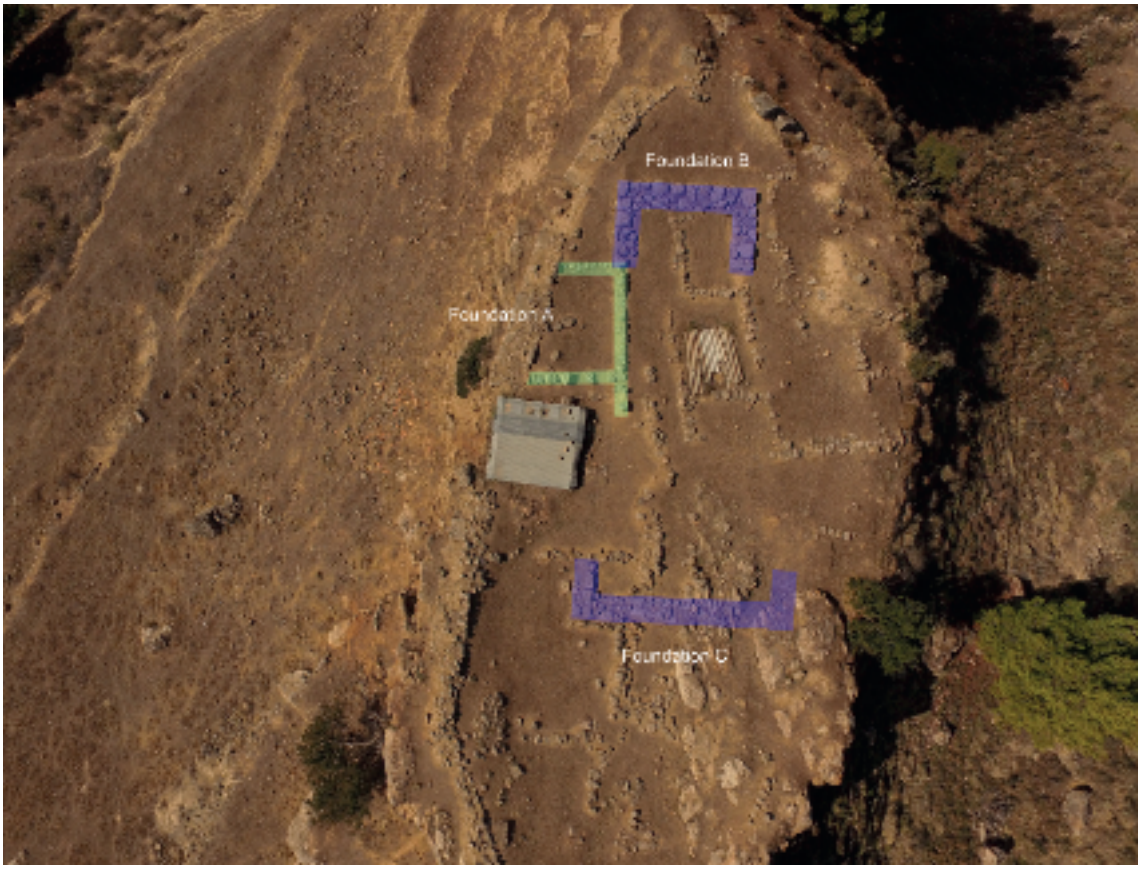
THE ACROPOLIS AREA

The acropolis area is essential for discussing queries related to an early stage of monumentalised space at Aigeira. The term »acropolis area« refers to the highest part of the settlement area in terms of elevation (c. 440 m above sea level), today called the acropolis (summit), and the plateaus to the south and east of it (lower plateaus), about 20 m lower in elevation; in total an area of about 10,000 m² (fig. 2).

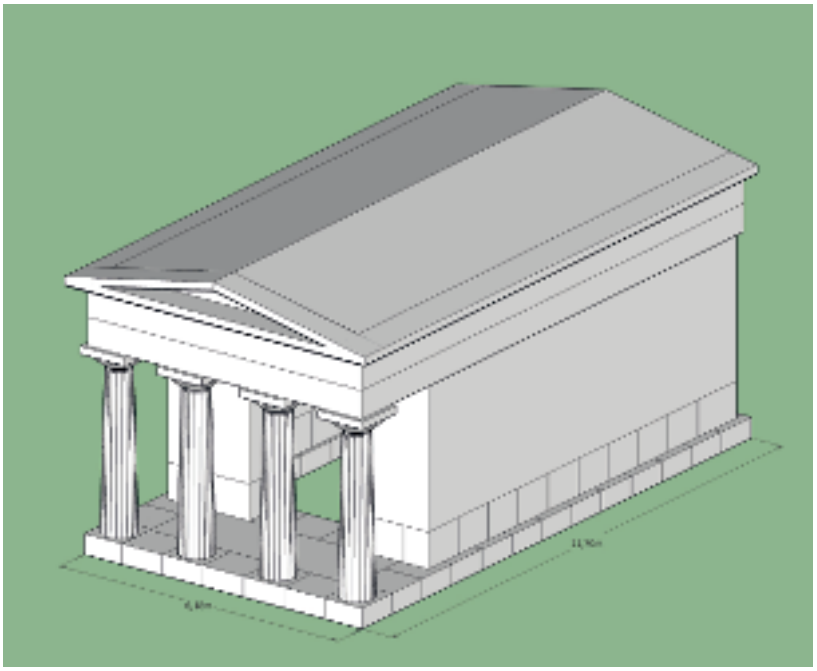
Excavations at the acropolis area revealed the remains of a prehistoric settlement that reaches back to Neolithic times[16]. Best known is the Mycenaean settlement of the 12th to 11th century BC. The summit of the acropolis and perhaps even parts of the settlement on the lower plateau were then protected by a fortification wall[17]. Aigeira is the only fortified site in the region and it should be understood as an important regional player that in all likelihood also controlled the neighbouring valleys. However, in the course of the 11th century BC the Mycenaean settlement at Aigeira ceased and the acropolis area may have not been inhabited for several generations[18]. From the first half of the 8th century BC, renewed activity is attested in the acropolis area: the summit became a locus of ritual activity as early as the late 8th century, but almost certainly no later than the first

6 Quote: Hansen – Fischer-Hansen 1994, 23 n. 2; similarly Hansen 2004, 140 n. 48. Regarding the question whether small-sized architecture can be monumental see e.g. Gleiter 2019.
7 Quote: Morgan – Coulton 1997, 104 f.; cf. also Meyers 2012, 6. 12.
8 Quote: Ma 2009, 248.
9 Quote: Trigger 1990/1991, 119. It needs to be stressed that the term »practical« in this respect needs further definition.
10 E.g. Blanton 1994; Rapoport 1990; Trigger 1990/1991.
11 E.g. Bradley 2002: 82. 84; Ma 2009.
12 Morgan 1990, 5.
13 E.g. Alcock 1993, 175–180. 196; Alcock 2002, 31. 46 f.; Alcock 2012; Autenrieth – van Boekel 2019.
14 E.g. Assmann 2010, 327; Alcock 2002, 31.
15 Studies of Late Antiquity and the Middle Ages commonly use this term, see e.g. Wickham 2005, 625, but it is uncommon in studies of previous periods. See also Autenrieth – van Boekel 2019.
16 See e.g. Alram-Stern – Deger-Jalkotzy 2006; Gauß 2018; Alram-Stern 2020.
17 See e.g. Gauß 2019; Alram-Stern 2020; Gauß (in preparation) a.
18 Gauß 2022b; Gauß (in preparation) a.

2 The acropolis summit and acropolis plateau, at the left, the so-called Solon area. View towards the east (© OeAW-OeAI/C. Kurtze)



3 The summit of the acropolis with foundations A, B and C (© OeAW-OeAI/C. Kurtze, with additions by W. Gauß)



4 Tentative reconstruction of the Late Archaic/Early Classical building on top of Foundation B (© OeAW-OeAI/D. Scahill)

half of the 7th century BC[19]. At present, however, the ceramic finds cannot be linked with certainty to any of the architectural structures known on the summit. The most promising candidate for an early cult building is the so-called Building A, a small rectangular building at the southwestern edge of the acropolis summit. W. Alzinger's tentative reconstruction is based on the well-known model from the Heraion at Argos (fig. 3)[20]. However, its chronological classification ranges between the end of the Mycenaean settlement in the 11th and the 6th century BC, and unfortunately, for the time being, cannot be more precisely dated[21].

From the mid-6th century BC onwards, the acropolis summit became monumentalised, presumably in a stepwise process[22]. This is indicated by the range of finds, their functions, and the several phases of building activity. Noteworthy is stone architecture built in the Doric style, as testified by several Doric capitals since the mid-6th century BC[23]. Furthermore, the existence of a cult building on the western part of the acropolis, the so-called Building B that was roofed with a high quality Corinthian roof of the late 6th or early 5th century BC, is proven. A structure in front of it to the east, designated Building C, possibly served as a small altar (figs. 3. 4). A polygonal terrace wall built at the southeastern foot of the acropolis summit also belongs to the Late Archaic to Early Classical period. It enclosed the steeply rising rock in a monumental manner and perhaps marked the boundary of the sacred precinct (fig. 5)[24].

The historical reason for the monumentalisation of the sanctuary on the summit of the acropolis remains an open question for now. In our opinion, the repeatedly cited raid by the Sicyonians (Paus. 7, 26, 2–3) should not be used as a reference to a historical event. This account, discussed in more detail elsewhere, ought to be interpreted as an attempt by the Aigeiratans to give their

19 Alzinger et al. 1985; Schwarz 2001; Gauß – Ruppenstein 2024.
20 Alzinger 1983, 36; Alzinger 1988, 23; Alzinger et al. 1985, 449.
21 Gauß – Ruppenstein 2024.
22 Heiden (in preparation); Scahill (in preparation); Gauß – Ruppenstein 2024.
23 Scahill (in preparation).
24 Gauß (in preparation) a.

5 Late Archaic/Early Classical terrace wall on the southern slope of the acropolis summit (© OeAW-OeAI/W. Gauß)

own history a mythological dimension extending back in time to the Homeric past[25]. Moreover, it seems perfectly reasonable to link the monumentalisation of the acropolis summit and another area closer to the theatre, which was built much later, (see below) with the formation of an Aigeiratan identity. Unfortunately, archaeological research at Aigeira has so far not succeeded in uncovering traces of the associated Archaic or Classical settlement, either in the area of the acropolis or elsewhere within the boundaries of the later Hellenistic and Roman city. Therefore it seems problematic to connect the creation of monumentalised space(s) at Aigeira, interpreted here as an expression of group identity (with respect to their formation), with the establishment of a nucleated settlement, and the foundation of the polis of Aigeira. At present, not enough is known about the Archaic and Classical periods at Aigeira, which at that time may have been a loose community consisting of individual farmsteads and hamlets stretching from the coast to the hinterland of the Krios valley[26]. In any case, the sanctuary on the acropolis summit and the other not yet precisely localised monumentalised area (see below) were in all likelihood the religious and presumably also political centres of this community. Furthermore, the monumentalisation of the acropolis summit created a landmark that was visible from the Corinthian Gulf and its coastal region, as well as from the hinterland.

The history of the sanctuary on the acropolis summit is less clear in Late Classical, Hellenistic and Roman times. The assumption that it was deliberately abandoned, demonumentalised and relocated in Hellenistic times to the generously extended public centre in the theatre area needs to be re-evaluated[27]. Moreover, there is now good ceramic evidence for the use of the acropolis summit in Late Roman, Byzantine and medieval times (14th cent. AD). In addition, the late enclosure wall of the summit belongs to one of these phases, although it is not yet clear to which one[28]. The enclosure wall includes spolia from Building B and other structures (see

25 Gauß 2022b.
26 Pontrandolfo 2016, 289. 291; Scafuro 2016, 298.
27 Gauß (in preparation) a on previous interpretations with further references.
28 Sokolicek (in preparation); Tzavella (in preparation).

6 Areal view of the Solon building after excavation in 2012 (© OeAW-OeAI/S. Gesfaidis)

above), which precipitated massive interventions that in all likelihood destroyed and demolished existing remains down to the level of the Mycenaean settlement. The absence of post-Classical remains may therefore be rather due to these interventions than to an assumed abandonment in the Hellenistic period. This interpretation is supported by excavations on the southeastern foot of the acropolis, where Hellenistic and Early Imperial Roman pottery was found that must have come from the summit and either slid down or was deliberately thrown down from the summit. Therefore, it can be postulated that the sanctuary on the summit existed considerably beyond the Late Classical period, otherwise a repurpursing of the sacral space must be assumed in this period.

THE SOLON AREA

On a terrace north of the acropolis summit, about 50 m lower in elevation, an extended multiphase public building, the so-called Solon complex, was mostly uncovered between the late 1990s and 2011[29] (figs. 2. 6). The lavishly equipped building includes an *andron* with a high-quality mosaic floor, as well as plastered and painted walls, and presumably functioned as a *xenonas* hosting official delegations and embassies (fig. 7). This building complex represents the chief development of another phase of monumentalisation, not least due to its size of almost 1000 m² and lavish equipment. Current interpretation implies a construction date in the 4th century BC and several

[29] Ladstätter 1999; Jahresbericht 1999, 370 f.; Jahresbericht 2000, 253 f.; Jahresbericht 2001, 358 f.; Jahresbericht 2002, 330–332; Jahresbericht 2003, 388–390; Jahresbericht 2004, 367 f.; Jahresbericht 2005, 361 f.; Jahresbericht 2006, 433 f.; Jahresbericht 2007, 433 f.; Jahresbericht 2008, 37 f.; Jahresbericht 2009, 38 f.; Jahresbericht 2010, 74 f.; Jahresbericht 2011, 92–94; Jahresbericht 2012, 88 f.; Jahresbericht 2013, 94–97; Trümper 2014, 211 fig. 9; Scheibelreiter-Gail 2022.

7 The mosaic in the *andron* of the Solon building (© OeAW-OeAI/S. Gesfaidis)

alterations of its plan in the 3rd century BC[30]. A short stretch of a wall underneath its foundations indicates even earlier building activity of undetermined date[31]. Considering the proposed foundation date of the Solon complex, it is very tempting to link it with the establishment of the polis of Aigeira (at least in political terms) in the later 4th century BC, at the same time that Aigeiratan coinage seems to start and an Aigeiratan *proxenos* is mentioned at Delphi[32]. The Solon complex may therefore be viewed as the »structural constitution of the polis«, a term coined by K. Rheidt for the development of the polis in the 4th and 3rd centuries BC[33].

The Solon complex is furthermore of special interest, as it is the only building excavated so far at Aigeira that bears archaeological evidence for the Aitolian assault of 219/218 BC (Pol. 4, 57–58). A hoard of silver coins was found hidden in a cooking jar, and buried underneath the floor of the building, with the latest coins dating shortly before to 219 BC[34]. It is not yet clear to what extent the building suffered from the assault, but its abandonment and the subsequent deliberate dismantling happened considerably later within the 2nd or 1st centuries BC[35]. Further detailed studies will address the date of abandonment and whether the dismantling was related to recycling building materials, and/or to the phenomenon of »demonumentalisation«.

The choice of this particular site for monumentalisation of the Solon complex is less obvious than in the case of the acropolis summit. The Solon complex is not visible from the coast or the immediate hinterland, nor is there a stone quarry nearby for building material. Nevertheless, the most likely reasons seem to be the topographical and geological conditions. The relatively flat

30 For further references see Gauß 2022b.
31 Jahresbericht 2005, 361.
32 See Gauß 2022b; see there for the discussion on connecting this event with the catastrophe of Heliki in 373 BC.
33 Rheidt 2015, 306 (»bauliche Konstituierung der Polis«).
34 Jahresbericht 2009, 39.
35 Jahresbericht 2002, 331; Jahresbericht 2003, 389; Jahresbericht 2011, 93.

8 The theatre area towards the Corinthian Gulf; view towards the northeast (© OeAW-OeAI/C. Kurtze)

terrain with physical soil close to the surface is sufficiently wide for the construction of a large building without the need for massive foundational substructures. Moreover, the transition zone between the water-permeable conglomerate rock of the Acropolis and the underlying impermeable marl is located exactly at this spot. Thus, the location of the Solon complex is ideal for extracting water needed in sufficient amounts for bathing and dining activities and actually the only well construction known so far was discovered here. Finally, it should be noted that the Solon complex borders a road[36]. However, it is not clear whether this road existed before the construction of the building or was designed together with it.

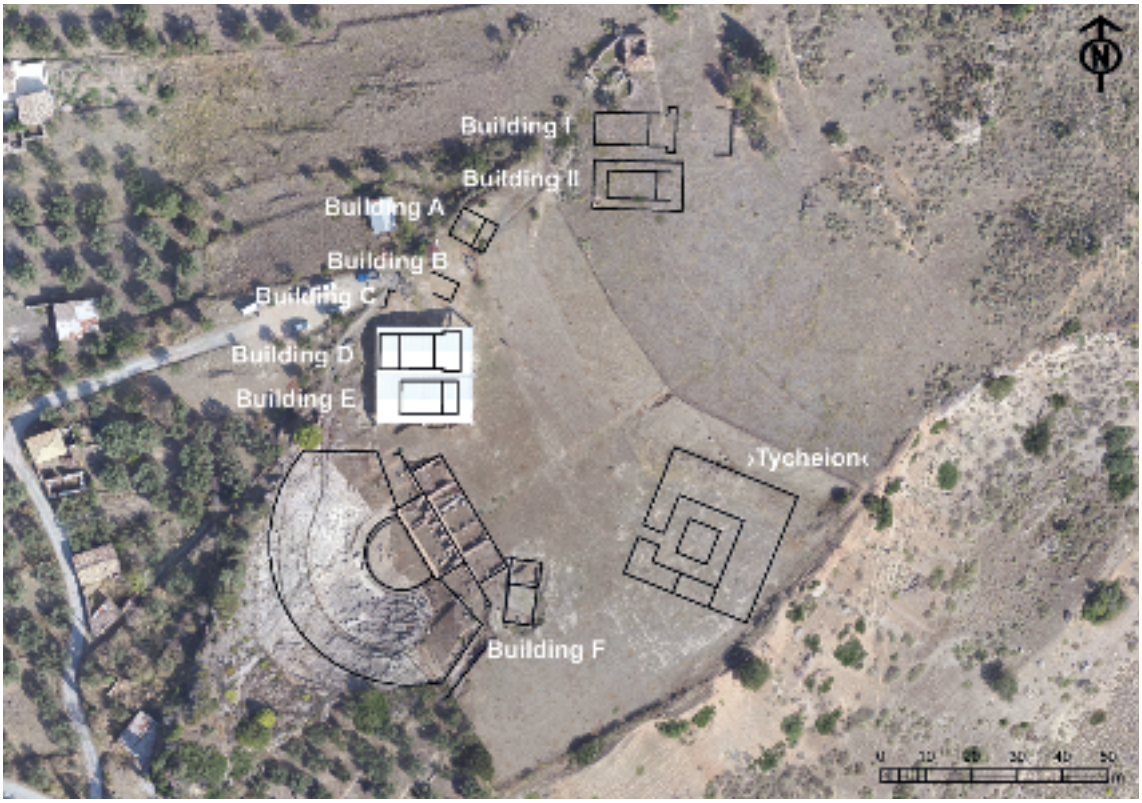
THE THEATRE AREA

The theatre area, located on a large terrace to the northeast of and well below the acropolis summit and Solon complex, is best known for its Hellenistic building ensemble (fig. 8). However, it seems likely that its wider surroundings were first monumentalised already in Late Archaic or Early Classical times. Several Doric capitals and other remains of a monumental building of that time period were used as spolia in the foundations of two Hellenistic buildings at the northwestern edge of the theatre area[37]. It should be noted, however, that no foundation remains in question were observed during the geophysical investigations of the theatre area and that Archaic or Early Classical pottery from here is almost entirely absent[38]. Therefore it should also

36 Jahresbericht 2003, 389.

37 Bammer 1996, 35 f.; Bammer 1997, 49; Bammer 1998, 203; Bammer 2001, 95; Bammer 2006/2007, 48 fig. 32. See also Scahill (in preparation).

38 Rusch et al. 2022 (geophysical research); Gauß 2022a (pre-Classical finds).

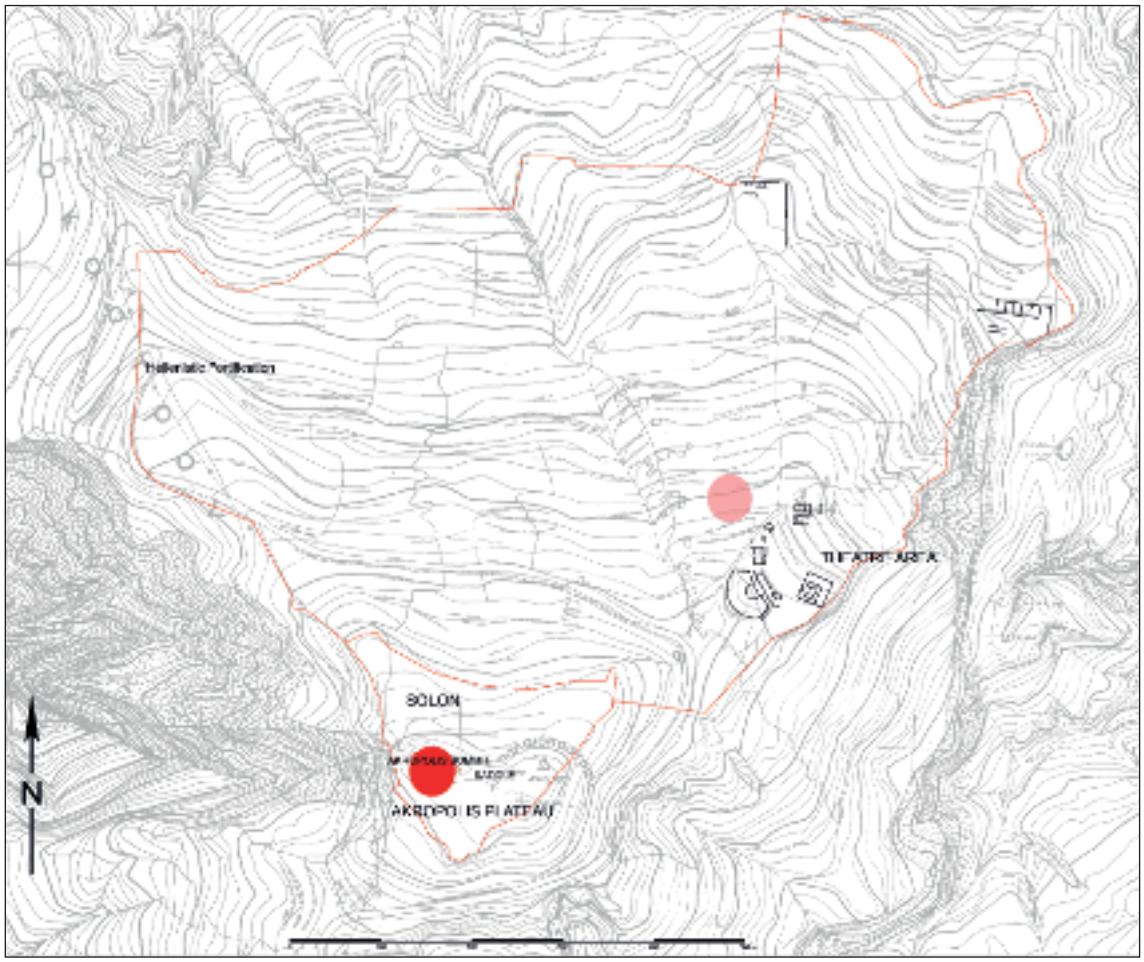


9 The theatre area and its buildings (© OeAW-OeAI/C. Kurtze, with additions by J. Donati and W. Gauß)

be considered that the spolia may have been brought from an unknown location further away[39]. At present, it is not possible to determine the function of this building precisely, although it is certainly public, perhaps even a temple, but we do not know whether it was already in ruins or was deliberately dismantled (»demonumentalised«). In any case, if the location of a Late Archaic to Early Classical public building on the theatre terrace is correct, this in turn could have been the starting point for the later large-scale development of the theatre area into a central area of the Hellenistic city[40].

In Hellenistic times Aigeira was enlarged considerably, as indicated by the extensive circumference of fortification walls and either an already existing public area was monumentalised on a grand scale starting in the mid-3rd century BC or a previously undeveloped area was monumentalised then (fig. 9). In any case, the choice of the theatre area is almost ideal, as outcrops of conglomerate rock can easily be used as building material and remains of an ancient quarry are traceable throughout the area[41]. The monumentalised area in Hellenistic times includes the theatre, perhaps a small stoa[42], at least four small temple-like structures (*naiskoi*), a peripteros, and a large building complex (»Tycheion«). The joining of Aigeira to the Achaean League and the initiation of the monumentalisation process in the theatre area are so close to each other that a connection between the two events is obvious. The assumption that the entire area developed almost at once needs recalibration[43], however, as recent research regarding the construction dates of individual buildings now affords a more nuanced interpretation[44]. The theatre and Naiskos E mark the beginning of a monumentalisation

39 Bammer 1998, 202. For the discussion whether or not building material can be removed from sanctuaries see e.g. Sioumpara 2019; Sioumpara 2020.
40 Gauß 2022b.
41 Gauß – Smetana 2022.
42 Tanner 2019, 72. 96 f. 106; Tanner 2020, 79. 84; Tanner 2024.
43 S. Gogos in: Alzinger et al. 1986, 25; Gogos 1992, 14 n. 9. 119.
44 See e.g. Tanner 2019; Tanner 2020; Tanner 2022; Tanner 2024.

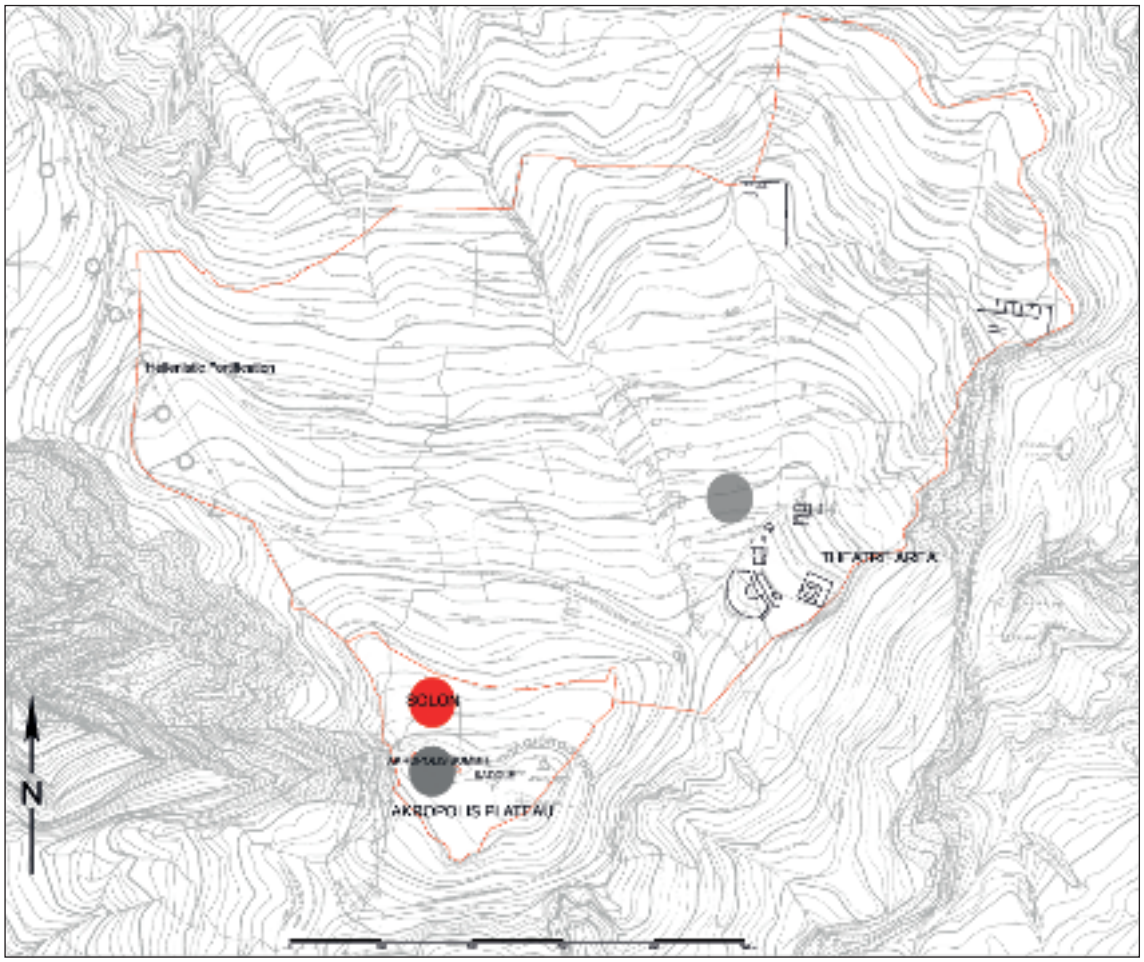


10 Areas of monumentalisation from Archaic to Classical time (© OeAW-OeAI/W. Gauß); full colour: monumentalised areas, reduced colour: uncertain location

process that lasted over a considerable period of time[45]. In this respect, the monumentalised theatre area clearly differs from other Hellenistic cities, where public and political centres respectively were implemented as part of a structural master plan and were usually framed by stoas[46].

With the construction of the so-called Tycheion between the middle of the 1st century BC and the middle of the 1st century AD, the layout of the theatre area changed fundamentally, as the previously open area in front of the theatre was now occupied by a c. 30 × 30 m peristyle building[47]. The function of the Tycheion is unclear and the assumption that it was the »oikema of Tyche« mentioned by Pausanias (7, 26, 8) should be revised[48]. Also the question of whether or not there is a connection between the construction of the Tycheion and the almost simultaneous abandonment and partial dismantling of the Solon complex must be investigated by future studies. If this supposition is correct, it is furthermore reasonable to assume that the Tycheion took over the functions of the Solon complex[49].

45 Tanner 2019; Tanner 2020, 84; Tanner 2022; Gauß 2022b; Tanner 2024.
46 See e.g. Lauter 1986, 98. 102. 109; Rheidt 2015.
47 Gauß 2022b, 475–480.
48 On the Tycheion see Alzinger 1989; Alzinger 1994; Osanna 1996, 257–259; Osanna 1998, 218–222; Hinker 2016a; Hinker 2016b; Hinker 2018; Gauß – Smetana 2022, 79–92; Aurenhammer 2022, 240–265; Gauß 2022b, 475–480; Alzinger 2022.
49 Gauß 2022b, 475.



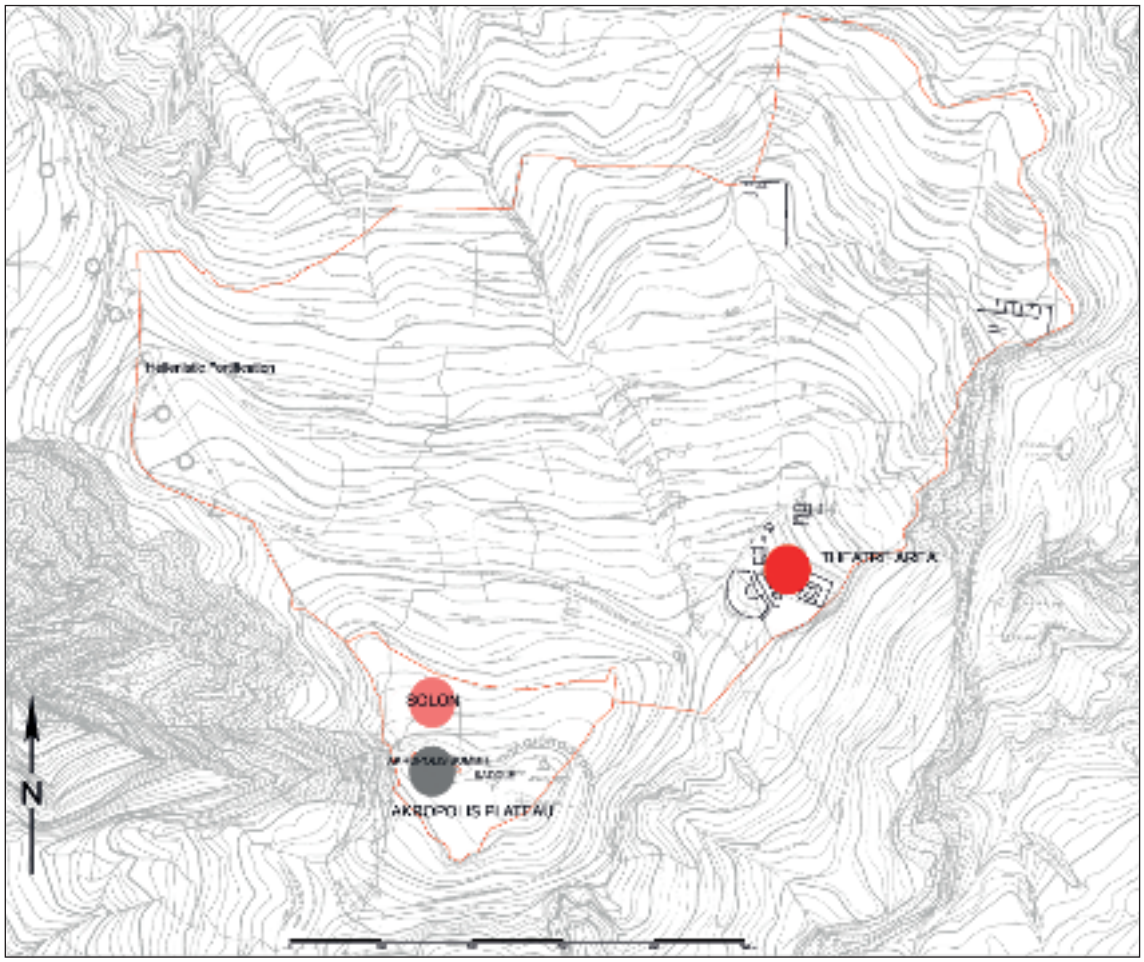
11 Areas of monumentalisation from Late Classical to Early Hellenistic times (© OeAW-OeAI/W. Gauß); full colour: monumentalised areas, reduced colour: uncertain location, grey colour: uncertain status/demonumentalised areas

CONCLUDING REMARKS

At Aigeira an early phase of monumentalisation is best documented on the acropolis summit and can be dated to the late 6th or early 5th century BC (fig. 10). The choice of this specific location is no surprise, as a sanctuary on top of a Mycenaean settlement had existed here since the late 8th or early 7th century BC. The excellent view of the acropolis summit from the Corinthian Gulf and the possibility of quarrying the required building stones on the spot were almost certainly also of importance.

Interestingly, another area was monumentalised at about the same time. Its location is not known, but there are plausible indications that the building is to be sought in the wider vicinity of the theatre area. Here the natural terrain is rather even, not affording massive substructures, and bedrock is visible or very close to the surface and was quarried for building stones. What makes the early monumentalised spaces so interesting is the absence of a corresponding nucleated settlement. Further research should therefore address the question of the extent to which nucleated settlements are necessary for the realisation of such projects.

There is no evidence for additional monumentalised spaces until the 4th century BC, when the Solon complex was founded (fig. 11). The choice for its location is less obvious and may have been determined by the need for a wider terrain for an extended building in combination with demand for a permanent water supply due to the assumed function of the building complex.



12 Areas of monumentalisation from Hellenistic to Roman Imperial times (© OeAW-OeAI/W. Gauß); full colour: monumentalised areas, reduced colour: uncertain location, grey colour: uncertain status/demonumentalised areas

The almost perfect topographical and geological situation of the theatre area in all likelihood determined the choice of this location for its monumentalisation. The cavea of the theatre and parts of the orchestra were hewn out of the bedrock, and the material thus obtained could be used for other constructions. Had there actually been an older building in its wider vicinity (see above), this would certainly have contributed to the choice of this location. In any case, the theatre area was in all likelihood monumentalised in connection with Aigeira's membership of the Achaean League in the mid-3rd century BC. As it seems, the monumentalisation of the theatre area from this point in time did not follow a general master plan but was a gradual process that may have lasted until Early Roman Imperial times (fig. 12). The obvious disadvantage of the lack of wells and springs to supply crowds of people was compensated for by piping fresh water via an aqueduct from the mountains to the south into the theatre area. The observations made here show how strongly the combination of topographical, geological (›natural‹) and historical conditions determined the choice of monumentalised spaces at Aigeira.

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Konstantinos Kissas

ERGEBNISSE DER RETTUNGSGRABUNGEN ENTLANG DER NATIONALSTRASSE KORINTH-PATRAS IN DER GEGEND VON SIKYON

ABSTRACT

The emergency excavations in the Syriona, Chtiri and Moulki areas, carried out by the responsible archaeological authority as part of the large public project to extend the motorway from Corinth to Patras, revealed extensive remains of houses and workshops, water supply facilities, sections of roads and necropoleis dating from the Early Geometric to the Roman period. The excavation areas extend across the plateau to the east of the Hellenistic-Roman city of Sikyon and are bordered by the rivers Asopos (to the south) and Elisson (to the north). The ancient structures were localised during the search trenches excavated in 2008 and 2009, but systematic excavation began in February 2011. The excavation revealed parts of the previously unknown city from the 5th and 4th centuries BC. Its residential units are separated by roads and canals for water disposal. The road network was not laid out in a strict grid plan. These results show the wealth and circumstances under which this settlement area developed before it was abandoned in 303 BC by order of the Macedonian Demetrios Poliorketes and the population moved to the more fortified plateau of the Hellenistic and Roman city of Sikyon.

Die Region von Sikyon, zwischen Achaia und Korinthia, war in der Antike während des größten Teils ihrer langen Geschichte ein autonomer und unabhängiger Staat, dessen politisches und wirtschaftliches Verwaltungszentrum die antike Stadt Sikyon war. Homer bezeichnet Sikyon als »geräumig« oder »umfangreich«. Der Name der Stadt leitet sich nach den antiken Quellen vom jungen König Sikyon ab, der ein Enkel des athenischen Urkönigs Erechtheus war und hierher übersiedelte. Glaubwürdiger scheint aber die Verbindung des Stadtnamens mit σικυόν zu sein, einer Gurkengattung aus der Familie der Kürbisgewächse, die in dieser Gegend häufig vorkommt.

In der mykenischen Zeit unterlag Sikyon der Herrschaft Mykenes. Im 11. Jahrhundert v. Chr. wurde die Stadt von Dorern erobert und blieb bis zum 7. Jahrhundert v. Chr. unter Herrschaft der dorischen Stadt Argos. Danach brachten die einheimischen achäischen Einwohner die Dynastie der Orthagoriden an die Macht. Die Orthagoriden waren unter dem Volk beliebt und etablierten eine jahrhundertelange Tyrannis in der Stadt. Der Gründer der Dynastie war Orthagoras aus Aigialeia, doch wird Kleisthenes, Tyrann von 590–560 v. Chr., für den fähigsten Vertreter der Dynastie gehalten. Kleisthenes ging gegen Argos vor, dessen Aristokratie jahrhundertelang in Sikyon geherrscht hatte, und löste so das alte Bündnis der beiden Städte auf. In der klassischen Zeit war Sikyon für etwa 200 Jahre Mitglied im Peloponnesischen Bund, der unter der Führung von Sparta stand. Sikyon beteiligte sich demnach an den Perserkriegen, dem Peloponnesischen Krieg sowie am Korinthischen Krieg. Im Jahr 369 v. Chr. wurde Sikyon von Theben erobert und geriet unter thebanische Oberhoheit.

Schon vor dem makedonischen Sieg in der Schlacht von Chaironeia (338 v. Chr.) war eine makedonische Garnison in Sikyon stationiert worden. Ein wichtiges Ereignis in der Geschichte Sikyons war die Eroberung der Stadt im Jahr 303 v. Chr. durch den Makedonier Demetrios Poliorketes. Er überzeugte die Bevölkerung davon, die in der Ebene gelegene Stadt zu verlassen, auf die flachen Hügel im Süden zu übersiedeln und dort die Stadt neu zu gründen. Es handelt sich bei dem neuen Ort um das Plateau des heutigen Dorfes Vassiliko. Die Stadt wurde zu »Demetriada« umbenannt, der neue Name aber bald wieder aufgegeben. Der aus Sikyon stammende General Aratos befreite 251 v. Chr. seine Heimatstadt von der makedonischen Herrschaft und brachte

1 Google Map von Sikyon mit Eintragung der Grabungsareale (1–5) und der hellenistischen Stadt (6) (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon auf der Basis von Google Earth)

Sikyon dazu, sich dem Achäischen Bund anzuschließen. Nach der Zerstörung Korinths durch Mummius im Jahr 146 v. Chr. war Sikyon für mehr als ein halbes Jahrhundert das politische und religiöse Verwaltungszentrum der römischen Herrschaft. Im Jahr 87 v. Chr. wurde Sikyon von Lucius Cornelius Sulla Felix geplündert; Kunstschätze wurden nach Rom gebracht. Einem Bericht des Periegeten Pausanias zufolge wurde die Stadt im 2. Jahrhundert n. Chr. durch ein schweres Erdbeben völlig zerstört. Im 6. Jahrhundert n. Chr. wurde sie zu »Neu-Sikyon« und in byzantinischer Zeit zu »Hellas« umbenannt.

Von diesem bedeutenden Stadt-Staat der Antike ist nur die neugegründete Stadt bekannt, die im hippodamischen System angelegt wurde. Die ersten Ausgrabungen auf dem Plateau wurden 1886–1898 von der Amerikanischen Schule für Klassische Studien im Gebiet des Theaters durchgeführt. Seit Anfang des 20. Jahrhunderts haben Alexander Philadelpheus (1920–1926), Anastasios Orlandos (1933–1941, 1951–1954) und Kaliopi Krystalli-Votsi (1982–1988) unter der Schirmherrschaft der Archäologischen Gesellschaft Grabungen im Gebiet der Agora durchgeführt, bei denen der Tempel, die Palästra des Gymnasions, die Stoa und ein Teil des Koilons des Theaters zutage kamen. Seit fast 30 Jahren führt Yannis Lolos die Forschungen auf dem Plateau fort.

Die Erweiterung der Autobahn von Korinth nach Patras machte Notgrabungen erforderlich, die von der zuständigen Behörde für Archäologie durchgeführt wurden. Die antiken Befunde wurden bei den 2008 und 2009 angelegten Suchschnitten lokalisiert, eine systematische Grabung folgte im Februar 2011 und dauerte bis Juli 2017. Die Grabungsareale erstrecken sich über die östlich der hellenistisch-römischen Stadt Sikyon liegende Hochebene und werden von den Flüssen Asopos (im Süden) und Elisson (im Norden) begrenzt (Abb. 1). Befunde, die von der frühgeometrischen bis in die römische Zeit datieren, wurden in den Fluren Syriona, Chtiri und Moulki gefunden. Es handelt sich um ausgedehnte Baureste von Häusern und Werkstätten, Einrichtungen zur Wasserentsorgung, Abschnitte von Straßen sowie Nekropolen. Zuerst werden die Wohnareale, Werkstätten, Kanäle und Straßen besprochen, abschließend die Nekropolen.

2 Syriona, zentrale Wohneinheit (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

BAURESTE IN DER FLUR SYRIONA

Sowohl die Befunde als auch die Funde aus den Grabungsflächen weisen auf zwei Bauphasen hin: eine frühere aus der klassischen und eine spätere aus der spätklassischen Zeit. Durch die Grabung wurde ein Teil der bislang unbekannten Stadt des 5. und 4. Jahrhunderts v. Chr. ans Licht gebracht. Sie zeigt Charakteristika, welche auch bei den großen zeitgenössischen Siedlungen wie Eretria und Olynth zu finden sind. Hierzu gehört die Unterscheidung in Wohneinheiten, die durch Straßen von unterschiedlicher Breite und durch Kanäle zur Wasserentsorgung getrennt werden. Das Straßennetz wurde nicht in einem streng rasterförmigen Plan angelegt. Diese Ergebnisse zeigen den Reichtum und die Umstände, unter denen sich dieser Siedlungsbereich entwickelt hatte, bevor er 303 v. Chr. im Auftrag des Makedoniers Demetrios Poliorketes verlassen wurde; die Bevölkerung übersiedelte dann in eine befestigtere Lage, nämlich in die schon bekannte Hochebene der hellenistischen und römischen Stadt von Sikyon.

Die im Grabungsfeld zentral liegende Wohneinheit in Syriona besitzt eine Länge von ca. 47 m (Abb. 2). Sie besteht aus zehn Räumen, die in drei Flügeln angeordnet sind, und folgt daher einem Haustypus, bei dem alle Räume um einen Hof herum situiert sind. Die Breite des Hofs beträgt ca. 6,5 m und die bekannte Länge 10 m. Südlich und südöstlich des Hofs sind drei Lagerräume erhalten, von denen die beiden südlich gelegenen teilweise unterirdisch verlaufen und neben der Lagerung von Pithoi auch als Küchen verwendet wurden. Der dritte, südöstliche Lagerraum hat einen Pi-förmigen Grundriss mit einem Eingang an der westlichen Seite und war überdacht. Für die Errichtung des Mauerwerks sind Fundamentgräben geöffnet worden, in die große rechteckige Steinblöcke gestellt wurden. Die Nutzung solcher Steinblöcke weist darauf hin, dass der südliche Flügel der Wohnung ein massives Mauerwerk hatte und höchstwahrscheinlich zweistöckig war.

Östlich des Atriums befinden sich drei Werkstatträume, die einen Boden aus Kalkmörtel haben und im Inneren über eine offene Ton-Stein-Leitung zum Wasserabfluss miteinander verbunden sind. Es ist nicht auszuschließen, dass diese Räume auch als Weinpresse gedient haben könnten. Entlang der Nordseite des Atriums wurde eine überdachte Halle mit einer Breite von 3 m und einer sichtbaren Länge von ca. 12 m freigelegt; hier liegt der mögliche Zugang vom Wohnbereich zu den Werkstätten. Auf der Südseite der Halle, in Richtung des Hofs, sind vier Standplatten für Säulen erhalten. Der Nordflügel des Hauses war zweigeschossig, hier handelte es sich wohl um die Vorhalle der Wohnung.

3 Syriona, Mosaikboden eines Androns (1. Viertel 4. Jh. v. Chr.) (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

Die Haupträume befinden sich im Nordflügel des Hauses auf beiden Seiten eines etwa 3,8 m breiten Flurs. Der Eingang zum Flur liegt im Süden, weist in Richtung der Halle und teilt den Flur in zwei Hälften. An der westlichen Hälfte befindet sich der Oikos mit rechteckigem Grundriss von 15 × 10 m. Er ist in drei Räume gegliedert, die nicht nur zu Lagerzwecken, sondern auch für Haushaltsarbeiten benutzt wurden; die große Anzahl von Webgewichten im mittleren Raum lässt die Existenz eines hölzernen Webstuhls vermuten.

An der östlichen Hälfte des Flurs liegt ein rechteckiger, 14 × 7 m großer Raum, der als Andron angesprochen werden kann und Platz für sieben Klinen bot. Fußboden und Wandbemalung weisen diesen Andron als einen besonders luxuriösen Raum aus: Die Wände waren rot und blau verputzt, wie ein *in situ* erhaltener Teil der unteren Wand zeigt. Der obere Teil des Mauerwerks bestand höchstwahrscheinlich aus Lehmziegeln, die auf Orthostaten auflagen. Der Kieselmosaikboden des Androns wurde durch einen Erdrutsch gestört und liegt heute auf zwei Niveaus (Abb. 3). Die Darstellung des Mosaikbodens gliedert sich in drei Zonen, in denen Motive mit weißen Steinen vor einem tiefblauen Hintergrund abgebildet werden. Die äußere Zone ist quadratisch und besteht aus einem Hakenkreuzmäander mit umschlossenen Quadraten. Die beiden inneren Zonen sind hingegen rund. In den Zwickeln zwischen der äußeren und der mittleren Zone befinden sich Palmetten mit Ranken. Die mittlere Zone zeigt einen runden Fries mit neun Tieren (Löwen, Greifen, Wildschweine, Pferde und Hirsch), die in Zweier- oder Dreiergruppen angeordnet sind. Der zentrale Bereich des Mosaiks besteht aus einem Kreis, in dem ein Anthemion aus hängenden und stehenden Palmetten und Blüten dargestellt ist. Im Zentrum befindet sich ein

4 Syriona, Baureste beidseitig des antiken Kanals (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

kleiner Oktopus, der auf den Eingang im Norden ausgerichtet ist. Die Funde – Bronzemünzen und Keramik – und der Stil des Kieselmosaikbodens datieren die Errichtung des Hauses in das erste Viertel des 4. Jahrhunderts v. Chr.

Nördlich des Hauses wurde ein eingesetzter Brunnen aufgefunden. Weitere, sporadisch aufgedeckte Mauern aus Kalksteinen und die Leitungen verweisen auf die Existenz eines komplizierten und großräumigen, akkuraten Wasserversorgungssystems (Abb. 4). Nördlich des eben beschriebenen Hauses wurde mit einem großen Kanal eine wichtige Einrichtung zur Wasserentsorgung bis zu einer Länge von 25 m freigelegt. Seine Breite beträgt etwa 3,5 m, er verläuft in Ost-West-Richtung und besteht aus zwei parallelen Mauern, die zugleich als Grenze zweier Wohneinheiten dienten. Der Kanal ist Teil eines ausgedehnten Systems, das notwendig war, um das Gebiet nördlich des Flusses Asopos zu schützen. Wie die Schichten in den Schnitten zeigten, wurde dieser Bereich bis zur archaischen Zeit häufig überflutet. Die südliche Kanalmauer ist aus einem unregelmäßigen mit zahlreichen Ausbesserungen aufgebaut, die nördliche besteht ebenfalls aus Steinblöcken. Aus dem Fundamentgraben der nördlichen Mauer entstammt Keramik des 6. Jahrhunderts v. Chr., die Hinweise zur Datierung der Errichtungszeit liefert.

Innerhalb des Kanals wurde eine sehr große Anzahl von Funden gemacht, die vor allem in das 4. Jahrhundert v. Chr. datiert werden. Obwohl der Kanal im 6. Jahrhundert v. Chr. angelegt wurde, stammen die Funde also größtenteils aus der letzten Nutzungsphase vor dem Verlassen der Siedlung um 303 v. Chr., als die Bewohner sich nicht mehr um die Reinigung des Bauwerks kümmerten und es allmählich zugeschüttet wurde. Nördlich des Kanals sind vereinzelte Reste von Räumen und Anlagen des mittleren und späteren 4. Jahrhunderts v. Chr. interessant, besonders ein für sieben Klinen vorgesehenes, quadratisches Andron eines Hauses. Seine Nordostecke wurde durch ein spätklassisches Schachtgrab zerstört.

Südlich des Kanals wurde ein Teil eines weiteren Hauses mit ehemals mindestens 13 Räumen aufgefunden, das von Nordwesten nach Südosten orientiert ist. Unter den Räumen des Hauses sind Raum I und II vom besonderen Interesse (Abb. 5): Raum I weist einen rechteckigen Grundriss von 5,3 × 2,5 m auf. In seinem südlichen Bereich sind Teile eines starken Bodens aus

5 Syriona, Raum I mit Brunnen und Raum II mit Mosaikboden (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

Kalkputz erhalten, welcher zwei unterschiedlich geneigte Ebenen formt. An der Südwestecke des Raumes wurde unterhalb des Bodens ein Brunnen aus einer älteren Bauphase freigelegt. Raum I war Teil der Werkstätten einer Wohnung, die mit der Wassernutzung zu tun hatten. Bei Raum II, der östlich von Raum I liegt, handelt es sich um ein für drei Klinen geeignetes Andron mit einem

6 Syriona, Häuser beidseitig einer antiken Straße (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

rechteckigen Kieselmosaik mit einer nach links drehenden, sechsblättrigen Wirbelrosette in der Mitte. Ein flacher Wasserkanal durchläuft den erhöhten Streifen um das Mosaik und endet in einem Abflussrohr in der Ostmauer des Androns. Das Mosaik wird in das 5. Jahrhundert v. Chr. datiert, wobei die anderen Wohnräume noch bis in das 4. Jahrhundert v. Chr. benutzt wurden.

Südlich des kleinen Androns wurden insgesamt 32 Räume untersucht, die zu mindestens drei Häusern gehören (Abb. 6). Sie liegen jeweils auf beiden Seiten einer 3,1 m breiten und auf 25 m Länge freigelegten Straße in West-Ost-Ausrichtung. Die Straße besteht aus zusammengepressten, unbearbeiteten, mittel- und kleinformatigen Kiesel- und Bruchsteinen auf einer lehmig-sandigen Bettung. Auf ihrer Oberfläche sind Wagenspuren und Ausbesserungsstellen zu beobachten. An der Südseite der antiken Straße verläuft ein 60 cm breiter, gedeckter Wasserabflusskanal, der auf einer Länge von 16 m erhalten ist. Seine Abdeckung besteht meistens aus zweitverwendetem Baumaterial.

Unter den Räumen, die sich auf beiden Seiten der Straße erstrecken, wurden auch zwei für jeweils sieben Klinen vorgesehene, quadratische Andrones gefunden, die einen Kieselmosaikboden aufweisen. Auf dem Kieselmosaik des ersten Androns ist eine Pflanzendekoration mit einer zentralen sechszehnblättrigen Rosette das Hauptthema, an dessen vier Ecken einzelne Tierdarstellungen, zwei Greife und zwei Hirsche, zu finden sind (Abb. 7). Unterhalb des um das Mosaik herumlaufenden Streifens wurde der exzentrische Eingang des Androns aufgefunden. Hier befand sich ein Mosaik mit der Darstellung eines Oktopusses, das zu der ersten Nutzungsphase des Raumes gehört. Die Errichtung des Androns reicht – dem Stil des Mosaikbodens nach zu schließen – in die erste Hälfte des 4. Jahrhunderts v. Chr. zurück, wobei eine Bronzemünze aus Korinth seine Nutzung auch während der zweiten Hälfte des 4. Jahrhunderts v. Chr. bestätigt.

Das teilweise erhaltene Kieselmosaik des zweiten Androns stellt ein Anthemion innerhalb von zwei konzentrischen Kreisen mit Ranken dar. In den Zwickeln befindet sich je eine Palmette, das Zentrum ist nicht erhalten. Zu der Türschwelle, die mittig auf der östlichen Seite liegt, schließt sich ein weiteres, kleines Mosaik mit einem Doppelmäander und einem Wellenband an. Von

7 Syriona, Kieselmosaikboden eines Androns (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

8 Chtiri, Detail des Mosaikbodens eines Androns (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

9 Moulki, Baureste und Nekropole entlang einer antiken Straße (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

Bedeutung ist die große Anzahl an Brunnen, insgesamt 18 Stück, welche der Wasserversorgung der Haushalte und Werkstätten dienten. Ihre Tiefe reicht bis zu 20 m hinab.

ANTIKE BAUTEN IN DER FLUR CHTIRI

In dem südöstlichen Teil der Flur Chtiri, an eine antike Straße anschließend, wurden vereinzelte Baureste aus der klassischen Zeit untersucht. Die antike Straße kommt aus Nordosten und gabelt sich nach Süden und Südwesten. Ihre Breite beträgt 5 m, sie konnte auf einer Länge von 20 m freigelegt werden. Im Westen wird die Straße von einer 60 cm breiten Stützmauer begleitet, welche dem Verlauf von Südwesten nach Nordosten folgt. Sie besteht aus größeren und kleineren Blöcken, welche auf Kalksteinen aufsitzen. Die Oberfläche der Straße besteht aus Kiesel- und mittelgroßen Kalksteinen auf einer Bettung aus Sand und Lehm.

In dem nördlichen Bereich der Flur Chtiri wurden Haus- und Werkstattanlagen sowie ein Andron für elf Klinen gefunden. Dort befindet sich ein besonderes Kieselmosaik, das aus einem umlaufenden quadratischen Streifen und zwei runden Zonen gebildet wird. In dem umlaufenden Streifen befindet sich ein doppelter Mäander mit umschlossenen Quadraten. Die Zwickel zu dem äußeren runden Feld wurden mit Palmetten gefüllt. Das runde Feld besteht aus einem Rankenornament. Im Zentrum befindet sich eine Rosette, aus der ein Anthemion mit acht Palmetten und Blüten erwächst. In einem rechteckigen Feld, das zur Tür orientiert ist, befindet sich ein Delfin, auf dem ein geflügelter Knabe reitet (Abb. 8). Ein Wellenband, das möglicherweise das Meer darstellen soll, schließt das Mosaik ab. Das Andron wird anhand des Mosaiks in die Mitte des 4. Jahrhunderts v. Chr. datiert.

BAURESTE IN DER FLUR MOULKI

In der Flur Moulki wurden in den Jahren 2010–2013 vereinzelte Baureste und ein Teil einer Nekropole untersucht, die sich nordwestlich und südöstlich einer antiken Straße erstreckt (Abb. 9). Unter den vereinzelten Bauresten wurden drei Räume freigelegt, die nach der Fundkeramik ebenso wie die benachbarte Nekropole vermutlich in die klassische und hellenistische Zeit datiert werden können. Möglicherweise handelte es sich um Werkstätten. Im nordöstlichen Bereich der

10 Syriona, Umfassungsmauern und Eingang einer Nekropole (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

Grabungsfläche wurde eine gemauerte Zisterne entdeckt, deren Becken eine Größe von 8,2 × 5,3 m misst und im Inneren verputzt ist. An der Ostmauer wurde ein Teil einer Treppe festgestellt, die zum Boden der Zisterne führte. Die Zisterne, die in das 3. Jahrhundert v. Chr. datiert werden kann, hatte vielleicht eine öffentliche Funktion.

Östlich und westlich der existierenden Autobahn kam ein 73 m langer Abschnitt einer antiken Straße in Ost-West-Ausrichtung zutage. In ihrem nordöstlichen Bereich sind Wagenspuren mit einer Breite von 1,5–1,6 m zu erkennen. Die Straße wird mithilfe der Fundkeramik, die an der Oberfläche und in den Fundamenten der Terrassenmauern gefunden wurde, in die klassische und hellenistische Zeit datiert. Die Untersuchung dieses Abschnitts der antiken Straße von Moulki ist deswegen besonders wichtig, weil es sich um eine Hauptstraße handelte, die die Stadt mit ihrem Hafen verband.

DIE NEKROPOLEN IN DER FLUR SYRIONA

In Syriona wurde eine geometrische Nekropole gefunden, die aber nur in den Bereichen ausgegraben werden konnte, die nicht von späteren Befunden überdeckt sind. Hier kamen zwei Umfassungsmauern der klassischen Zeit zutage, welche die geometrische Nekropole begrenzen. Der 1 m breite Eingang in der nördlicheren der beiden Mauern war so angelegt, dass man vom außen keinen direkten Einblick hatte (Abb. 10). Im südöstlichen Teil der Mauer wurde eine 50 cm starke Zerstörungsschicht gefunden, die eine große Anzahl an Gefäßen sowie figürlichen Terrakotten – anthropomorphe und Tierfiguren – enthielt. Unterhalb dieser Schicht wurde innerhalb einer rechteckigen, in den natürlichen Felsen eingetieften Grube die Doppelbestattung von zwei Erwachsenen gefunden. Die Häufung von Funden in der Schicht und die Bestattungen weisen darauf hin, dass es sich um einen Kultplatz, vielleicht für einen Ahnenkult, gehandelt haben könnte.

11 Syriona, geometrische Nekropole. Gesamtansicht (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

Direkt südlich dieser Schicht lag die zweite, südlichere Umfassungsmauer, die eine andere Gruppe von Gräbern einfasst. Hier wurde eine rechteckige Grube gefunden, die ebenfalls in den Felsen eingetieft war, jedoch keine Bestattungen aufwies. Die Grube macht einen unfertigen Eindruck, weil die Treppe, die nur für die Ausschachtung der Grube angelegt worden war, noch erhalten ist. Sowohl die Keramik aus dem Inneren der Grube als auch die Zerstörung der geometrischen Gräber während der Anlage der Grube datieren diese in die klassische Zeit.

Die klassischen Umfassungsmauern dienten wohl zum Schutz eines bestimmten Teils der geometrischen Gräber, die nicht durch Baumaßnahmen zerstört werden sollten. Von der geometrischen Nekropole wurden insgesamt 59 Gräber freigelegt, die in vier unterschiedlichen Tiefen angelegt worden waren (Abb. 11). Die Mehrheit bilden Grubenbestattungen oder Sarkophage, hinzu kommen ein Schachtgrab und fünf Gefäßbestattungen. Im Folgenden werden nur zwei großformatige Grubengräber näher erläutert, die wegen ihren Beigaben, aber auch wegen der aufwendigeren Art der Gräber wohl wichtigen Personen zuzuschreiben sind (vielleicht der lokalen Elite [?]).

Das erste Grab aus der ersten Hälfte des 8. Jahrhunderts v. Chr. ist 3,20 × 1,55 m groß (Abb. 12). In seinen Wänden gibt es acht halbkreisförmige Nischen, die als Ausnehmungen für Holzpfosten interpretiert werden können. Es handelt sich um die gleichzeitige Bestattung von zwei Personen, vielleicht von Verwandten: die Verstorbenen waren in Umarmung beigesetzt, ihre Beine lagen übereinander. Der obere Bestattete lag in nordöstlich-südwestlicher Richtung ausgestreckt, der tiefer liegende in Ost-West-Richtung in Hockerstellung. Als Beigaben fanden sich ein Eisengegenstand (Säge [?]), zwei große Bronzenadeln und eine Bronzephiale.

Von besonderem Interesse ist das zweite Grab. Innerhalb einer großen Grube wurde in einer Hälfte eine Bestattung von zwei Personen in einer kleineren Ausschachtung vorgenommen (Abb. 13). Es handelt sich um eine Doppelbestattung von zwei Erwachsenen in Umarmung. Brandspuren im Inneren der Eintiefung deuten vielleicht auf die Existenz einer Totenbahre hin. Neben der Bestattung wurden auf höherem Niveau zahlreiche Gefäße als Beigaben deponiert. Von besonderem Interesse sind zwei Grabvasen (Abb. 14 a. b): ein Krater, der auf eine männliche Person verweist, und eine Amphora, die auf eine weibliche Person hindeutet. Erwähnenswert ist, dass der Krater eine Doppelfunktion hatte, denn zusätzlich zu seiner Funktion als Grabvase wurden in seinem Inneren zehn Skyphoi, eine Oinochoe und ein Kalathos gefunden, die ebenfalls auf einen kultischen Zweck hindeuten. Die Grabvasen datieren das Grab in die erste Hälfte des

12 Syriona, geometrische Nekropole. Doppelbestattung im Grubengrab (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

13 Syriona, geometrische Nekropole. Doppelbestattung eines Paares mit Beigaben im Grubengrab (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

8. Jahrhunderts v. Chr. Auf der Oberseite der Wände des Grabes gibt es eine Auflage, wohl für die heute verlorene Abdeckung.

In der geometrischen Nekropole von Syriona herrscht keine einheitliche Ausrichtung der Bestattungen vor. Die meisten sind von Osten nach Westen orientiert (30), neun von Norden nach Süden, acht von Nordwesten nach Südosten und sieben von Nordosten nach Südwesten. Die meisten Verstorbenen wurden in Hockerstellung beigesetzt (33), nur wenige ausgestreckt (11).

14 Syriona, geometrische Nekropole. a: Amphora, b: Krater einer Grubenbestattung (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

15 Syriona, geometrische Nekropole. Sarkophag, Fünffachbestattung (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

Vorherrschend sind die Einzelbestattungen (25), nur neunmal kommen Doppelbestattungen, viermal Dreifachbestattungen und jeweils einmal eine Vierfach- und eine Fünffachbestattung vor (Abb. 15). In zwei Fällen wurden ältere Bestattungen zur Seite geräumt, um neueren Platz zu machen. Hauptsächlich handelt es sich um Bestattungen von Erwachsenen (43), 14 Bestattungen von Kindern konnten identifiziert werden. Aufgrund der Beigaben wurden drei Gräber als die von erwachsenen Frauen und eines als das einer Jugendlichen interpretiert. Allerdings ist der Großteil der Gräber beigabenlos, nur in 26 konnten Beigaben gefunden werden. Außergewöhnlich ist ein spiralförmiger Haarschmuck aus Bronze und aus Gold.

16 Syriona, Nekropole mit Gräbern aus frühgeometrischer bis in römische Zeit (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

Ein Abschnitt einer weiteren Nekropole, die sich vermutlich entlang einer Straße erstreckte, wurde nördlich des Flusses Asopos, ebenfalls in der Flur Syriona, gefunden. Die Nekropole wurde von dem Ende der frühgeometrischen Zeit bis in die römische Kaiserzeit belegt, die Mehrzahl der Bestattungen stammt aber aus dem 5. Jahrhundert v. Chr. (Abb. 16). Insgesamt wurden 92 Gräber verschiedener Typen festgestellt: Grubenbestattungen, Schachtgräber, Sarkophage und eine Gefäßbestattung in einem großen Pithos. In den meisten Gräbern lagen Einzelbestattungen (62), nur wenige sind Doppelbestattungen (5). In sechs Fällen wurden die Knochen älterer Bestattungen beiseite geschoben, um für jüngere Platz zu machen. Die meisten Gräber hatten eine reiche Beigabenausstattung, sie datieren zumeist in die Mitte des 5. Jahrhunderts v. Chr. In

17 Chtiri, Fundament eines hellenistischen Grabmonuments (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

manchen Fällen wurden in den Gräbern Objekte (Gefäße und figürliche Terrakotten) gefunden, die möglicherweise nicht als Beigaben zu verstehen sind, sondern für den Grabkult verwendet worden waren.

Neben den klassischen Gräbern wurden auch drei römische Schachtgräber mit einheitlicher Ausrichtung von Osten nach Westen gefunden. Die Abdeckung aus drei Deckplatten war nur in einem Fall erhalten, und der Boden der Gräber war mit Ziegeln gedeckt. In einem Grab wurden zwei Glasgefäße aufgefunden, menschliche Überreste waren allerdings in keinem der Gräber erhalten.

NEKROPOLE UND ANTIKE STRASSE IN DER FLUR CHTIRI

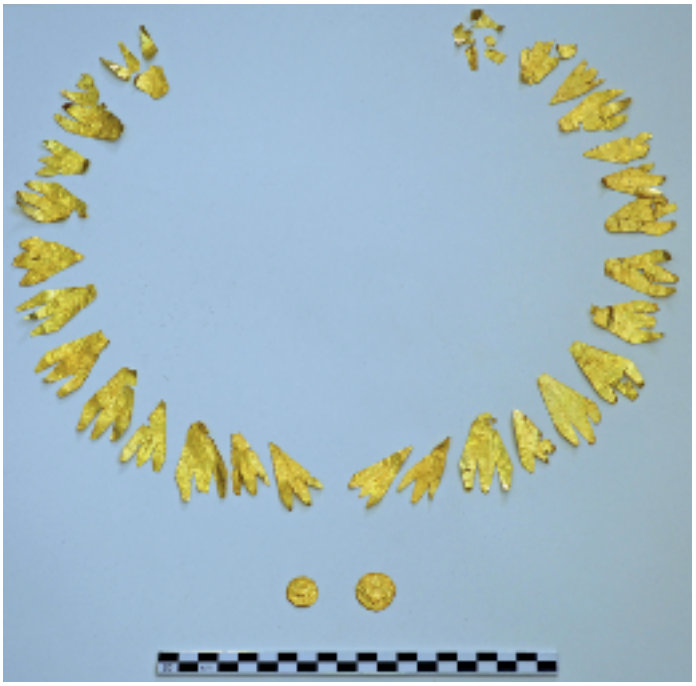
In der Flur von Chtiri, unter einer Autobahnbrücke, konnte die schon 1966 begonnene Erforschung einer Nekropole fortgesetzt werden. Es handelt sich um eine ausgedehnte Nekropole hellenistischer Zeit, die sich nördlich einer antiken Straße erstreckt, die in Ost-West-Richtung verlief und die Ebene mit der hellenistischen Stadt Sikyon auf dem Plateau von Vassiliko verband. Entlang der Straße wurden auch Reste von Mauern sowie ein gedeckter Kanal gefunden. Bei der Altgrabung wurde in der Nekropole neben 33 Gräbern auch ein großes Grabmonument gefunden. Die Ergebnisse der Altgrabungen führten damals zu einer Datierung nach 303 v. Chr., der Gründung der neuen Stadt Sikyon durch Demetrios Poliorketes, und zu einer Belegungszeit bis in das 1. Jahrhundert v. Chr.

Bei den neuen Grabungen wurde ein weiterer Abschnitt der Straße und der hellenistischen Nekropole freigelegt. Auf einer Länge von 44 m schwankt die Breite der Straße zwischen 6,2 und 6,8 m. Aufgrund der Konstruktionstechnik können zwei Phasen der Straße unterschieden werden: In der Klassik bestand die Straße aus einfachen Steinen, während sie im Hellenismus als Planierung zwischen zwei seitlichen Stützmauern angelegt wurde. Ausbesserungen zeigen die lange und intensive Nutzung als eine der Hauptstraßen. Die beiden Stützmauern der

18 Chtiri, hellenistische Nekropole (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

hellenistischen Straßentrasse sind nur teilweise erhalten und bestehen aus einer Lage von Quadern in Läufertechnik. Die nördliche Trassenmauer diente vielleicht zugleich als Umfassungsmauer der sich anschließenden Nekropole. Von der nördlichen Begrenzung der klassischen Straßentrasse ist eine Reihe von Bruchsteinen erhalten, die in der hellenistischen Phase als Randsetzung eines Kanals genutzt wurden.

Nördlich der Straße erstreckt sich die Nekropole, die zwei Nutzungsphasen hat. Im Zentrum befindet sich das große Grabmonument (Abb. 17), dessen Datierung an das Ende des 4. Jahrhunderts oder an den Anfang des 3. Jahrhunderts v. Chr. gesetzt wird. Sein nördlicher Teil wurde bei der Errichtung der Autobahnbrücke im Jahr 1967 zerstört. Es ist noch in sechs Quaderlagen mit einer Gesamthöhe von 2,25 m erhalten und misst eine Länge von 8,4 m und eine Breite von 2,92 m. Trotz der Beschädigungen und der teilweise leicht verrückten Blöcke kann das Monument mit



19 Chtiri, hellenistische Nekropole. Schachtgrab, goldener Blätterkranz und vergoldete Abdrücke von Münzen (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

20 Moulki, Nekropole beidseitig einer antiken Straße (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

21 Moulki, Nekropole, Bronzespiegel (© Ephorie für Altertümer von Korinth, Archiv Grabung Sikyon)

einem Pi-förmigen Grundriss in isodomer Quadertechnik rekonstruiert werden. Seine Ansichtsseite ist der Straße nach Süden zugewandt.

Östlich und direkt an das Grabmonument anschließend wurde ein Teil einer Umfassungsmauer auf einer Länge von 8,3 m aufgedeckt, die aus einreihigen Quadern in zwei Lagen besteht. Auf der Oberseite der Quader gibt es Einlassungen für Grabstelen. Die zugehörigen Gräber datieren in den Hellenismus. Im Bereich der Straße und des Grabmonuments wurden 23 Bauglieder gefunden, die zu einem monumentalen Gebäude gehörten. Die Bauglieder wurden hier offenbar nach dem Einsturz oder Abriss eines benachbarten Grabbaus, zu dem sie gehört haben dürften, zusammengetragen, vielleicht in der Absicht, sie wiederzuverwenden.

Von der hellenistischen Nekropole (Abb. 18), die sich von der antiken Straße nach Osten erstreckte, sind 26 unbeschriftete Grabstelen hervorzuheben, die bei den Grubenbestattungen *in situ* gefunden wurden. Erwähnenswert ist ein

Schachtgrab, das aus zweitverwendeten Grabstelen errichtet wurde. In seinem Inneren wurde eine Einzelbestattung in ausgestreckter Lage vorgefunden. Im Bereich der Beine wurden zusammenhanglose Knochen von vier weiteren Bestattungen angetroffen; es handelt sich dabei offenbar um zusammengeschobene, ältere Bestattungen. Außerdem befanden sich im Grab auch zahlreiche Beigaben, ebenfalls ohne erkennbare Aufstellung, die wahrscheinlich den früheren Bestattungen zugewiesen werden können. Das Skelett hatte 26 sehr feine goldene Blätter um seinen Schädel, die wohl zu einem Kranz aus nicht erhaltenem Material gehörten. In seinem Mund wurden zwei vergoldete Abdrücke von Münzen gefunden (Abb. 19).

Die Belegungsphase der Nekropole beginnt am Ende des 4. Jahrhunderts v. Chr. und reicht bis in das 1. Jahrhundert v. Chr. Im Zuge der Grabungstätigkeit wurden die Grabbauten der hellenistischen Zeit abgetragen, sodass die Nekropole der klassischen Zeit auf einem tieferen Niveau freigelegt wurde. Insgesamt wurden 14 Grabgruben gefunden.

DAS GRÄBERFELD IN DER FLUR MOULKI

Die Nekropole von Moulki liegt nordwestlich und südöstlich der schon beschriebenen antiken Straße (Abb. 20). Ihre Nutzungsdauer reicht vom Anfang des 5. bis in das 2. Jahrhundert v. Chr. Insgesamt wurden 107 Gräber untersucht, es konnten 97 Grubenbestattungen, 6 Schachtgräber und 2 Sarkophage festgestellt werden. Hauptsächlich handelt es sich um Einzelbestattungen, eine Ausnahme bildet eine Dreifachbestattung. 26 Gräber werden in das 5. Jahrhundert v. Chr. datiert, 29 in das 4. Jahrhundert und 23 in das 3. oder 2. Jahrhundert. Insgesamt kamen in den Gräbern 635 Tonobjekte (Gefäße und figürliche Terrakotten) sowie 45 Gegenstände aus Eisen und Bronze (Abb. 21), 2 Glasgefäße und ein Paar goldener Ohrringe zutage.

ZUSAMMENFASSUNG

Die von der zuständigen Behörde für Archäologie im Rahmen des großen öffentlichen Projekts zur Erweiterung der Autobahn von Korinth nach Patras durchgeführten Notgrabungen erbrachten wichtige neue Ergebnisse, die unsere Kenntnis der Geschichte des antiken Sikyon vertiefen. Die antiken Befunde wurden bei den 2008 und 2009 angelegten Suchschnitten lokalisiert, eine systematische Grabung begann aber erst im Februar 2011 und dauerte bis Juli 2017. Befunde, die sich von der frühgeometrischen bis zur römischen Zeit erstrecken, wurden in den Fluren Syriona, Chtiri und Moulki im Gebiet von Sikyon gefunden. Es handelt sich um ausgedehnte Baureste von Häusern und Werkstätten, Einrichtungen zur Wasserentsorgung, Abschnitte von Straßen und Nekropolen. Die Suche nach den öffentlichen Gebäuden der vorhellenistischen Stadt ist das Ziel einer im Jahr 2015 begonnenen Forschungskooperation zwischen der Ephorie Korinth, dem Dänischen Institut Athen, dem Nationalmuseum von Kopenhagen und dem Institut für Geowissenschaften der Universität Kiel. Die Ergebnisse der jüngsten Forschungen der Ephorie für Altertümer in Korinth zeigen eindeutig, dass die Lage der vorhellenistischen Stadt Sikyon in der Ebene östlich des Plateaus, auf dem später das hellenistische Sikyon des Demetrios Poliorketes gegründet wurde, lokalisiert werden kann.

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Giorgos Giannakopoulos – Zoe Spyranti

MATERIAL CULTURE IN CLASSICAL SIKYON

THE PRIVATE HOUSE ARCHITECTURE AND THE FINE WARE POTTERY

ABSTRACT
The paper sets out the research plans and preliminary conclusions of two ongoing PhD theses, both within the project »Finding Old Sikyon«. The two dissertations focus on the material culture in Classical Sikyon by analysing primary material yielded mainly in the emergency excavations conducted in the Sikyonian plain. The study of the domestic architecture focuses on the houses' typology and the building materials, assisted by the finds linked to the household. Through the combined study, light is being shed on further subject areas, for instance aspects related to the social structure, domestic cult, and home-based industry. The study of fine ware ceramics aims to identify the nature of pottery production and consumption in Classical Sikyon by integrating a wide range of contexts. A fundamental objective is to characterise the Sikyonian production as distinctive from the Corinthian. The relative abundance of at least three shapes demonstrates the existence of Sikyonian production in the Classical period. The preliminary conclusions provided by spatial occurrence will be supplemented by chemical analyses.

INTRODUCTION

Through the study of the private house architecture and the fine ware pottery, topics of two different dissertations that are housed at the University of Crete and are funded by the project »Finding Old Sikyon«, the present article will aid in the investigation of the material culture in Classical Sikyon[1]. It must be noted that the research is still at a preliminary stage. The material of both theses mainly derives from the large-scale rescue excavations conducted on the occasion of the construction of the new »Olympia Odos«[2] highway in the years 2008–2017[3].

In the southwestern part of the Sikyonian plain, a large part of the settlement has been unearthed, belonging to the Classical period and to the time before the translocation of the city from the plain to the plateau of the modern village Vasiliko on the orders of the Macedonian Demetrios Poliorketes in 303 BC. The results of the highway excavation have contributed significantly to the fragmentary image of the Classical city, known through the results of the small-scale excavations of the 20th and 21st centuries conducted by the Archaeological Society, the Archaeological Service and the Ephorates of Antiquities in charge[4]. Hence, results related to unearthed Classical structures are depicted on a map of the Sikyonian plain in order to demonstrate the available archaeological data[5] (fig. 1).

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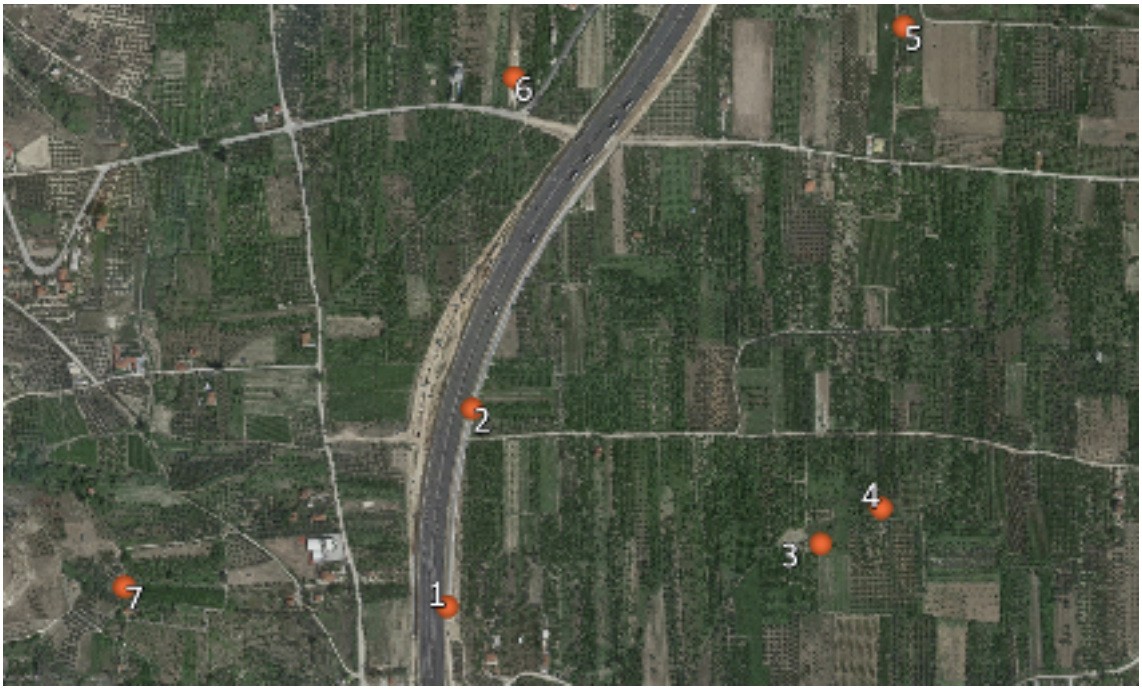
1 The private house architecture is being studied by Zoe Spyranti and the fine ware pottery by Giorgos Giannakopoulos.

2 The project is officially titled »Olympia Odos: Planning, construction, funding, function, restoration and exploitation of the Eleusis – Corinth – Patra – Pyrgos – Tsakona highway«.

3 At this point we would like to express our gratitude to the former Ephor Konstantinos Kissas and the Ephorate of Antiquities of Corinth for granting the publication rights to us, and to our colleagues for entrusting us with part of their work. Moreover, we are extremely grateful to Silke Müth and The National Museum of Denmark for integrating both theses in the project »Finding Old Sikyon«, and to The Carlsberg Foundation for the funding.

4 Orlandos 1939, 122 f.; Orlandos 1947, 59 f.; Charitonides 1968, 124; Krystalli 1968, 165 f.; Krystalli-Votsi 1976, 575–584; Lolos 2011, 272–274; Papathanasiou 2012, 152–154.

5 The research has resumed with the systematic excavations of the project »Finding Old Sikyon« since 2017. See S. Müth – K. Kissas et al. in this volume.



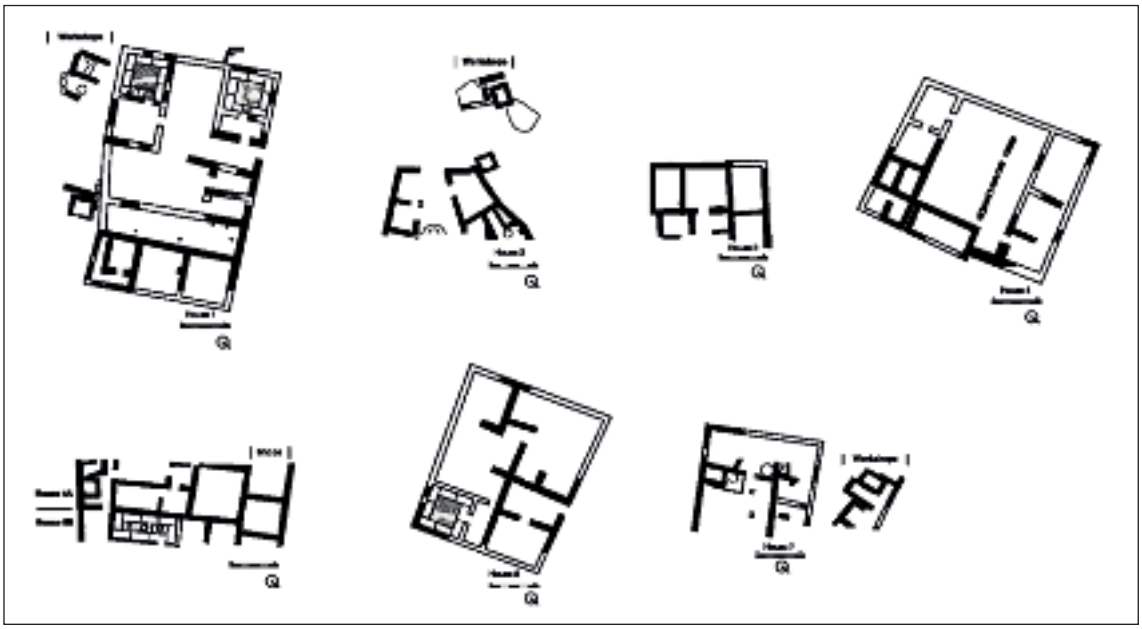
1 Google Earth map depicting unearthed architectural remains of the Classical city of Sikyon: 1: Syriona; 2: Chtiri; 3: Kollias plot; 4: Protopappas plot; 5: Kampardi plot; 6: Karampetsos plot; 7: Aghios Konstantinos (© Ephorate of Antiquities of Corinthia)

THE PRIVATE HOUSE ARCHITECTURE

At the Syriona site (fig. 1 no. 1), parts belonging to at least eight different private houses (fig. 2) have been uncovered over an area of c. 980 m². They are organised in *insulae* that are divided by main roads and alleyways[6]. The houses bear no common orientation and they are not built according to a strict grid. Individual plots have a rectangular shape and their preserved size varies from c. 320–380 m²[7]. However, the available living space must have been larger than this figure, judging by the fact that in three houses (Houses 2, 3 and 5B), stone stairbases have been found, a strong indication for the existence of an upper storey[8]. Regarding the building materials, only the stone foundation of the walls was preserved, consisting of random rubble or ashlar masonry, which most probably supported a mud-brick superstructure[9]. Moreover, large accumulations of terracotta pan and cover tiles, of either Laconian or Corinthian type, indicate that some of the roofs were pitched.

Most of the houses were accessible via one entrance, located directly on a street, and the first room to be entered was the courtyard. Thus, the Sikyonian houses could firstly be ascribed to the »single entrance, courtyard model«[10], and then to the »stoa house type«[11], a very common type

6 Jameson 1990b, 177.
7 Robinson – Graham 1938, 167; Jameson 1990a, 100 f.
8 Robinson – Graham 1938, 214–217; Nevett 1995, 367; Ault 2000, 487; Cahill 2002, 82; Ault 2005, 73.
9 Jameson 1990a, 97; Reber 1998, 22; Ault 2000, 485; Nevett 2010, 9 f.
10 Jameson 1990b, 179; Nevett 1995, 367. 379; Tsakirgis 2005, 80 n. 7; Nevett 2005, 84; Ault 2007, 260.
11 So far only the three best-preserved houses (Houses 1, 4 and 7) could be attributed with certainty to a house type, which would be the *pastas* type. Since the rest of the house plots have only been partially uncovered, it would be risky to attribute the domestic architecture of Sikyon to just one type. Another reason that it would be better to refer to such a porch as a stoa is the ongoing debate among scholars regarding the definition of the architectural terms »pastas« and »prostas«. For indicative references see Robinson – Graham 1938, 143–151; Graham 1966, 3–5; Jameson 1990b, 181 n. 10; Ault 2000, 484. 488 f.; Reber 2001, 68; Ault 2005, 66; Nevett 2007, 6; Westgate 2015, 67 n. 87.



2 Reconstructed house plots in the domestic area uncovered at the site Syriona (Schematic plans reproduced from the archive of the Ephorate of Antiquities of Corinthia)

3 Semi-enclosed stoa at House 4 (© Ephorate of Antiquities of Corinthia)

in Greek Classical architecture[12]. Another type is the ›double courtyard house‹ represented by Houses 1 and 5A. The placement of the rooms in the Sikyonian house plot is usually dictated by specific rules. At the centre of the house lies the courtyard[13], being the largest room[14] and having varying forms: from rectangular (Houses 4 and 7) to ›L‹- shaped (House 5A). Its most important

12 For examples attributed to the *pastas* and *prostas* types see Graham 1966, 10–12.
13 Nevett 1995, 368; Ault 1999, 537; Ault 2000, 486; Nevett 2007, 8; Westgate 2015, 67.
14 Ault 1999, 537.

4 Stoa (in the northern part) and treading floors (in the southern part) in House 7 (© Ephorate of Antiquities of Corinthia)

role lies in the fact that it served as one of the main living and working areas during the day due to the direct sunlight. It also gave further access to the other rooms of the house[15], like the ante-chambers of the *androne*s, the porch, and the workshop areas. In several houses, the courtyard was paved with cobbles or even pebbles (Houses 3, 5A and 7), while in most cases the floor was formed of beaten earth (Houses 1, 2 and 4).

Attached to one side of the courtyard is the stoa, a porch leading to the living chambers of the family. The stoa is easily distinguishable either in plan or by the architectural members for the internal partition of the room. The most representative examples are the porches of Houses 1, 4 and 7, where post-holes or even column bases are preserved *in situ*. In House 1, the longitudinal porch extends in front of the aligned living chambers and the only traces of internal partition are the three post-holes along the western side. Moreover, on the porches of Houses 4 and 7, column bases have been found *in situ*. More specifically, in House 4 (fig. 3) a low wall has been erected between the bases, turning the stoa into a semi-enclosed and more sheltered space[16]. The stoa of House 7 (fig. 4) was an open and much brighter porch, allowing more sunlight to reach the adjacent rooms[17]. Moreover, next to the column bases of House 7, several Doric capitals and a Doric column have been uncovered *ex situ*, further supporting the identification of the room as a stoa.

In most houses in Syriona, the living chambers, usually aligned in a row and accessible through the porch, are located in the northern part of the plot[18]. This is the case for Houses 4, 5A, 5B and 7, while in Houses 2 and 3 it is very difficult to judge, as only a part of the plot has been unearthed[19].

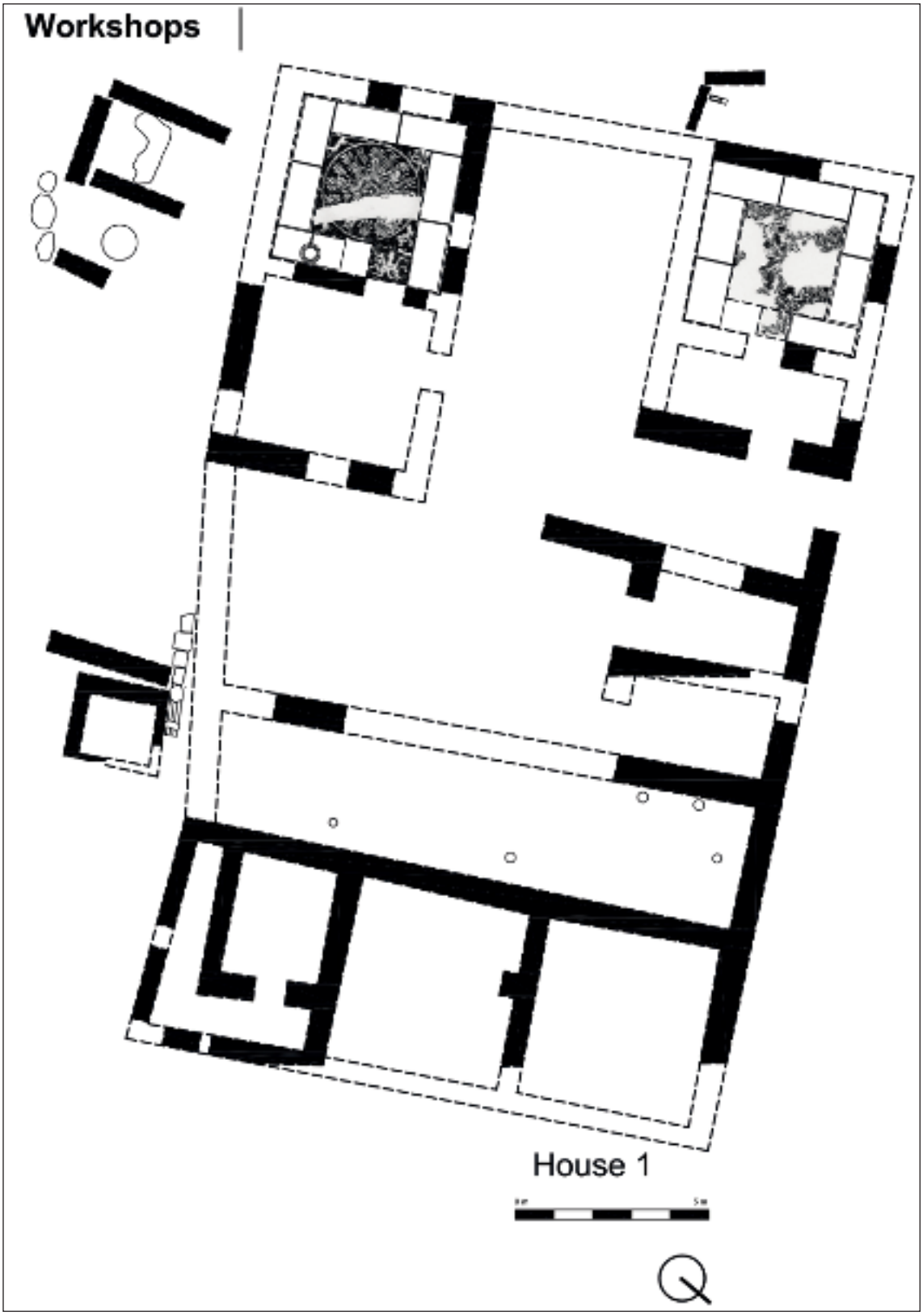
15 Cahill 2002, 76 f.

16 On the *pastas* of House A iv 9 at Olynthus cf. Robinson – Graham 1938, 87; Cahill 2002, 88. 109.

17 Hoepfner – Schwandner 1994, 319 fig. 303.

18 Robinson – Graham 1938, 170 f.; Jameson 1990a, 97 f.; Reber 1998, 35 n. 93; Ault 2000, 488; Cahill 2002, 79.

19 Cf. Hoepfner – Schwandner 1994, 318, where they mention that living chambers could be located on the upper storey as well. Moreover, see Ault 2000, 487. It must be noted that the documentation of House 6 at Syriona is still ongoing; thus, no accurate information about the placement of the living quarters can be given yet.



5 Reconstructed plan of House 1 (Schematic plan reproduced from the archive of the Ephorate of Antiquities of Corinthia)

An exception is House 1, where the main living rooms are situated in the eastern part of the plot (fig. 5). A possible explanation for this peculiar orientation could be that the planner had to rotate the whole plot and move the private section to the eastern side in order to find room for two *androne*s[20].

The most distinctive room in the Classical houses of Sikyon is the *androne*, the dining room hosting the symposia[21], usually accessible through an ante-chamber[22] (Houses 1 and 6, figs. 2. 5). It is the only room that has a semi-public character, as it is accessible to male guests[23]. Most of the Sikyonian *androne*s are square, having a side of c. 4.75 m (Houses 1 and 6) and suitable for accommodating seven couches[24], while only one uncovered in House 5B is rectangular and could accommodate either five or seven couches[25]. Moreover, other characteristic features are the off-centre entrance and the raised platform[26] running around a pebble mosaic floor, suitable for the placement of an odd number of dining couches[27]. House 1 is so far the only house at Syriona that possesses two *androne*s[28], both located away from the core of the house and next to the outer walls[29] in order to be exposed to daylight through large windows[30]. The *androne* is the most lavishly decorated room and, moreover, the only room where the owner could demonstrate his social position and wealth[31]. Such a feature is the central pebble mosaic floor, usually depicting either vegetal motifs (both *androne*s of House 1), geometric motifs (House 5B) or animals (House 6). All motifs in the pebble mosaic floors at Syriona unearthed so far are depicted using white pebbles on a dark blue background, while only a few details are shown in red[32]. Another important feature of the pebble mosaic floors, apart from the aesthetic result, is their waterproof nature[33]. Hence, two of the *androne*s are equipped with a drain[34], cut in the raised platform. This drain leads the waste water whenever cleaning the floor into a catchment vessel, usually placed in the platform (southern *androne* of House 1)[35] or into a vessel or drain located in an adjacent room (House 5B)[36].

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20 For House A viii 5a cf. Graham 1953, 206 pl. 64 b.

21 On the non-exclusive use of the andron for the domestic symposia see Lynch 2011, 76 f. The courtyard or any other room is considered to be suitable for hosting a symposium.

22 Jameson 1990a, 99; Reber 1998, 135; Cahill 2002, 180; Ault 2005, 70; Robinson – Graham 1938, 177.

23 Hoepfner – Schwandner 1994, 318; Cahill 2002, 80.

24 The assumed length used for the estimation of the number of dining couches at the Sikyonian *androne*s is 1.80 m. See Reber 1998, 27. 135 pl. 1 a. Reber places seven couches in *androne*s of the same size, each couch measuring 6 × 3 ft (or c. 1.80 × 0.90 m). Moreover, cf. Westgate 1997/1998, 106 n. 18. On the other hand, see Robinson – Graham 1938, 173. Robinson – Graham fit only five couches in similar sized *androne*s, each one having a length of 2.00–2.25 m.

25 The northern part of the *androne* uncovered at House 5B is not preserved. Nevertheless, strong indications for the rectangular shape of the room are the absence of the northern wall, the absence of the raised platform on the northern side, and moreover, the destroyed pebble mosaic floor showing that the depiction of the central panel continues further northward. According to other known examples, and as the inner width of the room is 2.80 m, the inner length of the *androne* could be estimated between c. 4.80 m and 6.60 m. Cf. Bergquist 1990, 42 tab. 3; 43 fig. 2. Either five or seven dining couches could be placed in *androne*s of similar dimensions.

26 In the houses of Syriona, the width of the raised platform varies from 0.80–1.00 m.

27 Robinson – Graham 1938, 171–179; Cahill 2002, 80; Ault 2005, 70.

28 Other contemporary examples with two *androne*s in the house plot are to be found at Olynthus. For the »Villa of Good Fortune« cf. Robinson – Graham 1938, 55–63. For House A v 8, where a second *androne* could be reconstructed as well, cf. Robinson – Graham 1938, 95 f. For House A vi 5, cf. Robinson – Graham 1938, 103–106; Cahill 2002, 180.

29 Robinson – Graham 1938, 177 f.

30 Jameson 1990a, 99; Cahill 2002, 80.

31 Ducrey – Metzger 1979, 42; Westgate 1997/1998, 100; Reber 1998, 115. 136; Cahill 2002, 180.

32 For similar pebble mosaic floors uncovered in the Classical city of Sikyon, cf. Salzmann 1982, 111 f.

33 Westgate 1997/1998, 97; Reber 1998, 115.

34 Cahill 2002, 180.

35 Robinson – Graham 1938, 176; Ault 2000, 487; Ault 2005, 70.

36 Cf. Robinson – Graham 1938, 106 pl. 98.

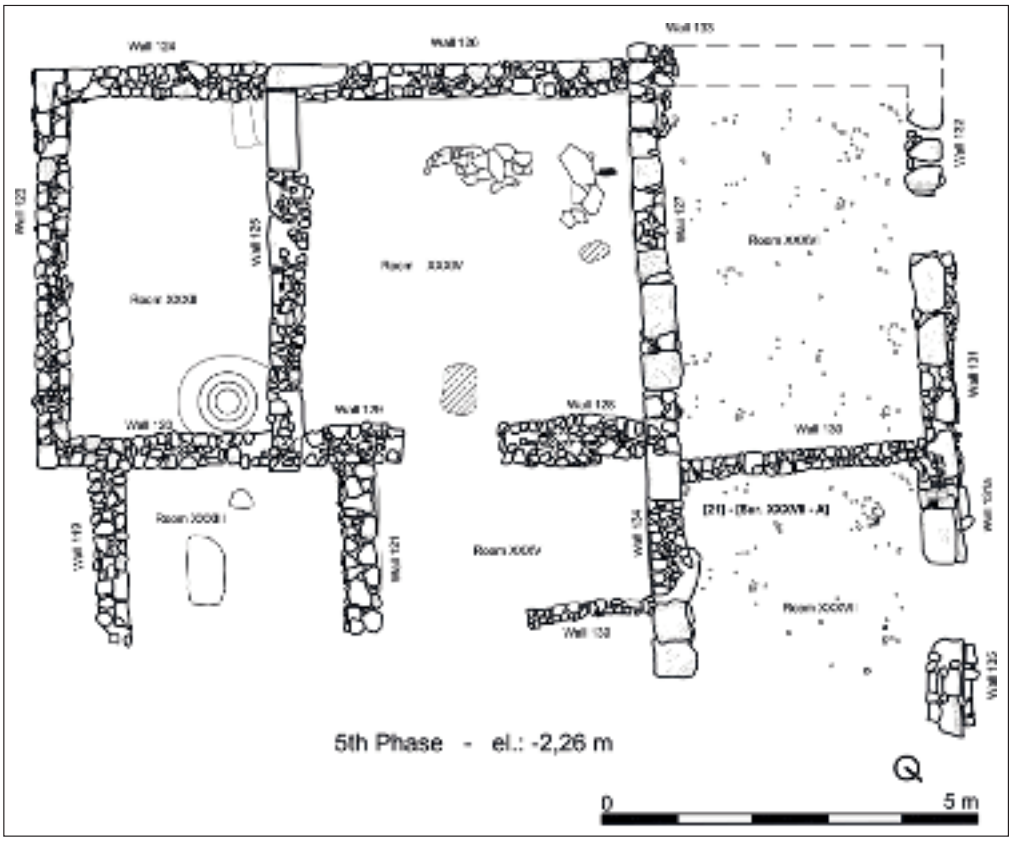
6 Treading floors in House 4 (© Ephorate of Antiquities of Corinthia)

Most of the houses possess workrooms to meet the needs of the household[37] or even for trade[38]. Domestic workrooms have been uncovered either incorporated in the house plot[39] and accessible through the courtyard (House 4, fig. 6; Houses 5A and 7), or in the vicinity of the houses (Houses 1 and 2, fig. 2). They are mostly characterised by permanent treading floors, paved with a thick lime mortar layer sitting on cobbles (thickness: 0.09–0.14 m)[40]. Their shape is usually rectangular and their size varies from 0.96 × 0.84 m to 2.70 × 2.50 m. Their surface is inclined towards one corner, usually to a drain leading the liquid produced to a catchment vessel (House 7, fig. 4) or even to a tank (House 5A). Furthermore, it must be noted that several treading floors have been added to the house plots next to the already existing ones (Houses 5A and 7) in order to support the increase in the production that was apparently in greater demand during the last habitation phase[41]. The installations at Syriona must have been used as treading floors for wine[42] since no surviving stone press bed or other obvious facilities for the crushing of olives[43] have been uncovered in their vicinity. Nevertheless, a possible use as olive press beds should not be excluded as it was common for such treading floors to be multi-purpose[44]. In these houses, the separation between the living and the working spaces is more than obvious[45].

37 Jameson 1990a, 102; Foxhall 2007, 37.
38 Cahill 2005, 55.
39 Tsakirgis 2005, 67. 78.
40 Savvodini 1993, 228 f.; Jameson 1990b, 184.
41 In general, we see a tendency towards an increase in domestic production during the latest habitation phase at the houses of Syriona. Cf. Hoepfner – Schwandner 1986, 72 f.
42 Reber 1998, 92; Foxhall 2007, 132.
43 Foxhall 2007, 146 f.
44 Foxhall 2007, 133. It could be mentioned with some reservation that one treading floor located southwest of House 1 could have been used for crushing olives, as three stones found *in situ* in its vicinity could have served as rollers. Cf. Foxhall 1993, 193. These stones could have belonged to a »roller and bed«-type olive crusher.
45 Tsakirgis 2005, 77. For instance, in Houses 4, 5A and 7, the living area is located in the northern part, while the working premises lie in the southern section of the house.

7 Storeroom in House 3 (© Ephorate of Antiquities of Corinthia)

8 Bathroom in House 1 (© Ephorate of Antiquities of Corinthia)



9 Plan depicting the shops in the northern part of House 3 during the 5th construction phase (© Digitalised plan from the Ephorate of Antiquities of Corinthia)

Moreover, storerooms were necessary for the storage of the commodities produced or consumed in the house, and these rooms have been easily identified, mostly due to the pithoi and amphoras uncovered in their interior[46] (House 3[47], fig. 7). Other rooms that are part of the houses are the cooking area and the bathroom, unfortunately only identified in House 1 so far (fig. 8). They are located next to each other and are accessible from the courtyard. The bathroom has been identified by its rectangular cement floor, with a drain on one side[48]. The drain ran through the foundation of the wall and found its outlet in the adjacent long drainage channel.

Finally, in three houses at Syriona (House 3 during an earlier phase, fig. 9; Houses 5A and 5B during the latest phase, fig. 10), rooms with separate entrances have been unearthed that were attached to the house but had no direct connection to it. In all cases, they are organised in a single row and face roads other than the ones where the entrances of the houses are located[49]. Most probably, these rooms could be identified as shops[50]. The fact that the shops located north of Houses 5A and 5B

46 Robinson – Graham 1938, 312; Jameson 1990a, 98.

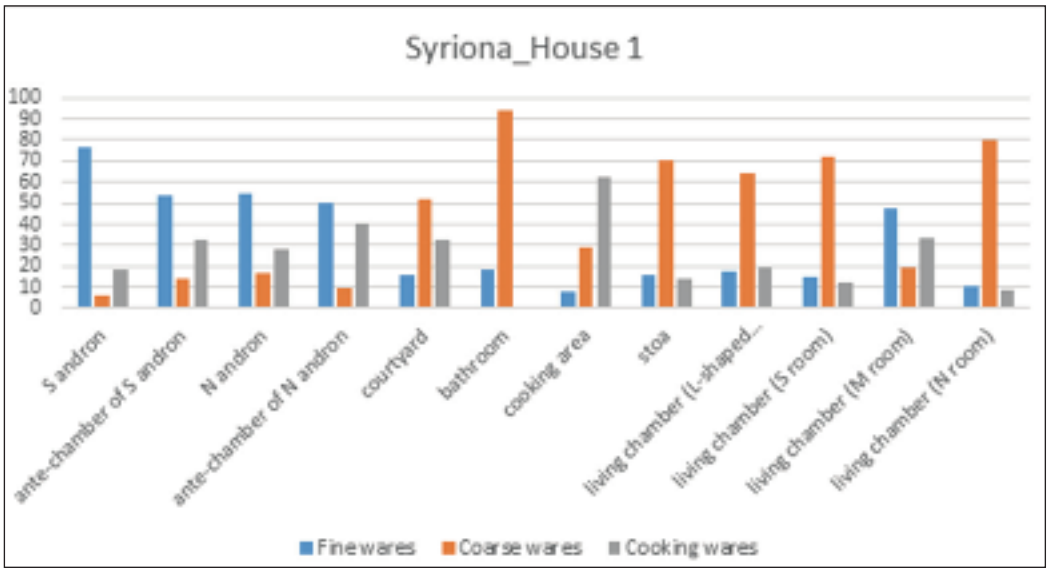
47 In House 3, a large pithos has been found intact and *in situ* at the northeastern corner of a partly subterranean room. It was placed in an upright position and buried in the earth floor up to the level of the rim. Tile fragments have been placed on top of its rim, serving as a lid. Cf. Robinson – Graham 1938, 312; Jameson 1990b, 185; Reber 1998, 29. 74; Cahill 2002, 94.

48 Shear 1939, 217 f.; Thompson – Wycherley 1972, 176; Jameson 1990a, 98.

49 For House A iv 9, where the eastern third of the house consists of three shops, cf. Robinson – Graham 1938, 86; Cahill 2002, 110.

50 Robinson – Graham 1938, 211–213; Thompson – Wycherley 1972, 176; Hoepfner – Schwandner 1994, 72 f.; Jameson 1990a, 102; Jameson 1990b, 185 f. Regarding the Sikyonian houses, it is possible that the northeastern corner of the plot at House 6 could have been used as a shop. However, this can only be mentioned with reservation, since the documentation of House 6 is still pending.

10 Plans depicting the shops in the northern part of House 5 during the 2nd and 3rd construction phases (Digitised plans from the archive of the Ephorate of Antiquities of Corinthia)



11 Chart depicting the first level of quantification of the finds recovered from the interior of the rooms in House 1 (© Ephorate of Antiquities of Corinthia)

12 Plan depicting the different construction phases of House 3 (Processed plan from the archive of the Ephorate of Antiquities of Corinthia)

used to be accessible from the interior of the house during an earlier phase (fig. 10) implies that they could originally have belonged to the owners[51].

However, in order to gain a holistic impression of the function of the rooms and the organisation of the household, it is important to study and evaluate the finds recovered inside the rooms as well. A first level of quantification has been applied at some of the houses so far; during this procedure, the pottery has been divided into three categories, more specifically into coarse, cooking and fine wares. The recovered sherds have been weighed and counted (fig. 11). The other objects, like loom weights, figurines, etc., have been dealt with separately. These results, combined with the interpretation of the rooms based on architectural features, offer helpful data in order to produce a pattern which will aid in the identification of room functions. A second level of quantification, according to shapes, aiming to estimate the minimum number of vessels, will be applied only in the case of the two best-preserved houses.

According to the architectural examination and the preliminary study of the finds so far, most of the houses show evidence for different construction phases. Such examples are Houses 3 (fig. 12), 5A, 5B and 7, where successive alterations of the house plots have taken place. A preliminary evaluation of the artefacts has shown that the main phases date back to the Classical and Late Classical periods.

Concluding, we realise that the Classical houses of Sikyon bear many similarities to other known contemporary examples – such as Olynthus, Eretria, Athens – as well as to other lesser-known houses from the Peloponnese – such as Corinth, Argos, Halieis. Such comparisons are essential in order to understand the interaction between the different cities and the probable influences. Furthermore, one significant aim would be to evaluate the possible contribution of Sikyon to Classical domestic architecture and to investigate whether some elements of private

[51] On the shop in House A v 10, cf. Robinson – Graham 1938, 98. On the shop in House A vii 4, cf. Cahill 2002, 107.

architecture, like the pebble mosaic floors, perhaps even originated here. It should be mentioned though, that the analysis of more aspects of special significance should be taken into account, such as the relationship between the Classical and the Hellenistic city of Sikyon, the social structure and gender relations. With regard to the first aspect, whether the old settlement was totally abandoned after the translocation of the city on the plateau in the year 303 BC or if some of the buildings remained in use must be explored. Finally, the social structure and gender relations as observed in the domestic architecture have to be studied, and the possible seclusion of women in the domestic sphere must be questioned, as the distribution of artefacts in the houses implies very different and much more diverse patterns of household organisation.

Zoe Spyranti

THE FINE WARE POTTERY

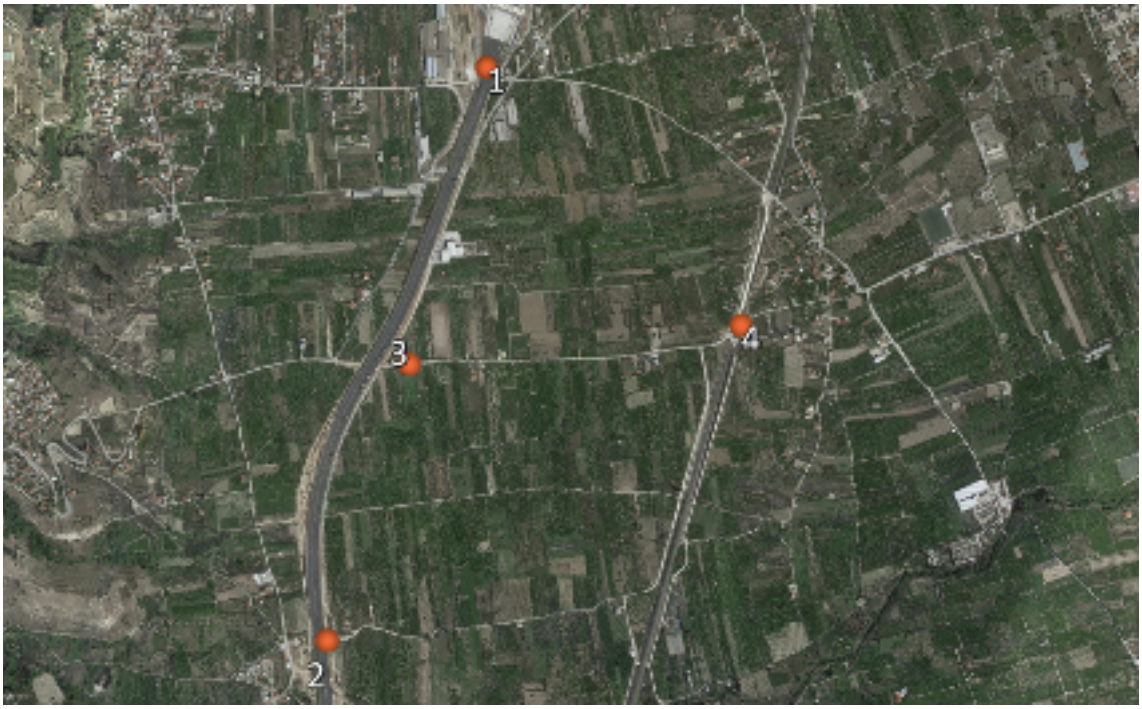
The second ongoing dissertation examines the Classical and Early Hellenistic fine ware pottery from Sikyon. As our knowledge on the topic is rather poor, the study poses the question of local fine ware production. Furthermore, it aims to explore the consumption of such ceramics at Sikyon through the analysis of typology, decorative techniques, and imports. Subsequently, further aspects, such as social changes and trade networks with other centres, will be illuminated. Finally, fine ware ceramics will offer insight into the chronological phases of the Classical and Early Hellenistic city and its abandonment at Demetrios Poliorketes' urging.

The history of scholarship on pottery from Sikyon is brief. Scholars of Hellenistic and Roman pottery from the plateau have made noteworthy progress in verifying local production from the 3rd century BC to the 3rd century AD. Sarah James, in her study on pottery from four rescue excavations on the plateau, concludes that a limited local production occurs already by the 3rd century and expands in the 2nd and 1st centuries BC, presumably as a result of the industry's significant recession at Corinth after its sacking in 146 BC[52]. Conor Trainor's technological study on the material generated by the Sikyon Survey Project, especially the 1341 kiln wasters, has verified that Sikyon housed an industry that specialised in coarse ware ceramics, in particular transport amphoras, from the 2nd century BC to the 3rd century AD. These products appear in the so-called Sicyonian Silicate Fabric family, which is rich in silicate and carbonate inclusions[53].

On the other hand, our knowledge about the pre-Hellenistic assemblages is rather meagre. Friis Johansen, in his »Les Vases Sicyoniens«, examined Geometric and Early Archaic fine ware vessels from various collections and sites, for which he suggested a Sikyonian origin[54]. This conclusion was dismissed due to the lack of hard evidence, while subsequent excavations and studies at Perachora and Corinth established the latter as the production centre of this pottery[55]. The only study involving, among other things, Classical fine ware pottery that has been excavated on the Sikyonian plain, is the recent dissertation by Photeini Balla titled »Burial customs of a Peloponnesian polis from the Orthagorids to Roman period«, based on a cemetery excavated at the sites of Chtiri and Zogeri[56].

Mapping the findspots of Classical and Early Hellenistic fine ware pottery on the Sikyonian plain, it becomes apparent that they can be divided into two broad categories, in particular cemeteries and residential areas. The excavations of the highway »Olympia Odos« have brought to light a roadside cemetery at the Moulki site, where the 107 graves span from the beginning of the 5th to the

52 James 2021; see also S. James in this volume.
53 Trainor 2015, 28–39. 41–71.
54 Friis Johansen 1923.
55 Dunbabin 1962, 1–3; Trainor 2015, xv.
56 Balla 2017. Unfortunately, the dissertation was not available when the present article was compiled.



13 Google Earth map. Cemeteries on the Sikyonian plain with Classical and Early Hellenistic burials among others: 1: Moulki; 2: Syriona; 3: Chtiri, Zogeri; 4: Tragana, Dragatsoula (© Ephorate of Antiquities of Corinthia)

2nd century BC[57], as well as a cemetery at the site Syriona, directly north of the Asopos river and only 60 m south of the residential area (fig. 13). The 64 burials investigated here date from the Geometric to the Early Hellenistic period, the majority, however, dating to the 5th century BC[58]. The extended roadside cemetery at Chtiri and Zogeri was mainly excavated in the 1970s, although recently more graves came to light during the highway project. It spans from the late 7th to the 1st century BC and is marked by some elaborate grave monuments of the Hellenistic period[59]. Approximately 800 m to the east, at the sites Tragana and Dragatsoula, 45 additional burials of the 5th and 4th centuries BC were investigated in the 1930s and 2000s[60].

Data for the pottery discovered in residential areas are not similarly clear (fig. 1). Whether pottery from two brief rescue excavations conducted by Anastasios Orlandos in the 1930s at Aghios Konstantinos and in the early 1940s at the Karampetsos plot was kept remains elusive[61]. The two excavations have brought to light two elaborate mosaic floors which date, according to Orlandos, to around 400 BC. Other rescue excavations that yielded Classical domestic architecture are located in the Kollias, Protopappas, and Kampardi plots, all three investigated in the 1960s and 1970s[62]. Nevertheless, it appears that ceramic assemblages from these plots have been only partially collected, and therefore the data do not meet the criteria for modern pottery studies. On the other hand, the large-scale rescue excavations of the »Olympia Odos« highway, discussed in

57 The chronological range of the cemetery at Moulki is based on a preliminary reading of the pottery.

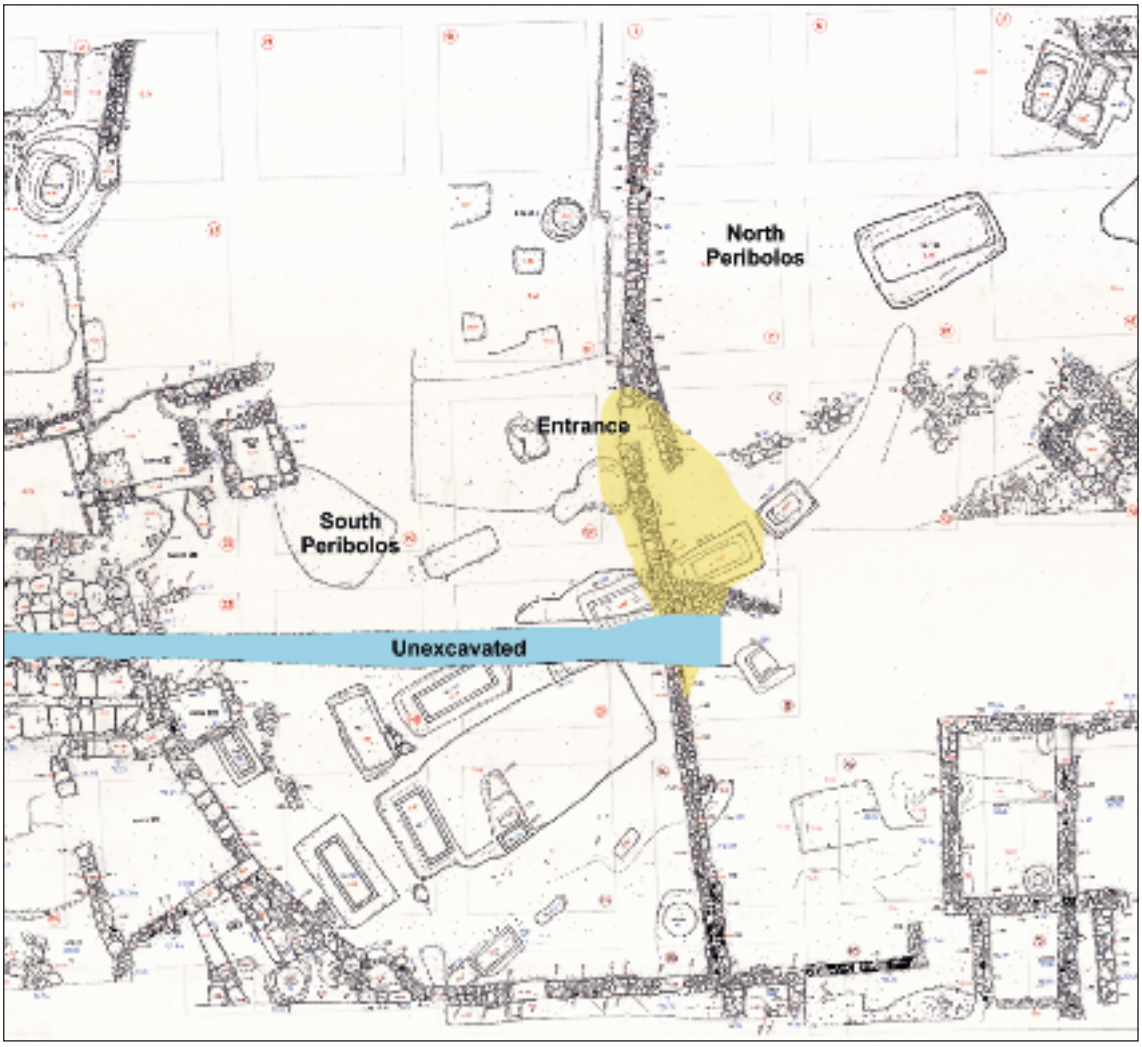
58 Maragoudaki 2013, 127.

59 Krystalli 1968, 165; Krystalli-Votsi 1984, 65; Lolos 2011, 283; Balla 2013; for the pyre of one of the grave monuments see Krystalli-Votsi 2013; for a discussion of the cemetery's imported pottery see Balla 2018.

60 Orlandos 1937, 92–94; Papathanasiou 2013, 485–488; Maragoudaki 2013, 128; Anagnostopoulou – Kasimi 2014, 474–476.

61 For the mosaic floor from Aghios Konstantinos see Orlandos 1939, 123; Lolos 2011, 273; for the Karampetsos plot see Orlandos 1947, 59; Lolos 2011, 273 f.

62 For the Kollias plot, see Krystalli 1968, 165; Krystalli-Votsi 1976.



14 Plan depicting the findspot of the votive deposit (© Ephorate of Antiquities of Corinthia)

this paper by Spyranti[63], have generated hundreds of kilos – if not tonnes – of Classical and Early Hellenistic fine ware pottery[64]. These areas are largely residential in nature, although a few votive contexts have been excavated too, as I will discuss below.

Since this will be the second ever study that involves Classical pottery from Sikyon and the first that poses questions regarding the general consumption and local production of Classical ceramics, it must include as wide a range of contexts as possible. Not all vessel types nor all decorative techniques or patterns of imported pottery are equally present in every kind of context. Moreover, the material under examination must refer to the full collection of ceramics and must be well-recorded, and stratified. Taking into account the above, as well as the time limitations deriving from a dissertation, I have decided to open three windows into the Classical and Early Hellenistic pottery from Sikyon by examining burial pottery from the cemetery at Syriona, votive pottery from the same site and the fine ware pottery from a domestic context. The latter was only recently excavated by the project »Finding Old Sikyon« at the Aghios Nikolaos site and appears to have been formed by dumping and by the collapse of a cellar.

63 See also K. Kissas in this volume.

64 Classical and Early Hellenistic pottery is also predominant in almost all the annual excavations of the project »Finding Old Sikyon«.

The nature of the dissertation's questions is largely quantitative, thus quantification of the assemblage is necessary[65]. First, the ceramics are counted and weighed as fine, coarse and cooking wares, but only the fine wares are kept for the study[66]. Terracotta figurines and other finds like loom weights and metallic objects are also counted and weighed, even though they are not examined further. Fine ware ceramics are counted and weighed by shape, main decorative techniques, and production centre. Finally, the minimum number of vessels for each shape is estimated primarily, though not exclusively, based on the fragments of rims and bases[67]. Each shape has already been assigned to one of the functional categories, i.e. vessels for consuming liquids, for serving and pouring liquids, for serving and consuming food, etc.

At this early stage of the dissertation, I am able to present observations and preliminary conclusions only about the votive deposit. It came to light approximately at the centre of the excavated district at Syriona, in an area defined by two periboloi, one in the south and one in the north (fig. 14). The two partially investigated periboloi date to the Classical period and were probably erected in order to prevent the disturbance of the 59 Geometric graves below the Classical domestic level. In the southeastern part of the northern peribolos, including the entrance, a large deposit of pottery and terracotta figurines has been recorded (figs. 15. 16). The large amount of material was not found within a pit or a structure. Rather, it was discarded on the remains of the wall that divides the two periboloi, against the wall's north face and to a lesser extent, south of the wall[68]. The deposit was oriented with reference to the wall, namely east-west, and was approximately 8.00 m long, while its width ranged from 1.50–3.60 m. The thickness varied from 0.22 to almost 1.00 m. The highest density was recorded in the area marked by the entrance to the west and the corner of the wall to the east.

The deposit consists of 291 kg of pottery and 9 kg of terracotta figurines, while the rest of the finds amount to approximately 4 kg[69]. Of the 291 kg – almost 47,000 fragments and 86 vessels preserving a half or full profile – 75.1 % are fine wares, 19.3 % coarse wares, and 5.6 % are cooking wares. The high percentage of fine wares among the total amount of ceramics and the large quantity of terracotta figurines speak to the votive character of the deposit. At the moment, there are two possibilities about the nature of the cult. It is reasonable to link the material with the cult of ancestors due to the Geometric burials and the interpretation of the two Classical periboloi. However, it should be underlined that it could also derive from a neighbouring sanctuary which has not yet been excavated.

The homogeneity of the soil in the deposit and the fact that multiple joins have occurred between different levels suggest that the material was discarded in a single episode at this spot. Furthermore, its wide timespan and its deposition on top of the walls suggest that the material was discarded here as a secondary deposit. A bronze coin of Sikyon, dated to c. 330–270 BC, was found in the deposit's core and indicates that this secondary deposition occurred at some point around or well after 330 BC. On the basis of comparanda from Corinth, the main body of ceramics preliminarily dates from the late 5th or early 4th century to around 340 BC. Nonetheless, there is certainly material from the entire second half of the 5th century BC here[70].

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65 For pottery quantification methods see Rice 1987, 288–293; Orton et al. 1993, 166–181.

66 Quantification of Classical and Hellenistic pottery is recent in pottery studies at Corinth. See McPhee – Pemberton 2012, 44 f.; James 2018, 20–26.

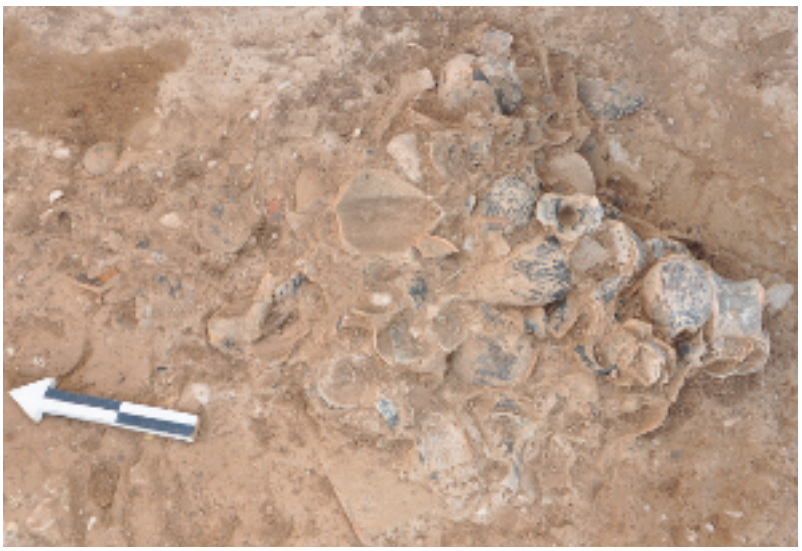
67 For estimating the minimum number of vessels for each shape, I have adopted the main idea of the formula developed by S. Rotroff and J. Oakley in: Rotroff – Oakley 1992, 133. The same formula has been applied for quantifying a household assemblage near the Athenian Agora in: Lynch 2011, 49 f.

68 Walls were preserved at the foundation level.

69 The predominant types of terracotta figurines are: horse and rider, standing female holding a dove or a phiale, reclining male, as well as ram, and dove. All these types are well represented at Corinth.

70 I ought to underline that the dates could alter once the full study of the deposit and pottery from the rest of the dataset has been concluded.

15 Concentrations of pottery and terracotta figurines in the deposit (© Ephorate of Antiquities of Corinthia)



16 Concentrations of pottery and terracotta figurines in the deposit (© Ephorate of Antiquities of Corinthia)

17 Goblets from the votive deposit, apart from the upper left, which was found in a domestic context (© G. Giannakopoulos)

In the following, I will focus on the most distinctive and numerous shapes or decorative styles. The deposit's fine ware assemblage largely consists of Corinthian and Sikyonian or regional pottery. Given the deposit's votive nature, the meagre presence of Attic imports sounds reasonable[71]. The goblet is the most popular drinking vessel within the deposit (fig. 17). It features a pedestal foot, low stem, deep convex body, and two small recurved handles of no practical value. So far, two main classes have been identified, the first having a concave undersurface, whereas the second has a flat one. Usually, the goblet is fully black-glazed, although there are examples decorated with added white and/or red bands on the handle zone and outer foot, and floral motifs on the handle zone. Goblets are not really common in Corinth, where around 80 examples have been recorded so far. The majority come from the Vrysoula deposit dated to 450–410 BC and from the Potters' Quarter, where they range from around the second quarter of the 5th to the first half of the 4th century BC[72]. Elizabeth Pemberton hypothesised that goblets were exclusively votive, based on their small size and their absence from domestic contexts at Corinth[73]. In fact, they appear to be uncommon in Corinthian sanctuaries too[74]. Conversely, at Sikyon the goblet is extremely popular. Apart from the hundreds of examples from the Syriona votive deposit, the shape is well represented in domestic contexts excavated in the different zones of the Sikyonian plain. It is indicative of its popularity that the archaeological survey on the plain has also generated many goblet fragments[75]. Moreover, the goblet did not go out of production even after the translocation of the city to the plateau in 303 BC[76]. The drinking vessels of the deposit are supplemented mainly by kotylai and Attic-type skyphoi[77].

18 Black-glazed ribbed chous (© G. Giannakopoulos)

Fine ware vessels for serving and pouring liquids occur sufficiently frequently in the deposit. The chous appears in two decorative techniques, black-glazed and black-glazed ribbed[78] (fig. 18). The shape comes from the Attic pottery tradition, where it developed out of the olpe and served as a common pouring vessel in the 5th and 4th centuries BC[79]. It features a low flaring ring foot,

71 Pemberton 2003, 170–172. Sanctuaries at Corinth show a significantly lower ratio of Attic imports to local pottery than graves and deposits linked with retail outlets and transfer points.

72 For goblets from the Vrysoula deposit see Pemberton 1970, 267. 269. 276 f. no. 18; 291 f. nos. 78–87; for goblets from the Potters' Quarter see Stillwell – Benson 1984, 192 no. 1017; 197 nos. 1042–1045; 213 f. nos. 1145–1146; 218 nos. 1169–1170; 313 no. 1741; an early 5th-cent. goblet, originally identified as a possible jug, with a zone of dots within diamonds on the outer foot was found in a well in the area of the Corinth Agora see Campbell 1938, 595 no. 140 fig. 15.

73 Pemberton 1970, 269.

74 Pemberton 1989, 126 n. 2. There is only one goblet fragment from the Sanctuary of Demeter and Kore at Corinth.

75 The archaeological survey was conducted in two field seasons in 2015 and 2016 by the project »Finding Old Sikyon« and publication thereof is in preparation. For the preliminary report on the 2015 field season see Frederiksen et al. 2017.

76 James 2021. In her study on pottery from four rescue excavations at the Sikyonian plateau, James concludes that the goblet was the only locally produced drinking vessel of the Early phase of the refounded city. On the evidence of these four rescue excavations, the goblet was produced from c. 250–175 BC or slightly later.

77 Three kotyle types have been observed so far in the deposit, i.e. ray-based, semi-glazed, and ovoid. Attic-type skyphoi appear to be from the 1st half of 4th cent. BC. The compound curve of the body is not pronounced and the foot not that constricted, like in the specimens of the 2nd half of the 4th cent. BC. For the most recent discussion on Corinthian Attic-type skyphoi see James 2018, 80–82.

78 Chous corresponds to oinochoe shape 3 of Beazley's principal shapes. For the latter see ABV 11 f.; ARV² 49–51.

79 For Attic black-glazed choes see Sparkes – Talcott 1970, 60–63; Rotroff 1997, 125–127.

a squat body with continuous curve with the neck, a trefoil mouth and a vertical handle, usually ridged and slightly overhanging the mouth at the top. Attic choes were imported to Corinth from the last quarter of the 5th century BC. Local imitations of both black-glazed and black-glazed ribbed classes appear by the early 4th century BC, although they never became common representatives of the Corinthian repertoire[80]. In contrast, the chous is abundant at Sikyon in both the aforementioned decorative styles. The votive deposit contains numerous examples, yet the shape is well attested in domestic contexts too.

Another trefoil shape enjoys the same great popularity at Sikyon. It features a turned foot, slender ovoid body, almost flat shoulder, offset slender neck, trefoil mouth and a high-swung handle attached to shoulder and mouth (fig. 19). Like the chous, it appears in black-glazed and black-glazed ribbed classes. The shape is completely absent from the assemblages at Corinth. It can be better classified under John D. Beazley's oinochoe shape 1 due to the offset neck. It is attested in the Athenian Agora in black-glazed, albeit most commonly was preferred for figured decoration[81]. The black-glazed specimens of the Athenian Agora date to the 6th and early years of the 5th century, even though an example with impressed decoration and slender proportions from the late 5th century BC is noted[82]. In any event, the Sikyonian examples from the votive deposit cannot date before the early 4th century BC as they coexist with the black-glazed and ribbed choes, which on evidence from Corinth can hardly be placed before 400 BC. Moreover, like with the choes, numerous complete or full-profile vessels have been retrieved from the deposit, indicating that they cannot date considerably earlier than their deposition.

19 Black-glazed ribbed oinochoe shape 1 (© G. Giannakopoulos)

A significant portion of the deposit consists of Corinthian red-figure pottery, primarily of bell kraters, hydriai and pelikai (fig. 20). Corinthian red-figure vessels are generally distinguished from the Attic ones by the fabric and lower quality of the execution[83]. Local potters adopted the red-figure technique from Athens in around 440/430 and the production lasted until c. 350 BC. Red-figure pottery from the Syriona votive deposit probably dates to the first half of the 4th century, as – according to the preliminary examination – the Pattern Painter and the Sketch Painter(s) are present[84]. The deposit's ceramic assemblage is supplemented by vessels for oil and perfumed oils, such as conventionalising broad-bottomed oinochoai and ovoid lekythoi, covered vessels such as plain lekanides, and vessels for cult purposes such as Vrysoula kantharoi and phialai[85].

To answer the dissertation's main question – whether Sikyonian production of fine ware ceramics existed in the Classical period – is rather challenging. In fact, the macroscopic survey of the dataset's fabrics does not suggest obvious differentiation from Corinth. Such an observa-

80 For Corinthian black-glazed and black-glazed ribbed choes see Pemberton 1989, 17 and n. 29; McPhee – Pemberton 2012, 152.

81 For the shape see Sparkes – Talcott 1970, 59; Richter – Milne 1935, figs. 124. 125. 129.

82 Sparkes – Talcott 1970, 24 n. 50. 59.

83 On Corinthian red-figure pottery see Herbert 1977; McPhee 1983; McPhee 1997, 118–134; McPhee – Kartsonaki 2010; McPhee – Pemberton 2012, 28 f.

84 For the Pattern Painter and the Sketch Painter(s) see Herbert 1977, 8–12.

85 For conventionalising broad-bottomed oinochoe see Risser 2001, 112–116; for ovoid lekythos see Risser 2001, 121–124; for plain lekanis see McPhee – Pemberton 2012, 217–219; for Vrysoula kantharos see Pemberton 1970, 276 f.; for phiale see McPhee – Pemberton 2012, 209 f.

tion sounds reasonable since the two neighbouring cities share an identical geological background and claybeds. The problem of distinguishing the local fabrics or products from the Corinthian has been implied or directly addressed by all the scholars who at some point examined pottery from Sikyon[86]. James acknowledges the great similarity between the main Sikyonian and Corinthian fabrics; nonetheless she notes the ubiquity of small grey angular inclusions and the general absence of the reddish-brown mudstone as the main distinguishing characteristics of the Hellenistic local fine ware ceramics[87]. Nancy Bookidis, in her recent study of the Greek lamps from the Sanctuary of Demeter and Kore, employs the term »Corinthian« in its modern geographical sense, underlining that lamps identified as such may come from a broader area with similar clays, e.g. Sikyonia[88].

20 Corinthian red-figure hydria (© G. Giannakopoulos)

Since pottery kilns have not yet been investigated in the Sikyonian plain, this complex matter demands thorough examination of typology, decorative techniques, and fabrics. At this elementary stage of the study, decoration styles appear to be the less promising for providing us with differentiations between Corinthian and Sikyonian fine wares[89]. In contrast, typology already suggests that at least three shapes were produced at Sikyon in the Classical period. The abundance of goblets, chous, and shape 1 oinochoai at Sikyon is combined with their scarcity, or total absence in the case of shape 1 oinochoai, from the archaeological record at Corinth. The criterion of relative abundance demonstrates that density of pottery of a particular category is greater near the site of its manufacture[90]. Hence, goblets, chous, and shape 1 oinochoai are the first three shapes which can be attributed with some certainty to the Sikyonian pottery production of the Classical period. This set of shapes serves as the starting point for applying analytical methods of provenience studies, as the preliminary conclusions provided by spatial occurrence will be supplemented by chemical analyses[91]. The latter will include clay samples from both Sikyon and Corinth, vessels of the aforementioned shapes, and shapes from Corinth that are rare or absent at Classical Sikyon.

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86 Friis Johansen 1923. Friis Johansen's concept is in fact an early scepticism on the issue; Edwards 1975, 10. 190 n. 7; Trainor 2015, xv.

87 James 2021; James 2018, 10 and n. 83; see also S. James in this volume. At this early stage of my study, I am not able to address whether James' criteria are applicable for Classical fine ware ceramics too.

88 Bookidis – Pemberton 2015, 3.

89 The pottery in the dataset corresponds fully with the well-attested decoration styles of the Classical period at Corinth.

90 On the matter of locating the production see Rice 1987, 177–180. 413–426.

91 The analyses will be carried out at the Fitch Laboratory of the British School at Athens. The Enbom Foundation of Denmark has generously provided the necessary funding.

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Sarah A. James

REVEALING SIKYON-DEMETRIAS

LOCAL RESPONSES TO POLITICAL AND ECONOMIC CHANGE IN THE HELLENISTIC PERIOD

ABSTRACT
Sikyon-Demetrias had been a significant lacuna in the northeastern Peloponnese prior to the work begun by Yannis Lolos in the 1990s. The new picture that emerges from archaeological survey, rescue excavations, and new excavations in the agora is one of a sprawling city that matches its ancient reputation. Using rescue excavation material, the author has built a typology for local pottery from the late 4th century BC to the early 1st century AD. This study demonstrates that trends in Sikyonian ceramic production are closely connected to broader historical and economic changes in the region. In this paper, I discuss how local ceramics reveal the city's evolving relationships with Corinth and later Rome, as well as how Sikyon developed its own unique Hellenistic assemblage.

Located on a plateau overlooking the vast plain running down to the sea, the Hellenistic-Roman city of Sikyon-Demetrias has been the focus of intense archaeological inquiry for more than 25 years, thanks largely to the work of Yannis Lolos of the University of Thessaly[1]. He realised the potential of this 2.3 km² site to provide evidence about the activities of the Antigonids in the region, as well as illuminating aspects of the Late Hellenistic and Roman periods in the northeast Peloponnese. Sikyon was a leading member of the Achaean League and remained a prominent Peloponnesian city even after the destruction of Corinth in 146 BC and the incorporation of southern Greece into the Roman province of Achaea[2]. The city's stability during these times of significant political change provides a unique opportunity to understand the impact of external forces on the material culture of the Corinthia from the 3rd century BC to the 1st century AD.

Using archaeological finds, particularly ceramics, this paper presents a revised history of Sikyon-Demetrias in the Hellenistic period. While it contrasts with some of our written sources, it also reveals details that are lacking from synthetic histories of the site. The archaeological data demonstrates that although Sikyon-Demetrias was an important city in its own right, its material culture shows signs of influence first by Corinth and then Italy.

IDENTIFYING THE LOCAL CERAMIC ASSEMBLAGE

Part of my research at Sikyon has been creating a local typology and chronology of Hellenistic ceramics using excavated deposits[3]. Material from four ›rescue excavations‹ done in the 1990s near

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1 See Lolos 2011; Lolos – Gourley 2012; Lolos 2021. Y. Lolos also directed five seasons of excavations in the agora (2013–2017), the results of which are being published in Lolos 2021.

2 Plutarch's »Life of Aratos« is the main ancient source for the city's role in the Achaean League. For an excellent overview of the late 4th cent. BC to 1st cent. AD at Sikyon, see Lolos 2011, 76–80 with full references to other ancient works.

3 The Sikyon Survey Project found several kiln sites that enabled C. Trainor to discuss local production of some cooking pots, coarse wares, and lamps but without internal chronological control (Trainor 2015).

the village soccer field formed the basis of this initial work[4]. These excavated areas were chosen for study from a larger group because they had architectural remains, clear stratigraphy, and quantities of local and imported pottery often found in strata with legible coins. Architecturally, these structures are relatively simple with walls built of cobbles and small blocks. The associated finds of table and cooking wares, utilitarian pottery, loom weights, lamps, animal bones, and shells has led us to interpret these buildings as houses.

Domestic material from houses is, in general, the best place to start building pottery chronologies and typologies for a site. The self-contained ideal of the oikos for ancient Greeks means that many different activities took place in the average house – such as cooking, storage, dining, and weaving. As a result, they tend to use and dispose of most of the available local ceramic assemblage. This is in contrast to specialised contexts like sanctuaries, cemeteries, or civic spaces where a more limited range of vessels were typically employed. Although none of the rescue excavations had *in situ* deposits, each had stratified refuse fills within architecturally-defined spaces that allowed a chronological framework for the datable material within them to be established[5].

The city of Corinth was Sikyon-Demetrias's largest and most powerful neighbour and was a prolific ceramic producer and exporter throughout much of antiquity. Sikyon appears to have imported significant quantities of Corinthian-made pottery of all types until the mid-2nd century BC. Some of these imported Corinthian ceramics have locally made parallels, but Sikyonian potters also produced their own distinctive shapes. The result, from an archaeological perspective, is a functional ceramic assemblage at Sikyon in the Early Hellenistic period (c. 300–150 BC) composed of both Corinthian and Sikyonian pottery.

One consistent challenge encountered by those attempting to study Sikyonian pottery in the past has been how to distinguish clearly between Sikyonian and Corinthian products in the Hellenistic period. Corinth and Sikyon-Demetrias are located on the same marine uplift terraces and potters used the same pelagic clay beds for their products[6]. One might therefore expect that the fabric of the Hellenistic pottery made at both sites would look very similar, and it does, but closer study reveals macroscopic differences (some of which have been confirmed petrographically) in inclusions and other clay properties[7]. Moreover, there are two types of Hellenistic Sikyonian fabrics that do not occur at Corinth – a medium-coarse clay that fires pink and a fine clay that fires to a light-brown colour[8].

Most problematic is the third major fabric, Sikyonian ›buff‹, which is a similar colour to the classic Corinthian pale yellow fabric. But, there are several ways to tell even these fabrics apart. In fine Hellenistic tablewares, the Sikyon ›buff‹ fabric fires a little softer, it is more granular or

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4 Y. Lolos secured permission for the material from these excavations to be studied and published. In 2010, the author and D. Grigoropoulos began work on the Greek and Roman pottery from them. The specific plots are owned by the Sidiropoulos, Tsoulphas, Gousidis, and Thanopoulos families. Detailed discussions of each plot are presented in Lolos 2021. The Hellenistic pottery found by the Sikyon Survey Project was studied by P. Stone (Stone 2021).

5 The resulting typology and chronology are presented in James 2021.

6 This is also the case for other ancient cities on the north coast of the Peloponnese and use of similarly formed clay beds may explain the predominance of ›buff‹-coloured pottery along both sides of the Corinthian Gulf. On the geology and clays of the Corinthia, see Hayward 2003 and Whitbread 2003. Hayward's study of the plateaus of Sikyon-Demetrias is published in Lolos 2021. For a brief overview of Sikyon's geology, see Lolos 2011, 28–32.

7 It is important to note the distinction between Coronthian pottery made in the Classical periods (c. 450–300 BC) and that produced in the Hellenistic period (c. 300–50 BC). A recent project collaborated with the BSA's Fitch laboratory to study Classical pottery found at Corinth and Sikyon and determined that it is nearly impossible to distinguish between them (Giannokopoulos et al. 2022). These results, however, cannot be applied to Hellenistic pottery produced at these two sites. At Corinth, by the late 4th cent. BC, the early clay beds in the Potter's Quarter were nearly exhausted and compelled by potters to find new sources of clay. These new clays have distinctive properties compared to Classical products (James 2018; 2022). Additionally, Hellenistic pottery at both sites is generally less well levigated than in the Classical period making it easier to identify unique characteristics found in the pottery at both sites.

8 **Cat. 1**–**4**, **10** and **11** are examples of these local pink and pale-brown fabric types.

sandy, the breaks are smoother, and the glaze tends to be a dull blackish-brown ranging to grey rather than a true black in the 3rd century BC[9]. These characteristics make it possible to identify local tableware and discuss their relationship to larger trends in regional ceramics. Coarser Sikyonian ›buff‹ fabrics, such as those used for tiles and pithoi, typically lack the reddish-brown mudstone inclusions of Corinthian products. Instead, in firing of clay, these inclusions tend to turn a dark-grey colour like those seen in other northern Peloponnesian workshops[10].

Sikyonian tableware can thus be divided into »Early« and »Late« phases and this chronology was applied to the archaeological record across the site to reconstruct a fuller history of Sikyon-Demetrias[11].

FOUNDING SIKYON-DEMETRIAS

Before the foundation of the Hellenistic city, small quantities of Archaic and Classical pottery attest to a modest degree of occupation on the plateau. Pausanias recounts the presence of two sanctuaries and several smaller shrines in the area of the agora (Paus. 2, 7, 5–8). Of the architectural remains from this period, the Temple of Apollo is the most visible sign that the area of the Hellenistic agora was a locus of ritual activity[12].

Ceramic finds in the agora include dozens of Classical figurine fragments, small oil vessels, and decorated drinking cups that have strong parallels to assemblages from the North Cemetery and the Demeter and Kore Sanctuary at Corinth[13]. Many of the vessels are Corinthian, but Athenian and local pottery is also represented. Conversely there are very few Archaic or Classical cooking or storage vessels, lamps, or loom weights from the agora excavations. Taken together, the evidence suggests that a large section of the plateau was reserved for ritual activity and that whatever habitation there was from the 6th to 4th centuries around the later Hellenistic-Roman agora was relatively ephemeral[14]. These factors would have made the plateau, i.e. the acropolis of Archaic-Classical Sikyon, an ideal place to move the city in 303 BC.

According to ancient authors, when Demetrius Poliorcetes came to the Corinthia, he destroyed the lower city on the plain next to the Gulf of Corinth and ordered the Sikyonians to move to the plateaus, where he also installed a garrison[15]. The explanation given for this action is that the Archaic-Classical city lay on a swampy and ›unhealthy‹ area on the plain. But, from a strategic standpoint, the acropolis was a much better defensive position for the city. This was one of several acts attributed to Poliorcetes in the region, others include attempting to dig a canal through the Isthmus, rebuilding the city walls of Corinth, remodelling Lechaion harbour, and refortifying Acrocorinth[16]. Corinth became one of the ›fetters of Greece‹ for the Antigonids when securing and maintaining control over this region from c. 303 to 243 BC was a primary concern.

Theoretically, if the city was moved to the plateau in the late 4th or early 3rd century, then there should be evidence of roughly contemporary domestic assemblages. Interestingly, so far, the excavated contexts contain very little material of the late 4th or early 3rd century BC – local or imported. Instead, Hellenistic material only appears in large quantities beginning in the 260s BC.

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9 For definitions of these terms, see Sanders et al. 2017, 122–126. **Cat. 7** is a lamp in Sikyonian ›buff‹ fabric.

10 These grey inclusions can also be seen in the regional ›buff‹ pottery on display in the Aigio, Amphissa, and Patras museums, so it is likely that they are not purely indicative of Sikyonian production.

11 James 2021.

12 For an excellent discussion of Archaic-Classical Sikyon, see Lolos 2011, 61–70. On the Archaic temple, see most recently Krystalli-Votsi – Østby 2010.

13 This observation is based on my analysis of material from excavations in the agora conducted between 2013–2018. The final publication of these seasons's result is in progress.

14 Martha Risser, who studied the survey finds, suggests that there was only a small settlement on the plateau in this period (Risser 2021).

15 Diod. 20, 10, 2–4; Plut. Demetrios 25, 2; Paus. 2, 7, 1; Polyain. 4, 7, 3; Strab. 8, 6, 25.

16 Diod. 20, 103, 2; Plut. Demetrios 25.

Although typically it takes about a generation for the ›living‹ assemblage to be deposited in the archaeological record, this time lapse suggests that moving the city was a lengthy process indeed. At about 40 years after the traditional foundation date, it accords well with patterns seen at the Roman colony at Corinth, which was founded in 44 BC and its first public buildings were constructed in the late 1st century BC[17]. Some evidence from the new agora excavations indicate that this area was remodelled, and new buildings were also constructed in the second quarter of the 3rd century BC.

Corinthian-made pottery dominates the tableware assemblage at Sikyon during the Early Hellenistic period (ca. 270–160 BC). Most imported Corinthian shapes are drinking equipment like kantharoi, kraters, and pouring vessels; other shapes include bowls, fish plates, and loom weights[18]. During this period, Corinth appears to have been producing pottery of all types on a very large scale[19]. Given its proximity, it is perhaps not surprising that Sikyonians were among the many consumers of Corinthian ceramics in this era. Corinthian influence on the assemblage is to be expected, but the prevalence of non-local shapes as ›prestige wares‹ perhaps indicates a degree of cultural influence as well.

Some locally made tablewares in this early period show Corinthian connections, but Sikyon-Demetrias had its own thriving ceramic industry that filled out the rest of its 3rd-century assemblage[20]. A distinctly Sikyonian shape is the goblet, which first appears in the Classical period (e.g. **cat. 1**. **2**)[21]. This cup has either a flat or solid carinated foot and can be fully or partially black glazed. Its small capacity relative to other contemporary drinking shapes and its ubiquity at the site may indicate that the goblet had a specific and locally defined purpose. Echinus bowls and bowls with out-turned rims are similarly ubiquitous and demonstrate the city's interaction with the Hellenistic ceramic *koine*, particularly of the northern Peloponnese. Other categories of ceramics, including cooking and utilitarian wares, lamps, loom weights, figurines, and tiles, were produced in large quantities. These shapes continued to be made with little interruption into the 1st century AD[22].

LATE HELLENISTIC SIKYON

Sometime between 175 and 150 BC, the Sikyonian ceramic industry began to grow, especially in terms of tablewares, and this growth accelerates into the later 2nd century BC. This expansion of local pottery production after 146 BC is probably related to the steep decline of the Corinthian ceramic industry after the city was attacked by Rome at the end of the Achaean War[23]. Yet, the 2nd century BC is also a time in which there is a significant increase in the geographical range of imported pottery (including transport amphoras) found in contexts at both Corinth and Sikyon[24]. The appearance of these imports in the archaeological record seems to indicate that the northeast

17 On the earliest colony deposits see Wright – Jones 1980 and Slane 1986. The earliest building activities are discussed in Walbank 1997.

18 Other imports include cups from Athens, eastern Aegean transport amphoras, bowls from Argos, and a ›Tanagra‹ style figurine (James 2021, nos. 95–98. 106. 107. 114. 115).

19 James 2018, 72–74.

20 Two main tableware shapes with connections to Corinth are the semi-glazed bowl and the saucer; these were once thought to be exclusively Corinthian products but new studies show they were also made at Sikyon (for Corinthian examples see James 2018, 103–106. 176–180 nos. 173–214 figs. 26–30 pls. 21–24; for Sikyonian products see James 2021, nos. 9–12). See Trainor 2015, 19–40 for a full discussion of local production.

21 James 2021, nos. 1–7. Additional examples of this shape are published in Likoudi 2013, 69–71 nos. 12–15 pls. 2. 3. 39. 40. 68.

22 James 2021, nos. 52–94 fig. 6, 5–13. 17–19.

23 For a discussion of the fate of Corinth and its potters after 146 BC see James 2018, 4–21.

24 The Corinthian fine tableware assemblage responded to the influx of imports by developing new shapes and abandoning some forms with Classical predecessors (James 2018, 99 f. 151–154).

Peloponnese had greater contacts with extra-regional trade networks in this period[25]. This new internationalism ushers in the »Late« Hellenistic period at Sikyon from the 150s to the end of the 1st century BC.

Literary and archaeological evidence make it clear that Sikyon benefitted economically from Corinth's decline for several generations before the city fell into debt. Ancient sources tell us that the Romans gave Sikyon control of the Isthmian Games after 146 BC and the city retained this position until the early 1st century AD[26]. Signs of a greater Sikyonian presence after 146 BC can be seen in the relatively large quantities of the famous Sikyon dove coins, tablewares, and lamps in post-146 BC deposits in the South Stoa at Corinth. This is in striking contrast to the very small number of Sikyonian products that date to the 3rd and early 2nd century BC[27]. Strong circumstantial arguments can be made that Sikyon also took control of Corinthian lands and their harbours at Lechaion and Kenchreai[28]. Imports from late-2nd- and early-1st-century deposits at both Sikyon and Corinth show that goods continued to flow through Lechaion and Kenchreai after the sack in 146[29]. Moreover, without the massive market of urban Corinth to absorb goods passing through the isthmus, more ceramic imports appear at Sikyon by the end of the 2nd century BC. These Late Hellenistic imports include a few from Corinth and Athens, but also from Ionia, Antioch, Argos, southern Italy, and North Africa[30].

Overall, the later second and first half of the 1st century BC were a time of economic growth for the city and the expanding local ceramic assemblage provides some clues about how Sikyonian society reacted to these changes. The collapse of the Corinthian ceramic industry spurred a sharp increase in Sikyonian pottery production, while contacts with new regions, as demonstrated by their imported goods seem to have been a catalyst for innovation in the local assemblage and cause the introduction of new shapes, types of tablewares, and lamps. Influence from Italian markets and their products also appear for the first time, notably in the creation of a local transport amphora (see below). Many of these new pottery types are also found in Late Hellenistic deposits at Corinth, suggesting that Sikyonian ceramic production had grown beyond the level of local consumption. The appearance of regional and extra-regional exports is a clear change from the Early Hellenistic period and is evidence for economic expansion in this era.

Late Hellenistic Sikyonian tableware includes some earlier shapes and new ones from the broader Hellenistic ceramic *koine*, like the rolled rim plate and mould-made bowl (e.g. **cat. 3**. **4**), were introduced; the city's potters may also have contributed to regional gray ware production[31]. Grey ware is a type of fine tableware with a grey fabric with a grey glaze that appears in many parts of the eastern Mediterranean in the 2nd century BC. A northeast Peloponnesian grey ware industry with its centre in the Corinthia has recently been identified, and it seems likely that

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25 Finds of imported Hellenistic pottery in well-dated deposits at Corinth show that city consuming goods from a greater geographical range of sites through roughly 150–50 BC (James 2020a).

26 Paus. 2, 2, 2; Strab. 8, 6, 23; Zon. 9, 21, 6. An inscription from Corinth also attests to this situation (Kent 1966, 70–72 no. 153 lines 6–8).

27 For 1st-cent. Sikyonian coinage see Lolos 2011, 79. On Late Hellenistic coins in the South Stoa wells at Corinth see Connor 2013. Examples of Sikyonian tablewares from late-2nd–1st-cent. BC deposits at Corinth are Corinth inv. C-1934-1601 (Sikyonian goblet), C-1934-1602 (rolled rim plate), C-1947-403 (flat rim plate), and C-1934-474 (bowl with out-turned rim).

28 Sikyon was a ›free city‹ and held *possessio*, not ownership, of most of the former Corinthian territory. It was probably responsible for organising the payment of taxes from Corinthian lands to Rome through the mid-1st cent. BC (James 2013, 19).

29 James 2013, 27–30; James 2020a.

30 James 2021, nos. 95–115 fig. 6, 13–15. 19.

31 One characteristic feature of Sikyonian rolled rim plates is the circular groove(s) on the interior near the base (cf. **cat. 4**). For a discussion of this type of plate see James 2021, nos. 44–48 fig. 6, 4. 5. There are not enough local mould-made bowls yet to determine their distinctive features, but those that have been recovered are in the Corinthian tradition (cf. James 2021, nos. 30. 31 fig. 6, 3).

Sikyon was involved with this new type[32]. Locally made grey wares are very common at Sikyon and Corinth, appearing in nearly every 2nd to 1st-century BC context (e.g. **cat. 5**. **6**)[33]. Nearly all tablewares have versions in this fabric, which is soft with very few inclusions and a grey to greenish-grey glaze; i.e. they lack the fine sparking inclusions associated with eastern Aegean grey wares.

Sikyonian potters also show a keen interest in adopting and emulating imports throughout the mid-1st century AD, while maintaining their Hellenistic black-glazed pottery tradition. Of the Early Hellenistic shapes, echinus bowls, saucers, and bowls with out-turned rims are the most common among the long-lived black-glazed pottery. These black-glazed vessels are partially glazed by dipping and fire to a range of colours from black to brown to a greenish grey, notably the quality of their manufacture tends to decline in the Late Hellenistic period[34].

Further evidence for both conservativism and invention by Sikyonian potters can be seen in local cooking wares. Most cooking pots produced during the 2nd and 1st centuries BC have their origins in the Late Classical period, especially stewpots and casseroles, and appear to be part of a strong regional tradition[35]. New forms of baking and frying pans are introduced in the Late Hellenistic period, however, indicating a shift in dietary habits[36]. This greater range of cooking ware shapes was surely stimulated through Italian contacts and gradually evolves into a fully ›Roman‹ cooking assemblage by the late 1st century AD[37].

Beyond cooking pots, local cooking ware fabric was also used to produce new three types of lamps in the Late Hellenistic period[38]. Sikyon-made cooking-fabric Broneer type X and Broneer type XVII lamps are found at both Corinth and Isthmia indicating that they were exported beyond the city (e.g. **cat. 7**. **8**)[39]. Finds of kiln wasters by the urban survey and macroscopic similarities to local cooking wares demonstrate that Sikyon was the production centre for these types[40]. Contextual evidence suggests that type X lamps were made at Sikyon from the 3rd to the 1st century BC and perhaps as late as the early 1st century AD[41]. Broneer type XVII lamps have a similar date range as the type X, but may continue slightly later into the mid-1st century AD. Both types of lamps seem connected to the Broneer type XVI cooking-fabric lamp that develops in the late 1st century BC and continues into the 1st century AD[42]. Evidence for this connection are finds of

32 James 2020a.

33 The grey wares found at Sikyon are described more fully in James 2021 (nos. 109–112 fig. 6, 15).

34 Early Hellenistic Sikyonian pottery tends to be fully glazed, or even when it is partially glazed, has a more consistent black colour than in the latter half of the 2nd cent. BC (James 2021).

35 James 2021, nos. 52–63. 67–70 fig. 6, 5–8. 10.

36 James 2021, nos. 64–66. 71–76 fig. 6, 9. 11. 12.

37 James 2020.

38 Production of traditionally fine tableware shapes in cooking fabric is a phenomenon also seen at Corinth, beginning in the 2nd cent. BC (James 2018, 133 f.). At Sikyon, tableware bowls were also made in cooking fabric. These vessels bear some resemblance to bowls with out-turned rims but vary greatly in their size and rim profiles (James 2021, nos. 74–76 fig. 6, 12).

39 Note that **cat. 7** is not in cooking fabric, but it is representative of the basic shape of type X lamp produced at Sikyon (James 2021). For a definition and discussion of the type X lamp in the Corinthia see Broneer 1930, 49–51 nos. 154–169 figs. 14, 39–40 pl. 4; Broneer 1977, 22 f. nos. 218–226 pls. 4. 18; Bookidis – Pemberton 2015, 66–68 nos. L101–L104 pl. 11. On the type XVII see Broneer 1930, 60 f. nos. 294–300 fig. 14, 53–54 pl. 6; Broneer 1977, 35 nos. 1109. 1110 pls. 4. 19; Bookidis – Pemberton 2015, 70 no. L112 pl. 12. Although the type X is ubiquitous at Corinth and Isthmia, the type XVII is less common and consequently more problematic for scholars working outside of Sikyon.

40 Trainor 2015, 61 f.

41 James 2021.

42 A staggering number of type XVI cooking-fabric lamps have been found in the new agora excavations. For type XVI lamps at Sikyon see Grigoropoulos 2021. On these lamps at Corinth and Isthmia see Broneer 1930, 56–60 nos. 196–293 fig. 14, 50–52 pl. 5; Broneer 1977, 26–34 nos. 339–1108 pl. 5, 19–21; Pemberton 1989, 9 f. 23 f. 27 nos. 1–7 fig. 1 pl. 1; Wohl 2017, 13–15. 86 f. nos. 75–82 fig. 1 pl. 9. A connection between the type XVII and XVI lamps is also noted by Bookidis (Bookidis – Pemberton 2015, 68).

hybrid lamps at the site (e.g. **cat. 9**), which have the body of type X/XVII lamps, but the squared nozzle of the cooking-fabric type XVI, suggesting a linear development from one to the other. Type XVI lamps in cooking fabric are extremely common throughout the Corinthia in the Early Roman period. We are therefore seeing innovation and expansion in local products that are distributed throughout the region.

Late Hellenistic Sikyonian potters were clearly influenced by early sigillata wares. By the first half of the 1st century BC, they produced some of the earliest imitations of ›Roman‹ shapes in the Corinthia. Vessels inspired by late-2nd- and 1st-century BC forms of ESA and ESB are relatively common, but into the 1st century AD local versions of Italian sigillatas become more popular[43]. One such imitation is a dish commonly found in both the rescue and agora excavations, which has its best parallels in ESB form 23 and Conspectus form 14.4.1 in Italian Sigillata (e.g. **cat. 10**. **11**)[44]. Its fabric is slightly coarser than the originals, but the shape is fairly quite similar close. An interesting feature of these imitations is that they are fully glazed like the originals and unlike contemporary Hellenistic shapes that are normally partially glazed by dipping. Yet, the copies are not red-glazed and no attempt was made to make them appear so. Instead, potters seem to have been satisfied with a mottled red-black glaze[45]. True red-glazed imitations of sigillatas do appear in the 1st century AD, a type known as local red-slip. This ESB/Italian sigillata inspired shape illustrates the complex relationship between local producers and the imported products now entering the city. Clearly there was a market for tablewares echoing foreign sigillatas at Sikyon and local potters strove to fill this new demand.

The resulting ceramic assemblage is a hybrid or transitional one that bridges the Late Hellenistic and Early Roman periods. Composed of ceramic shapes from the local Hellenistic tradition and local imitations of imported sigillatas and cooking wares, as well as the imports themselves, this type of assemblage creates challenges for ceramicists due to the conventional chronological divisions between these periods[46]. Such assemblages are important, however, because they reflect the process of stylistic and cultural transmission during periods of political and social change. Potters did not immediately produce an assemblage that is definitely ›Roman‹, instead there was a long period of experimentation and ›Hellenistic‹ and ›Roman‹ shapes co-existing well into the 1st century AD[47].

The appearance of the first locally made transport amphoras, known as the Sikyonian A, around the mid-2nd century BC is a further sign of the city's expanding economy in the Late Hellenistic period[48]. A logical assumption is that the introduction of this new shape is connected to Sikyon's control over former Corinthian lands, which were famous for their olive oil[49]. This theory is supported by literary references to Sikyonian olive oil, which appear only in works of the late 2nd and 1st centuries BC[50]. For their first transport amphora, Sikyonian merchants chose a shape that was recognisably in the Greco-Italic tradition, closely resembling Lamboglia 2 and Brindisi 2/4 amphoras[51]. By producing an amphora in the central Mediterranean tradition, Sikyonian potters were

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43 Sikyonian imitations of ESA shapes were found in the new agora excavations and their publication is in process. Some of these Sikyonian-made imitations also appear in deposits at Corinth.

44 This dish is discussed in James 2021, nos. 32–35 fig. 6, 3. ESB form 23 (early 1st cent. AD), see Hayes et al. 1985, 57 f. pl. 12, 18. Conspectus form 14.4.1 (mid-late Augustan) appears in Ettinger et al. 1990, 76 f. pl. 13.

45 Similarly, local imitations of Italian thin-walled wares copy the shapes very closely but none of the decoration.

46 James 2020b.

47 For an example of a transitional assemblage from the South Stoa at Corinth, see James 2019, 186–197.

48 Kiln sites and wasters of these transport amphorae were found by the urban survey (Trainor 2015, 48–53 fig. 4, 5. 6). See also Lolos 2011, 40. A Sikyonian A amphora appears as a proto-Dressel 25 in an article by A. Opaiţ (2010, 155 f. pl. 87, 3).

49 James 2014, 19.

50 Verg. georg. 2, 519; cf. Stat. Theb. 4, 50.

51 Gassner 2011 (Ionic-Adriatic amphoras); Palazzo 2013 (Brindisi amphoras); Carre et al. 2014 (Lamboglia 2/ Dressel 6 amphoras). The origins of the earliest Greco-Italic amphoras are Corinthian A and B transport amphoras, and this type developed independently beginning in the 4th cent. BC (Will 1982, 341).

making a conscious move intended to facilitate engagement with the markets of the Adriatic and southern Italy and break away from Corinthian A and B types. The invention of the Sikyonian A amphora is therefore a physical manifestation of the economic prosperity (and expanded trade contacts) that occurred in the wake of Roman political control in Greece. Sikyonian A amphoras may have been produced into the 2nd century AD when they were replaced by the ›B‹ type[52].

CONCLUSIONS

Although the material from the rescue excavations and the agora excavations is only a sample of the plateau, the evidence to date allows us to reconstruct some new aspects of ancient Sikyon from the 7th century BC to the 1st century AD. In the Archaic and Classical periods, the plateau was dominated by ritual activity and some scattered habitation. After establishing the city in 303 BC, it seems to have taken more than a generation for occupation to become dense enough to leave a clear archaeological signature. In the Early Hellenistic period, Sikyon was under the shadow of Corinth, which as its large, powerful and well-connected neighbour, heavily influenced local pottery at Sikyon through the early 2nd century BC.

By the mid-2nd century BC, Sikyon began to produce a unique range of ceramic shapes, and this assemblage expanded further with the fall of Corinth in 146 BC. Sikyon became the manager of Corinthian territory and its harbours for the Roman Senate until the foundation of the Caesarian colony in 44 BC. This new position benefitted the city economically, at least at first, by granting it access to additional agricultural resources, as well as to trade routes and markets formerly dominated by Corinth[53]. A strong and friendly relationship with the Romans may also have enabled Sikyon's products to reach markets west of the Corinthian Gulf for the first time. It is apparent that Sikyonians were able to respond quickly to political changes and economic opportunities in the Late Hellenistic period. Ancient literary accounts may be largely silent on this era of the city, but the archaeological evidence from ancient pottery speaks volumes.

CATALOGUE[54]

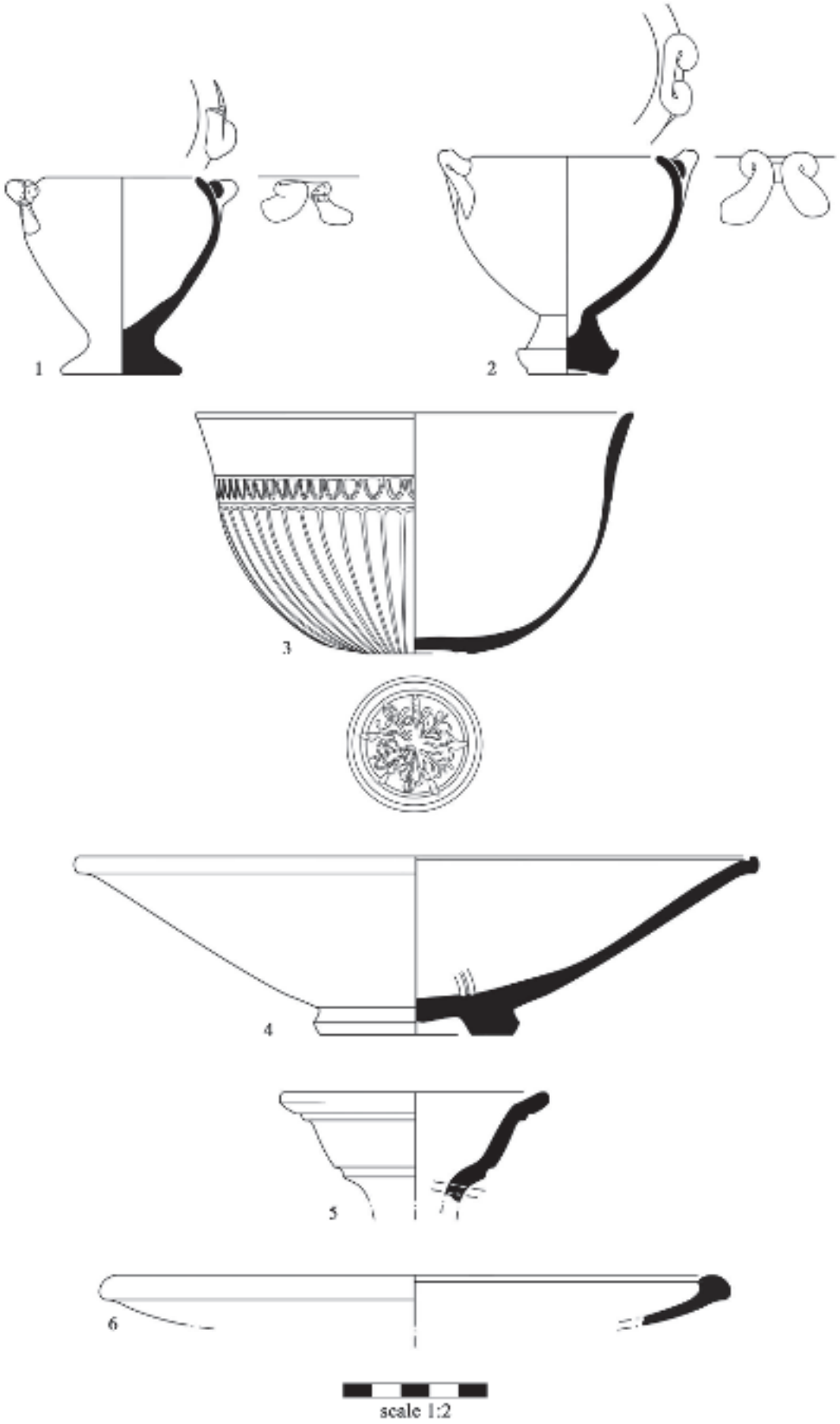
Cat. 1 fig. 1, 1
Sikyonian goblet
Sikyon inv. 3-3-76
H. 0.065 m, base diam. 0.043 m, rim diam. 0.080 m (est.)
Fine pale-brown (2.5Y 8/2) clay with rare small angular-tabular and angular-platy dark-grey inclusions, rare small rounded-spherical and rounded-tabular white inclusions, and rare small voids. Flat string-cut pedestal base, short thick stem to an ovoid body with maximum diameter at the shoulder, to an incurved rounded lip. One recurved handle attached below lip. Traces of black glaze all over. (James 2021, no. 1 fig. 6, 1. 16).

Cat. 2 fig. 1, 2
Sikyonian goblet
Sikyon inv. 3-3-92
H. 0.076 m, base diam. 0.028 m, rim diam. 0.063 m
Fine pale-brown (2.5YR 7/3-4) clay with rare small angular-tabular white inclusions, rare fine sparkling inclusions, and rare small voids. Pedestal foot with a string-cut disc base, globular body with maximum diameter at the shoulder to an incurved tapered lip. Two recurved handles attached at shoulder rise above the lip. Interior has a deep depression in the stem. Flaking black glaze all over including undersurface of base. (James 2021, no. 3 fig. 6, 1).

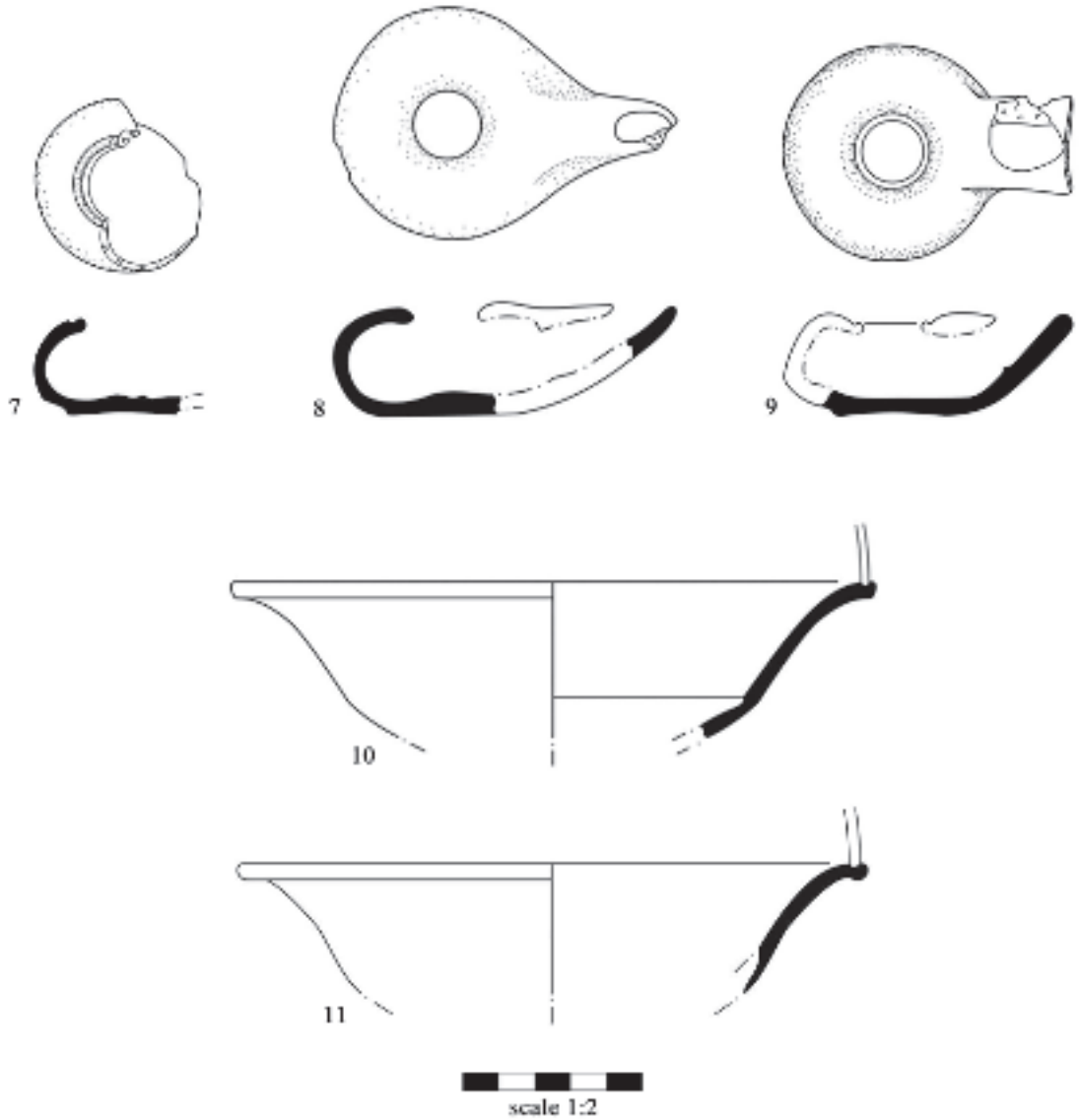
52 Trainor 2015, 53.

53 In c. 61–59 BC, Sikyon was unable to repay a loan from Cicero's friend Atticus (1, 12; 1, 19, 1; 2, 1, 10; 2, 13, 2) and were forced to sell their »art gallery« a year later (Plin. nat. 35, 127). See also Lolos 2011, 77–79, for a historical summary of the city in the 1st cent. BC. For Corinthian trade routes in the Hellenistic period see James 2020.

54 Catalogue entries conform to the standards of Corinth and Sikyon excavations as detailed in Sanders et al. 2017, 109–116. 122–127. All drawings are by Christina Kolb.



1 Hellenistic Sikyonian table wares, **cat. 1**–**6** (scale 1 : 2). 1. 2: Sikyonian goblet; 3: mould-made long petal bowl; 4: rolled rim plate; 5: grey ware pitcher; 6: grey ware rolled rim plate (© C. Kolb)



2 Hellenistic Sikyonian lamps and local imitations of sigillata forms (**cat. 7**–**11**) (scale 1 : 2). 7: locally made Broneer type X lamp; 8: cooking-fabric Broneer type XVII lamp; 9: hybrid type X/XVI/XVII cooking-fabric lamp; 10. 11: imitation Conspectus Form 14/ESB Form 23 (© C. Kolb)

Cat. 3 fig. 1, 3
Mould-made long petal bowl
Sikyon inv. 3-M2-14
H. 0.085 m, max. diam. body 0.128 m, rim diam. 0.149 m
Fine reddish-yellow (7.5YR 7/6) clay with rare small angular-tabular white, yellow, and grey inclusions, rare small angular-spherical white inclusions, and rare small voids. Hemispherical body with slightly flaring upper walls to a tapered outward thickened rim. Good black to red glaze all over. Medallion motif of an eight-petalled rosette encircled by two raised bands, continuous long petals tapering towards the base cover two-thirds of body, topped by an egg and dart band. (James 2021, no. 30 fig. 6, 3. 16).

Cat. 4 fig. 1, 4
Rolled rim plate
Sikyon inv. 3-M2-3
H. 0.061 m, base diam. 0.065 m, rim diam. 0.233 m
Fine pink (5YR 7/4) clay with rare small to large angular-spherical and angular-tabular white inclusions, rare small angular-tabular orange and grey inclusions, and rare small to medium voids. Thick heavy ring foot with a flat resting surface and slightly nippled undersurface, straight flaring walls to a slightly outward flaring rounded lip. Mottled black to red glaze by dipping. Two deep circular grooves around interior of base, one deep groove articulates rim from body. (James 2021, no. 44 fig. 6, 4. 16).

Cat. 5 fig. 1, 5
Grey ware pitcher
Sikyon inv. 3-M2-35
preserved H. 0.037 m, rim diam. 0.095 m
Fine light-grey (5Y 7/1) clay with rare small rounded-spherical white inclusions and rare small voids. Cylindrical neck to a convex flaring cup-shaped rim with a flaring rounded lip. Exterior articulated with grooves at rim and top of neck. One small hole pierced pre-firing at base of rim. Good dark-grey glaze all over. (James 2021, no. 112 fig. 6, 15).

Cat. 6 fig. 1, 6
Grey ware rolled rim plate
Sikyon inv. 4-1-33
preserved H. 0.018 m, max. preserved diam. 0.069 m, rim diam. 0.30 m (est.)
Fine light greenish-grey (5G 7/1) clay with rare very small angular-spherical white inclusions. Straight flaring wall to a thickened rounded well-defined rim. Dull medium-grey glaze all over. (James 2021, no. 109 fig. 6, 15).

Cat. 7 fig. 2, 7
Broneer type X lamp
Sikyon inv. 4-1-36
H. 0.027 m, base diam. 0.031 m
Fine very pale-brown (10 YR 8/4) clay with rare very small angular-spherical pink and grey inclusions and rare very small voids. Flat disc foot to a squat globular body that curves sharply inward to a round lip at the fill hole. Fill hole is round and encircled by a deep groove. Mottled black to brown glaze on exterior and part of interior. (James 2021, no. 85 fig. 6, 13).

Cat. 8 fig. 2, 8
Broneer type XVII lamp
Sikyon inv. 2-3-74
H. 0.028 m, L. 0.091 m, base diam. 0.039 m, rim diam. 0.015 m
Medium dark reddish-grey to brown (5YR 4-3/2) clay with few small to large rounded-spherical and angular-tabular white quartz and orange inclusions and rare small voids. Flat disc foot to a convex body with a rounded rim to a round, slightly depressed, fill hole. Long tapered nozzle to a rounded tip with oval wick hole. No handle. Unglazed. (James 2021, no. 83 fig. 6, 13).

Cat. 9 fig. 2, 9
Hybrid Broneer type X/type XVI lamp
Sikyon inv. 2-3-9
H. to rim 0.029 m, L. 0.080 m, rim diam. 0.017 m, base diam. 0.032 m
Granular to hackly grey (GLEY 2 4/5PB) clay with few small angular-spherical white and orange inclusions and rare small voids. Short disc foot, convex body to rounded rim with circular fill hole with raised edge. Short nozzle with squared splaying (flukes) wick hole. No handle. (James 2021, no. 87 fig. 6, 17).

Cat. 10 fig. 2, 10
Imitation Conspectus Form 14/ESB Form 23
Sikyon inv. 3-3-59
preserved H.0.057 m, rim diam. 0.180 m (est.)
Fine pink (7.5YR 7/4) clay with rare small angular-tabular black inclusions, rare small rounded-spherical white inclusions and rare small voids. Low broad carinated body to a gently flaring out-turned rounded lip. Mottled black to red glaze by dipping. Single grooves at base of wall and at lip. (James 2021, no. 34 fig. 6, 3).

Cat. 11 fig. 2, 11
Imitation Conspectus Form 14/ESB Form 23
Sikyon inv. 3-M2-44
p. H. 0.043, rim diam. 0.190 (est.)
Fine pink to reddish-yellow (7.5YR 7/4-6) clay with rare small angular-tabular dark-grey inclusions and rare fine sparkling inclusions. Vertical flaring upper body to a rounded lip articulated by a groove. Brown-red glaze all over (James 2021, no. 33 fig. 6, 3).

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THE SANCTUARY OF ARTEMIS HEMERA AT LOUSOI IN THE GEOMETRIC AND ARCHAIC PERIODS

A CONTEXTUAL AND INTERDISCIPLINARY APPROACH[1]

ABSTRACT
This paper presents the preliminary results of an ongoing project on the Sanctuary of Artemis Hemera at Lousoi in the Geometric and Archaic periods. The focus is on the interdisciplinary study of the pottery, most of which was found in the Embankment Deposit of the upper sanctuary terrace. This closed deposit contained pottery dating from the first half of the 9th to the early 5th century BC, indicating that the cult started about 150 years earlier than hitherto assumed. The results of the first stage of archaeometric investigations show that local and regional wares predominated in the Geometric period, while Corinthian and eastern Achaian imports constituted the largest portion in the second half of the 7th and in the 6th century BC.

THE SANCTUARY OF ARTEMIS HEMERA: LOCATION AND STRUCTURES

The peri-urban Sanctuary of Artemis Hemera is located uphill northeast of the town of Lousoi[2]. In the Hellenistic period, a sacred way of about 1 km in length connected the Artemis Sanctuary with the town centre, where a large peripteral temple and a monumental stoa were built in the second half of the 3rd century BC[3]. The sacred way is still traceable on the southwestern slope of the sanctuary plateau[4]. It may well go back to earlier periods, as it seems that the settlement of the Early Iron Age was situated at the site of the later town centre, assuming that the two apsidal houses, which were excavated beneath the Early Hellenistic peripteral temple, were part of a larger cluster of buildings[5].

The distance to the settlement was not great, but great enough to mark the temenos as belonging to the ἐσχατιά, the marginal, uncultivated land, which was the realm of Artemis[6]. The rough

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1 This article presents the research questions and the results of the first two years of the project »Geometric/Archaic pottery from the Artemis Sanctuary, Lousoi«, FWF P 30095–G26 (funded by the Austrian Research Fund FWF with Michael Kerschner as principal investigator). It was written in 2020. Later literature could not be included. A summary of the main archaeological results of the entire project has since been published in Charalambidou et al. 2024 (with an updated bibliography). We thank Georg Ladstätter (Athens), the former director of the Lousoi excavations, and Georgia Z. Alexopoulou (Ephorate of Antiquities of Achaea, Patras) for their continuous support during the study seasons at Kato Lousoi. The stratigraphy was analysed by G. Ladstätter in collaboration with N.-M. Voß. Veronika Mitsopoulos-Leon (†) and Franz Glaser (Klagenfurt) provided valuable information on their excavations in the sanctuary.

2 On the peri-urban location of the sanctuary see Jost 2013, 144–146.

3 Baier et al. 2018, 19 f. fig. 1. On the extension of the Hellenistic town see Baier et al. 2018, 23–35 fig. 6. Cf. Mitsopoulos-Leon 2010, 31 fig. 1. On the Hellenistic town centre see Baier et al. 2018, 36–44 (with bibliography). On dating of the monumental buildings see Baier et al. 2018, 23. 42 (with bibliography). Jost 2018, 105–110 for the latest reconstruction of the Hellenistic peripteral temple by G. Ladstätter.

4 Baier et al. 2018, 26–28 figs. 6. 7.

5 Jahresbericht 2009, 37; Jahresbericht 2010, 71 f.; Baier et al. 2018, 23; Schauer 2018, 585 f. fig. 1.

6 Cf. Morgan 1997, 185–187; Jost 2013, 145.

1 Aerial view of the Sanctuary of Artemis Hemera at Lousoi from the west. Above on the right, the upper terrace with Hellenistic temple. In the centre, the lower terrace of the temenos. On the left, the steep cliff at the foot of which the *katavothra* (ponor) of the Lousoi plateau is situated (© OeAW-OeAI/C. Kurtze)

nature of the place strengthened this notion. This was an ideal environment for the »rites de passage«, which played an important role in the cult of Artemis Hemera, as Veronika Mitsopoulos-Leon emphasised[7].

The temenos of Artemis Hemera is located on a small plateau above a high cliff (fig. 1)[8]. At the foot of the steep rock is a ponor (καταβόθρα), where the surface water, which accumulates during the heavy winter rains, flows underground into the karst system[9]. The ponor prevented the upland plain of Lousoi from permanent flooding. Its functioning was essential for the agriculture in this area and required divine protection. As Madeleine Jost pointed out, »Artemis, the goddess associated with dampness, and Poseidon, the master of underground waters, are particularly often found« as main deities in those Arkadian upland plains that are not drained by a river[10]. It is likely that the location directly above the ponor was a decisive criterion for founding the Sanctuary of Artemis on this plateau[11].

7 Mitsopoulos-Leon 2012, 54 n. 176; 56; Mitsopoulos-Leon 2018, 330. 347. Cf. Jost 1985, 424.
8 Reichel – Wilhelm 1901, 8–15 fig. 4.
9 Reichel – Wilhelm 1901, 11.
10 Jost 1994, 219 f. Cf. Ellinger 2009, 15–19 on the comparable situation at Stymphalos.
11 This idea was expressed by G. Ladstätter in an unpublished paper at the colloquium »Natur – Kult – Raum« at Salzburg 2015. Cf. Sporn et al. 2015.

The temenos is divided into an upper and a lower terrace (fig. 1)[12]. Much of the upper terrace is occupied by the Hellenistic temple of the early 3rd century BC and by the so-called East Building, presumably a short-lived westward-facing temple dated to the second half of the 4th century BC (fig. 2)[13]. In between the two buildings, there was probably an altar, of which no secure traces have been found[14]. The lower terrace provided space for smaller structures: a propylon, a fountain house and an exedra (so-called Bouleuterion)[15]. Terracotta roof tiles of Late Archaic style attest several buildings of the late 6th and early 5th centuries BC, of which no foundations have been identified so far[16]. Among these buildings was presumably also a predecessor of the Early Hellenistic temple of Artemis. It seems likely that its foundations were destroyed when the upper terrace was levelled for the construction of its (larger) successor in the early 3rd century BC[17].

The only extant structure of the Archaic and Early Classical periods discovered so far is a rubble embankment (figs. 2–4), which was built in the first half of the 5th century BC to enlarge the upper terrace at its northern side[18]. It is located northeast of the Hellenistic temple, which it antedates. This embankment consists of densely packed, irregularly shaped, quarried limestone rubble (fig. 3)[19]. A levelling layer of loamy earth with numerous flakes of flysch covered the rubble embankment and the northern part of the terrace (fig. 4)[20]. Both the rubble embankment and the levelling layer contained a large number of votive offerings and pottery fragments from the Geometric and Archaic periods. The analysis of the stratigraphy showed that there was no internal stratification within the deposit (fig. 5)[21]. Joining vessel fragments from both the rubble embankment and the levelling layer indicate that both were part of the same construction process. The original surface of the Early Classical sanctuary terrace has not been preserved. Only parts of its substructure are extant.

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12 Reichel – Wilhelm 1901, 23 fig. 13.

13 On the Hellenistic Temple of Artemis see Reichel – Wilhelm 1901, 24–33 figs. 14–19; Ladstätter 2001; Jost 2018, 108 f. fig. 4. On the so-called East Building of the 2nd half of the 4th cent. BC see Mitsopoulos-Leon – Ladstätter 1997, 59; Mitsopoulos-Leon – Ladstätter 1998, 88–90 figs. 11. 12; Jahresbericht 2000; Mitsopoulos-Leon 2009, 258; Jost 2018, 109 f.

14 von Miller 2016, 277; Jost 2018, 108.

15 Reichel – Wilhelm 1901, 15–23 figs. 6–24; Mitsopoulos-Leon 2009, 256 fig. 1.

16 Reichel – Wilhelm 1901, 32. 61 f. figs. 128–133; Mitsopoulos-Leon 1990; Mitsopoulos-Leon 2006, 436 f. 449 fig. 3; Mitsopoulos-Leon 2009, 257; Mitsopoulos-Leon 2011, 148; Schauer 2006, 66–70 figs. 1–4.

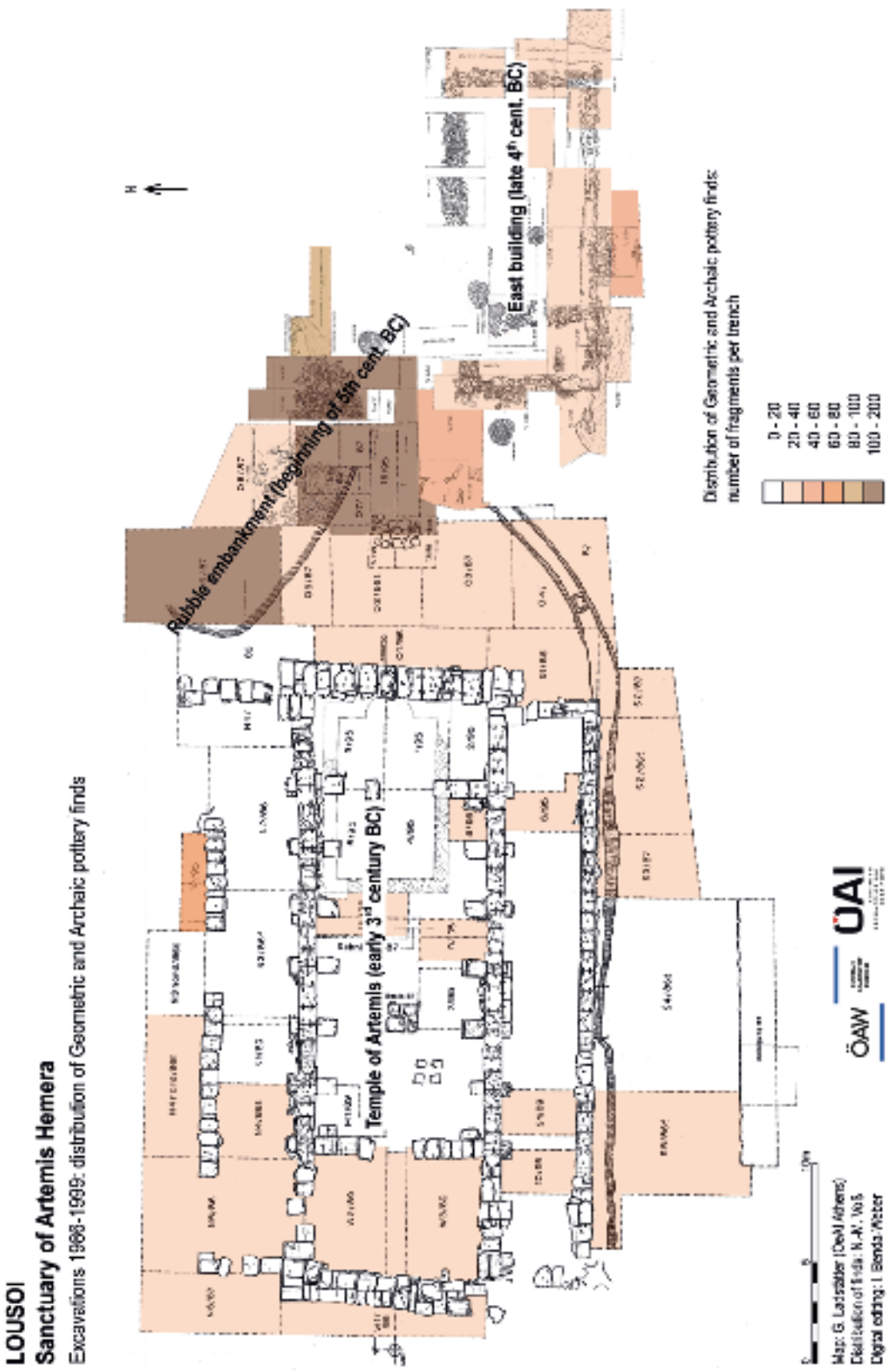
17 Mitsopoulos-Leon 1990, 165.

18 This area was excavated by V. Mitsopoulos-Leon from 1986–1999. In previous publications, this deposit was designated with different names: Mitsopoulos-Leon 1990, 165 (»Grube … vor der NO-Ecke des jüngeren Tempels«); Mitsopoulos-Leon – Ladstätter 1996, 44–46 (»Bothros«); Mitsopoulos-Leon – Ladstätter 1997, 59 f. (»Bothros«); Mitsopoulos-Leon – Ladstätter 1998, 82–88 figs. 1–3 (»Steinpackung«); Mitsopoulos-Leon 2006, 436 (»μια χαμηλή λιθόστρωση ανατολικά τού νεώτερου ναού«); Mitsopoulos-Leon 2009, 258 (»stone setting to the east of the large temple«); Mitsopoulos-Leon 2011, 148 (»Der Apothet/Bothros im NO des hellenistischen Tempels«); Mitsopoulos-Leon 2012, 33 figs. 2–4 (»Steinsetzung, Steinpackung«); von Miller 2016, 277 f. figs. 2. 3 (»Steinpackung«). The dating is based on the finds from this context, both the small objects (Mitsopoulos-Leon 2012, 58–60. 138 f.) and the pottery finds (Schauer 2014, 238 f.; von Miller 2016, 279 and the discussion below). For a detailed discussion of the rubble embankment, the »Embankment Deposit« and their chronology see now Charalambidou et al. 2024, 193–195. 204–209.

19 Mitsopoulos-Leon – Ladstätter 1998, 82 figs. 1–3.

20 Mitsopoulos-Leon – Ladstätter 1997, 59 f. (»Erdschicht«); von Miller 2016, 277 fig. 3.

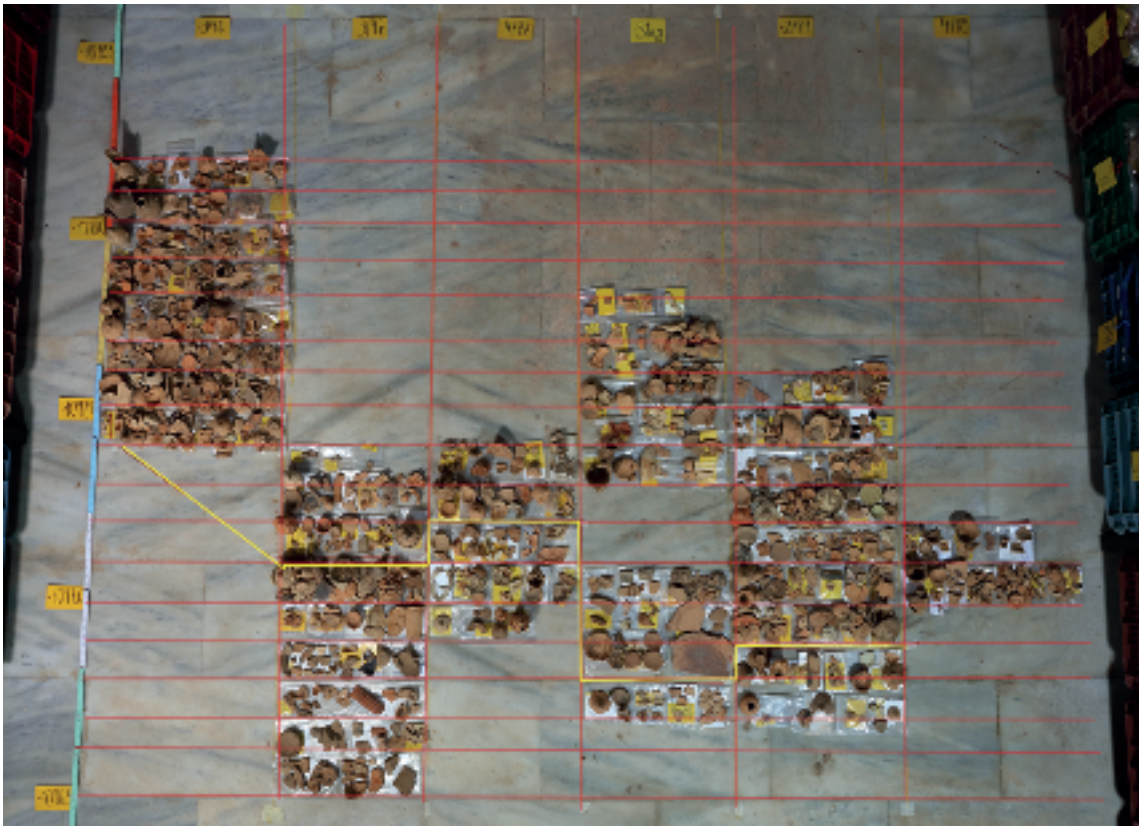
21 The analysis of the stratigraphy was carried out by G. Ladstätter and N. Voß with the support of V. Mitsopoulos-Leon (†) and F. Glaser.



2 Lousoi, Sanctuary of Artemis Hemera. Distribution of Geometric and Archaic pottery in the excavations 1986–1999 (© OeAW-OeAI/plan: G. Ladstätter; distribution of finds: N.-M. Voß; digital editing: I. Benda-Weber)

3 Lousoi, Sanctuary of Artemis Hemera, 1997 excavation. Late Archaic rubble embankment east of the Hellenistic temple of Artemis (© OeAW-OeAI/G. Ladstätter)

4 Lousoi, Sanctuary of Artemis Hemera, 1996 excavation. View from the Hellenistic temple (in the foreground the foundations of its eastern front) to the east. On the left, the rubble embankment, in the centre the levelling layer of the Late Archaic sanctuary terrace (© OeAW-OeAI/photo: G. Ladstätter; digital editing: N.-M. Voß – I. Benda-Weber)



5 Lousoi, Sanctuary of Artemis Hemera. Pottery finds from the rubble embankment and the levelling layer of the Late Archaic sanctuary terrace (trenches 2/97 and 4/97) arranged according to their position in the stratigraphy (© OeAW-OeAI/arrangement: N.-M. Voß; photo: N. Gail)

ARCHAEOLOGICAL EVIDENCE FOR CULT AND VOTIVE PRACTICES IN THE GEOMETRIC AND ARCHAIC PERIODS

There are only a few extant written sources on the Sanctuary of Artemis Hemera and its cult, and most of them relate to the Classical and Hellenistic periods[22]. We therefore have to rely mostly on the contextual analysis of the archaeological evidence, if we want to investigate the beginnings of the cult, its development, the sacrificial and votive practices or the regional and supraregional importance of the sanctuary in the Geometric and Archaic periods. Closed deposits have the greatest significance for the interpretation. We have therefore focused on the large deposit from the above-mentioned Early Classical enlargement of the upper sanctuary terrace consisting of the rubble embankment and the levelling layer behind and above it.

This large deposit contained several hundreds of ceramic vessels, votive offerings – mainly terracotta and bronze figurines as well as jewellery made of metal, bone, precious stone and amber – and a few animal bones. Veronika Mitsopoulos-Leon has meticulously studied the small objects dedicated to the goddess and also analysed the votive practices[23]. Pottery is, as usual in

22 The most important sources are Bakchyl. 10 (11) 92–116; Kall. h. Artemis 233–236; Hes. fr. 131. 133; Paus. 8, 18. For an overview of the literary and epigraphic sources see Jost 1985, 47 f.; Mitsopoulos-Leon 2012, 39–44; Mitsopoulos-Leon 2018, 329.

23 Mitsopoulos-Leon 2006; Mitsopoulos-Leon 2009, 259–265 figs. 3–6; Mitsopoulos-Leon 2012 (with bibliography). The range of these objects is largely similar to that of small finds from looting in the 19th cent. – Sinn 1980 – and from the excavations of 1898–1899: Reichel – Wilhelm 1901, 33–59 figs. 20–122.

deposits from Early Greek sanctuaries, the most numerous group of artefacts[24]. A great share of it was used for ritual dining, while another major part – especially pyxides, pseudo-pyxides and miniature vessels – constituted votive offerings (see below).

The scarcity of animal bones is conspicuous, as is the lack of cooking pots[25]. Alexandra von Miller assumed that specific cultic regulations might have prohibited the consumption of meat in the sanctuary[26]. However, we have nearly contemporaneous evidence of animal sacrifice in the Sanctuary of Artemis Hemera. Bakchylides of Keos relates that the Proitidai founded a temenos with an altar for Artemis Hemera at Lousoi and sacrificed sheep to her in thanks for her cure of madness. They offered sheep to the goddess, in contrast to her father, who slaughtered »twenty red oxen«: »But they straightway made for her a precinct and an altar, and shed the blood of sheep thereon, and set choruses of women around it.«[27]

This can be taken as an aetiological legend for the ritual practice in the Sanctuary of Artemis Hemera, in which sacrifice of sheep must have played a major role[28]. But if this was the case, how do we explain the striking scarcity of animal bones? Only 67 bones, mostly fragmentary, and teeth were found in the excavations on the upper sanctuary terrace from 1986 to 1999[29]. There are other possible scenarios to explain the (apparent) rareness of animal bones and cooking equipment[30], if we consider the fact that only a part of the Early Classical terrace enlargement has been excavated. Large sections of the rubble embankment were left untouched to ensure the stability of the upper sanctuary terrace. How much further the structure extended to the southeast is not known. In addition, we cannot yet assess how much of the original deposit has been preserved *in situ*[31]. Large parts of the rubble embankment had collapsed or were removed, and the same is true for the levelling layer above it. It may well be that certain residues of the sacred meals, for example cooking equipment and animal bones, were deposited in layers which later slid down the slope. Or, they were dumped at another, not yet excavated place in the temenos, the original extension of which is still unexplored. The occasional fragments of early cooking pots found in later contexts may point in that direction[32].

THE INVOLVEMENT OF THE SANCTUARY OF ARTEMIS HEMERA IN THE ACHAIAN COLONISATION IN SOUTHERN ITALY AND THE DEBATE ABOUT AZANIAN IDENTITY

Lousoi was a small town, which never played a major political or economic role among the poleis of the northwestern Peloponnese[33]. It is therefore all the more remarkable that its main sanctuary had gained supraregional importance already at the beginning of the 7th century BC, when Achaian settlers chose Artemis Hemera as their tutelary deity and gathered at the sanctuary of Lousoi before founding Metapontion in southern Italy, as Bakchylides of Keos relates[34]. It is

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24 Preliminary reports and studies of specific groups of vessels: Schauer 1998; Schauer 2001; Mitsopoulos-Leon 2011; Schauer 2011; Schauer 2014; von Miller 2016; Schauer 2018, 588–590 figs. 5. 6.

25 On the animal bones see von Miller 2016, 280 with n. 40; Mitsopoulos-Leon 2018, 340 f. On the cooking pots see von Miller 2016, 279–281 and below.

26 von Miller 2016, 280 f.

27 Bakchyl. 10 (11) 110–112 (translation R. C. Jebb).

28 Dowden 1989, 91; Cairns 2005, 46; Mitsopoulos-Leon 2018, 344.

29 Mitsopoulos-Leon 2018, 336 with n. 79; 340 f. 346.

30 So far it is not only cooking pots but also bronze kettles and iron obeloi that are missing on the upper sanctuary terrace: see Mitsopoulos-Leon 2018, 344 f.

31 Cf. Schauer 2001, 159 (»… nur um einen kleinen Prozentsatz der ursprünglich vorhandenen Weihgaben handelt«).

32 von Miller 2016, 279.

33 Morgan 1999, 417 f.; Roy 2001, 267; Nielsen 2002, 473 f. 565.

34 Bakchyl. 10 (11) 113–126. Cf. Tausend 1993, 24. 26; Morgan 1999, 418 f.; Cairns 2005, 36–38; Kowalzig 2007, 267–271; Mitsopoulos-Leon 2012, 45; Jost 2013, 146; Petrovic 2013, 218–220. On the cult of Artemis Hemera at Metapontion see Olbrich 1979, 84–86; Mitsopoulos-Leon 2001b, 137 f.; Giangiulio 2002, 291–294; Morgan 2002, 101; Kowalzig 2007, 291–297. On the foundation of Metapontion see Lombardo 2011, 27–29.

striking that the Achaian emigrants had chosen a sanctuary in northern Arkadia as their cultic reference point, and not one in Achaia. Klaus Tausend suggested that this was because of an assumed special status of Lousoi for the Azanes, an ancient ethnos in north and northwest Arkadia, which had disappeared by the 5th century BC[35]. His hypothesis is based on three assumptions:

1. that there existed a common cult and an amphictyony of the ethnos of the Azanes;
2. that the Sanctuary of Artemis Hemera at Lousoi was the religious centre of this Azanian amphictyony;
3. that Azanes living in Achaia prevailed over the other Achaians in the choice of the main deity of the new colony to be founded at Metapontion.

Thomas Heine Nielsen and James Roy disagreed fundamentally with this hypothesis: »There is no evidence for the common Azanian cult postulated by Tausend …, and no evidence that the Azanians were united in an Azanian amphictyony centred on the Sanctuary of Artemis Hemera at Lousoi, as tentatively suggested by Tausend.«[36]

Since the written sources are insufficient to clarify these questions, we have only the archaeological evidence to test these hypotheses. If the Sanctuary of Artemis Hemera was indeed a common cult centre of the Azanian tribe, one should expect to find pottery and votive offerings from the individual Azanian cities and settlements. The same assumption applies to objects from the Achaian poleis if the sanctuary actually played a crucial role in the foundation of Metapontion. These questions will be investigated in our interdisciplinary project, not only by means of stylistic and typological analysis, but also through systematic investigation of the pottery fabrics with archaeometric methods[37].

A distinctive Azanian ethnicity must have been a phenomenon of the Geometric and Archaic periods, as the scarce extant literary sources indicate[38]. »In the context of the present discussion, the establishment of the shrine of Artemis Hemera at Lousoi late in the eighth century is the most important evidence for local consciousness in Azanian territory«, as Catherine Morgan has pointed out[39]. The pottery, together with the votive offerings from the sanctuary, thus provide a promising basis for investigating the material culture of the Azanians, the picture of which is still blurred, let alone the characterisation of local nuances within the region[40].

One of the aims of our project is a systematic provenance determination of the Geometric and Archaic pottery finds by means of archaeometric analysis using pXR, WD-XRF and petrography (see below). The comparison of the results with data from other sites in northern Arkadia and eastern Achaia will help to determine individual production centres in this region[41]. In this way, it will be possible to identify imported vessels at Lousoi. If the Sanctuary of Artemis Hemera was actually a cultic centre of Azania, as Klaus Tausend suggested, we may expect pottery produced in other Azanian poleis among the finds from the Lousiote shrine.

Michael Kerschner

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35 Tausend 1993, 23–26. On the Azanes see Jost 1985, 25–27; Pikoulas 1981/1982; Nielsen – Roy 1998; Morgan 1999, 416 f.; Morgan 2003, 42. 175–187. On the »ekleipsis« of the Azanes see Morgan 2003, 185 f.

36 Nielsen – Roy 1998, 15 f. Cf. Morgan 1997, 189–191; Morgan 2002, 109; Morgan 2003, 185–187.

37 To investigate these research questions, comparative samples from sites in northern Arkadia (in collaboration with G. Z. Alexopoulou, Ephorate of Achaea, Patras), Achaia (in collaboration with A. Gadolou, now Archaeological Museum of Thessaloniki) and Incoronata near Metapont (in collaboration with M. Denti, Université de Rennes 2, Jan-Paul Crielaard and Xenia Charalambidou, both Vrije Universiteit Amsterdam) were analysed. The archaeometric analyses (pXRF, WD-XRF, petrography, NAA) were carried out by Pamela Fragnoli (Austrian Academy of Sciences, with the assistance of Luzia Thaler and the Fitch Laboratory of the British School at Athens) and Johannes Sterba (TU Vienna).

38 On the question of Azanian identity see Morgan 1999, 189–191; Morgan 2002, 109; Morgan 2003, 183–187.

39 Morgan 2002, 109.

40 For an overview on the material culture of Azania see Morgan 2003, 183–185.

41 So far we have sampled Geometric and Archaic pottery from Skepasto/Kalavryta and Psophis in collaboration with Georgia Alexopoulou and from Ano Mazaraki, Bachoumas, Helike/Nikoleika and Soudenaika in collaboration with Anastasia Gadolou.

THE GEOMETRIC AND ARCHAIC POTTERY FINDS: PRELIMINARY RESULTS ON CHRONOLOGY, TYPOLOGY AND MICROSCOPIC FABRIC ANALYSIS[42]

The focus of the current project is on the Geometric and Archaic pottery finds from the Sanctuary of Artemis Hemera. In addition, pottery from a small, stratified deposit excavated beneath the Early Hellenistic peripteral temple in the town centre has been analysed[43]. As a closed deposit of the Geometric period, it is particularly important to establish a typo-chronology of the local pottery[44]. Furthermore, it provides an excellent basis for comparing the evidence in the settlement and in the peri-urban sanctuary in the Geometric period. Altogether, 2540 diagnostic – mostly fragmentary – vessels have been studied.

In the Sanctuary of Artemis, the majority of the Geometric and Archaic pottery was found in a closed deposit in the rubble embankment mentioned above and its covering levelling layer at the northern fringes of the upper sanctuary terrace east of the Early Hellenistic temple (fig. 3). This deposit was probably filled in early 5th century BC and contained 1853 mostly fragmentary ceramic vessels. A smaller quantity of pre-Classical pottery was found in a secondary deposit in the adyton and along the north side of the temple (fig. 2). These smaller deposits inside and along the temple are related to its construction in the early 3rd century BC. An unknown number of Geometric and Archaic objects may have slid down the slope and still await excavation.

A significant number of vessels from the rubble embankment and the covering levelling layer were discovered in complete condition or, if they were broken, they could be reconstructed almost entirely from the fragments. This indicates several intentional depositions. When the pottery fragments were arranged according to their stratigraphic context in a true-to-scale grid (fig. 5), it emerged that most of the well-preserved pieces were found at the top of the rubble embankment in cavities between the densely packed stones. Obviously, these vessels were carefully placed and subsequently covered by the levelling layer.

The oldest finds from the Embankment Deposit can be typologically dated to the early 9th century BC[45]. The most recent pottery of this context, which provides a *terminus post quem* for the construction of the rubble embankment, are some fragments from kylixes dated to the late 6th or early 5th century. The most distinctive one is the rim of a Palmette Kylix[46] comparable to a fragment found in an early 5th century grave at the North Cemetery of Corinth[47]. Thus, the deposit of the terrace enlargement comprises finds from four centuries, ranging from the early 9th to the first half of the 5th century BC.

Pyxides and miniature vessels of different shapes make up a large share in the pottery from this deposit. Both can be interpreted as votive offerings for the goddess[48]. Another significant number of the vessels from this deposit were probably used in the context of ritual dining[49], such as drinking vessels like skyphoi, kotylai and kantharoi. There is also a fair amount of bowls and pouring

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42 The following considerations are based on the catalogue and the typology of the pottery finds. Xenia Charalambidou (Volos) will carry out the chronological and functional analysis of the pottery assemblage as a whole.

43 On the excavation see Jahresbericht 2009, 37; Jahresbericht 2010, 71 f.; Schauer 2018, 585 f. fig. 1. For a preliminary report on the Geometric pottery finds see Schauer 2018, 586–588 figs. 2–4. For a detailed discussion of the stratigraphy and finds from this excavation, see now Charalambidou et al. 2024, 196–202. 209–212 figs. 7–12. 19–24.

44 In this project, we have considered only those Geometric and Archaic fragments, which were excavated in closed deposits of pre-Classical date. On the total amount of diagnostic fragments from the Geometric and Archaic pottery from the Artemis Sanctuary and its distribution according to individual areas within the temenos see von Miller 2016, 278 fig. 4.

45 For an update on the chronology of the Embankment Deposit see Charalambidou et al. 2024, 204–209.

46 Inv. K 204/96.

47 Blegen et al. 1964, 216 fig. 20 inv. 262–10.

48 For pyxides see Milne 1939, 248; Roberts 1978, 7. For miniature vessels see Hammond 2005, 420. 426; Barfoed 2015, 174. 184.

49 Bookidis et al. 1999, 14–16; Schauer 2001, 159; von Miller 2016, 279.

6 Lousoi, Sanctuary of Artemis Hemera. Selection of pseudo-pyxides (© OeAW-OeAI/N. Gail)

vessels, but only few craters. The absence of cooking vessels among the Geometric and Archaic pottery from the enlargement of the upper sanctuary terrace is remarkable[50]. We have, however, to keep in mind that this deposit has only been partially excavated so far (cf. above).

The high percentage of pyxides is particularly characteristic for the Geometric and Archaic pottery from the Sanctuary of Artemis Hemera. The majority of them were presumably produced locally, but there are also imports, mainly from the Corinthia or eastern Achaia. Two types of pyxides can be clearly distinguished: those with removable lids and those with irremovable lids. The latter type is referred to as pseudo-pyxides and is only known from Lousoi so far[51]. The forms of the pseudo-pyxides (fig. 6) range from simple elongated cones or flat-bottomed, almost spherical shapes to vessels with elaborately shaped bodies. However, variants with a slender, cylindrical body are by far the most common. A conical upper section, a flat base, and a stirrup handle are common to all varieties. Both the irremovable lid and the barely or non-functional flat handles of these pseudo-pyxides indicate a votive function[52]. Typical characteristics of these vessels are painted bands and small holes, which were pierced into the body before firing. These holes were previously interpreted as air holes[53], thought to be necessary for the firing process. But since some pieces do not have any pierced holes at all, while others have up to 12 holes spread over the entire vessel, this feature cannot be explained exclusively by technical necessities relating to the process of firing.

In the Embankment Deposit, fragments of about 300 miniature vessels were found. Miniature kotylai dominate the group by far. Furthermore, small bowls, amphoriskoi or hydriskoi, and krateriskoi occur. It is notable that small kotylai were almost exclusively imported from the Corinthia or eastern Achaia, as were a large percentage of the other miniature vessels.

50 von Miller 2016, 279–281.
51 Schauer 2001, 156–158 pl. 18; Mitsopoulos-Leon et al. 2013, 92; von Miller 2016, 281–283; Schauer 2018, 588 f. fig. 5.
52 von Miller 2016, 283.
53 Schauer 2001, 156; von Miller 2016, 282.

Only a group of small, flat bowls with overhanging rim, often pierced with small holes arranged in pairs, are made of the same – presumably local – raw material, which had also been used for the pseudo-pyxides.

Furthermore, several fragments of Achaian kalathoi with impressed decoration have been identified among the finds[54]. They are comparable to kalathoi of the ›Impressed Ware‹ which have been studied by Anastasia Gadolou, who convincingly assigned them to a production site in the region around Ano Mazaraki[55]. In addition to the kalathoi, there are fragments of a pyxis, a drinking vessel and two lids, probably from pyxides with impressed decoration.

All catalogued pottery fragments were classified according to their fabric. A microscope with 40× magnification was used for the determination of the fabric. Main criteria for the classification were the type of inclusions found in the matrix, their colour, size, shape and frequency, as well as the frequency of the voids, the structure of the clay matrix and the fresh breaks[56]. Based on microscopic comparison, 987 fragments were assigned to 35 different fabrics[57], which, in turn, were grouped into 11 wares[58]. Each of the wares consists of several fabrics with similar characteristics[59].

The analysis of fabrics has shown that the majority of the pottery was most likely produced locally or regionally (figs. 7–9). The reference group for the local fabric is the pseudo-pyxides. As this class of pottery has so far only turned up in Lousoi, a local production of these vessels can be confidently assumed. Fabrics with similar inclusions as the – assumed – local fabric are regarded as regional. Both hypotheses will be checked by the ongoing archaeometric analyses.

The individual fabrics of presumed local production differ from each other with regard to the compactness of the clay matrix and the number of inclusions and voids. A common feature is a light reddish-brown or brownish-grey colour of the fresh break. The matrix is soft and has isolated voids on the surface[60]. The most common inclusions are fine, rounded, transparent quartz particles, as well as some fine, rounded, hard black and soft red inclusions[61]. Characteristic for these fabrics is furthermore the occurrence of fine to medium size, rounded and soft particles of a light-grey colour, probably limestone[62]. These fabrics are frequent in the Sanctuary of Artemis Hemera. They occur in vessels of almost all shapes except the kotylai (both miniature and normal sized kotylai). This predominance suggests that these fabrics were produced at Lousoi or in its vicinity[63].

Apart from the locally produced wares, a considerable percentage of the assemblage are imports

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54 Mitsopoulos-Leon – Ladstätter 1998, 88; Schauer 2001, 157 pl. 19, 4; Schauer 2014, inv. 18–22; Schauer 2018, 589 f. fig. 6.

55 Gadolou 2003, 308.

56 Orton et al. 1993; Tomber – Dore 1998; Gassner 2003. In order to give a standardised and comprehensive description of the fabric, the Munsell Soil Color Charts (Baltimore 2009) for colour determination were used. For shape, sorting, and the frequency of the inclusions and voids see Kinne 2006, 28–30. For the determination of the inclusions see Orton – Hughes 2013, 236–37.

57 Each fabric was registered with an individual number and described in a database. A reference sherd of each fabric has been kept separately to facilitate comparison. This ensures uniformity and simplifies the description and classification of the fragments. Cf. Orton et al. 1993, 67–75; Gassner 2003, 30–32.

58 In the diagram, the numbers given refer to the individual fabric. The designation, such as »regional I«, refers to the ware. Gassner 2003, 32.

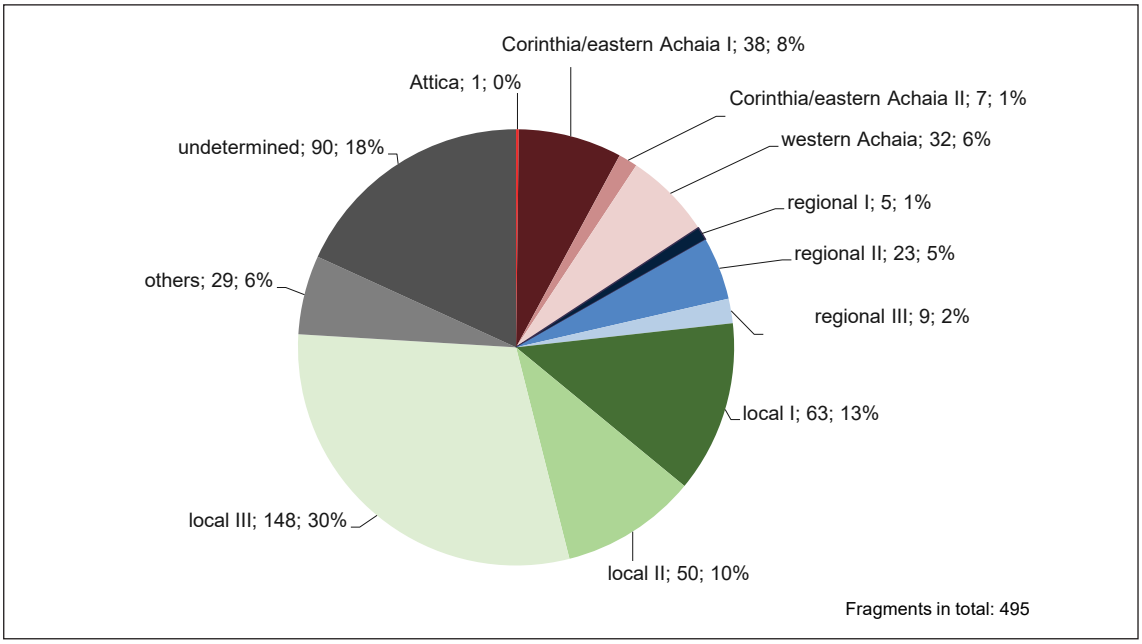
59 The term »ware« refers to fabrics with similar inclusions, but with variations in other features. The recognised characteristics are, in particular, inclusions and voids, as well as the appearance of the break. »Fabric« refers only to the composition of the clay and its appearance. Orton et al. 1993, 75; Gassner 2003, 30–34.

60 The information on the amount and size of the inclusions corresponds to the database of the Austrian Archaeological Institute. Amount: isolated (< 1 %), some (1–5 %), many (5–25 %); Size: fine (< 0.02 cm), medium (0.02–0.063 cm). Also Rheinisches Landesmuseum 1986, 35.

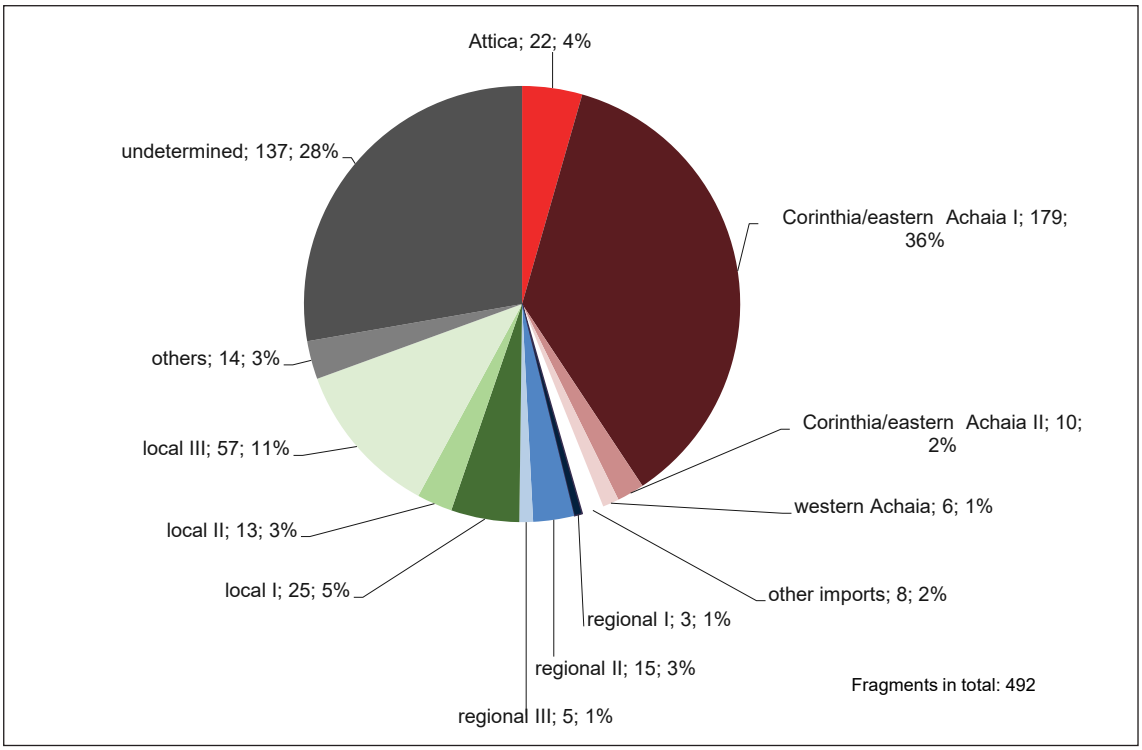
61 The colour of the red inclusions varies between bright yellowish-red, red and dark reddish-brown.

62 Orton et al. 1993, 236 tab. A.2.

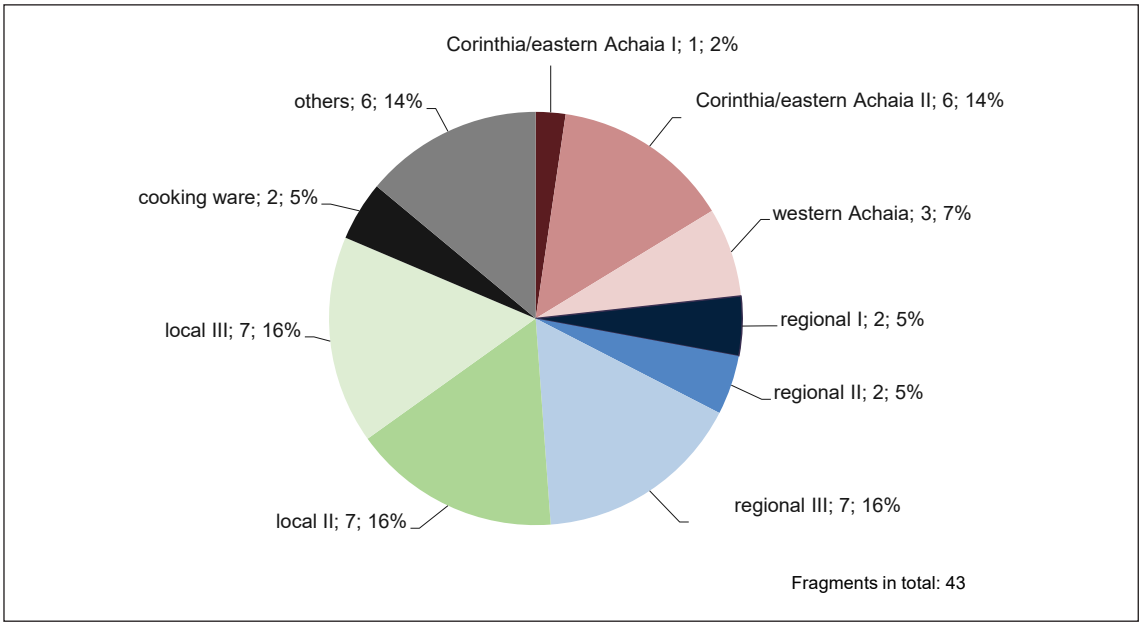
63 Cf. Mommsen 2007, 188.



7 Lousoi, Sanctuary of Artemis Hemera. Distribution of ceramic fabrics in the Geometric period (© OeAW-OeAI/ N.-M. Voß)



8 Lousoi, Sanctuary of Artemis Hemera. Distribution of ceramic fabrics in the Archaic period (© OeAW-OeAI/ N.-M. Voß)



9 Lousoi, excavation beneath the Early Hellenistic peripteral temple in the town centre. Distribution of ceramic fabrics in the Geometric period (© OeAW-OeAI/N.-M. Voß)

from the Corinthia and eastern Achaia. Among the Achaian products is the so-called Impressed Ware. Additionally, there are some imports from Attica and a few from the Argolid and Laconia[64].

If we consider the distribution of fabrics in the different periods, we notice a significant change from the Geometric to the Archaic period (figs. 7. 8)[65]. In the Geometric period, local and regional fabrics make up the majority of pottery in the Sanctuary of Artemis, whereas in the Archaic period, imports from the Corinthia and eastern Achaia dominate.

At Lousoi, we have the opportunity to compare the distribution of fabrics with the situation in the contemporaneous settlement. As mentioned above, Georg Ladstätter excavated parts of two Late Geometric/Early Archaic apsidal buildings beneath the Early Hellenistic peripteral temple in the town centre[66]. Beneath the apsidal buildings, there was an even earlier layer with Geometric pottery[67]. The earliest pottery from this lower layer can be dated to the Early Geometric or Middle Geometric I period[68]. The upper chronological range of the Geometric pottery is therefore comparable to the situation in the Sanctuary of Artemis Hemera. If we look at the distribution of the fabrics, most of the pottery was produced locally or regionally, with the exception of very few imports from the Corinthia or eastern Achaia as well as from western Achaia (fig. 9). This distribution is similar to the situation in the peri-urban Sanctuary of Artemis Hemera. However, one must keep in mind that the two assemblages differ significantly in their quantities.

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64 A relief bowl from the Argolid (Rogl 2008, 34 type 1 scraper) was used as a reference for the attribution of a miniature kotyle to this region. The attribution to Laconian production is based on typological criteria. Laconian imports comprise a lakaina (inv. K 071/87), a pyxis (inv. K 012/87) and an aryballos (inv. K 013/87), cf. Schauer 1998, 259. 261–264. 267–268; Schauer 2001, 158; Pipili 2002, 49. On the small share of Laconian imports see von Miller 2016, 284 fig. 9.

65 As the deposit of the upper terrace enlargement has no internal stratification, the attribution to the two periods is based on typological criteria, mainly following Harrison 1996; Coldstream 2009, 302–331; Neeft 2012.

66 Jahresbericht 2009, 37; Jahresbericht 2010, 71 f.; Baier et al. 2018, 23. For a detailed discussion of the stratigraphy and chronology if the apsidal buildings see now Charalambidou et al. 2024, 198–201. 210–211.

67 Schauer 2018, 585–588 figs. 1–4.

68 Charalambidou et al. 2024, 209–211.

PRELIMINARY RESULTS OF THE ARCHAEOMETRIC ANALYSES

The main aim of the archaeometric analyses performed on the pottery found at Lousoi is to define the places and modes of its production, which could be indicative of different workshops. This kind of determination is a precious tool for reconstructing the regional and supraregional network the sanctuary was embedded in. These issues will be investigated through thin section petrography and wavelength dispersive X-ray fluorescence. In order to select representative samples for these analyses, we first sought to identify compositional groupings by using a portable X-ray fluorescence spectrometer (hereafter pXRF). In this paper we report preliminary groupings obtained by pXRF and discuss their correlations with fabrics, wares, shapes, and typology.

We used the spectrometer Olympus InnovX Delta Premium 6000 on 165 pottery and other clay-based artefacts, i.e. statuettes, kiln spacers and test pieces, excavated both in the Sanctuary of Artemis Hemera and in the town centre of Lousoi. The investigated vessels cover the whole spectrum of shapes, wares, and fabrics observable at the site. Two measurements of 60 seconds were performed on the fresh break of each sample. The means of both measurements were calculated for the following elements: Al, Si, P, K, Ca, Ti, Fe, Mn, Cr, Cu, Zn, Rb, Sr, Y, and Zr (tab. 1). The obtained chemical values were then elaborated through multivariate cluster analyses (Ward's method) using the software package SPSS 17 (Statistical Package for Social Science). For the purpose of calculation, the raw chemical values were summed to a constant of 100 %, transformed logarithmically to base 10 and standardised in order to give all elements approximately equal weight[69]. Ca, K and P were not considered in the statistical elaborations as they are easily influenced by post-depositional changes[70].

Within the first dendrogram (fig. 10), most of the vessels of foreign typology, i.e. Achaian, Laconian and Corinthian wares, cluster at each extremity of the diagram. In the lowest part of the dendrogram, at a distance between 10 and 15, a group of Corinthian/eastern Achaian craters, kantharoi, krateriskoi, and trefoil jugs with fabrics 10 and 15 emerges. However, some local reference material, such as pieces of kilns and kiln spacers (fabrics 60 and 61), as well as most of the craters classified into fabric 46 also occur in the same group. At lower distances (between 5 and 10) and in the opposite upper part of the dendrogram, Achaian ›Impressed Wares‹ sharing the same peculiar fabric (fabric 23) clearly stand out from the rest of the analysed pottery.

A few other Corinthian/eastern Achaian wares, mainly characterised by fabrics 25, 12 and 13, cluster in the middle part of the dendrogram mostly occupied by local fabrics and wares. Although cooking pots differ in fabrics (50, 52, 55, 56, 61), they are generally grouped together between Achaian ›Impressed Ware‹ and local wares. Between these latter and Corinthian/eastern Achaian craters, kantharoi, krateriskoi, and trefoil jugs, a very mixed group occurs composed of Achaian ›Impressed‹ and Corinthian/eastern Achaian wares (fabrics 23, 15 and 10) as well as of local pyxides (fabrics 40 and 33).

A second cluster analysis (fig. 11) was performed by excluding samples of foreign typology, in order to assess whether local wares clustered according to fabrics. In this calculation, cooking pots were not considered since they cluster quite separately. Each fabric is generally scattered within the whole dendrogram, and thus, no clear correlations between chemical clusters and fabrics appear. However, the dendrogram allows for identifying affinities between some fabrics. At the highest distance (25), two main groups can be distinguished. The first one mainly includes fabrics 40, 43, 44, 45, 46 and 60; the second one, fabrics 31, 32, 33, 34, 35, 36 and 38.

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69 Baxter 1994; Baxter 1995; Baxter 2003a; Baxter 2003b; Glascock 1992.

70 Schwedt et al. 2004.

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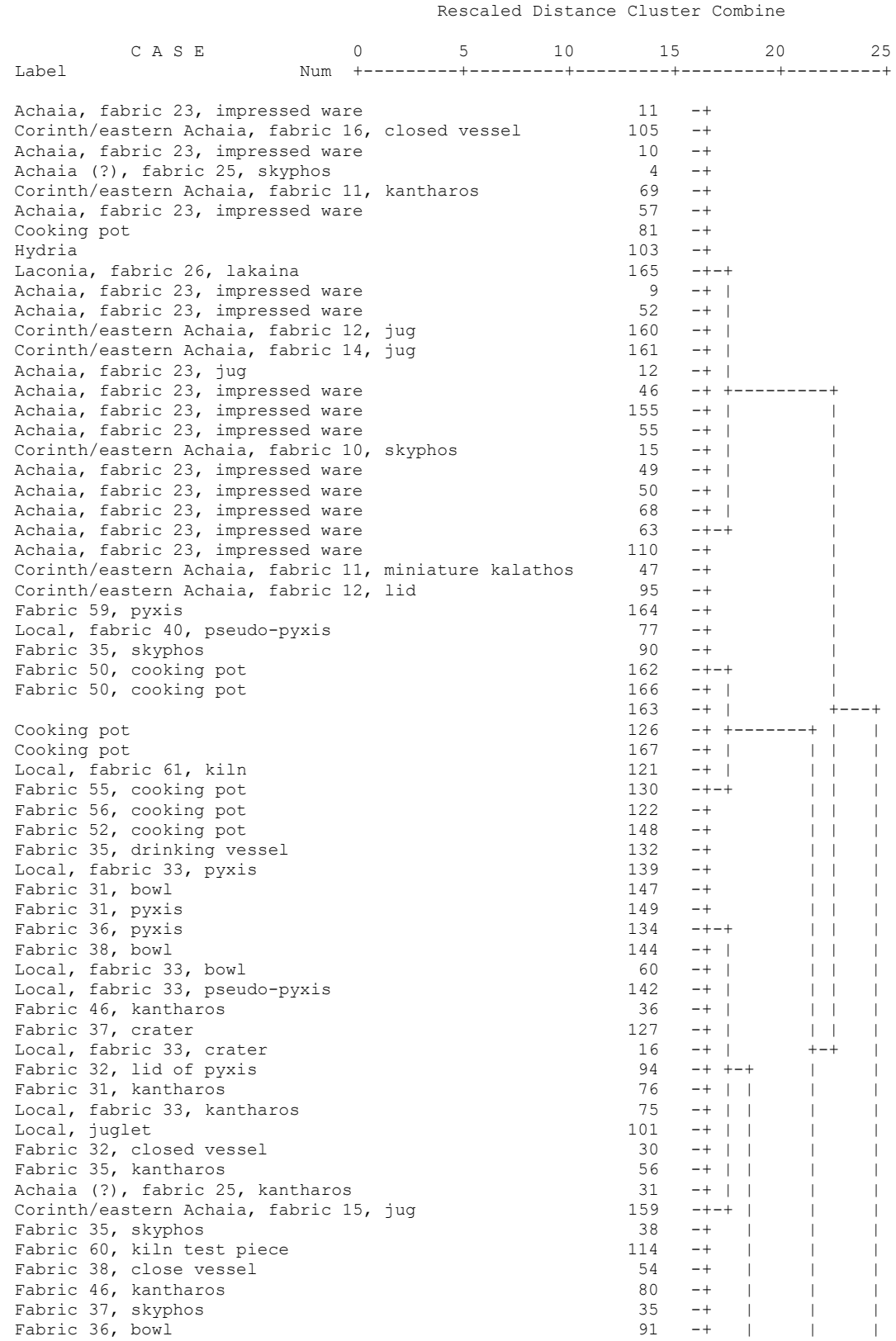
Dendrogram using Ward Method



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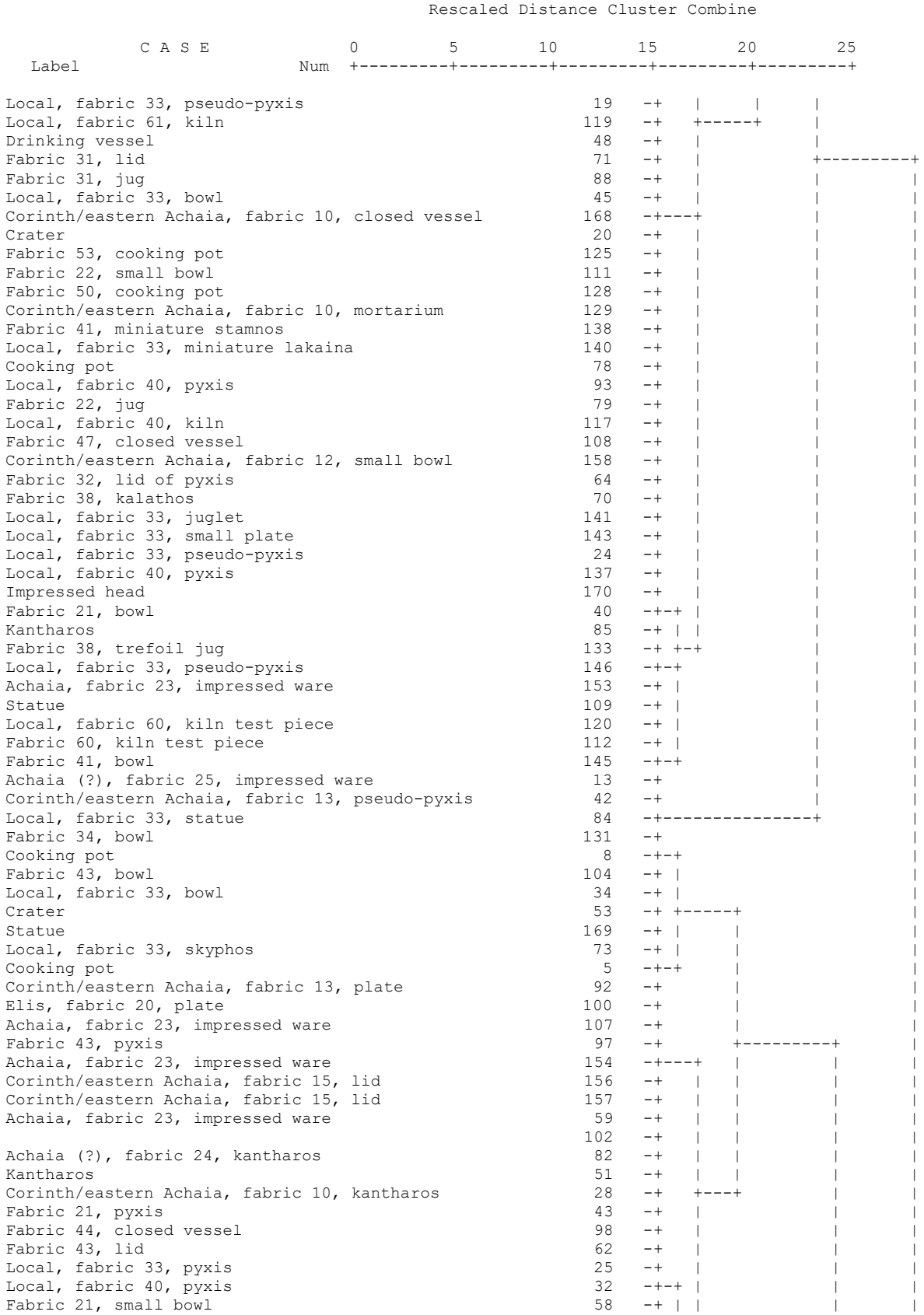
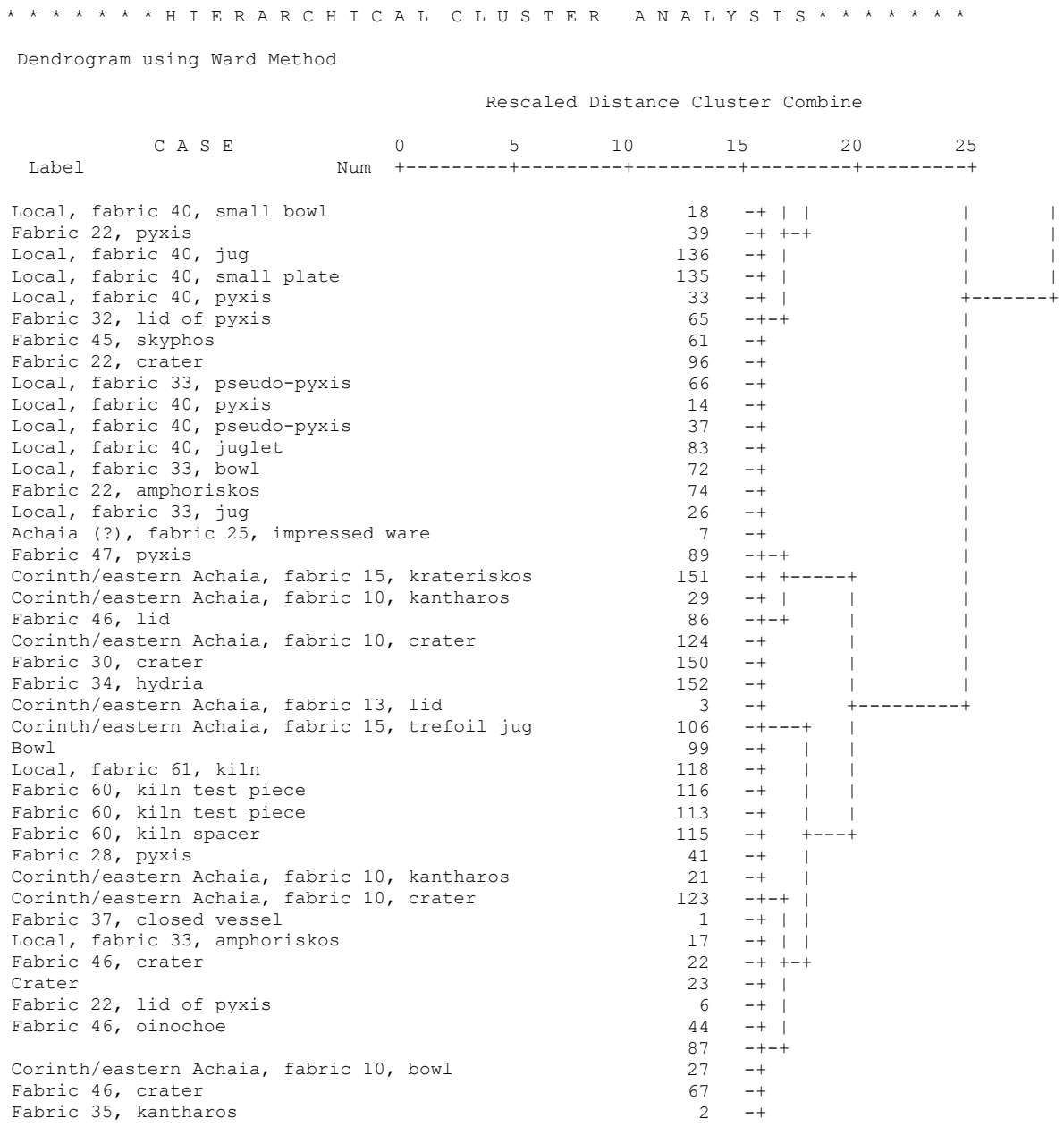
Dendrogram using Ward Method





10 Major and trace element contents obtained by pXRF. The value of each element is the result of a mean calcu-lated on two measurements (© OeAW-OeAI/P. Fragnoli)

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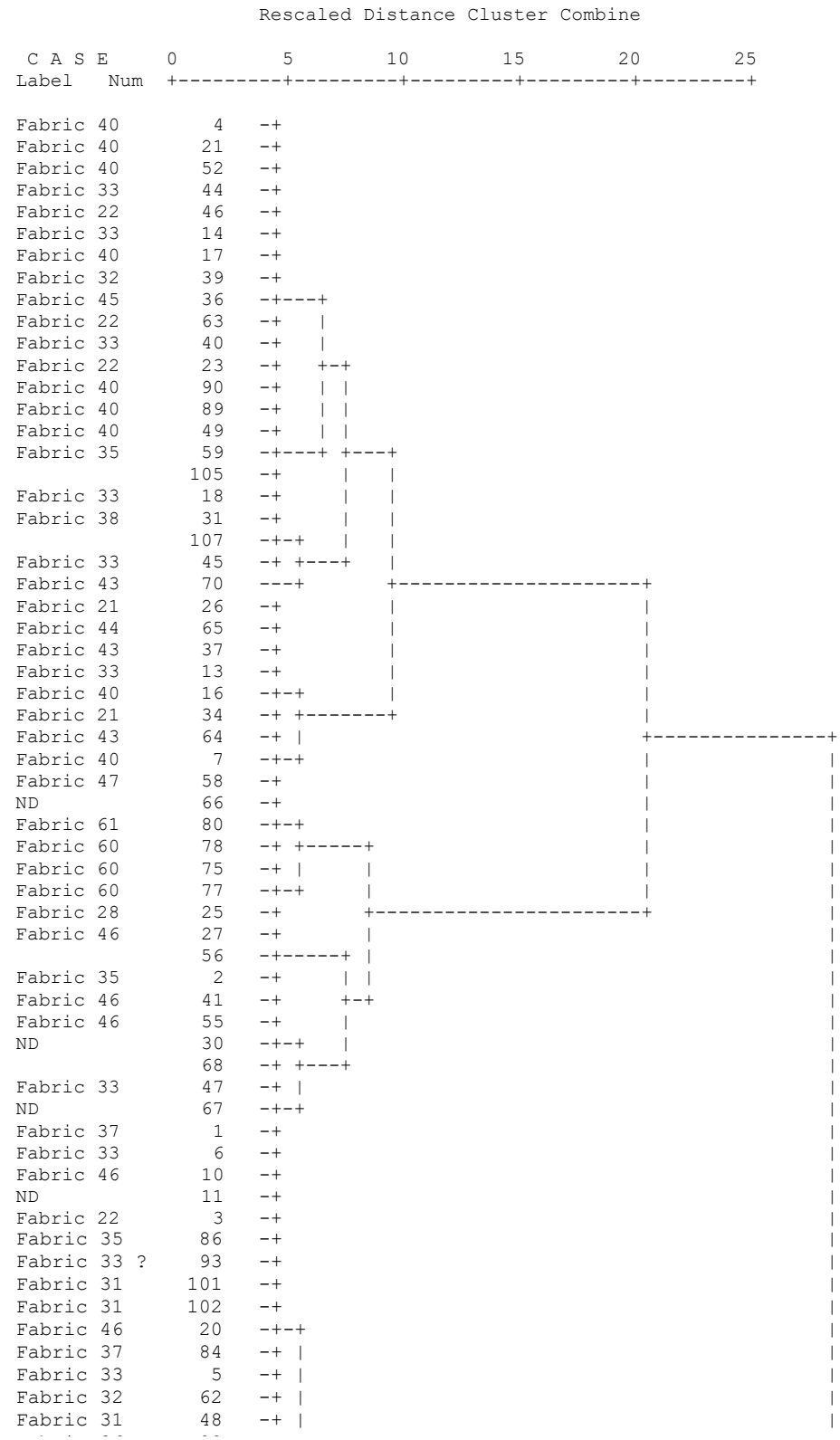
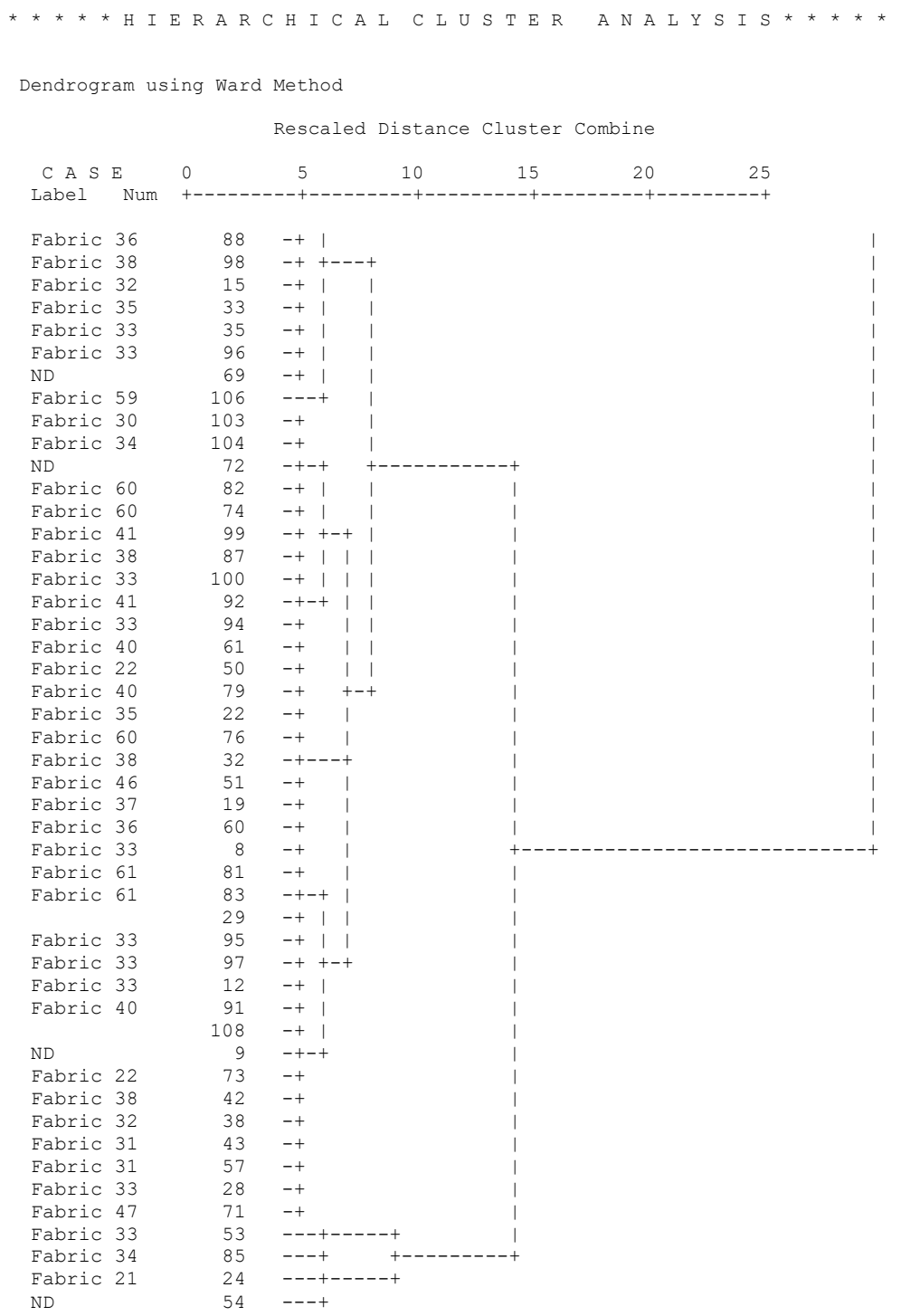
Dendrogram using Ward Method





11 First cluster analysis (Ward's method). Typological affinities, distinguished in Corinthian, Achaian, Laconian and local, fabrics and shapes are reported on the left (© OeAW-OeAI/P. Fragnoli)

Table 1 Second cluster analysis (Ward's method) that excludes vessels of non-local typology and cooking pots. Fabrics are reported on the left (© OeAW-OeAI/P. Fragnoli)

Sample	Fabric	Ware	Typology	Al	Si	P	K	Ca	Ti	Fe	Mn	Cr	Cu	Zn	Rb	Sr	Y	Zr
K03/08	37	closed vessel		8,90	16,84	5,64	0,34	1,88	0,41	5,95	0,11	272	78	147	22	172	42	179
K04/08	35	kantharos		4,12	9,26	2,12	0,20	6,90	0,74	11,47	0,19	439	160	137	32	204	96	242
K1/97	13	lid	Corinthian/ eastern Achaian	8,27	23,31	0,31	0,41	9,11	0,53	7,91	0,14	259	108	211	29	99	43	137
K100/10	25	skyphos	Achaian (?)	9,51	23,12	1,59	1,33	7,75	0,66	9,29	0,14	292	71	125	49	164	52	154
K103/08	ND	cooking pot		6,56	14,12	1,55	1,38	0,92	0,51	9,81	0,12	624	110	181	75	83	39	144
K104/08	22	lid of a pyxis		12,40	22,70	6,59	0,96	7,76	0,63	9,43	0,20	481	105	171	43	184	48	168
K110/97	25 (?)	pyxis (?) (impressed ware)	Achaian (?)	8,32	21,28	0,97	0,13	7,41	0,63	9,21	0,18	339	152	98	19	76	51	194
K111/97	ND	cooking pot		5,67	14,09	0,59	0,26	8,43	0,69	10,06	0,27	824	186	166	26	89	44	206
K112/97	23	kalathos (impressed ware)	Achaian	10,61	22,87	0,43	1,04	5,69	0,50	6,80	0,09	216	88	83	45	184	35	184
K113/97	23	kalathos (impressed ware)	Achaian	7,34	18,81	0,60	1,29	6,25	0,61	8,73	0,16	284	108	130	50	175	44	183
K115/97	23	kalathos (impressed ware)	Achaian	10,05	23,13	0,85	1,25	5,73	0,56	8,00	0,15	289	111	107	44	148	36	172
K12/98	23	kalathos (impressed ware)	Achaian	11,71	22,42	0,51	1,47	5,58	0,57	8,43	0,12	278	123	169	62	263	32	138
K124/08	25 (?)	pyxis (?) (impressed ware)	Achaian (?)	6,62	18,78	1,71	1,64	10,14	0,53	9,24	0,33	429	228	229	119	414	58	168
K124/98	40	pyxis	local	7,52	20,83	0,41	0,56	4,21	0,62	8,96	0,17	409	129	176	41	69	56	189
K125/08	10	skyphos	Corinthian/ eastern Achaian	9,93	22,64	1,32	1,17	12,85	0,49	7,55	0,14	191	83	113	58	255	30	134
K125/97	33	crater	local	8,71	19,28	0,56	0,96	4,50	0,44	8,11	0,19	252	101	115	88	113	50	177
K126/08	33	amphoriskos	local	9,43	18,24	2,71	0,67	7,94	0,44	6,98	0,17	209	83	111	27	149	34	137
K133/97	40	small bowl	local	8,84	21,61	0,66	0,33	4,41	0,60	8,69	0,24	307	142	361	26	62	49	185
K14/97	33	pseudo-Pyxis	local	4,86	17,36	0,25	1,19	2,80	0,57	7,81	0,17	267	144	171	107	89	41	201
K145/96	ND	crater		10,92	24,17	0,98	1,15	2,81	0,59	8,60	0,22	326	168	171	86	83	45	191
K16/08	10	kantharos	Corinthian/ eastern Achaian	6,54	17,01	5,20	0,26	8,03	0,56	7,73	0,19	309	81	101	30	257	55	164
K16/09	46	crater		6,74	15,21	2,82	0,61	7,89	0,42	6,84	0,17	288	100	94	32	209	47	149
K17/08	ND	crater		6,10	16,05	2,39	0,50	8,71	0,50	6,97	0,16	347	98	106	35	181	55	195
K17/97	33	pseudo-Pyxis	local	8,92	24,40	0,50	0,80	5,08	0,61	8,31	0,17	268	125	150	42	105	53	187
K170/97	33	pyxis	local	8,48	20,42	0,69	0,41	5,77	0,58	7,96	0,15	287	93	97	21	75	58	173

K172/97	33	jug	local	6,35	17,43	0,60	0,74	2,58	0,48	7,44	0,17	400	108	110	37	69	53	196
K18/07	10	bowl	Corinthian/ eastern Achaian	6,32	15,64	3,74	0,37	6,99	0,69	10,17	0,35	641	141	265	22	315	110	224
K18/08	10	kantharos	Corinthian/ eastern Achaian	8,10	16,89	3,62	0,44	2,13	0,66	7,03	0,07	198	96	173	40	141	60	200
K18/10	10	kantharos	Corinthian/ eastern Achaian	6,87	15,45	5,73	0,10	9,53	0,53	7,38	0,17	359	52	74	11	238	68	151
K182/87	32	closed Vessel		8,43	20,87	0,65	0,99	7,85	0,54	7,54	0,13	338	103	128	68	143	51	178
K19/07	25	kantharos	Achaian (?)	8,12	21,15	2,45	0,74	3,23	0,58	7,81	0,11	416	100	143	58	125	53	183
K19/97	40	pyxis	local	8,74	19,99	0,55	0,53	3,34	0,48	6,96	0,14	258	96	84	18	49	48	162
K19/98	40	pyxis	local	8,88	19,34	0,46	0,61	2,62	0,49	7,09	0,14	275	94	118	52	77	45	193
K199/97	33	bowl	local	7,12	18,59	0,57	0,85	4,51	0,70	10,81	0,24	525	163	170	69	103	60	213
K2/08	37	skyphos		8,30	21,46	2,57	1,36	4,26	0,55	7,50	0,27	323	117	172	102	168	66	173
K210/97	46	kantharos		11,42	25,55	0,75	1,46	11,88	0,61	8,83	0,25	353	108	148	110	182	50	164
K215/97	40	pseudo-Pyxis	local	8,62	20,27	0,47	0,61	3,06	0,65	9,11	0,18	390	133	180	52	83	55	201
K216/97	35	skyphos		7,44	18,95	0,61	0,71	10,92	0,61	8,37	0,15	399	144	116	52	194	44	213
K224/97	22	pyxis		10,73	20,38	0,46	0,81	2,81	0,43	6,94	0,20	191	111	128	22	52	44	152
K256/97	21	bowl		13,44	20,41	0,21	4,52	4,63	0,61	9,31	0,41	262	228	229	88	224	56	148
K26/97	28	pyxis		11,39	17,80	0,42	0,35	6,20	0,55	8,98	0,21	291	192	132	20	118	50	155
K260/97	13	pseudo-Pyxis	Corinthian/ eastern Achaian	8,17	19,84	0,29	1,37	5,81	0,54	8,89	0,17	556	5654	221	110	107	56	197
K271/97	21	pyxis		8,77	17,47	0,47	0,33	2,91	0,45	6,42	0,18	260	104	150	29	57	46	177
K28/09	46	oinochoe		6,11	18,29	2,77	0,44	6,60	0,59	8,39	0,17	388	110	126	27	245	93	192
K28/97	33	bowl	local	5,97	19,13	0,35	0,92	3,36	0,54	7,03	0,19	329	130	147	78	82	46	195
K29/87	23	kalathos (impressed ware)	Achaian	10,86	21,29	0,43	1,56	5,10	0,62	9,42	0,13	282	146	188	74	237	34	149
K29/98	11	cup	Corinthian/ eastern Achaian	8,93	22,61	0,59	1,63	6,43	0,55	7,66	0,12	264	82	114	96	233	39	170
K3/95	ND	drinking vessel		2,30	10,12	0,27	1,08	5,18	0,47	6,84	0,16	236	155	135	87	107	44	164
K30/87	23	closed vessel (impressed ware)	Achaian	12,26	20,58	1,11	1,44	7,89	0,50	7,66	0,18	301	67	101	71	291	33	144
K31/87	23	pyxis (impressed ware)	Achaian	9,77	22,53	0,37	1,34	6,89	0,56	8,03	0,16	218	117	117	61	236	37	182
K33/98	ND	kantharos		9,11	17,60	0,69	0,48	10,78	0,52	7,83	0,10	223	160	92	21	169	40	136

Table 1 (cont)

Sample	Fabric	Ware	Typology	Al	Si	P	K	Ca	Ti	Fe	Mn	Cr	Cu	Zn	Rb	Sr	Y	Zr
K332/87	23	leg of a tripod (impressed ware)	Achaian	9,84	21,58	0,32	1,03	5,60	0,56	7,88	0,13	227	82	78	32	214	47	163
K339/97	38	crater		6,81	15,97	0,50	0,62	9,27	0,72	9,83	0,26	403	166	159	46	102	47	166
K34/08	38	closed vessel		8,33	18,19	2,88	0,90	3,77	0,52	8,41	0,25	310	133	169	69	132	56	185
K34/87	23	closed vessel (impressed ware)	Achaian	8,55	19,77	0,21	1,84	5,31	0,66	10,48	0,14	371	150	207	67	255	44	161
K341/97	35	kantharos		8,35	18,92	0,42	0,70	8,40	0,44	6,92	0,11	450	83	135	87	123	45	166
K35/87	23	leg of a tripod (impressed ware)	Achaian	5,96	16,24	0,32	1,10	5,80	0,70	10,08	0,17	412	108	171	55	201	50	219
K350/97	21	small bowl		10,24	17,82	0,90	0,27	4,21	0,49	7,40	0,18	278	76	102	19	55	52	166
K36/87	23	kalathos (?) (impressed ware)	Achaian	9,99	21,35	0,86	0,62	6,26	0,54	8,31	0,08	280	108	74	25	104	50	143
K363/97	33	bowl	local	8,66	18,83	0,52	0,71	4,76	0,45	6,37	0,08	284	103	110	71	97	43	178
K367/97	45	skyphos		9,81	16,23	0,45	0,78	2,19	0,53	8,18	0,16	237	91	122	57	63	46	239
K371/97	43	lid		10,60	21,34	0,83	0,32	1,57	0,45	6,24	0,18	291	89	105	27	39	44	187
K38/87	23	lid (impressed ware)	Achaian	9,08	22,36	0,51	1,44	5,33	0,48	6,68	0,11	251	84	114	74	197	31	171
K38/97	32	lid of a pyxis		8,75	20,90	0,90	0,89	5,58	0,43	6,12	0,12	259	182	103	76	109	46	170
K39/97	32	lid of a pyxis		9,82	22,12	0,41	0,54	2,46	0,42	5,72	0,15	288	94	112	43	61	49	181
K39/97	33	pseudo-Pyxis	local	10,82	25,46	0,89	1,28	1,99	0,69	7,45	0,19	219	120	139	51	61	55	273
K4/09	46	crater		6,21	17,19	3,77	0,28	6,91	0,72	10,43	0,24	444	146	178	18	209	96	206
K4/96	23	biconical vessel (impressed ware)	Achaian	8,68	20,31	0,47	1,42	8,83	0,52	7,42	0,14	215	106	116	72	229	43	165
K40/10	11	kantharos	Corinthian/ eastern Achaian	9,02	22,00	2,45	1,44	4,59	0,66	9,52	0,16	344	100	164	62	192	55	188
K41/10	38	kantharos		8,24	20,85	2,56	1,06	3,10	0,58	7,47	0,20	290	148	138	92	88	56	168
K43/97	31	lid		6,54	18,17	0,47	0,86	5,94	0,56	8,69	0,16	384	107	155	85	107	49	191
K436/97	33	bowl	local	7,47	20,80	0,60	0,74	3,82	0,61	8,30	0,13	389	117	144	46	91	61	207
K45/97	33	skyphos	local	5,45	15,27	0,55	0,83	3,92	0,66	9,79	0,12	588	335	182	78	93	54	231

K454/97	22	amphoriskos		8,90	20,23	1,10	0,80	3,42	0,57	9,25	0,14	397	131	143	55	92	59	189
K5/08	33	kantharos	local	10,10	21,12	5,05	0,70	4,11	0,44	6,44	0,17	418	60	116	59	154	60	157
K510/97	31	kantharos		8,21	20,22	0,50	1,13	5,75	0,50	6,97	0,16	245	121	160	110	123	45	169
K52/96	40	pseudo-pyxis	local	9,39	21,67	0,19	1,16	0,47	0,52	7,56	0,16	314	130	128	76	54	42	202
K56/96	ND	cooking pot		8,68	18,44	0,31	1,20	8,56	0,54	8,32	0,20	288	151	213	86	151	43	154
K56/98	22	jug		9,45	18,72	0,46	1,10	3,00	0,52	7,87	0,14	253	126	162	70	139	45	182
K6/08	46	kantharos		6,43	21,46	1,91	1,01	5,44	0,61	7,76	0,19	392	130	157	80	132	57	177
K6/09	ND	cooking pot		6,98	24,11	1,11	1,32	0,83	0,53	7,80	0,17	407	136	183	65	175	51	192
K6/95	24	kantharos	Achaian (?)	6,77	18,87	0,45	0,70	7,13	0,54	7,83	0,09	331	161	97	32	124	51	162
K6/98	40	juglet	local	8,76	21,77	0,87	0,65	3,18	0,55	7,85	0,22	264	107	169	36	54	45	175
K600/97	33	statue with impressed zig zags on the head	local	8,35	20,14	0,73	0,96	4,34	0,56	8,17	0,19	329	1657	152	97	110	63	216
K63/08	NC	kantharos		9,62	20,02	0,66	1,59	1,14	0,41	8,27	1,12	207	261	233	112	107	47	121
K64/09	46	lid		8,41	15,77	5,57	0,18	8,72	0,52	7,73	0,18	332	81	84	14	260	59	178
K66/09	ND	ND		5,56	19,34	2,06	0,58	5,08	0,67	9,45	0,22	335	123	164	31	154	73	182
K660/97	31	jug		7,72	19,18	0,44	1,04	3,86	0,60	8,53	0,18	306	118	161	89	100	45	180
K661/97	47	pyxis		10,06	20,01	0,93	0,14	5,64	0,42	7,42	0,23	235	102	77	19	62	38	161
K683/97	35	skyphos		8,93	19,23	0,40	1,12	1,12	0,53	7,57	0,15	226	127	116	63	50	43	182
K69/08	36	bowl		5,57	15,03	2,92	0,69	7,48	0,60	9,22	0,19	529	128	131	99	173	65	208
K7/97	13	lid of a pyxis	Corinthian/ eastern Achaian	10,81	25,26	1,47	1,78	8,08	1,07	16,22	0,26	5195	694	361	146	164	96	235
K707/97	40	pyxis	local	10,43	24,77	0,27	1,46	5,94	0,61	8,58	0,19	349	202	180	107	124	48	180
K709/97	32	lid of a pyxis		8,80	20,80	0,54	1,07	7,63	0,56	8,04	0,15	327	108	145	105	140	55	215
K711/97	12	lid	Corinthian/ eastern Achaian	8,81	21,86	0,33	1,65	6,88	0,53	7,41	0,14	270	79	153	110	209	34	135
K727/97	22	crater		11,07	22,97	0,91	0,93	2,69	0,59	8,34	0,20	222	84	135	42	70	48	250
K733/97	43	pyxis		11,57	21,24	0,80	0,33	2,28	0,47	6,28	0,06	310	61	64	27	42	46	159
K736/97	44	closed vessel		10,31	20,76	0,65	0,40	2,59	0,59	8,43	0,13	438	141	190	30	56	53	212
K75/97	ND	bowl		9,40	19,93	0,35	0,95	11,51	0,57	8,56	0,36	311	191	186	52	253	46	149
K767/97	20	plate	Elis	9,82	20,96	0,61	0,75	6,04	0,50	7,33	0,08	240	61	56	32	117	50	160

Table 1 (cont)

Sample	Fabric	Ware	Typology	Al	Si	P	K	Ca	Ti	Fe	Mn	Cr	Cu	Zn	Rb	Sr	Y	Zr
K8/95	ND	juglet	local	8,26	20,27	0,80	0,53	8,15	0,57	8,04	0,11	320	59	92	37	173	46	146
K81/96	ND	ND		11,20	22,54	0,34	0,59	5,61	0,46	7,37	0,08	294	93	78	23	99	42	137
K822/87	ND	hydria		10,12	25,49	0,27	1,28	4,34	0,54	7,21	0,10	269	78	114	46	184	43	198
K824/87	43	bowl		6,75	16,65	0,80	0,40	6,47	0,93	12,38	0,31	2392	543	336	61	107	75	261
K825/87	16	closed vessel	Corinthian/ eastern Achaian	12,12	24,29	0,80	1,26	6,03	0,54	8,34	0,14	284	111	121	50	177	37	179
K826/87	15	trefoil Jug	Corinthian/ eastern Achaian	9,11	18,03	0,28	0,39	6,11	0,50	7,36	0,19	187	125	137	28	142	43	138
K83/98	23	skyphos (?) (impressed ware)	Achaian	13,13	23,22	0,77	1,12	6,38	0,53	8,56	0,10	348	55	82	60	105	63	159
K845/97	47	closed vessel		8,67	22,71	0,64	1,20	7,53	0,59	8,33	0,33	344	122	98	62	103	43	165
K890/97	ND	statue		9,35	19,77	0,34	1,10	9,85	0,49	7,63	0,25	285	164	171	66	225	47	139
K9/96	23 (?)	miniature kalathos	Achaian	10,66	23,95	0,75	1,44	6,19	0,51	6,91	0,12	253	91	126	65	235	30	168
K904/97	22	small bowl		7,40	17,85	0,55	0,76	6,34	0,44	6,39	0,18	217	100	108	67	81	34	137
LOUH45/18	60	kiln test piece		8,93	22,47	0,81	1,34	9,36	0,44	6,80	0,21	233	195	112	65	180	36	143
LOUH46/18	60	kiln test piece		8,26	20,00	0,52	0,35	11,73	0,45	7,81	0,21	258	266	119	21	213	40	134
LOUH47/18	60	kiln test piece		6,84	19,35	0,57	0,58	13,84	0,68	10,03	0,27	349	159	164	70	199	35	171
LOUH48/18	60	kiln spacer		8,87	20,71	0,33	0,33	10,06	0,43	6,43	0,20	243	253	112	24	167	34	139
LOUH49/18	60	kiln test piece		8,18	20,77	0,34	0,45	12,12	0,50	7,58	0,43	243	162	125	29	286	41	132
LOUH50/18	40	kiln	local	9,53	22,62	0,55	1,10	3,65	0,44	7,17	0,18	246	167	155	70	135	36	130
LOUH51/18	61	kiln	local	10,11	19,48	0,38	0,58	11,63	0,55	7,45	0,28	268	161	151	40	333	39	156
LOUH53/18	61	kiln	local	5,78	21,50	0,38	1,65	1,95	0,48	6,55	0,28	338	140	174	121	110	41	176
LOUH54/18	60	kiln test piece	local	9,37	22,29	0,38	1,05	7,28	0,47	7,86	0,23	243	148	147	66	187	41	144
LOUH55/18	61	kiln	local	9,07	24,69	1,06	1,51	0,97	0,51	5,97	0,27	290	97	128	111	81	45	193
LOUT1/18	37	crater		9,25	23,42	0,47	1,48	10,10	0,51	7,01	0,24	243	94	116	109	183	41	153
LOUT10/18	50	cooking pot		9,02	22,36	0,17	1,12	4,29	0,48	7,51	0,26	331	158	131	72	84	33	170
LOUT11/18	10	mortarium	Corinthian/ eastern Achaian	8,82	19,87	0,30	0,54	6,44	0,44	6,78	0,30	209	164	117	64	63	36	130

LOUT12/18	55	cooking pot		9,30	26,50	0,67	1,79	1,93	0,49	6,66	0,25	177	108	108	110	73	35	140
LOUT13/18	34	bowl		8,30	23,47	1,11	1,62	4,38	0,65	11,22	0,32	1516	5521	412	100	92	41	209
LOUT14/18	35	drinking vessel		8,47	21,01	0,26	0,58	10,29	0,50	6,17	0,13	248	117	100	67	172	41	165
LOUT15/18	38	trefoil jug		8,78	26,36	0,71	1,48	8,82	0,50	6,35	0,09	234	368	149	117	165	44	177
LOUT16/18	36	pyxis		9,61	25,16	0,42	1,03	4,62	0,43	5,97	0,10	188	91	102	87	105	37	183
LOUT17/18	40	small plate	local	10,89	23,17	0,56	0,55	2,51	0,50	7,44	0,16	346	172	106	30	72	45	186
LOUT18/18	40	jug	local	11,27	22,35	0,50	0,96	3,41	0,53	8,13	0,13	305	103	110	23	67	46	213
LOUT19/18	40	pyxis	local	10,13	23,50	0,61	0,78	3,26	0,49	6,89	0,14	268	181	105	45	74	44	176
LOUT20/18	41	miniature stamnos		7,30	21,74	0,19	1,12	9,82	0,45	6,06	0,17	335	189	124	82	141	45	157
LOUT21/18	33 ?	pyxis	local	8,88	20,70	0,44	0,53	10,74	0,51	6,31	0,15	213	74	82	65	161	40	169
LOUT22/18	33	miniature lakaina	local	8,08	22,71	0,29	1,13	8,27	0,46	6,06	0,14	293	198	118	75	134	47	168
LOUT23/18	33	juglet	local	8,88	20,28	0,69	0,91	4,96	0,50	7,33	0,16	240	113	120	60	99	44	167
LOUT24/18	33	pseudo-pyxis	local	10,79	22,96	0,49	1,13	4,65	0,50	6,79	0,16	321	84	91	76	104	39	176
LOUT25/18	33	small plate	local	9,86	21,96	0,49	0,90	4,35	0,54	7,50	0,16	253	125	145	56	105	51	181
LOUT26/18	38	bowl		9,31	23,67	0,38	1,20	6,01	0,48	5,96	0,08	286	96	106	105	110	44	159
LOUT27/18	41	bowl		12,42	27,26	2,11	1,62	8,54	0,57	9,99	0,37	254	165	211	95	190	48	156
LOUT28/18	33	pseudo-pyxis	local	6,60	17,03	0,24	1,06	4,17	0,41	5,78	0,12	187	270	106	82	111	44	165
LOUT29/18	31	bowl		9,79	19,99	0,30	0,85	6,79	0,52	7,27	0,19	236	73	80	88	118	44	170
LOUT3/18	52	cooking pot		12,20	25,65	0,66	1,50	0,18	0,53	7,70	0,03	165	99	132	106	88	43	192
LOUT30/18	31	pyxis		9,06	21,42	0,36	0,70	7,12	0,45	5,85	0,15	202	107	77	68	112	41	163
LOUT31/18	30	crater		10,35	22,02	0,30	0,62	5,78	0,46	7,86	0,21	208	168	154	39	132	38	124
LOUT32/18	15	krateriskos	Corinthian/ eastern Achaian	10,98	18,85	0,21	0,05	10,09	0,49	7,13	0,07	233	67	52	8	109	49	140
LOUT33/18	34	hydria		9,97	20,14	0,17	1,01	8,08	0,48	7,52	0,21	244	168	169	51	148	44	145
LOUT34/18	23	kalathos (impressed ware)	Achaian	10,41	24,68	0,54	1,29	5,58	0,51	7,11	0,10	198	395	80	47	221	34	164
LOUT35/18	23	pyxis (impressed ware)	Achaian	11,14	20,71	0,79	0,62	3,13	0,47	6,80	0,12	257	58	77	27	79	32	151
LOUT36/18	23	kalathos (impressed ware)	Achaian	10,54	21,65	0,35	1,67	5,67	0,55	8,63	0,15	222	143	180	82	288	39	141
LOUT37/18	15	lid	Corinthian/ eastern Achaian	11,03	18,28	0,63	0,24	8,89	0,52	8,61	0,09	286	62	64	15	110	36	129
LOUT38/18	15	lid	Corinthian/ eastern Achaian	9,01	17,25	0,48	0,43	11,35	0,68	11,14	0,09	583	91	91	18	132	72	171

Table 1 (cont)

Sample	Fabric	Ware	Typology	Al	Si	P	K	Ca	Ti	Fe	Mn	Cr	Cu	Zn	Rb	Sr	Y	Zr
LOUT39/18	12	small bowl	Corinthian/ eastern Achaian	10,46	21,23	0,42	1,01	4,99	0,50	6,93	0,23	326	107	81	48	119	54	159
LOUT40/18	15	jug	Corinthian/ eastern Achaian	9,33	20,57	0,47	0,91	8,43	0,64	9,68	0,11	704	66	151	59	114	53	155
LOUT41/18	12	jug	Corinthian/ eastern Achaian	10,21	20,56	0,14	0,61	13,44	0,50	8,02	0,10	240	106	108	35	427	36	125
LOUT43/18	14	jug	Corinthian/ eastern Achaian	8,55	20,29	0,17	0,40	15,10	0,54	8,07	0,09	217	107	121	41	496	35	127
LOUT5/18	50	cooking pot		10,38	25,40	0,15	0,80	0,12	0,47	7,31	0,27	284	124	156	58	50	54	188
LOUT5/18	ND	ND		10,10	26,53	0,14	0,75	0,22	0,54	8,98	0,11	871	57	147	65	42	45	238
LOUT52/18	59	pyxis		10,22	28,73	/	2,30	7,88	0,54	6,80	0,11	288	57	137	135	263	35	142
LOUT56/18	26	lakaina	Laconian	10,46	25,56	0,17	1,36	8,34	0,57	8,21	0,11	369	90	152	62	234	41	219
LOUT7/18	50	cooking pot		8,94	26,70	0,19	1,17	0,51	0,32	6,63	0,20	227	127	119	91	46	51	106
LOUT9/18	NC	cooking pot		10,28	28,65	0,28	2,42	0,84	0,47	7,19	0,20	259	124	130	144	68	32	149
P08/39	10	closed vessel	Corinthian/ eastern Achaian	8,43	19,70	1,19	1,10	1,81	0,63	9,84	0,16	322	140	211	85	68	48	197
T48/87	ND	statue		6,34	19,17	0,50	1,14	5,26	0,62	9,13	0,24	480	202	204	70	136	57	195
TK15/97	ND	impressed head		10,15	22,05	0,38	0,88	3,45	0,50	7,08	0,21	220	170	122	59	106	48	185

SUMMARY AND OUTLOOK

The preliminary results of the ongoing interdisciplinary project have shed new light on the Sanctuary of Artemis Hemera at Lousoi in the Geometric and Archaic periods. Only one structure of pre-Classical date has been unearthed so far in the temenos: the rubble embankment built in the first half of the 5th century BC to support a northward extension of the upper sanctuary terrace (figs. 2–4). This embankment and the levelling layer behind and above it contained a closed deposit, which was rich in pottery and small votive objects. Several dozens of Early and Middle Geometric vessels indicate that the cult activity started already in the first half of the 9th century BC, and thus much earlier than previously assumed[71].

The systematic microscopic description of the ceramic fabrics and the first phase of the scientific analysis by means of pXRF show that local and regional pottery prevailed in the Sanctuary of Artemis during the Geometric period. In the second half of the 7th and in the 6th centuries BC, imports from the Corinthia and eastern Achaia formed the majority of the assemblage, while Attic, Laconian and Argive pots were few in number. At the next stage of archaeometric research, petrographic and chemical analyses by means of XRF will provide a clearer picture of the individual production centres in Achaia and northern Arkadia. The samples from other sites in the area and from Incoronata in the vicinity of Mentapontion will help to localize some of them. These results will provide new evidence to assess the supraregional role of the Sanctuary of Artemis Hemera at Lousoi in the network of Azanian and Achaian poleis and in the foundation of Metapontion.

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Christa Schauer

LOUSOI AND THE ΛΟΥΣΙΑΤΑΙ

STUDYING THE MATERIAL CULTURE OF LOUSOI

To the memory of Veronika Mitsopoulos-Leon

ABSTRACT
This paper focuses on the material culture of Lousoi, combining evidence from the excavations in the ›public centre‹ of the Hellenistic polis, the Sanctuary of Artemis and the Hellenistic residential area. In contrast to the cities in the coastal region of the northern Peloponnese, Lousoi was a rural community in North Arcadia with limited territory, where livestock farming and related industries formed the basis of subsistence. While there is evidence of a wider cultural network of Lousoi, local production played a major role for the supply of pottery and large terracotta objects such as roof tiles and terracotta hearths. Three votive deposits of the Classical and Hellenistic periods in the public centre add to our understanding of religious attitudes of the Λουσιάται, documenting ceremonies that included the redeposition of older votive objects, and communal feasting. The political role of the public centre in the Classical period is testified to by four proxeny inscriptions.

As only a small number of ancient sources refer to Lousoi, providing us with a rather fragmentary picture of its institutions and history[1], study of the material culture is essential for extracting further information on the community of Lousoi, its population, the living conditions, and the political, economic and cultural interactions of the Λουσιάται[2] with the neighbouring areas. Ideally, the results will also contribute to our understanding of the general history of the region[3].

Earlier excavations in Lousoi were carried out in the Sanctuary of Artemis[4] and two houses in the Hellenistic settlement site locally known as »Phournoi«[5]. The excavations in the area of the Hellenistic ›public centre‹ between 2001 and 2010, initially directed by Veronika Mitsopoulos-Leon and subsequently by Georg Ladstätter, added important information on the public building programme of the 3rd century BC in this location, earlier cult buildings, and deposits related to cult activities of the Λουσιάται[6].

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1 Reichel – Wilhelm 1901, 1–7. 64–88 (A. Wilhelm); Jost 1985, 46–48. 419–425; Rizakis 1995, 382–383 cat. 712; Tausend 1999a; Perlman 2000, 158–160. 240–245; Mitsopoulos-Leon 2012, 39–43.

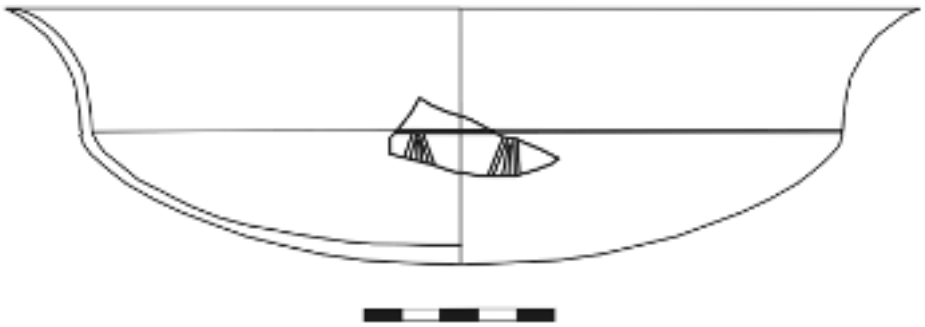
2 For variants of the *ethnikon* cf. Bölte 1927, 1891.

3 This paper is based on the finds from the old and the newer excavations in Lousoi 1898/1899 and 1981–2010. I would like to thank the excavators, my colleagues during the excavation and study campaigns in Lousoi, the Ephorate of Antiquities of Achaia, and the many scholars who have contributed to our knowledge on Arcadia and Achaia.

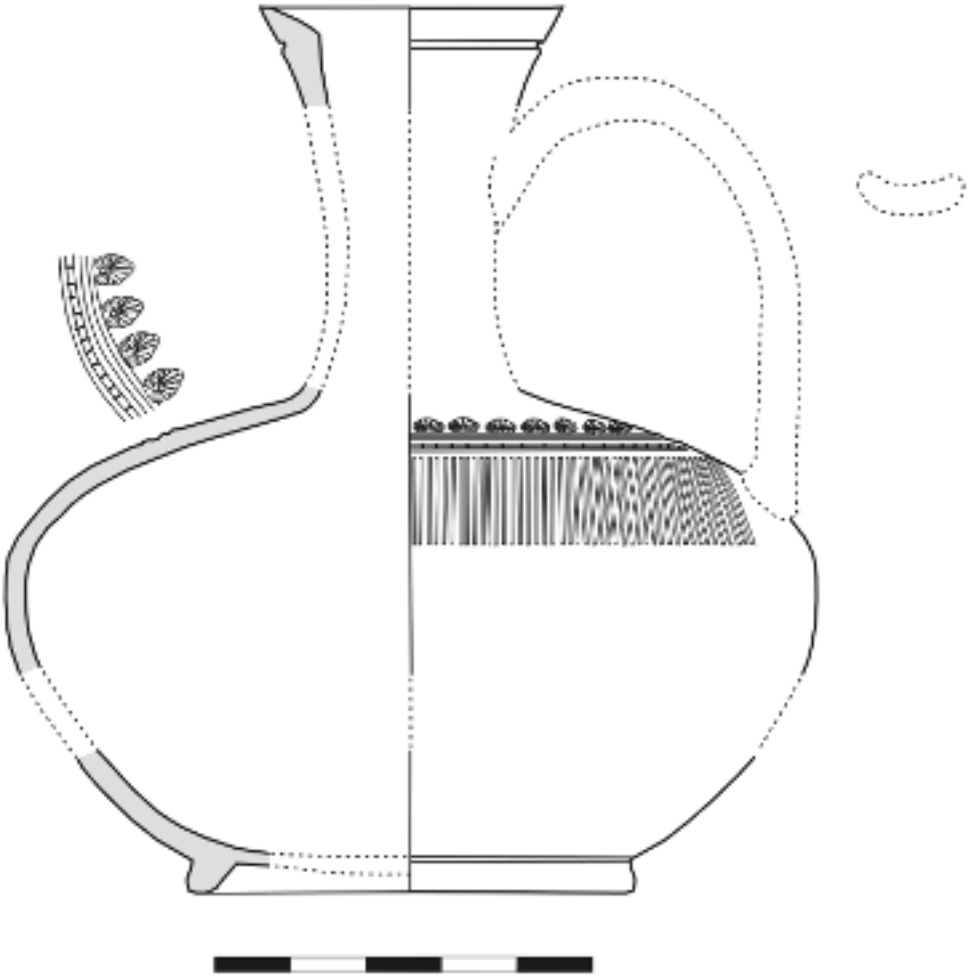
4 Reichel – Wilhelm 1901; Mitsopoulos-Leon 2012.

5 Mitsopoulos-Leon 2017; Rogl 2008.

6 For the evidence for use of the area for communal dining from the Early (or Middle) Geometric period onwards, cf. Schauer 2017; Schauer 2018.



1 Lousoi, Sanctuary of Artemis. Transparent glass bowl, reconstruction (© OeAW-OeAI/C. Schauer)



2 Lousoi, Sanctuary of Artemis. Lekythos jug, reconstruction (© OeAW-OeAI/C. Schauer)

IMPORTED VOTIVE OBJECTS AS EVIDENCE FOR THE CONNECTIVITY OF LOUSOI

The small finds from the Sanctuary of Artemis published by Wolfgang Reichel and Adolf Wilhelm in 1901 and Veronika Mitsopoulos-Leon in 2012 provide a good starting point for tracing the connections between Lousoi and the surrounding regions, as the votives show relations with Arcadia, but also with Laconia, the Argolid and the northern coast of the Peloponnese. There are, for example, a Laconian bronze scarabaeus[7], a Corinthian animal-shaped perfume vessel, and a Corinthian sphinx relief[8], as well as jewellery and a type of small bronze box[9] also encountered in other regions. The Geometric lead griffin and its counterpart in Karlsruhe[10], also from Lousoi, may be of Arcadian production, as the type is not represented among the numerous lead votives in Laconia. An open-work Late Geometric kalathos and other fragments with impressed decoration can be attributed to a workshop in the area of Aigion[11]. The early terracotta figurines representing Artemis are easily recognisable as local products[12]. A small terracotta head[13] is evidently moulded from a Late Archaic Laconian bronze.

A rather unusual find in the Sanctuary of Artemis is the fragment of a transparent glass bowl (fig. 1)[14], probably of Late Classical date. Similar bowls were produced in the first half of the 4th century in a workshop in Rhodes, the type being based on Achaemenid prototypes[15]. The presence of the type in Lousoi is remarkable. On the other hand, for example, a fragmented Early Hellenistic black-glazed lagynos or lekythos jug with palmette stamps on its shoulder (fig. 2) shows connections between Lousoi and the Argolid and Arcadia[16]. Evidently, the location of Lousoi off the coast in the mountainous landscape of Azania[17], forming part of northern Arcadia, did not prevent intense relations with the neighbouring regions of Achaia and around the Gulf of Corinth from an early period[18].

LOCAL PRODUCTIONS, INCLUDING PRODUCTION OF TERRACOTTA ROOFS AND HEARTHS

Local industries testified to in the Hellenistic houses included production of wine, woven textiles and ceramic vessels, as well as of large-scale clay objects[19], probably mainly to supply the inhabitants. The importance of local production in Lousoi can be particularly well studied in the case of terracotta roofs[20] and other large terracotta objects[21]. Unlike in Aigeira or in other sites along the coast where Corinthian roofs were very popular, in Lousoi there is a conglomerate of styles and influences with local variants of the Arcadian roofing system already in the Archaic and Early Classical periods.

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7 Mitsopoulos-Leon 2012, 66 f. 141 cat. 1 pl. 1.
8 Mitsopoulos-Leon 2012, 189 f. cat. 555. 556 pl. 50.
9 Mitsopoulos-Leon 2012, 69–72. 143 cat. 23–32 pls. 5–7.
10 Sinn 1980, 31 fig. 8; Mitsopoulos-Leon 2012, 97 f. 167 cat. 341 pl. 28.
11 Schauer 2014b.
12 Mitsopoulos-Leon 2012, 107–110. 172 f. cat. 404–419 pls. 34. 35.
13 Mitsopoulos-Leon 2005, 447 f. fig. 2; Mitsopoulos-Leon 2012, 128. 187 f. cat. 538 pl. 49.
14 Schauer 2007.
15 Triantafyllidis 2000.
16 Schauer 2011. The suggested reconstruction is tentative, based on the similarities with a lagynos from Mycenae published by Rudolph 1978, 222. 231 f. cat. 46 fig. 10 pl. 30.
17 Cf. Jost 1985, 25–27; Alexopoulou 2009, 1. 9 f.; Alexopoulou 2012.
18 Cf. Alexopoulou 2012, 317; Perlman 2000, 158–160. For Late Archaic pottery from the Sanctuary of Artemis, attributed to different areas of the Peloponnese and Attica, cf. Schauer 1996/1997.
19 Mitsopoulos-Leon 2007; Mitsopoulos-Leon 2010; Mitsopoulos-Leon 2017, passim.
20 Reichel – Wilhelm 1901, 61–64; Schauer 2006; Jahresbericht 2014, 89 fig. 1.
21 Cf. Mitsopoulos-Leon 2017, cat. 228–234. 236. 390–393 pls. 52–54. 65.

3

4

3–4 Lousoi, antefixes from the public centre (left) and from the Sanctuary of Artemis (right) (© OeAW-OeAI/K.-V. v. Eickstedt)

Among the terracotta roofs, only a few pieces correspond to the well-known Corinthian types – like the palmette antefix from the old Austrian excavations illustrated by Wilhelm Wilberg[22]. Fragments from other Archaic or Early Classical roofs may either be classified as Arcadian adaptations of the Laconian-style roof or show connections to Central Greece and Argos[23]. It is evident that for the roofing of their public buildings the inhabitants of Lousoi did not follow the general trend to call travelling Corinthian tile-makers, but selected from a wider range of prototypes from other regions, adapting them for their purposes and possibly creating some variants on their own.

The curved antefix decorated with an old-fashioned volute palmette in relief from the Sanctuary of Artemis (fig. 4), published by Veronika Mitsopoulos-Leon[24], and the disc akroteria fragments from the Sanctuary of Artemis[25] and the public centre[26] represent Arcadian variants of the Laconian roofing system, as does the single palmette antefix recovered in the public centre (fig. 3)[27]. Judging from traces of a Laconian-style cover tile on its back side, it cannot be excluded that this antefix belonged to the same roof as the fragments of peculiar ridge tiles (fig. 5)[28], a geison and two probable sima fragments from the area of the peripteral temple. There were also small terracotta plaques with rim decoration imitating a twisted cord[29]. So far, whether they too belong to the roof decoration cannot be decided. The ridge tiles from the public centre differ from the usual Laconian or Arcadian ridge tiles, as the overlapping part of the tile is on the exterior rather than on the interior. This singular design seems to testify to a strong local component in the construction of roof tiles. The standard shape can be seen on a ridge tile from a Laconian roof in Olympia[30]. Regarding local production, it is to be noted that the excavations in the area of the Hellenistic stoa uncovered kiln supports and other remnants belonging to two different workshops. The earlier workshop

22 Reichel – Wilhelm 1901, 62 fig. 134; cf. Schauer 2006, 67.

23 Cf. Mitsopoulos-Leon 1990; Schauer 2006.

24 Tka 116/87. Mitsopoulos-Leon 1990; Winter 1993, 203; Mitsopoulos-Leon 2006, fig. 3; for further references to the suggested comparative examples cf. Schauer 2006, 67 nos. 6. 7. The excavations east of the Temple of Artemis yielded several smaller antefix and cover tile fragments of the same type, cf. Schauer 2006, 66.

25 Reichel – Wilhelm 1901, 61 fig. 128; Schauer 2006, 66 fig. 1.

26 Cf. Schauer 2006, 75; Jahresbericht 2014, 89.

27 Jahresbericht 2014, 89 fig. 4.

28 Schauer 2006, 75 fig. 8; Jahresbericht 2016, 95 fig. 3.

29 TKa 2/07; TKa 1/10 and smaller fragments (unpublished); Schauer (unpublished).

30 Heiden 1995, 69. 190 cat. 26.4 fig. 7, 2 pl. 38, 2, attributed to the Treasury of Kyrene. For fragments from the Heraion of Olympia and a reconstruction of a ridge tile see Heiden 1995, 67. 189 cat. 25.19 and 25.20 fig. 7, 1 pl. 37, 3; for other examples from Olympia cf. Heiden 1995, pl. 119, 2. Also Skoog 1998, 184 f. cat. R4–R8.

5 Lousoi, kalypter and ridge tile from the public centre (© OeAW-OeAI/K.-V. v. Eickstedt)

was active in the Archaic period and may have produced roof tiles[31], though this hypothesis remains to be examined by further excavations and technological studies.

In the Hellenistic period, after the decline of the Corinthian workshops, there tends to be a greater variety of roof decorations. In its first phase, the Early Hellenistic Temple of Artemis had a sima with a painted lotus-palmette frieze with flame palmettes, eaves tiles with Corinthian-style painted meanders and antefixes with a double flame palmette, a flower bud in the centre, and tendrils forming volutes in the lower thin-walled part (fig. 6 on the left)[32]. Flame palmettes became very popular in Athens in the Late Classical period. Double flame palmettes decorate Attic grave stelai, mostly of the second half of the 4th century[33], though the motif continued to be used in the Hellenistic period. For an open-work terracotta variant of the double flame palmette, the antefixes on the Leonidaion sima[34] recommend themselves for comparison.

The roof decoration of the Temple of Artemis was renewed at a later stage during Hellenism. It seems that the rims of the original Corinthian-style eaves tiles were intentionally cut off, while the original flame palmette antefixes were replaced with a type known from Athens, featuring a palmette with straight, pointed leaves and a small helmeted head of Athena between the tendrils rising from its base (fig. 6 on the right)[35]. The published examples from Athens are dated between the second half of the 2nd century BC and the Roman Imperial period[36]. From the context in the Sanctuary of Artemis, it is evident that the antefixes from Lousoi are Hellenistic in date, probably reproducing an early Athenian series. Veronika Mitsopoulos-Leon[37] has argued that in Lousoi the helmeted goddess would have been considered as representing Artemis Hemera, as there are testimonies for Artemis in arms, and because of the nature of the goddess, who could be fierce and revengeful but also a guardian of the polis of Lousoi in times of war.

31 Jahresbericht 2014, 89 with fig. 3.
32 Reichel – Wilhelm 1901, 63 fig. 137; Schauer 2006, fig. 5 (on the left) and fig. 6.
33 Möbius 1968.
34 Cf. Heiden 1995, roof 51 pls. 96, 1; 97, 1, and the related roof 52.
35 Reichel – Wilhelm 1901, 63 f. fig. 140; Mitsopoulos-Leon 2001; Kreidl 2001; Schauer 2006, 70 f. fig. 5 (on the right).
36 Billot 1976, 128–130 cat. 73–76 pl. 32; Hübner 1976; cf. Schauer 2006, 71 n. 29.
37 Mitsopoulos-Leon 2001.

6 Lousoi, antefixes from the Temple of Artemis. Original type and replacement type (© OeAW-OeAI/K.-V. v. Eickstedt)

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7–8 Lousoi, antefix types from the Hellenistic residential area Phournoi (© OeAW-OeAI/K.-V. v. Eickstedt)

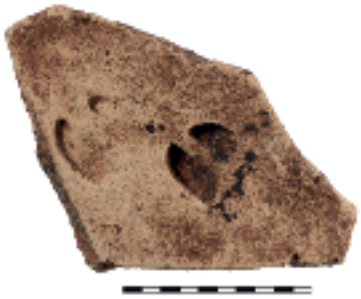
The individual antefixes preserve traces of different colouring applied after firing, another Hellenistic feature, documented by Detlev Kreidl[38]. Comparable traces of paint are preserved only on one early Athena antefix in Athens, found in the Kerameikos[39]. Nonetheless, the Lousoi series shows considerable shrinkage of the clay relief, evidence for a repeated surmoulage

38 Kreidl 2001.
39 Hübner 1976, 176 f. pl. 63, 1 (Z. 178).

process. As dating evidence for the Athena-type antefixes is otherwise rather elusive, it is difficult to determine if the replacement of the roof decoration, probably along with larger parts of the roof, may have been the result of the attack by the Aetolians in 220 BC recounted by Polybios[40]. Given that the older antefix type from the Temple of Artemis was imitated for antefixes found in the settlement at Phournoi[41], a date in the late 3rd/earlier 2nd century BC for the renewal of the roof seems possible.

The architecture and finds from the residential area at Phournoi provide insight into the living conditions mainly from the late 3rd to the 1st century BC[42]. The equipment of the rooms with terracotta hearths appropriate for the cold climate, terracotta bath tubs, water channels, terracotta antefixes and evidence of a wooden door with elaborate bronze door bosses testify to a good standard of living and concern for comfort but also for decorative qualities[43]. There are four different antefix types from the area of the two excavated houses (figs. 7. 8)[44]. One of them (fig. 7 on the left)[45] reproduces the flame palmette antefixes from the earlier roof of the Temple of Artemis, in a coarser and potentially more stable version. The second antefix type (fig. 7 in the middle; fig. 9)[46] reproduces an Argive type, used in Argos for the roof of the Temple of the Pythian Apollo in the first third of the 4th century, as well as on several other roofs[47]. Marie-Françoise Billot noted that the type was also used in Aigeira[48], for the roof of Naiskos D, and probably the skene building of the theatre, dated to the second or third quarter of the 3rd century by Savas Gogos[49]. In Lousoi, Veronika Mitsopoulos-Leon observed that the lower part of the Argive antefix type was also used for the decoration of the terracotta *hestia* of one of

9 Lousoi, antefix and *hestia* block with corresponding moulded decoration, from the Hellenistic residential area Phournoi (© OeAW-OeAI/C. Schauer)



10 Lousoi, tile fragment with hoof print of a sheep or a goat from the public centre (© OeAW-OeAI/K.-V. v. Eickstedt)

40 Pol. 4, 18, 9–12; 4, 25, 4; 9, 34, 9.
41 Schauer 2006, fig. 7 (on the left), for the antefixes from Phournoi, see below.
42 Mitsopoulos-Leon 2017, passim.
43 Mitsopoulos-Leon 2010; Mitsopoulos-Leon 2017.
44 Schauer 2006, 73–75 fig. 7.
45 Schauer 2006, fig. 7 (TKa 9/88).
46 Schauer 2006, fig. 7 (TKa 6/88).
47 For the antefixes from Argos, see Billot 2013, 234 figs. 15. 17. 19.
48 Gneisz 1994, inv. E 24/88 pl. 38 c.
49 Billot 2013, 234 with reference to Gogos 1992, 119–121. For the antefixes from Aigeira cf. now Tanner 2024, pls. 58. 59.

the houses (fig. 9)[50]. Because of the identical decoration, it is safe to conclude that both the antefix and the *hestia* were produced locally in the same workshop.

Another indication for a local terracotta workshop are stamps in the shape of a palmette that appear on a *hestia* fragment and a tile fragment from Phournoi as well as on tile fragments from presumably Hellenistic contexts in the Sanctuary of Artemis[51]. More evidence for the local production of roof tiles is provided by a tile fragment (fig. 10)[52] from the public centre of Lousoi that preserves footprints, probably of a sheep or goat that stepped on the tile when it was left on the ground to dry before firing.

POTTERY PRODUCTION

In the 2nd and 1st centuries BC, relief bowls were popular drinking vessels in Lousoi[53]. Apart from owning imported examples, the Λουσιάται relied to a large extent on the local production. This was particularly the case for the long petal bowls, where the decoration was largely incised into the moulds in combination with a rosette stamp for the bottom. Evidence is provided by several mould fragments published by Christine Rogl in her monograph on the relief bowls from Lousoi[54].

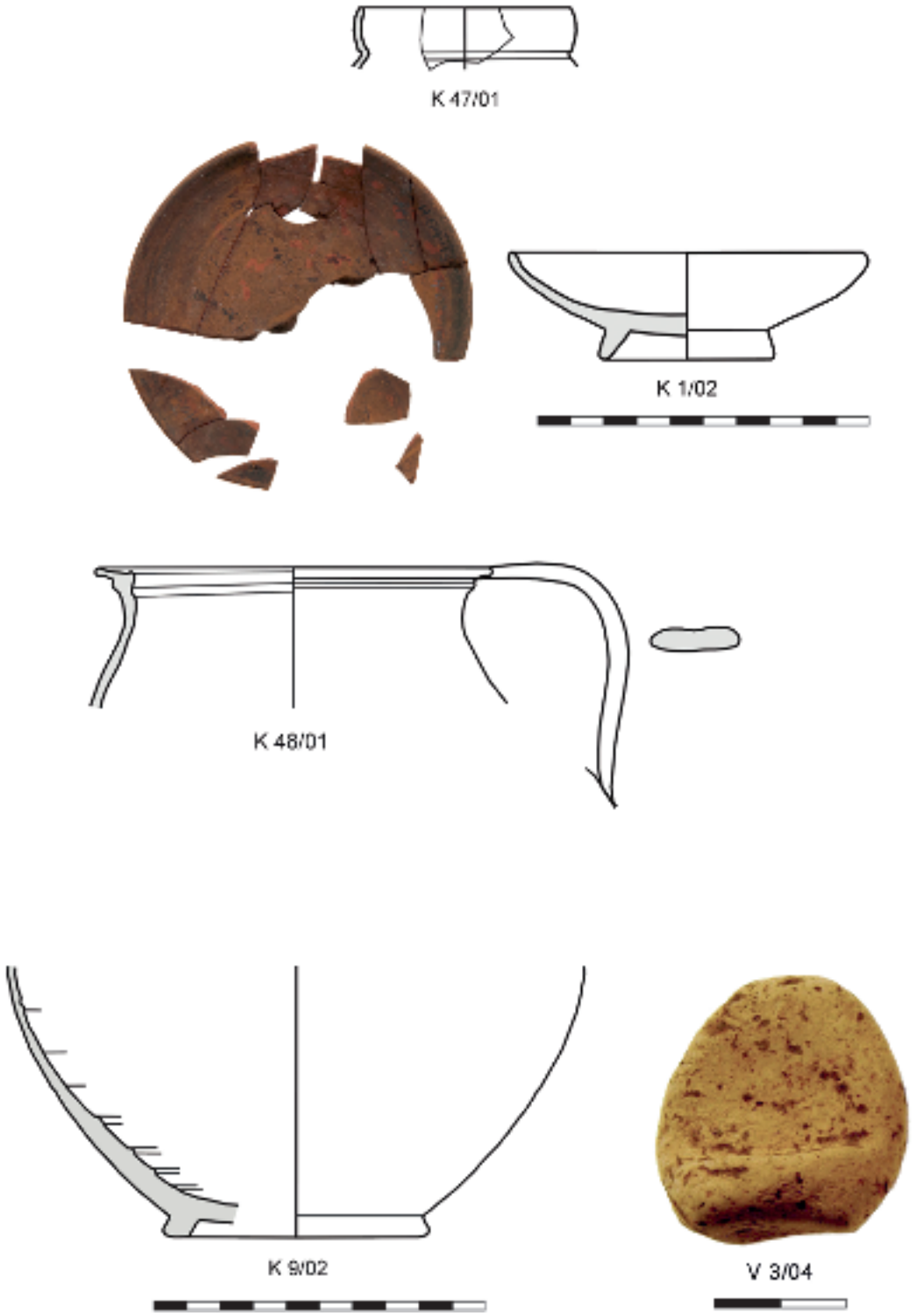
A few Augustan or Early Roman pottery fragments (fig. 11) found near the workshop site in the public centre[55], namely a wide-mouthed jug, a beaker with a convex rim and a small dish that can be identified as imitating a sigillata type on account of the preserved traces of red coating, are also verified local products[56]. As the vessel fragments are overfired, they can be characterised as wasters.

Although generally very fragmented, in several cases the Hellenistic and Early Roman clay vessels from the public centre can be paralleled with the ceramic types represented in Phournoi. The types documented in both areas include plates, unguentaria, lamps, relief bowls, two-handled cups with a convex rim, a thymiaterion, and cooking vessels[57]. It is probable, therefore, that the families living in the Hellenistic houses also visited the public centre for meetings, cult activities or festivals.

VOTIVE DEPOSITS IN THE PUBLIC CENTRE AS EVIDENCE OF LOCAL CULTS

An important addition to our knowledge of the people of Lousoi is the discovery of three votive deposits dating to the Classical and Hellenistic periods. The rather spectacular find complex in the floor of the small Hellenistic cult building, the so-called Orthostat building included lamps and spindle-shaped unguentaria (figs. 12. 13) of types popular in the later half of the 2nd and the earlier 1st century, but also a Geometric bronze statuette of a horse (fig. 14). The horse statuette had been placed carefully in the central part of the deposit surrounded by the lamps and unguentaria[58]. Directly south of the central room of the Orthostat building, a cooking pot was found standing *in situ*, while the stratum that covered it contained fragments of more cooking pottery, conical

50 Jahresbericht 1991/1992, 27–29 fig. 5; Mitsopoulos-Leon 2017, 177. 234 cat. 392. 393 pl. 65.
51 Reichel – Wilhelm 1901, 64 fig. 142; Mitsopoulos-Leon 2017, 177. 234 cat. 390. 391 pl. 65.
52 Inv. Z 8/05.
53 Rogl 2008.
54 Rogl 2008, 102 cat. 24 pls 3. 30. 46; 106 cat. 46 pls. 5. 31. 46; 113 cat. 76–78 pls. 8. 34. 46.
55 Jahresbericht 2003, 387; Jahresbericht 2004, 367.
56 Jahresbericht 2014, 89.
57 Similar vessels from a Hellenistic house in Keryneia (modern Mamousia) were published by Anderson 1953.
58 Schauer 2014a; Schauer 2017, 106 f. 115 fig. 7; Schauer 2021, 724 f.; for the horse statuette see also Jahresbericht 2015, 91 fig. 1 and Schauer 2020, 517 f. with figs. 1–2.



11 Lousoi, wasters and kiln support from the Early Roman pottery workshop in front of the Hellenistic stoa (© OeAW-OeAI/C. Schauer)

plates, animal bones as well as another lamp and another unguentarium[59]. The find situation suggests that a sacrificial meal accompanied the deposition of the votives in the renewed floor of the

59 Jahresbericht 2005, 360; Schauer 2014a.

12 Lousoi, lamps from the Late Hellenistic votive deposit in the main room of the Orthostat building (© OeAW-OeAI/K.-V. v. Eickstedt)

13 Lousoi, unguentaria from the Late Hellenistic votive deposit in the main room of the Orthostat building (© OeAW-OeAI/K.-V. v. Eickstedt)

14 Lousoi, Geometric horse figurine from the Late Hellenistic votive deposit in the main room of the Orthostat building (© OeAW-OeAI/K.-V. v. Eickstedt)

15 Lousoi, terracottas, miniature vessels and knuckle bones from the Classical votive deposit in the Oikos building (© OeAW-OeAI/K.-V. v. Eickstedt)

building. The cooking pot must have been covered shortly after its use with the layer of rubble, maybe in context with the addition of the building's south and north wings. The votive deposit and cultic meal thus probably date the renovation and expansion of the building to the later 2nd or early 1st century BC.

The Geometric horse statuette can be attributed to the stylistically defined workshop group Lousoi-Olympia[60] that produced not only individual horse figurines but also groups showing a mare nursing her foal. The best comparative examples are a group from Olympia in the National Archaeological Museum in Athens and a group in the Liebieghaus in Frankfurt[61]. The horse from the public centre of Lousoi adds evidence for the attribution of this workshop group to Arcadia,

60 Weber 1967; Heilmeyer 1979, 99–109 with fig. 6; 233 cat. 455–457 pls. 58. 59; Zimmermann 1989, 36–43; Janietz 2001, 95–98; Schauer 2020, 517 f. with figs. 1–2.

61 Weber 1967; Bol – Weber 1985, 14–16 cat. 3.

16 Lousoi, votive objects from different periods, deposited in the peripteral temple in the public centre next to the base for the cult image (© OeAW-OeAI/K.-V. v. Eickstedt)

even though the type was strongly influenced by Argive prototypes[62]. Besides, the context provides insight into a religious ceremony and rite. The ritual dedication of the Geometric horse statuette together with the Late Hellenistic lamps and unguentaria can possibly be interpreted as an act of commemoration of an ancient heroic past. A similar redepositing of valued older objects can be observed at the peripteral temple, as will be shown below.

In the rear part of the small Oikos building under the Orthostat building, a Classical votive assemblage came to light. The assemblage contained terracottas, miniature vessels, and knuckle bones (fig. 15) deposited between the rear wall of the building and a big stone[63]. The complex, which was evidently disturbed in a later phase, either dates to the foundation of the building or, possibly, the abandonment of the specific cult originally connected with it. The repertory of terracottas includes figurines of standing girls, a female protome, and a dove, all of them belonging to the female sphere, yet in juxtaposition with a Corinthian satyr figurine and a bearded mask probably representing Dionysos[64]. The combination suggests that the cult was of agrarian nature and was celebrated with the participation of young girls. The Corinthian miniature cups and craters and the terracottas date the deposit to the late 5th century.

A gold finger ring (Au 1/07)[65] found in front of the building has a very small diameter of 1.6 cm and thus may have belonged to a young girl before ending up as a votive at the Classical sanctuary. Comparative examples come from the necropolis of Pydna in the Pieria[66] and from Tarentum in Apulia[67], dated to around 300 BC, but also from a tomb in Lithovouni in Aetolia[68] dated to the 5th century BC.

62 Cf. Coldstream 1977, 156 f.
63 Jahresbericht 2005, 360; Schauer 2021, fig. 2.
64 Cf. Jahresbericht 2015, 91 with fig. 2; Schauer 2021, 719–721 with fig. 3.
65 Unpublished. Schauer (unpublished). Mentioned in Schauer 2020, 520.
66 Greek Jewellery 1997, 117 cat. 786 (around 300 BC).
67 De Iuliis 1986, 291 cat. 213–214 (1st quarter 3rd cent.).
68 Zapheiropoulou – Georgiadou 2010, 23. 77. 80; from tomb 11 pl. 8, 3 (3rd quarter 5th cent.).

In the peripteral temple, the area immediately next to the base for the cult statue and a secondary block placed in front of it yielded a number of votive objects from different periods (fig. 16)[69]. They include an iron sword, a bronze sauroter, a bronze arrowhead and a handle from a large bronze vessel, probably a cauldron. There were also a fragmented phiale made from thin bronze sheet, three Classical miniature vessels, three knuckle bones, a bone pin, and fragments from a clay vessel with piecrust decoration, probably a thymiaterion. Five Early Roman lamps were evidently deposited independently on later occasions. Three of them[70] are wheelmade and resemble the type Howland 35 C[71], according to Howland an intermediate type between Hellenistic types and the Corinthian type Broneer XVI[72]. They probably belong to the Augustan period or the early 1st century AD. The two fragmentary mould-made lamps can be attributed to type Broneer XXII and dated from the period of Augustus to the middle of the 1st century AD.

The deposition of the Geometric horse statuette in the Orthostat building and the deposition of older votive objects at the base for the cult image in the peripteral temple testify to similar ritual acts. It can be suggested that the occasion for the rituals in both cases was the renovation or alteration of the relevant building in the later Hellenistic period. The deposition of the older weapons is an especially interesting feature. The iron blade sword Fe 1/07 is probably Archaic. It is reminiscent of the sword from the »Warrior's Tomb« in Kalavryta dated to the early 7th century BC[73] and an Archaic bronze sword from Olympia[74]. The sauroter Ae 6/07 is characterised by its circular-section spike and the horizontal ribs on the tubular socket for the wooden spear. In Olympia, this is a very rare type with only one good comparative example that was found in the Echo Stoa directly on the classical surface[75]. The bronze arrowhead Ae 3/02 corresponds to a type best attested in layers of the 5th century[76]. There is also an iron spearhead (Fe 1/10), discovered in the south colonnade of the peripteral temple in the vicinity of older walls located there. In the classification by Anthony Snodgrass[77] it corresponds to the long-lived type R. According to Holger Baitinger, spearheads of this size mostly belong to the Late Archaic and the Early Classical periods[78].

Also of special interest is a small decorated sheet bronze fragment (Ae 1/02)[79] from the area of the Hellenistic stoa, as it can be identified as belonging to the armband of an Argive shield. The type has an exact parallel in Olympia dated to the first quarter of the 6th century by Emil Kunze[80]. As the shield was probably a votive object, it is an indication for the existence and character of an Archaic cult in the area of the public centre.

The movable handle with solid-cast spool and elliptical loop with a central bead from a Classical bronze vessel (Ae 2/02) belongs to a well-known type. While this shape of handle is also known from bronze and iron *exaleiptra*, mainly from Macedonia[81] and southern Italy[82], it is more probable that it was originally attached to a cauldron (*lebes*). Complete cauldrons with this type

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69 Excavated in 2002 and in 2007. Schauer 2021, 725–727 with figs. 8–12.

70 L 5/02, L 6/02, L 1/07.

71 Parallels can be found in Athens, Isthmia, Epidauros and reportedly Phleious, see Howland 1958, 112 f. cat. 481. 482; type 35 C and 35 C Prime, pls. 17. 43 (late 1st cent. BC into 1st cent. AD); Proskynitopoulou 2011, 245 cat. P 65.

72 Broneer 1930, 56–60 type XVI cat. 287 fig. 25.

73 Mastrokostas 1961/1962 pl. 156 ε; Kunze 1967, 119; Kunze 1991, 21.

74 Baitinger 2001, 77. 233 cat. 1315 pl. 64, with reference to the »Warrior Grave« in Kalavryta, a sword from a grave in Drepano in Achaia and a sword from the Sanctuary of Hera Limenia in Perachora. I wish to thank Holger Baitinger for valuable help with the classification of the offensive weapons.

75 Baitinger 2001, 67 f. 215 cat. 1169 pl. 54.

76 Cf. Baitinger 2001, 25–30. 130–135 pls. 11. 12 (type II D, 5th cent.).

77 Snodgrass 1964.

78 Baitinger 2001, 50–53. 175–179 cat. 800–846 (»Stoßlanzenspitzen« type B 9 b) pls. 35. 36.

79 Jahresbericht 2016, 94 f. fig. 1.

80 Furtwängler 1890, 112 cat. 738; Kunze 1958, 84 with pl. 19, 3; Bol 1989, 28. 132 cat. G 96. G 97 pl. 29.

81 Sindos 2, 311–313 cat. 434–437 plans 82–85 figs. 535–543.

82 Tarditi 1996, 116–118 cat. 263–266.

of handle are known from Classical graves where they were used as cinerary urns[83], or in the case of Sindos, as grave offerings[84]. The find spot in Lousoi indicates that the vessel belonged to the inventory of the Classical sanctuary, where it may have been used as a mixing bowl or a cooking cauldron in connection with feasting and sacrifices[85].

Regarding religious practices in Lousoi, the material evidence is much enriched by the new excavations in the public centre. For the Hellenistic period, the find contexts also provide us with evidence for rituals honouring both the deities and the heroic past of the polis. The desire to celebrate the ancient past has been identified as a cherished idea in Hellenistic cities, but in the case of the public centre of Lousoi the long tradition going back to the Geometric period may actually have been discovered by the Hellenistic inhabitants of the polis. Judging from the ritual deposition of the older objects, we may assume that the Λουσιάται were very proud of their heroic past.

THE MATERIAL CULTURE OF LOUSOI AND HISTORICAL SOURCES

The deposition of weapons in the peripteral temple and its presumed predecessor is an indication for the character of the worshipped deity, but also permits us to reflect on the dedicators. The iron sword, the bronze sauroter, the bronze arrowhead, the iron spearhead, and the Argive shield all suggest they were dedications by Λουσιάται who had returned from war or military service[86]. A famous example is a man known from Xenophon's »Anabasis«, called Ευρύλοχος Λουσιάτης Αρκάς or Ευρύλοχος Λουσιεύς, who was a hoplite in the army that Cyrus the Younger had formed to overthrow his brother Artaxerxes[87]. In a dangerous situation, Ευρύλοχος protects Xenophon with his shield[88]. As the Arcadian mercenaries formed a large group in the army of the Ten Thousand[89], we may suppose that there were also other men from Lousoi who joined Cyrus' army. Men from Lousoi may have regularly served as mercenaries[90].

Rituals and feasting were customarily accompanied by music, dancing and choral chants, as mentioned in the literary texts[91]. Polybios describes how in Arcadian education, training in the fields of dance, music and singing also played a major role for boys and young men, alongside military training, as a compensation for the hardships of life in the harsh climate and hard labour[92]. We may assume that in Lousoi too, similarly to the customs in other Arcadian poleis, there were frequent feasts[93] honouring different gods and heroes.

There is evidence that shows that Lousoi was a polis in the Classical period and may have been one already in the Late Archaic period[94]. The diplomatic contacts of the Λουσιάται, often comprising the descendants of the honoured persons, were inscribed on bronze tablets or bronze sheets and attached in the sanctuaries for commemoration and public viewing. The Hellenistic

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83 Tarditi 1996, 116–118 cat. 263–266; de Ridder 1913, 101. 103 cat. 2590 pl. 93; Amandry 1971, 602–609 figs. 9–11; Parlama – Stampolidis 2000, 332 f. cat. 350. 351 (500–470 BC).

84 Sindos 2, 285 cat. 404 plans 50. 51 figs. 486. 487.

85 Cf. Gauer 1991, 5. For a comparable handle from Keryneia attributed to a cooking cauldron, cf. Kanellopoulos – Kolia 2011, 167 with fig. 32.

86 For the evidence for dedicating one's own shield, contrary from weapons taken from the enemy, cf. Lo Monaco 2016, 211–214.

87 Xen. an. 4, 2, 21; 7, 6, 40; cf. Nielsen 1999, 26.

88 Xen. an. 4, 2, 21.

89 Roy 1967, 299; Roy 1972, 134 calculated that there were around 4000 mercenaries from Arcadia in the army of Cyros; cf. Nielsen 1999, 27 with n. 83; 45. According to Alexopoulou 2012, 318 half of the Arcadian mercenaries i.e. a number of about 2000 men, were from Azania.

90 Cf. Tausend 1999b, 366.

91 For the case of the Sanctuary of Artemis at Lousoi cf. Jost 1985, 421.

92 Pol. 4, 20, 8–12.

93 Cf. Pol. 4, 20, 1– 4; 4, 21, 12.

94 Nielsen 2002, 195–196: Cf. Nielsen 1999, 43; Nielsen 2004, 516.

17 Lousoi, bronze tablet with proxeny inscription from the area of the peripteral temple (© OeAW-OeAI/N. Gail)

proxeny decrees provide evidence of some of the institutions of the polis and functions of the officials of Lousoi, the committee of five δαμιουργοί, that at one point around 200 BC included an οικονόμος and a priest (ιερεύς)[95]. Two other proxeny decrees mention a ιερομνάμων as the highest official[96]. The institution of the proxeny was evidently very important for the small cities of Arcadia, including Lousoi[97]. Until recently, the testified network of the Λουσιάται included 9 πρόξενοι mentioned in the Hellenistic decrees from the Sanctuary of Artemis, and 5 πρόξενοι on the Classical bronze diskos in Berlin. The ιερομνάμων Θέοξις is the only known *proxenos* from Lousoi to another city, namely Orchomenos, around 200 BC[98]. This list of *proxenos* honours granted by the Λουσιάται can now be supplemented with four inscribed tablets from the 5th century found in 2003 to the south of the peripteral temple near the older architectural remains (fig. 17)[99]. The inscriptions that will be published by Hans Taeuber are strong evidence for the importance of the

95 A. Wilhelm in: Reichel – Wilhelm 1901, 65–67 no. 1 fig. 144; a δαμιουργός is also mentioned in the proxeny decrees nos. 2, 3 and 4. For the presumably both political and religious functions of the δαμιουργοί in Lousoi cf. Meyer 2012, 211–212.

96 A. Wilhelm in: Reichel – Wilhelm 1901, 70–73 no. 5 fig. 148; 6 figs. 149 a. b. According to Wilhelm, this evidence may reflect a change in the political system of Lousoi. Cf. also Bölte 1927, 1899.

97 Cf. Mack 2015, 3. For the popularity of proxeny inscriptions on bronze in Arcadia, cf. Plassart – Blum 1914, 450; cf. Kralli 2017, 450–457.

98 Plassart – Blum 1914, 457–459 no. 3 fig. 4. Theoxis from Lousoi who was honoured in Orchomenos was probably the same cult official who is mentioned in the inscription from Lousoi, Reichel – Wilhelm 1901, 71–73 no. 6.

99 A fifth tablet was found in bad condition, cf. Whitley 2004, 35; Mitsopoulos-Leon 2006, 435; Mitsopoulos-Leon 2012, 40 f.; for the findspot of the bronze tablets in a Hellenistic context cf. provisionally Jahresbericht 2016, 94.

18 Lousoi, pottery from the foundation trench of the colonnade of the peripteral temple (© OeAW-OeAI/K.-V. v. Eickstedt)

location of the public centre also in the 5th century. The fact that the area was chosen for displaying the Classical proxeny decrees is particularly remarkable, because the decrees from the Sanctuary of Artemis are younger, mostly belonging to the 3rd century. With the new finds, the number of foreign πρόξενοι testified in Lousoi rises to 19[100].

Due to the limited space in the basin of Lousoi (or Soudena), it is evident that Lousoi always remained a relatively small community that never had a large population. According to an estimate by Günter Stangl, Lousoi most probably could not sustain a population larger than c. 1000 inhabitants[101]. Animal breeding can be considered the basis of subsistence for the population, supplemented by agriculture in the plain, some hunting and trade with animals and animal products[102].

In the public centre, the construction of the three Hellenistic buildings according to Georg Ladstätter can be identified as belonging to a common architectural programme[103]. Reliable evidence for the dating so far comes only from the foundation trench of the south *peristasis* of the peripteral temple that contained fragments of three kantharoi, a fragmented lamp, a juglet handle and a vessel base with a ring foot (fig. 18)[104]. Based on the evidence of these stratigraphically relevant pottery finds, the building programme can be dated to the 3rd century, and probably its second half. The kantharos fragment K 2/10 with traces of angular West Slope decoration is related to the group of Thorn Kantharoi probably produced in Achaia in the second and third quarter of the

100 Cf. the compilation in PNAW.
101 Stangl 1999, 180; Nielsen 2004, 56.
102 For animal bones from the Hellenistic residential quarter cf. Forstenpointner – Hofer 2001. For the »sacred herd« belonging to Artemis, cf. Sinn 1992. Tausend 1999b, 366 considers the possibility that inhabitants of Lousoi may also have traded timber.
103 Cf. Jahresbericht 2010, 71.
104 Jahresbericht 2010, 71; Jahresbericht 2016, 94 with fig. 2.

3rd century[105]. This type is also known from Aigeira[106]. The slimmer kantharos K 1/10, though not exactly paralleled, may be morphologically compared with types from Attica that point to a date within the second half of the 3rd century[107]. The handle with handle plate K 17/10, on the other hand, belonged to an older kantharos type popular in Elis from the middle of the 4th century and until the beginning of the 3rd century and probably created there[108], but imitated and with longer popularity in other regions[109]. The fragmented lamp L 1/10 can be roughly placed in the 3rd century. Combining this evidence, it seems that the construction of the foundations for the *peristasis* have to be dated at least to the middle years, but probably to the second half of the 3rd century.

Could the building programme be a consequence of the accession of Lousoi to the Achaian Koinon? The probable date for the accession is between 235 and 229 BC[110]. The new political affiliation would have been a good occasion for a renewed self-representation of the polis. The building programme can certainly be considered a testimony to the social coherence of the polis and the cooperation of the citizens, who probably contributed donations, taxes, or labour. The late 3rd century was also a troubled period when, as recorded by Polybios, the Aetolians arrived at the sanctuary[111], robbing the herd of Artemis, even after the Λουσιάται had given them some valuables from the sanctuary treasure in order to prevent them from doing so. This happened in 220 BC, when Lousoi had already joined the Achaian Koinon and probably was at a peak of its prosperity. The polis of Lousoi is not mentioned by Polybios in this context, however, although supposedly, the buildings in the public centre were at least under construction.

In the last phase of the peripteral temple, the western and the eastern rooms of the three-part cella were evidently used for ceremonial dining by the Λουσιάται, as the stratum above the floor contained numerous fragments of cooking pottery, tablewares, and lamps. Only the central room of the cella with the base for the cult image was still reserved for cult purposes. The pottery from the western room can be classified as Late Hellenistic, while the stratum covering the floor of the eastern room contained pottery fragments datable to the Augustan or the Early Roman Imperial period[112], including some grey ware fragments and imitations of terra sigillata plates.

In the earlier 1st century AD, the larger part of the public centre seems to have been abandoned, as were the Hellenistic houses in the Phournoi area[113]. However, in the vicinity of the altar on Terrace I, ritual practices continued into the early 2nd century, documented by fragments of mould-made lamps, glass beakers that testify to drinking ceremonies, and two coins of Trajan[114]. In Phournoi, fragments of glass vessels point to some habitation in Lousoi also during the Middle Roman Imperial period[115]. In the 3rd century, moderate reuse of the area is testified to by walls built above the Hellenistic houses, ceramic vessels, two Roman lamps of type Broneer XXVII b[116], and a coin hoard containing coins from Hadrian to Gordian III (AD 238–244)[117].

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105 Π 3574, Kyriakou 1994, 190 pls. 134. 139 β; Dekoulakou 2011; Kyriakou-Zapheiropoulou 2011, 58 tab. 1 pl. 19 β (325–300 BC).

106 Alzinger 1986, 57 fig. 90 (R. Trummer).

107 Cf. Rotroff 1997, 102. 264 f. cat. 206–218 pls. 19. 20 (240–220 BC).

108 Cf. Schilbach 1995, 60–65. 120–124 cat. FB 12– 27. 34–35 pls. 5. 54–58.

109 Cf. James 2010, 71–73 cat. 71. 72 fig. 13 pl. 9 (from contexts of the later 3rd cent.).

110 Cf. Rizakis 1995, 139 cat. 597, dated to 229/228 BC, where Αρκέτας from Lousoi is mentioned among the Achaean νομογράφοι, and Pol. 4, 25, 1–4, cited by Rizakis 1995, 268 cat. 442 (220 BC). Cf. Bölte 1927, 1899.

111 Maybe not for the first time, a passage in Pol. 9, 34, 9 cites a speech by the Acarnanian Lyciscus in Sparta in 211 BC, who refers to a plundering of Lousoi by Timaios of Aitolia. This plundering may have happened around 240 BC, cf. A. Wilhelm in: Reichel – Wilhelm 1901, 3; Bölte 1927, 1898; Scholten 2000, 264.

112 Jahresbericht 2016, 95 f. with fig. 4; Schauer 2017, figs. 12. 13.

113 Mitsopoulos-Leon 2017, 19; similarly, the Hellenistic stoa seems to have been abandoned, as can be concluded from the evidence of the pottery workshop placed directly in front of it, cf. above and Jahresbericht 2014, 88 f.

114 Schauer 2017, 109 with fig. 11.

115 Schauer 2005.

116 Mitsopoulos-Leon 2017, cat. 254. 255 pl. 56.

117 Mitsopoulos-Leon 2017, 20 with n. 41; Oeconomides-Caramessini – Mitsopoulos-Leon 2017, 183 f. cat. 110–118.

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This volume presents an interdisciplinary discourse on recent archaeological investigations at the ancient sites of Sikyon, Aigeira and Lousoi. These three Northern Peloponnesian poleis represent microregions which from the Geometric and Archaic periods onward participated in similar networks of exchange, albeit with different roles. In light of their geographical location on the southern coast of the Corinthian Gulf and in the mountainous hinterland, respectively, they offer insight into three microcosms with very different environmental conditions, socio-political structures and economic potential. As the new studies demonstrate, the microregions and their main settlements were linked throughout antiquity by strong cultural, economic and at times also political ties, despite all their differences.
The new primary sources revealed by the various contributions help to characterise each place within its unique local context from the Geometric up to the Roman period. The broad spectrum of topics discussed include the spatial configuration of settlements, the various factors of urban growth and decline, changes in consumption and production patterns as well as religious practices, and the shaping of group identities on different cultural levels.

ISBN 978-3-7001-9304-3

www.oeaw.ac.at/oeai