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NETWORKS AS RESOURCES FOR ANCIENT COMMUNITIES

Editors
Raffaella Da Vela
Mariachiara Franceschini &
Francesca Mazzilli

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Networks in Sacred Landscapes

Preface

The idea for this book was developed after a successful session at the Virtual Annual Meeting of the European Association of Archaeologists (EAA), organised by the three editors. Session #276 'Networks as Resources for Ancient Communities' was hosted within Thematic Field 1 'Networks, Networking, Communication: Archaeology of Interactions'. It took place on 26 August, 2020. The central theme was initiated by Raffaella Da Vela, postdoctoral researcher at the research centre SFB 1070 RessourcenKulturen, by putting together the international organisers' team for the session. The positive response from both speakers and audience to the intriguing outpouring of new ideas on a research domain that is rarely addressed in this way, and on which there is still a lack of publications, led us to the idea of starting a book project looking specifically at networks as resources. Not all the session talks could be included in the volume. In addition, new contributions were introduced for the publication stage, allowing a harmonic thematic matching and integration between interpretative layers. With this volume we hope to fill a gap in the research of networks and provide new material for future discussion and development on such a relevant and interesting topic.

Many people and institutions deserve our gratitude for their cooperation, contribution and help in making this volume possible. First, we have to mention the local organising committee in Budapest and the scientific committee and secretariat of the Virtual Annual Meeting of the European Association of Archaeologists 2020, in particular Kateřina Kleinová, who gave us the space and support to develop this topic within the conference, giving us the possibility of a broad exchange of ideas in the scientific community. The thematic structuring and practical realisation of this volume have been developed in close scientific exchange with the research centre SFB 1070 RessourcenKulturen and its members. We would like to express our gratitude to the Deutsche Forschungsgemeinschaft for the generous financial support for the proofreading and for funding the volume's expenses (Project Number 215859406) within the project B 04 'Resources as incentive for colonisation processes', and to the editorial board of SFB 1070 for accepting our proposal, as well as to the editorial team (Marlene Bayer, Hannah Bohnenberger, Marion Etzel, Carolin Manzke, Uwe Müller and Henrike Srzednicki) for their support and help during the book production. Massive thanks are due to all speakers and authors who showed constant enthusiasm, dedication, and commitment to each stage of this project: Your fresh ideas and open mind on new perspectives have been inspiring. The many scholars who undertook the double blind peer-reviews of each article despite the many commitments and the stressful time during the pandemic deserve a very special thanks for helping us to improve and maintain high-quality scientific standards and coherence of the whole volume. Sincere thanks are due to Richard Neal, who has efficiently and professionally proofread the whole volume. Last but not least we would like to mention our positive adventure as editorial board of this volume. Our three different research focuses and backgrounds have given us a broad and nuanced view of the subject from different perspectives and a wider insight into the topic. Working together and complementing each other as a team has been a wonderful and successful experience and has made us grow, scientifically and personally.

This book was conceived, written, and mostly produced during the COVID-19 pandemic and different lockdown stages in different countries, a time when all our habits were turned upside down, our routine was reinvented and access to the resources (libraries, materials etc.) of our work

was drastically reduced. Most of all we missed the possibility of meeting each other in person, although we had several occasions to have online scientific exchanges and communication to connect the people involved first in the conference and then in the book production. With this project we aim to overcome and shorten both conceptual and physical distances between scholars particularly interested in looking at networks as resources. The open access distribution of the book represents for us a unique opportunity to overcome these distances and to involve a broader part of the scientific community in this discourse.

Tübingen, Freiburg im Breisgau,
Bergen, 20.12.2021
Raffaella Da Vela, Mariachiara Franceschini,
Francesca Mazzilli

Raffaella Da Vela, Mariachiara Franceschini
and Francesca Mazzilli

Rethinking Networks as Resources for Ancient Communities

Keywords: archaeology, anthropology, socio-natural networks, human-environmental interaction, sacred landscape, resources, mobility

1. Introduction

The concepts of both 'network' and 'resource' have gained high interest and visibility in recent research, including the field of archaeology, becoming central issues in contemporary social and cultural discourse.[1] In the current era, networking is considered a powerful resource ensuring social stability and improving wellbeing through dimensions such as social connections, economic relationships, working partners, cultural circles, friendships and so on. Networks are considered to be a means to gain or maintain status, economic, social, or political power. Thus, they appear to be among the most powerful resources for society, today as well as in the past. As such they can become the setting of prolific competition, conflict of interests, attributions of power, and a means of social and political control.[2] The perception of networks as resources is a central criterion for their conscious exploitation: This appears self-evident in our own society, but how could this be explored in the ancient world? What kinds of information and clues can help us to decode the intentional organisation and exploitation of different kinds of networks in their capacity as resources? With this volume we aim to open up a debate on the perception and use of networks as social and cultural resources in antiquity, on their value and meaning for ancient communities and for the construction of nested identities (Scopacasa 2014, 69 f.) within geographically and temporally determined societies.

When considering ancient communities in archaeological and historical studies, the term 'resource' is usually confined to material elements, such as water, minerals, and clay. This conception of resources encourages the study of the dynamics of exploitation and exchange, and in this context the network mainly represents a formal analytical tool to examine material resources,

1 For an overview in development of network analysis in archaeology see Collar et al. 2015; Brughmans/Peeples 2017, esp. 3–8; Knappett 2020; about resources and the contemporary discussion on the resource turn, esp. Scholz et al. 2017. The great contemporary interest in resources is also underlined by the success of different research centres in Germany, such as the SFB 1070 RessourcenKulturen – Socio-Cultural Dynamics in the Use of Resources in Tübingen (<https://uni-tuebingen.de/en/research/core-research/collaborative-research-centers/sfb-1070/> last access: 01.10.2020), the ReSoc – Resources in Societies in Bochum (<https://www.bergbaumuseum.de/forschung/forschungsprojekte/projekt-detailseite/resources-in-societies-resoc-leibniz-postdoc-schule> last access: 01.10.2020), and the SFB 1095 Schwächediskurse und Ressourcenregime in Frankfurt (<https://gepris.dfg.de/gepris/projekt/230856760?context=projekt&task=showDetail&id=230856760&> last access: 02.11.2022). The terms ResourceCulture, ResourceComplexes, ResourceAssemblage are a set of terms coined in German and English by the SFB 1070 RessourcenKulturen project team as it was founded to help define a set of concepts associated with analysing resources in the round that were then new, and which this volume continues to explore.

2 Hertler/Karl 2006, esp. 33–42; a common example for competition and cooperation dynamics within ancient networks are the networks of intermarriages of elites: Padgett 2010; Beck 2015. These networks based on strategies of kinship are powerful political resources for families and clans as well as for a whole social segment, which can rule the access to the network itself to preserve its power outside the network in a broader social frame.

especially acknowledging the mutual relationship between settlements and landscape. This essentialist understanding of resources is only one facet of a bigger picture regarding how networks were understood as resources in the past and specifically by their actors. Thus, there is still a need for a comprehensive analysis of the subject. This volume aims to fill this gap by analysing multiple thematic domains and a wide range of methodical approaches in light of the recent 'resource turn' in cultural studies and the expansion of the concept of resource to non-tangible, immaterial, and abstract means (Hardenberg et al. 2017, 14–18).[3] By proposing a new and alternative perspective on the analysis of networks, one that breaks with a materialistic definition of resources, it intends to show how networks can be interpreted and understood as a form of immaterial resource for past communities.

The choice of communities rather than societies as the unit of analysis has to be framed within the sociological definition of community as a group sharing values and goals. A community does not necessarily need to be linked to a particular geographic region or a cultural identity; it may conceivably also be transregional or transcultural (Bruhn 2011, 12 f.). This definition leaves the contributors free to present networks involving communities living in different regions, or those forming subgroups within a society, thus opening up the analysis to different dimensional scales, from the proximal to the distant, in some cases even crossing several scales (Knappett 2011, 26–33). Moreover, the focus on communities foregrounds human actors' sense of belonging within their relational context. Communities are not viewed as the social frame of networks, but rather as the social acknowledgement of the network itself, which is a necessary condition for transforming a network into a resource. The modern use of the term 'community' to define actors/users of social networks (Facebook community, Tik Tok community and so on) is a fortunate coincidence, framing our research on past societies within a contemporary interpretative key.

2. Resources and Networks in Archaeology

Resources have been mostly discussed in research on ancient economies in terms of a material supply of economic wealth. However, the variety and complexity behind the concept of resources has been gradually revealed by giving proper attention to the identification of material and immaterial resources. The former stand for raw materials, such as minerals and water, and economic supply, such as land and capital. The latter denoting abstract concepts, like relationships and knowledgescapes (Schweizer 2020). Thus, the definition of resources in this volume does not exclusively imply natural sources of wealth and revenue, or the material supply of economic wealth. Instead, a relational definition of resources is adopted here: They are any material and immaterial means which can be activated by individuals or communities to improve or maintain their quality of life, their status, their power or their knowledge; and they become resources only if the society gives or recognises their value and their role as such (Hardenberg et al. 2017, 13–16; Vorbrugg 2019).

This new definition of resources has been developed in the collaborative research centre SFB 1070 RessourcenKulturen at the University of Tübingen,[4] which has advanced the understanding of resources, focusing on the socio-cultural dynamics connected with their use. Resources are intended here as each means able 'to create, sustain and alter social relations, units and identities within the framework of cultural ideas and practices' (Bartelheim et al. 2015, 39 f.; see also Hardenberg et al. 2017, 14; Bartelheim et al. 2021a, 9). Taking as its starting point the concept of resources developed by this research centre, this volume sets out to explore the plurality of relationships binding networks and resources together, which allow networks themselves to be interpreted as resources. This nexus leads to a deeper investigation of the network concept, especially in the field of archaeological research.

3 For our use of the terms material and immaterial resources see also Hahn 2017, 35 f.

4 <https://uni-tuebingen.de/en/research/core-research/collaborative-research-centers/sfb-1070/> last access: 11.12.2022.

Several network approaches in archaeology focus on interactions between settlements and territories, using natural resources as data (e.g. water, stone, clay), which underlines their role in linking places.[5] Other studies use network analysis to understand social relationships between ancient actors, commercial exchange, and the diffusion of ideas.[6] The volume aims in particular to interrogate the overlapping areas between formal network analysis as a heuristic approach and networks as an ontological approach to ancient communities (Knox et al. 2006; Knappett 2011, 8; Fulminante 2014; Brughmans/Peeples 2017, 2). A formal network is a heuristic tool, which, through multivariate statistical applications and social network analysis, enables syntheses and analyses of complex phenomena. Network as an ontological description of human interaction is a conceptual frame, in which relationality becomes the interpretative key of interactions. Although formal analysis and ontological networks are frequently considered opposed approaches, they are not mutually exclusive and can be adopted simultaneously (Walsh 2014, 72). It is challenging for archaeological science to confront this entanglement, because it reconciles the tendency to pursue scientific objectivity (formal networks and network theory) with the interpretative approach to the social and cultural value of objects and situations (contextual archaeology).

The integration of formal analysis and metaphorical value of relationality can thus help to overcome the traditional contrast between processual and post-processual archaeology (for the discussion: Shanks 2008, 139; Watson 2008, 33) and be framed in Hodder's 'Entanglement Theory' (Hodder 2011; 2012). If the formal analysis expresses the instances, in particular in the modelling of networks, of the positivistic approach to the ancient record, a metaphorical approach constructs or reconstructs the social context of networks and network data.

The intersection between these two different applications of networks in archaeology becomes clear when considering networks as resources. Ancient networks and their perception or valuation (in the sense of *Inwertsetzung*) as resources can be described formally as a dynamic evolution of the network structure, the network density, and measurements, but they can also be described metaphorically, since ancient actors were involved in networking and in giving social value to networks in their function as resources.

3. Networks as Resources

3.1. From Networks as Formal Description of Resources to Networks as Resources

The relationship between networks and resources has been discussed during the last years in the SFB 1070 RessourcenKulturen (Klocke-Daffa 2017; Teuber/Schweizer 2020; Bartelheim et al. 2021b; Knopf et al. 2021). Sabine Klocke-Daffa (2017) proposed socio-natural networks as models to describe and study ResourceComplexes; Sandra Teuber and Beat Schweizer (2020, 15 f.) approached the question of the scale of the networks in ResourceComplexes; Döbereiner Chala-Aldana (2021, 43–45) applied formal network analysis to understand the evaluation of pottery forms in their function as resources for the transmission of knowledge; Thomas Knopf, Thomas Scholten and Peter Kühn (2021, 373–375) considered Resource-Assemblages as dynamic networks while studying soil as a dynamic-adaptive ResourceComplex, the result of natural factors and cultural processes.

In these studies, networks are heuristic tools to describe and analyse ResourceComplexes, which are dynamic complexes of social actors, resources, practices, and knowledge with their socio-cultural and functional interactions.[7] These semantic networks enable us to describe, analyse and understand the socio-cultural dynamics between resources, social actants and their frame of interactions. The approach of the edited volume

5 For a recent review of the approaches to territorial and transport networks: Verhagen et al. 2019.

6 Knappett 2011, 124–145. For an updated review of the trends in the application of social network analysis in archaeology: Brughmans/Peeples 2017.

7 The term 'ResourceComplexes' follows here the definition in Hardenberg et al. 2017, 18.

mirrors this relationship and presents a new perspective by shifting from the structural analysis of a ResourceComplex as a network to the analysis of the network itself as a resource. Looking at networks as resources means focusing on the perception and awareness of the actors participating in them, as well as on the social evaluation of these networks in the broader frame of the societies or communities in which these networks are developing, growing, and breaking out.

3.2. Networks and Their Potential as Resources: Archaeological Proxies and Contexts

A network is a relational structure resulting from the entanglement of actors and their interactions (Wasserman/Faust 2012, 20). Networks are thus not a resource until they become acknowledged or evaluated as resources by the actors and their social frame. When a network becomes a resource for a single person, for a social segment, for specific groups, or for a whole community, it plays an important role in the construction of social and cultural identities, as well as of nested or partial identities within a society (Scopacasa 2014). The participation or the evaluation of the network as a resource can be restricted to a specific social group or segment (a community), which constructs its own identity on the values shared in the network. For example, a religious network can involve different actors (e. g. priests, worshippers, deities, shamans, practitioners) who have a common religious identity and whose power relationships are able to affect the network structure (see the papers of Francesca Mazzilli in this volume reviewing the studies on religious networks in the last decades). The same religious networks can also be cross-cultural, involving and linking particular actors building broader communities of practices (see Raffaella Da Vela in this volume) or represent an entanglement of different layers of the social and political life of local communities (see Robinson Krämer in this volume).

Furthermore, the historical and geographical context influences different subjective cognitions in a network. In a given time and space, actors participating in a network can have a partial perception of it as a resource, based on their own needs, social role, education, knowledge, and view. For instance, the functioning of political networking as a resource for a city can be understood only by some social segments, although the whole civil body is involved in political decisions. Looking, for instance, at settlement systems in communities with different levels of hierarchisation, networks of secondary settlements became a resource of change and integration for local communities (see Francesca Fulminante in this volume). Moreover, the social valuation of resources and of the networks as resources are not static, but can evolve over time within the same community.

One-mode networks are networks in which the ties link actors (nodes) to each other. Common examples of this kind of network in archaeology and history are trade networks and kinship. Trade networks are intended as relationships of commercial exchange or as structural potentiality of exchange along a communication infrastructure (de Haas 2017, 69–72).[8] The commercial networks of a local community can have a strong impact on social relationships and on local identities (see Nadia Coutsinas in this volume). In a network of kinship, families establish and reinforce their social identities through marriage strategies (Padgett 2010; Padgett/Ansell 1993). The network became a resource for these families to create political cohesion, to control and rule the possession of land, and to obtain economic advantages, such as privileged transactions. Within this network the social identities are clustered between families,[9] while power relationships influence the actors' choices in establishing relational ties.

Affiliative networks consist of two different sets of nodes and the relational ties can link a node of the first set to one or more nodes from the second. Classic examples of this kind of network are political affiliation or consumption choices.

8 For a critical view on the application of one-mode networks to distribution and consumption patterns see Walsh 2014, 71–73.

9 About the relationship between social identities and clustering: Collar 2013, 10–16.

Propaganda and marketing strategies show how strong the perception of affiliative networks as resources can be. An example is the case of socio-natural networks linked to specific manufactures (see Wulf Frauen and Sabine Klocke-Daffa in this volume). The construction of political identities by networking is well studied in ancient societies, for example in the Roman Late Republic (Lomas 2019). The study of ancient consumerism shows the value of networking in market distribution, consumption choices, and lifestyles, with the creation of a specific habitus that expresses socio-economic identities (Bourdieu 1984, 169–225; Daveloose 2017; Roth 2018, 306–313; Toplak 2021). Specific social segments thus express their social identities through networks of consumption and life styles, which become means of distinction and social statement (see Isabella Bossilino in this volume).

Semantic and semiotic networks, regarding respectively the correlation between concepts and the interlacing within a communications system, form a special kind of affiliative network (Hyman 2007; Wintergrün 2019). Local communities can also express their identities in the form of mental distances or proximity, reflected in public monuments and graves. This creates networks of commemoration forms, a special kind of visual communication (see Ulla Rajala in this volume). In archaeology these networks are particularly appreciated in production studies and studies on the widespread use of models and ideas, as well as in the analysis of communities of practices. Their function in the construction of professional and transcultural identities indicates how professional and social groups activated semantic and semiotic networks as resources to maintain tradition, introduce innovation, and create cultural bridges over physical and political boundaries. The transmission of specialised knowledge and taste in building processes, flowing within the social network of craftsmen and customers, is a resource for creating and consolidating the value of architectural styles as status symbols in public and political communication (see Dominik Maschek in this volume).

The environment plays a significant role in shaping social networks and cannot be seen only as a frame in which relationships take place. Geo-economic factors, such as bottle-necks, scarcity of natural resources, and connectivity had such a great impact on networking strategies and the social hierarchies acting in networks in antiquity that it seems appropriate to abandon an exclusively anthropocentric view of networks, and to include environmental and natural agents in the discourse of networks as resources. Socio-natural and territorial networks can also be studied as powerful resources, by reframing social actors in their geographical and natural landscape. The construction of these networks and their diachronic evolution shows the strategies of integration between human and environment, as well as the use of the socio-natural networks as resources for improving quality of life and communication between local communities. These networks are the object of landscape and social archaeology, taking into account human behaviour, settlement distribution, and settlement layout in their entanglement with their environment. For example, communities living near a river are highly intertwined within the riverine network, using it for human consumption as well as communication and transport routes. At the same time, the multiple use of rivers is also shaped and influenced by them in their way of leaving and moving in the landscape (see Mariachiara Franceschini in this volume).

4. Thematic Domains

As resources, networks activate complex socio-cultural dynamics dealing with economic, religious, social, and socio-natural systems and spaces. In this respect, this volume will deal with different network systems that can operate as resources interacting with each other.

Although there is a high degree of entanglement among different networks and relational ties, it is possible to analyse single networks and their implications, based on their most salient aspects. The structure of the book is thus organised into three intertwined thematic domains. The outline of the volume and its sections should thus be seen as a tool for readers to pinpoint the main topics under discussion:

(1) Socio-natural networks: Socio-natural and territorial networks reframe social actors in their geographic and natural landscape, taking into account human behaviour, settlement distribution, layout, and entanglement with the environment. The construction of these networks and their diachronic evolution point to strategies of integration between humans and the environment. Socio-natural networks are resources for improving quality of life and the quality of communication between local communities. Thus, they can also become resources in times of crisis to protect communities from negative turns of events and external attacks.

(2) Networks of power and knowledge: Both socio-political networks and networks of knowledge present huge potential as private and public resources. The former can appear in different forms, such as kinship, associationism, and corporations, as well as the interactions between a city and its territory. Their archaeological traces are visible in how cemeteries, settlements, and landscapes are managed and organised. While diverse, all such networks share target-oriented strategies to create and maintain status and power. Networks allowing the sharing of knowledge are linked to the maintenance and creation of power structures, but also permit a relational analysis of the formation and the performativity of communities of practices (Knappett 2011, 99–122). They can operate horizontally or transculturally, involving different local communities or separate groups within a community; they can be vertical and diachronic, involving different generations within the same community or community of practice. Their relational ties refer to shared know-how, becoming resources while improving, for example, the quality of artistic, technological, and scientific production, introducing progress and innovation, as well as preserving the cultural heritage of a community with regard to religion and consumption (habitus of consumption and social value of taste).

(3) Networks in sacred landscapes: Religious networks are one of the most dynamic aspects of sacred landscapes. They are affiliative networks in which worshippers, cult practices, and deities are engaged in deeply entangled interactions. The variety and the cultural impact of religious networks can be archaeologically observed in the spread of mythology and sacred practices, as well as in the similarity of some aspects of religious behaviour, such as the cult of specific deities, the ritual practices, and the topographic position of sanctuaries. Religious networks may act as resources for the building of transcultural bridges, or conversely can represent a disruptive factor, fracturing groups and social segments. An approach to religious networks as resources furthers understanding of their socio-political value in improving social cohesion, managing power-relationships, and safeguarding intercultural contacts.

5. Thinking Networks as Resources: A New Perspective

This volume offers new perspectives on the manifold possibilities of understanding and investigating networks as resources in antiquity, which raises several questions and requires a review and reassessment of both issues. It aims not only to create space for new approaches to the topic, but also to stimulate discussion and provide insights to reflect on.

On the one hand, networks as resources share dynamics of inclusion and exclusion of groups and individuals or interactions between social actors. When networks become resources, the socio-cultural dynamics linked to resources – such as cooperation, competition, sharing, appropriation, inclusion of a broader part of society, or exclusion of some groups – strongly affect the network structure. Networks are normally applied in archaeology to analyse connections and shared aspects, thus constituting bridging structures. Viewing networks as resources also permits characteristic aspects that obstruct social interrelations to be considered, such as their role in splitting societies and communities. In this regard, analysing clusterisation and inclusion/exclusion social-dynamics, shaping different kinds of inclusive and exclusive networks, allows us to understand their value as resources. These structures are dynamic and the social rules and values can determine the inclusion of new actors or the exclusions of old actors when the networks are viewed in their diachronic and longitudinal aspects.

On the other hand, the relational implications of network thinking, as offered by multi-layered and interlocking networks, present great potential for a more dynamic conceptualisation of resources. The resulting interaction and entanglement of socio-natural spaces not only creates new social structures, but also calls for the formulation of a corresponding analytical procedure. This new perspective can be analytically approached from different directions, thus becoming heuristically fruitful.

Different kinds of multi-layered or interlocking networks (such as socio-economic, knowledge, and religious networks), as well as their dynamics, longitudinal structures, and entanglements (such as those of topographic and human-environmental networks) are inquired into in the following pages in their potential as a resource. The papers of the volume point out how no network can be considered an isolated closed relational structure; networks are in the end a global social experience which involve several aspects of entanglement at different scales. Thus, any relational tie on which the edges of a network are built is strongly entangled with many others. Multi-layered relational ties, multi-level networks, and interlocked networks are emblematic when explaining how ancient communities could have perceived networks as resources, based on the different evaluation of these ties. This approach also provides new inputs for a relational conceptualisation of resources and ResourceComplexes, which appear much more fluid and dynamic, being intertwined to numerous and various degrees of social evaluation within social groups and communities.

The ground-breaking perspective introduced in this volume contributes to a better understanding of both networks and resources. There is in fact a mutual advantage in thinking of networks as resources, since the properties of networks (such as connectedness, fluidity, redundancy, strength, or fragility) give a relational understanding of resources and resource-related socio-cultural dynamics; while the properties of resources (such as scarcity, abundance, changing or relative values, dependences) help us to discover new implications in (ancient) network structures.

Raffaella Da Vela
Eberhard Karls Universität Tübingen
SFB 1070 RessourcenKulturen
Gartenstraße 29
72074 Tübingen, Germany
raffaella.da-vela@uni-tuebingen.de

Mariachiara Franceschini
Albert-Ludwigs-Universität Freiburg
Institut für Archäologische Wissenschaften
Abteilung Klassische Archäologie
Friedrichstraße 39 (Fahnenbergplatz)
79098 Freiburg, Germany
mariachiara.franceschini@archaeologie.uni-freiburg.de
ORCID-iD:
https://orcid.org/0000-0003-1768-4720

Francesca Mazzilli
University of Bergen
Department of Archaeology, History, Cultural Studies and Religion
Postboks 7805
5020 Bergen, Norway
Francesca.Mazzilli@uib.no

Royal Holloway, University of London,
Egham, Surrey TW20 0EX, United Kingdom
Francesca.Mazzilli@rhul.ac.uk

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Socio-Natural Networks

Nadia Coutsinas

Itanos (Eastern Crete)

A Greek City-State with a 'Mediterranean Territory'

Keywords: Itanos, eastern Crete, Hellenistic period, maritime routes, interconnections

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Summary

Itanos is a Greek city-state situated at the extreme eastern tip of Crete. It is close to Cape Samonion, a strategic point at the crossroads of the maritime routes of the eastern Mediterranean. The city has always had contact with Africa and the eastern Mediterranean, it is said to have been founded by the eponymous hero Itanos, son of the Phoenician Phoenix. The early historic connectivity between Itanos and Cyrenaica is highlighted by Herodotus, relating the foundation of Cyrene in the 7th cent. BC, when Korobios, a purple fisherman from Itanos, informed the Therans how to reach Libya. From the Hellenistic period onwards, close political and economic contacts with Egypt are attested: a garrison was sent by Ptolemy II Philadelphus, and contacts can also be noticed in the material culture. As a coastal site and harbour situated at the easternmost part of Crete, Itanos was more easily connected to the eastern Mediterranean than to the rest of Crete. Its hinterland is just enough to sustain the inhabitants of the city. As such, the territory of Itanos remained much the same over the course of its history as the city did not need to expand inland. On a non-tangible level, it appears that the city belonged to a multiple-scale religious network, both regional and supra-regional. In a few words, Itanos was highly connected in many ways and could not have remained independent and survived throughout the centuries without its Mediterranean connections.

1. Introduction

The Greek city-state and harbour town of Itanos is situated at the extreme eastern tip of Crete. Given its topographical situation, it is better connected to the eastern Mediterranean than to the rest of the island. Indeed, the city holds a key position within the maritime routes of the Mediterranean, especially in the Hellenistic and Roman periods. Thus, maritime trade played a major role in the development of the city, which has a limited hinterland, and never expressed the desire to expand it. Accordingly, the territorial framework of the city is not strictly restricted to its physical position in the landscape but embraces the contacts it made by its economic, religious and socio-political networks. These multiple immaterial networks work as

proper resources for the city. In fact, Itanos would not have survived throughout the centuries without its Mediterranean connections.

This paper explores the historical and archaeological evidence that shows the importance for the city of Itanos of its maritime connections with the whole eastern Mediterranean.

2. The Physical Territory of Itanos

The island of Crete is the biggest of the Greek islands (8336km^2) (Bowman 1998), situated at the crossroads of the eastern Mediterranean, with connections to the Aegean islands, mainland Greece, Asia and Africa. The island is located at an equal distance from mainland Greece, the Cyclades and Rhodes. Moreover, Sicily is as far off as Cyprus or Egypt, Cyrenaica much closer.

The central location of Crete has been emphasised by ancient authors: Aristotle sees it as the explanation for the domination of Minos on the seas (Politics 2.1271b), and Diodorus Siculus, relating the works and deeds of Heracles, makes the island the base of the hero from which he can reach any part of the œcumene (4, 17, 3).

2.1. The Terrestrial Isolation of Eastern Crete

One very important element that has to be stressed to really understand the situation of Itanos, and thus its story, is the natural isolation of eastern Crete from the rest of the island (*fig. 1*). The Ierapetra isthmus, south of the bay of Mirabello, and where Crete narrows to a width of only 14km (whereas in the centre of the island it can reach 60km), works as a real regional border. The isthmus and its north/south transverse plain provide the best passageway across Crete, rapidly connecting the coasts of the Aegean and the Libyan Sea, a factor which gives the region its significance. But at the same time, it cuts eastern Crete off from the rest of the island, a separation enhanced by the Thryptis mountains, east of the isthmus, which are high and unoccupied. Indeed, the easternmost region represents a small independent world. It is of interest to note that in the 'Tabula Peutingeriana', the roads of Crete end at Hierapytna in the east, as if nothing existed thereafter east of the isthmus (Pazarli et al. 2007). No other city is mentioned, strangely enough not even Itanos. In fact, this situation accurately reflects the fact that terrestrial communication is quite limited in eastern Crete, where the most efficient way of moving is by sea.

The plain of the Ierapetra isthmus is the best agricultural area of eastern Crete, and Hierapytna, at its southern end, certainly occupied the best situation in the region. Controlling the plain gave the city the means to regulate communication and transport between both seas. The city, which appeared on the political map only in the 4th cent. BC (Guizzi 2001, 287–303; Gallimore 2011, 97–104) quickly became the most important of the region. Plains in the east are otherwise very few, small and limited to the coastal zones. Eastern Crete is occupied by the mountains of Sitia, which culminate at 1476m at Mount Thryptis. At the very far east, Mount Modi (529m), shaped like a cone on a deserted upland plateau, is the most visible peak. It has been identified by some as being the ancient Dikte, due to the presence in the region of Praisos of the temple of Zeus Diktaios (Strabon, X, 4, 12; Bosanquet 1939–1940, 62–63). But Mount Dikte is more usually identified with one of the summits around the Lassithi plateau.

Quite logically, urban centres developed on coastal plains and the cities were spaced out along the coasts. Inland plains are too scarce and small to allow for the development of a city. The notable exception is Praisos, situated right at the centre of eastern Crete, inland (*fig. 2*). When the topography is examined, it appears that the city is situated on the second north/south corridor of eastern Crete, even if this one is a bit less obvious or accommodating than the plain of the Ierapetra isthmus. In fact, the passage is distinctly hilly at its centre, exactly where Praisos was founded, but even so the corridor links the bay of Sitia, at the north, to the bay of Makrygialos, at the south. Another corridor of sorts can be identified at the extreme east of the island, but not exactly along the coastline itself, except for its northern part, starting at Itanos. It then swerves inland, through the modern village of Chochlakies and the Epano Zakros plain, ending north of the city of Ampelos (modern Xerokampos), from which it is isolated by a hilly range.

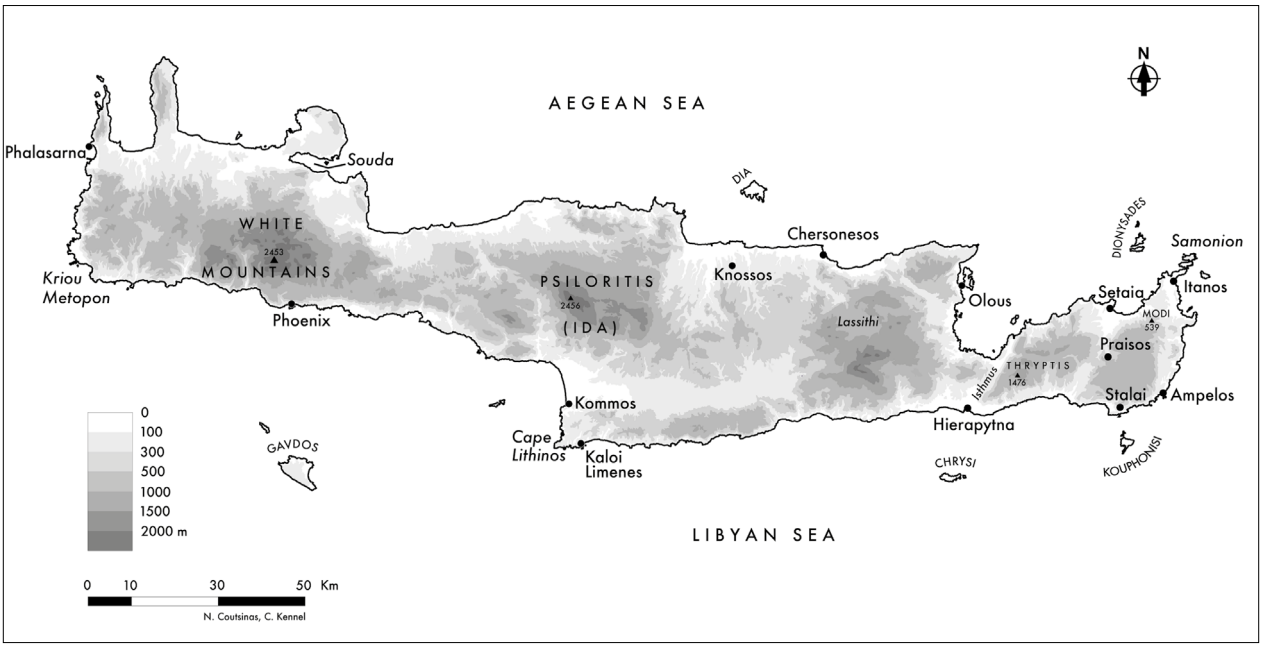

Fig. 1. Map of Crete with sites mentioned in the text (by N. Coutsinas).

2.2. The Evolution of the Political Map of Eastern Crete

The numerous ancient cities of eastern Crete all have their positions dictated by these geographical considerations (*fig. 2*). On the north coast, the harbour of Setaia, occupies the western part of a bay, protected by a promontory to the west. In the centre of the same bay, Polichna (modern Trypitos) occupies the only small promontory existing. At the northern part of the eastern coast, the city of Itanos benefits from a good harbour and the largest inland plain of the region. The city of Dragmos, known from the inscriptions (IC III, iv, 9, l. 58, 68), is not securely located. It is generally considered to be an inland city, rather close to the eastern coast of Crete. Several locations have been suggested (Coutsinas 2013, 199 f.) but the city is still not located with certainty. On the southern part of the eastern coast, the city of Ampelos is situated at modern Xerokampos (Coutsinas 2013, 195–198). On the southern coast, the city of Stalai is also not securely located (IC III, 2; Coutsinas 2013, 186). It is either to be placed at Dasonari on Cape Goudouras, or in the bay of Makrygialos, further west. A location in Dasonari seems to correspond better to the information given by the 3rd cent. BC agreement between Praisos and the Σηταῆται and

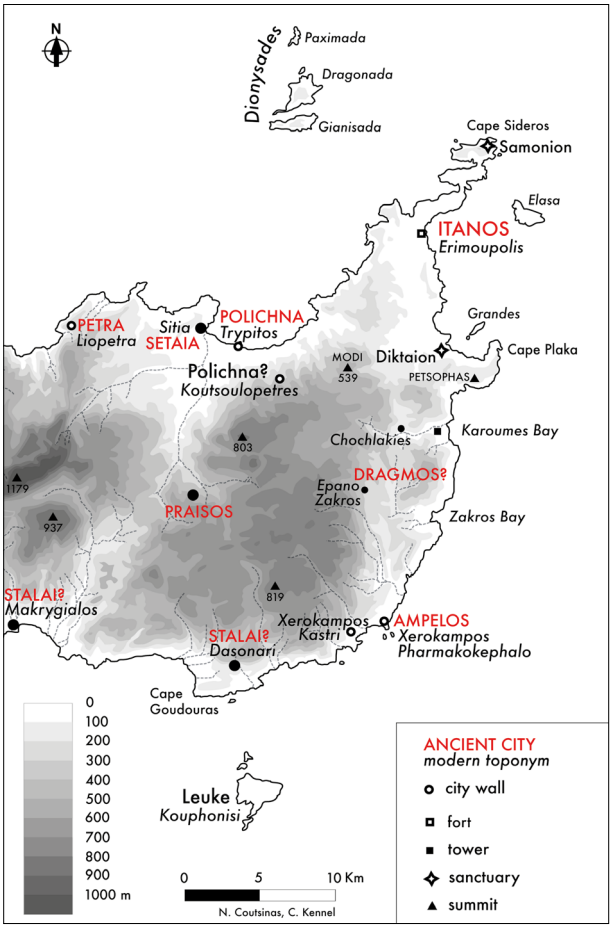

Fig. 2. The easternmost part of Crete (by N. Coutsinas, after: <http://nrs.harvard.edu/urn-3:hlnc.essay:CoutsinasN.The_Establishment_of_the_City-States_of_Eastern_Crete.2013>, fig. 7).

the Σταλῖται (IC III, vi, 7), which speaks of the islands of the Stalites, among which was probably Leuke (modern Kouphonisi), located just south of Cape Goudouras. However, a situation at Makrygialos is equally quite plausible as it would be, on the south coast, the exact counterpart of Setaia to the north, marking off both terminals of the north-east/south-west corridor which divides far-eastern Crete in two, and at the centre of which is situated Praisos, who controlled both cities (Coutsinas et al. 2021). The latter is the only inland city of far-eastern Crete.

From the Classical period to the end of the Hellenistic, we can observe quite an evolution of the political map of eastern Crete. In the Classical period, there are several independent coastal cities, each with a small territory. In the middle of the 3rd cent. BC, the region is dominated by Itanos and Praisos. By the beginning of the 3rd cent. BC already, Praisos had demonstrated a policy of territorial expansion (Coutsinas 2013, 186 f.). Situated inland, the city needed to secure access to the sea, which it achieved with the conquest, during the 3rd cent. BC, of Setaia, probably Polichna, Dragmos, Ampelos, Stalai, and possibly the island of Leukè, which was initially a possession of Itanos. In fact, already in the middle of the 4th cent. BC the Pseudo-Skylax tells us that Praisos governed both sides (of the island) (Periplus, §47.4; Counillon 2001). At the same time, at the southern end of the isthmus, the harbour-town of Hierapytna sought to secure control over the isthmus and, by extension, over the maritime traffic along both coasts and transit traffic overland between the Cretan Sea and the Libyan Sea (Coutsinas 2013, 202 n. 140, 337–343).[1] In the middle of the 2nd cent. BC (in 145 or 140 BC), Praisos was eventually conquered by Hierapytna. So, by the second half of the 2nd cent. BC, the only independent cities remaining in eastern Crete were Itanos and Hierapytna.[2]

What appears clear is that while Praisos and then Hierapytna pursue an expansionist policy to gain control over inland territories but more so over harbours both on the north and the south coast of Crete, the territory of Itanos remains much the same over the course of its history. It seems that the city did not need to expand inland as it already possessed a hinterland sufficient to sustain its inhabitants. It is not so much a geographical determinism that led Itanos to territorial stability (the Modi upland plateau does not act as a barrier) but much more an absence of necessity: contrary to Praisos and Hierapytna, Itanos had both enough land and enough maritime connections.

2.3. The Territory of Itanos and its Borders

The urban centre of Itanos is situated by the sea. It has two *acropoleis*, the eastern (forming two bays) and the western, and it is limited to the north and the south by two hills, the first holding the necropolis and the second the fort protecting the city. The arable plain extends about 2km west of the town. This in turn is then surrounded by several hills that border the peninsula which forms the territory of the city (Atzikiari, Alatopatela, Soros, Trapezes, Travouni, Gyalies, clockwise, from the west).[3] Such a configuration is quite common for city-states, whose borders most generally correspond to hilly or rather mountainous zones.

The territory of Itanos, compared to other Cretan cities, is easily defined, as it occupies the north-eastern tip of Crete, so most of its borders correspond to the sea (Viviers/Tsingarida 2014, 166, fig. 8.1). The only part on land that has to be delimited is the southern side, corresponding to a hilly zone. As for that, we are fortunate to possess the complete description of the borders of Itanos, set down in the final judgment of the dispute between Itanos and Hierapytna (IC III, iv, 9, l. 63–65;

1 The date of the foundation of the city of Hierapytna is not secure: 5th, 4th or even the 2nd cent. BC. It would have resulted from a *synœcism* with the city of Larissa, according to the testimony of Strabo (IX, 5, 19). However, the city does not appear on the Cretan political scene before the 4th cent. BC.

2 And possibly Setaia which may have regained its independence then.

3 For a presentation of the zone studied by the Itanos Survey (corresponding to the northern part of Itanos' territory): <http://prospection-itanos.efa.gr/?action=text&text=Presentation_Zone>. For a detailed map of the region with toponyms: <http://www.sitia-geopark.gr/en/downloads/map.aspx> (last access: 24.10.2021).

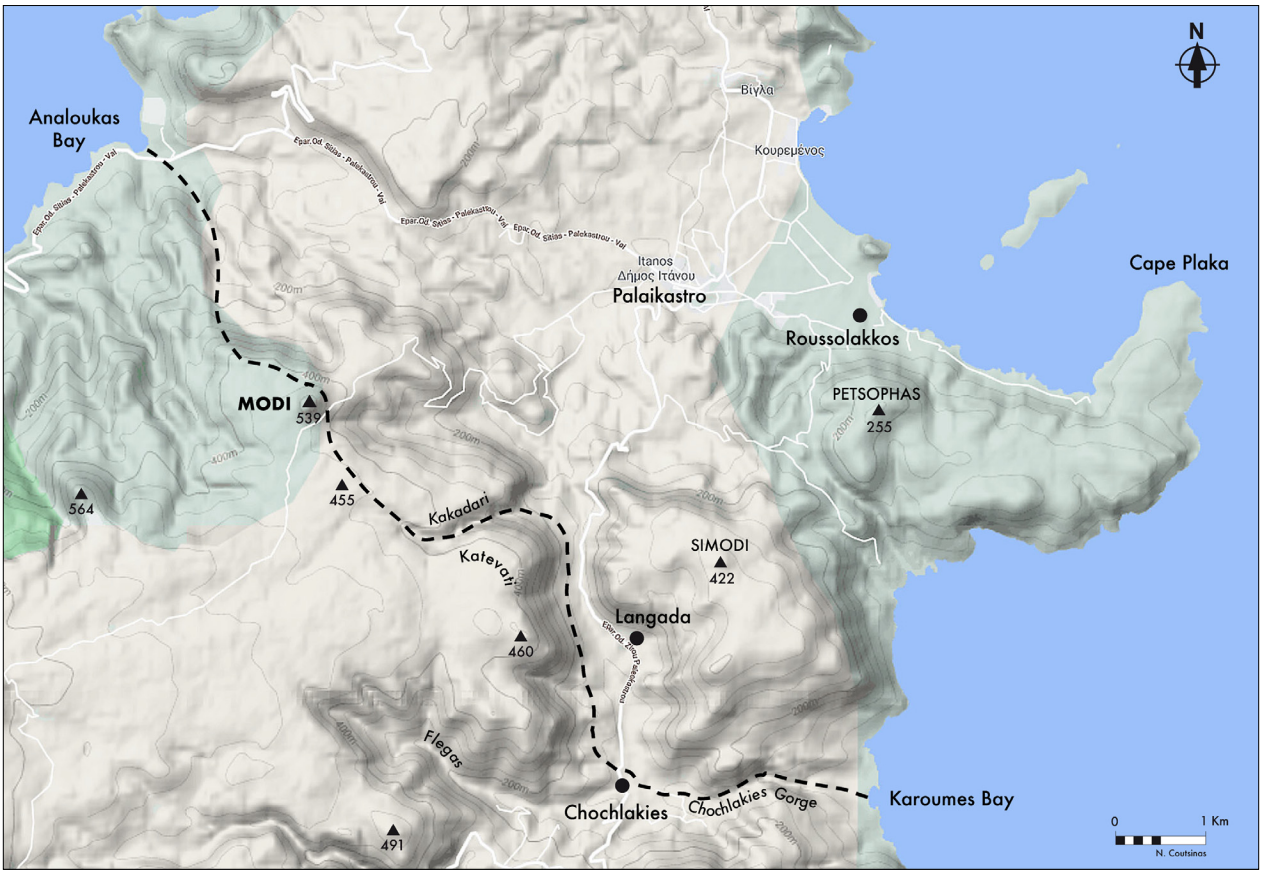

Fig. 3. Restitution proposal of the southern border of Itanos (Map Data: © GoogleMaps 2021, restitution by N. Coutsinas).

IC I, xvi, 18, l. 12–14). After the conquest of Praisos by Hierapytna in the middle of the 2nd cent. BC, the expansionist city became a neighbour of Itanos. A conflict broke out then between the two over the administration of the sanctuary of Zeus Diktaios (Prent/Thorne 2000; Sporn 2002, 45–50) and the surrounding land, as well as for the control over the island of Leuke, both claimed by Itanos and disputed by Hierapytna. Indeed, control of access to the sanctuary was a useful source of revenue through the taxes paid by pilgrims, while the island of Leukè is the base of an important trade in murex-purple as well as a transit port for trade between Greece and Africa (Viviers 1999, 222–226; Carrara 2014, 458 f.). The disputed area was occupied by Hierapytna. In 122 BC, war was declared by Itanos, though it no longer had the support of the Ptolemies. In 115 BC, Hierapytna turned to Rome to settle the conflict. After several contradictory decisions, the dispute was finally settled in 112 BC with the arbitration of Magnesia on the Maeander (Coutsinas 2013, 320 f.). The borders are described as follows (IC III, iv, 9, l. 63–65):[4]

'As the (river) Sedamnos flows, to Karymai to the mountain valley and beyond to the mountain edge, and around along the mountain edge and straight on to Dorthanna to the hollow, and along the road south of the road that goes through Atron, and to Mollos, and from the Mollos in a straight line to the sea.'

The route is here described from east to west (*fig. 3*).[5] The starting point would be the Karoumes

4 'ὡς ὁ Σέδαμνος ἐς Καρύμας ἐς τὰν δηράδα καὶ πέ[ραν ἐς] τὰν στεφάναν καὶ περιαμπέτις ὡς ἀ στεφάνα καὶ εὐθυωρίᾳ ἐς Δορθάννας ἐπὶ τὸν λάκκον καὶ ὡς ἀ ὁ[δὸς] ποτὶ μεσαμβρίαν τᾶς ὁδῶ τᾶς ἀγώσας δι' Ἀτρῶνα καὶ ἐς Μόλλον καὶ ἀπὸ τῶ Μόλλω εὐθυωρίαι ἐπὶ θάλασσαν.' Translation adapted from Chaniotis 1996, 304 (see 303–306 for full comment).

5 The border of Itanos has been studied by Didier Viviers (to be published in the future publication of the Itanos

bay, south of Cape Plaka, whose toponym recalls the ancient Καρύμαι of the arbitration. Ancient Sedamnos would then be the modern river flowing into the Chochlakies gorge. From Chochlakies, the trace would then go up the valley going north to Langada, going around the hills forming the border of the plateau (altitude above 400m) situated west of the valley. Then the route would go around the northern side of the Katevati hill, which is quite round and could correspond to the Stephana ('crown') mentioned. It would then turn west following the Kakadari torrent, probably the lakkos where the Dorthanai (probably some settlement) were situated. From there, the route goes northwest to join the Mollon, that should certainly be identified with mount Modi (539m). Its conical shape, rising from the plateau already mentioned, constitutes a principal landmark in the landscape of the region, as it is visible from many points. From the Mollon the line runs straight to the sea, as indicated. From the Modi, a valley, going northwest, ends at the Analoukas bay, on the easternmost side of the Sitia Gulf.

If we refer to Aristotle, in the 'Politics', the territory of a city 'must be able to be taken in one view'; such intervisibility facilitating military protection. At the same time, it has to be self-sufficient: 'the self-sufficient land is that which bears every sort of produce, for self-sufficiency means having a supply of everything and lacking nothing' (Aristotle, Politics, 7, 5, 3; Coutsinas 2013, 308–310). In reality, city-states are connected and some commercial exchanges take place. Moreover, connections are not only economic but also religious.

In the territory of Itanos, three main sanctuaries are known, each revealing three different network scales, a regional, a Cretan-wide and a supra-Cretan one.[6] The sanctuary of Demeter at Vamies, extra-urban even if quite close to the city centre, shows some early regional connections. It yielded figurines of the Archaic period probably coming from Praisos, the neighbouring and rival city (Brun/Duplouy 2014, 219–222, 234–237), showing a certain East-Cretan identity, which never ceased to characterise Praisos (Whitley 2008; Erickson 2009). From the end of the 6th cent. BC onwards, offerings at Vamies already show a broader connection to the Aegean world (Ionia, Corinth, Attica: Brun/Duplouy 2014, 236).

The sanctuary of Zeus Diktaios, located at Roussolakos, near modern Palaikastro, in the southern part of the Itanos territory, also has a regional importance (Bosanquet 1939–1940, 66–68; Perlman 1995, 163–165; Crowther 2000). We have seen that its territory had been claimed in the 2nd cent. BC by Itanos' new neighbour, Hierapytna. Angelos Chaniotis has identified it as an 'extra-territorial sanctuary, the centre of an amphictyony of some kind' (Chaniotis 2009, 64), and not just an Itanian civic sanctuary. This would explain the interest of a city (Hierapytna) situated quite far from it. It shows that Itanos was not entirely isolated nor disconnected from the other parts of eastern Crete.[7] However, as a harbour situated at the easternmost part of Crete, Itanos has looser ties to the rest of Crete than it enjoyed with the eastern Mediterranean.

This is what reveals the third main sanctuary, the Samonion (discussed below, 3.1), situated in the norther part of the city's territory, at Cape Sideros, at the crossroads of the east Mediterranean maritime routes. It appears that Itanos, even if with a restricted and stable territory, played a major role in the ritual landscape at different scales: local, Cretan, Mediterranean.

Survey). His recreation of the border follows roughly the same line as presented here, even if he prefers to include the Modi in the Itanos territory and thus to have the border pass south of it instead of north (Viviers/Tsingarida 2014, fig. 8.1., 166). However, Viviers had first preferred a much southern trajectory, continuing west after Chochlakies, instead of turning north (Viviers 2006, fig. 1, 97; see also Bosanquet 1939–1940, 74 f.). I am indebted to Max Guy (another member of the Itanos team) who also gave his interpretation of the route, and who kindly shared his research with me, and took me to visit some segments of the border with him.

6 The relation between these networks is difficult to apprehend as only the material from Vamies has been studied.

7 Thus, the study of pottery from the necropolis shows links with central Crete in the Archaic, Classical and Hellenistic periods, as some Cretan wares have been identified, similar to types discovered also at Myrtos Pyrgos, Kato Symi, Knossos and Gortyn (Apostolakou et al. 2004–2005, 993–1003).

3. The Connectivity of Itanos and its Extended Territory

The Gulf of Grandes, on the northern side of the eastern coast of Crete, has two anchorages: the bay of Eremoupoli, where Itanos lies, and the bay of Kouremenos the harbour of modern Palaikastro, thus offering shelter in any wind condition. They are mentioned in modern nautical treatises, as Thomas Abel Brimage Spratt's 'Sailing Directions for the Island of Candia or Crete' (1866, 19 f.).

Strangely enough for an island with 1046km of coastline, Crete does not have many good harbours offering shelter in any wind conditions (*fig. 1*). The very best can be counted on the fingers of one hand: Souda and Olous on the north coast, Itanos on the east coast, and Phoenix on the south coast. Souda bay is the biggest natural harbour of Crete (Spratt 1866, 9 f.). However, it seems to never be mentioned in the texts of ancient geographers, either in simple descriptions or on proper *periploi*.[8] Phoenix (modern Loutro), which offers shelter behind a headland, is the only good harbour on the southern coast of the island (Spratt 1866, 27 f.). It is where the captain of the boat bringing Saint Paul to Rome wanted to winter but was taken off-route by violent winds that pushed it to Gavdos (Acts, 27, 1–44; 28, 1–13; Coutsinas et al. 2016, 335 f.). The existence of the Kolokytha peninsula, gives to Olous three harbours of different natures, which make it the best anchorage on the north coast of Crete, after Souda (Spratt 1866, 15 f.; Coutsinas 2020, 36 f.).

It is the quality of the anchorage that gives its importance to the city of Itanos, which is a natural stopover on the maritime routes of the Mediterranean. Indeed, it is also the first harbour encountered when arriving from Rhodes or Asia Minor, or the last one before sailing east when coming from western Mediterranean. The easternmost cape of the north coast of Crete, Cape Samonion, also belongs to the territory of the city.

3.1. Cape Samonion

North of the city of Itanos, is modern Cape Sideros, the ancient Samonion, a strategic point at the crossroads of the maritime routes both between the Aegean and Africa and between Asia Minor and the western Mediterranean.[9] In both cases, Cape Samonion is a landmark for sailors, who necessarily have to pass it. Indeed, it offers more: south-east of the northern tip of Cape Sideros there is a small bay where in Antiquity there was a temple, from which the name Samonion is derived. Moreover, it had an element very important for sailors: a source of fresh water to stock up on, after a long sail, or before leaving Crete. Apollonius of Rhodes (Argonautics, Book 4, l. 1690–1694) relates that the Argonauts, on their return from Colchis, following a storm, landed in this bay. In the morning, they erected a temple there, in honour of Athena Minoa or Samonia.

For ancient authors, the Samonion represented the eastern tip of Crete (though it actually points north). It is mentioned by Pliny (Natural History, IV, 12, 58.11.), Ptolemy (Geography, 3.15.4.1–8) and the 'Stadiasmus' (Müller 1855–1861, 505, §318). The description of Strabo gives some interesting information: it says that after Hierapytna there is a promontory pointing towards Egypt and the islands of the Rhodians, which are Kassos and Karpathos (Geography, X, 4.3). In referring to this network, Strabo clearly demonstrates their maritime connection. Rhodes would seem here to be the only island at the centre of long–distance journeys, especially towards Asia Minor. It is indeed at the crossroads of routes coming from Crete, the northern Aegean and eastern Mediterranean (*fig. 4*).

Even if not directly linked with Itanos and Cape Samonion, Rhodes (as with Egypt and Rome)

8 These sources, concerning Crete, are: the Pseudo-Skylax, 'Periplus' (mid-4th cent. BC); Strabo, 'Geography' (1st cent. BC); Pliny the Elder, 'Naturalis Historia' (1st cent. AD); Ptolemy, 'Geography' (2nd cent. AD); 'Stadiasmus Maris Magni' (compiled in the 5th cent. AD from earlier sources, mainly 3rd cent. AD); Stephanus of Byzantium, 'Ethnica' (6th cent. AD).

9 For the identification of the ancient Samonion and the confusion during centuries about its location, see Coutsinas, in preparation.

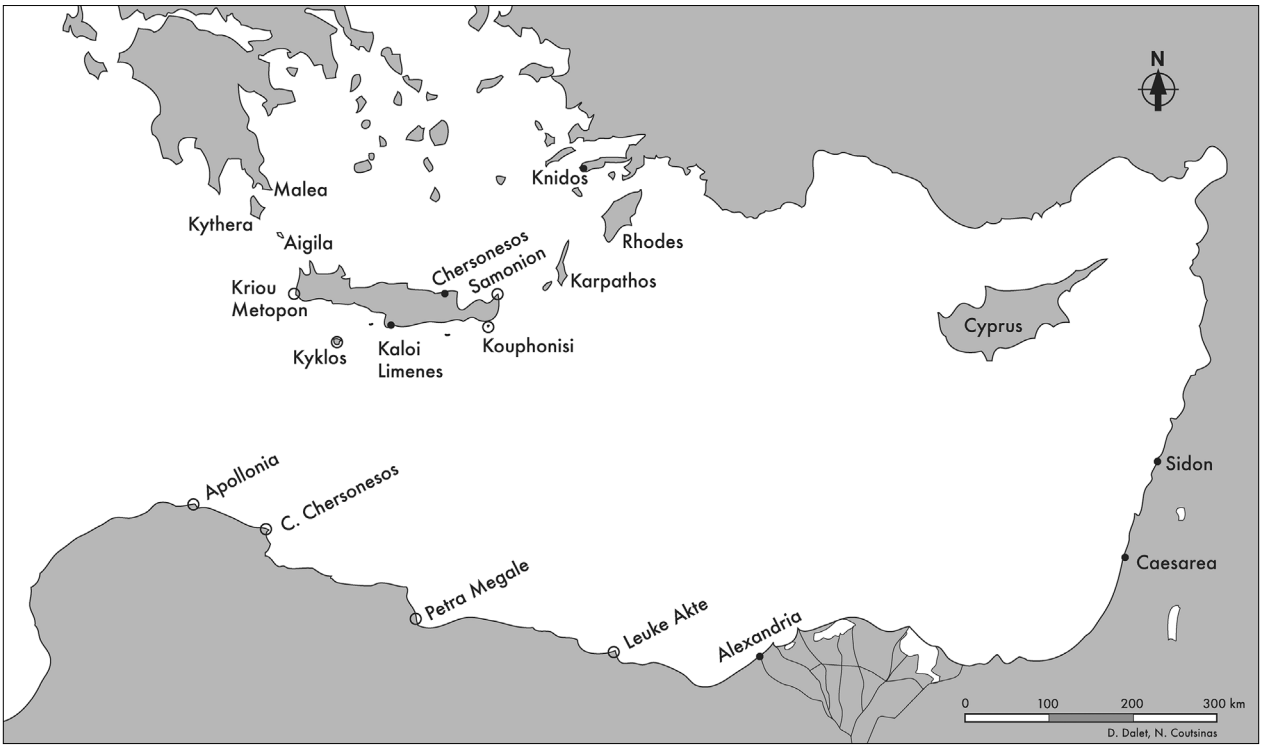

Fig. 4. Map of the eastern Mediterranean, with sites mentioned in the text (by N. Coutsinas, after: <https://www.pedagogie.ac-aix-marseille.fr/jcms/c_67064/en/cartotheque>, Coutsinas et al. 2016, fig. 1).

got involved in the Cretan affairs during the Hellenistic period. At the end of the 3rd cent. BC there occurred the so-called Cretan War, following an attack on the Dodecanese islands and the cities of Asia Minor by Cretan ships. It has been reported by Diodorus Siculus (XXVII, 3) that Rhodes decided to intervene in order to counter piracy that threatened trade. But this intervention has been seen by Paula Perlman (1999) as prompted by commercial competition between Rhodes and Crete. From another point of view, Angelos Chaniotis sees it as a strategy of Philip V of Macedon to gain control of the eastern Mediterranean (Chaniotis 2005, 11). Whatever the reasons, the end of the war, in 201 BC, saw Rhodes conclude *symmachia* treaties with three eastern Cretan city-states (Hierapytna, Olous, and Chersonesos), giving Rhodes bases in key harbours of the island, and so allowing it to secure the maritime routes to the eastern Mediterranean (Coutsinas 2020, 38).

A number of Roman shipwrecks discovered in the waters around Crete point to a considerable degree of traffic plying the Cretan coast at this time (Theodoulou 2015). Most are situated on the north coast, especially near the promontories at the western and eastern ends of the island. The area between Cape Samonion and the Dionysades islands is noted as perilous by Spratt, who mentions a dangerous rock 'midway between the east end of Yanisada and Cape Sidero' (Spratt 1866, 18). At the same time the area is one of the most frequented of the eastern Mediterranean. One Roman wreck was found lying between Cape Samonion and the Dionysades islands at a depth of 43m (Preka-Alexandri et al. 2012, 103–105). The ship's cargo consisted mainly of Cretan wine amphorae and African oil amphorae. In light of this dual cargo, it is tempting to speculate that this vessel plied a route running from Africa to perhaps Rome, featuring a stopover in Crete (Coutsinas et al. 2016, 336). Arriving from the east (see description of the route from Egypt to Crete below), and having presumably loaded the Cretan amphorae on the north coast of the island, the ship was probably about to round Cape Samonion to traverse the southern coast of Crete when it hit the reef. In the same area of the Samonion, one might note the existence of the wreck of an Early Byzantine ship carrying columns and architectural members (Theodoulou 2015, 35).

Fig. 5. Itanos, the urban centre and the eastern acropolis seen from south (by N. Coutsinas).

3.2. The Route to Asia

3.2.1. The Route Between Asia and Cape Malea

The route between Asia and Cape Malea is described by the Pseudo-Skylax, in the middle of the 4th cent. BC: from Cape Malea it passes Kythera, Aegialia, Crete, Karpathos, Rhodes and then reaches Asia Minor (*fig. 4*). This seems to be the classic passage between Asia and the central Mediterranean (Arnaud 2005, 217). It suggests sailing along the northern coast of Crete, but there was also a route passing south of Crete, connecting Cape Samonion, at the north-east, to Kriou Metopon, at the south-west of the island (Arnaud 2005, 218).

Travel from the Levantine coast to Italy is well attested by the famous journey of Saint Paul from Caesarea Maritima, where he had been arrested, to Rome, where he was to be tried (Luke the Evangelist, Acts of the Apostles, 27, 1–44; 28; Pomey 1997, 10–17; Coutsinas et al. 2016, 335 f.). Coming from Knidos, the ship passed by Cape Samonion intending to travel along the sheltered coastline of Crete. It arrived at Kaloi Limenes but the captain decided not to winter there and to proceed to Phoenix instead, which is a better harbour. But a violent north-east wind pushed the ship towards the island of Gavdos, and from there again to Malta, where the ship stayed three months before leaving for Rome.

3.2.2. The Presence of the Phoenicians

The link with the Levantine coast is also attested by the historical link of Itanos to the Phoenicians. According to Stephanus of Byzantium, Itanos was founded by the eponymous hero Itanos, son of Phoenix (Ethnica, s.v. Itanos). With this myth, Itanos shows a different origin to the other cities of Eastern Crete, thought to be native foundations all, by the so-called Eteocretans (Viviers 1996). In Crete, the presence of Phoenician merchants is archaeologically clearly attested in the harbour of Kommos, on the western coast of Messara (Shaw 1989), as well as in Knossos, on the northern coast of the island (Muñoz Sogas 2019).

Didier Viviers and Athéna Tsingarida have suggested that the geomorphological structure of the Itanian landscape itself was convenient for a ‘Phoenician emporium’ (Viviers/Tsingarida 2014, 169 f.). The eastern acropolis is a small rocky headland protruding into the sea (*fig. 5*) – a topographical pattern favoured by Phoenician travellers,

because it was a location similar to that found in their mother cities, thus convenient to harbour their ships for a short time. The well-protected bay of Itanos could offer shelter to ships going towards cape Samonion and the northern coast of Crete or towards Rhodes and Asia Minor. Thus, it seems that the development of the city of Itanos should probably be associated with the development of maritime routes. Connection of Crete to the Levant during the Classical period, which was thought to be non-existent, has recently been evidenced. An analysis of several groups of 'East Greek' painted pottery found on Levantine sites made clear that several vessel types (all containers) of the 5th and 4th cent. BC were produced in central Crete (Gilboa et al. 2017, especially discussion 581–586). This shakes up the image of isolation of Crete in the Classical period and confirms continuous links to the Near East after the Archaic period, rather than a shift towards mainland Greece. Even if this evidence does not imply directly Itanos, it nonetheless shows the special links of Crete with the eastern Mediterranean.

3.3. The Route to Cyrenaica

Due to the short distance involved, Crete is naturally linked to Africa, situated some 300km off, depending on the exact departure point. One should not forget that after the Roman conquest (in 67/66 BC) a single province was formed with the two regions of Crete and Cyrenaica (Chevrollier 2016). Some routes are recorded by ancient geographers, especially those departing from western Crete, which is nearer to Africa (Arnaud 2005, 187 f.; Coutsinas et al. 2016, 336) (*fig. 4*). One route connected Kriou Metopon with Cape Phycus (Apollonia) (Pseudo-Skylax, §47). Another route linked Cape Chersonesos of Cyrenaica (Ras-el-Tyn) to Kyklos island, which is probably Gavdos (Strabo 17.3.22). But Strabo also locates a harbour, on the Cyrenaic coast, facing Cretan Chersonesos – even if the latter is located on the north coast of Crete – which should probably be identified with the Petra Megale of Ptolemy.

Early connectivity between Crete (and specifically Itanos) and Cyrenaica is recorded by Herodotus (Historiae, 4, 151, 5–10; Spyridakis 1970, 10 f.) when relating the story of the foundation of Cyrene in the 7th cent. BC (traditionally dated to 631 BC). After a long drought, the Therans decided to establish a colony in Libya, as the Pythia in Delphi had instructed. Unsure of their route, they sought out a guide in Crete, eventually locating one at Itanos. The purple fisherman Korobios claimed that he had already been to Platea, an island off the Libyan coast, when his boat was blown off course by violent winds, probably the *meltemi* that blows all summer. The existence of direct, regular relations, in both directions, between Crete and Cyrenaica from early times is underlined by Pascal Arnaud (2005, 187).

3.4. The Route to Egypt

However, Itanos and Cape Samonion are more evidently linked to Egypt. As already mentioned, Strabo clearly describes the promontory as pointing towards Egypt as well as the islands of the Rhodians (Geography, X, 4.3). A simple look at a map, however, shows that if the cape points indeed towards Rhodes to the north-east, Egypt is in fact distinctly situated south-east of the island. Indeed, this description shows the function of the cape more as a crossroads between both routes, going to Asia Minor through Rhodes or to Alexandria. It is the point where ships that had sailed along the coasts of Crete had to take their final departure (Arnaud 2005, 212 f.). Moreover, these different points – i.e. Cape Samonion, Rhodes and Egypt – are necessarily linked on the return route from Egypt. If connections between Crete and Africa are accomplished directly from north to south throughout the summer months – as such southbound journeys were then facilitated by the *meltemi* – return journeys from Alexandria were necessarily indirect following a course along the Levantine coast, passing Cyprus and along the southern coast of Anatolia, in order to reach Crete and the Aegean. However, from September onwards, the regular north to south summer traffic tends to disappear and is replaced by a system of more capricious currents. An anticyclonic gyre, the so-called Ierapetra Gyre, generally appears in

the waters to the south-east of Crete at the end of summer and disappears in spring. It combines a strong current with a weak north-west wind, and allows trajectories directly to the north from the African coast. The channel inexorably arrives at Kouphonisi, from where it extends along the eastern coast of Crete to Itanos (Coutsinas et al. 2016, 337 f.). This natural feature explains the wealth of Kouphonisi in the Hellenistic and Roman periods, when maritime trade was particularly developed, and the attempt first of Praisos, then Hierapytna, to get hold of it (Coutsinas et al. 2016, 333–335). The settlement mainly grew and became prosperous during the Roman period, as the luxury of the houses excavated there reveals, along with the presence of a theatre and of a bath house, requiring a complex water supply system (Papadakis 1983; Coutsinas et al. 2016, 338–341). The abandonment of Kouphonisi in the 4th cent. AD seems to have to be connected to the great earthquake of July 21st 365 – or one of the series of subsequent events. Affecting the whole eastern Mediterranean, this event not only destroyed the settlement but also certainly disrupted the broader trade network in which Kouphonisi had operated. Itanos, being part of the same network, was certainly also affected by the event. But it did not spell the end of the city, which continued to flourish in the Late Antique period. Some other element must have led to Kouphonisi's abandonment. This should probably be sought in the disruption to the island's groundwater from the earthquake, affecting the aqueduct supply for the town and initiating a process of desertification on the island, which subsequently was inevitably abandoned (Coutsinas et al. 2016, 341 f.).

During the Hellenistic period, the Ptolemies displayed an interest in eastern Crete (Spyridakis 1970, 69–103; Spyridakis 1985; Papadakis 2000). The installation of a Ptolemaic garrison at Itanos in the second quarter of the 3rd cent. BC, under the command of Patroklos, admiral of Ptolemy II Philadelphus (283–246), is traditionally considered as the beginning of Egyptian influence in Crete (Coutsinas 2013, 187–189). During the Chremonidean War (267–261 BC), we know that some Cretan cities were in the anti-Macedonian camp, and thus on the side of Egypt. These were Itanos, Olous, Gortyn, Lyttos, Rhithymna, Aptera, Polyrrhenia and Phalasarna (van Effenterre 1948, 203 f.). Itanos and Phalasarna, the two most important Cretan harbours on the east-west maritime route in the eastern Mediterranean, can be found again among the cities which honoured Ptolemy III Euergetes (246–222 BC): namely Itanos (IC III, iv, 4; Reinach 1911, 391–400), Eleutherna, Lappa and Phalasarna (Coutsinas 2013, 191 f.). This clearly shows that Egypt was interested in Crete (and some key positions) due to the strategic geographical location of the island on the main maritime routes. This link to Egypt can also be found in the archaeological material. For example, much of the glass found at Itanos came from Egypt, or the Levantine coast (Coutsinas 2012).

4. The City of Itanos and the Study of Networks

The situation of Itanos at the north-eastern tip of Crete implies its central place in a general Mediterranean network. It is both at the end of terrestrial routes, linking it to the rest of the island of Crete, and at the beginning of maritime routes, linking it to the Aegean, the eastern Mediterranean and Africa. By its topographical situation Itanos seems to be entirely turned towards the outside world, but connection to the island itself is undisputable, despite the poor quality of terrestrial routes (indeed, connections could very well have been also made – and more easily – via navigation).

The importance of Itanos does not rely so much on any natural resources (stones, clay, agricultural production etc.) that would have been exploited by its inhabitants, but on its very location. The resource here is the immaterial network induced by the location of the city. Its strategic location in the Mediterranean is what gave to Itanos this attractiveness to foreign powers – Egypt, and, later, Rome (Coutsinas 2013, 319–321). It is the very first harbour encountered by seafarers coming from the east (or south, as we have seen), or the last one before heading east, so, like its western counterpart Phalasarna, it also had a technical importance for supplying the boats before travelling (or after a long trip).

However, the situation of Itanos as a harbour is ambiguous. Did the maritime routes (determined by specific environmental constraints such as winds and currents) impose the development of the city at that particular place or did the existence of the city imply the development of maritime routes? In other words, did the existing network create the central place or did the central place gave rise to the development of the network? Indeed, as underlined by Justin Leidwanger and Carl Knappett, 'a distinction must be made between connectivity as potential or precondition, and mobility as the instantiation and realisation of that potential' (Leidwanger/Knappett 2018, 4).

The question is interesting and difficult to answer. The connectivity of the north-eastern coast of Crete is attested in all periods. Before the establishment of the Greek city-state at Itanos, the main Minoan town of the area was situated 8km south, at Roussolakos, in quite a similar topographical location, next to a hill protruding into the sea (*fig. 3*). The specific choice of Itanos has been connected to its similarity with the Phoenicians' favoured sites, as it is considered as a Phoenician foundation. This slight translation to the north of the main urban centre of the region does not change anything of the wider general connection of the place to the Aegean, Asia Minor and Egypt. Itanos is therefore the perfect site to apply the techniques of network analysis (Dawson 2020), both to the imports found (from the Archaic to the Late Roman period) and to the known social relations with other cities (either Cretan or foreign), so as to apprehend and reveal the evolution of all interactions (places, quantity or frequency etc.).[10]

5. Conclusion

The history of the city of Itanos can only be understood if it is set in its broader geographical context. This is not limited to Crete: Itanos holds a key position in the eastern Mediterranean, which explains its initial settlement, its development and the fact that it is one of the very rare cities of eastern Crete that kept its independence from the Classical to the Hellenistic and Roman periods. The fact that its territory never changed throughout the centuries is also to be explained by the fact that Itanos survived and thrived primarily through its maritime network and its connections all over the eastern Mediterranean.

The city was occupied from the 8th cent. BC (Viviers/Tsingarida 2014, 167) until shortly after the mid-7th cent. AD, when it was abandoned during the very first Arab incursions into Crete (Tsigonaki 2009, 172 f.). It was the threat of invasion, rather than any actual destruction by raiders, that finally brought the Itanians to abandon their city. In the same period (AD 670), a powerful earthquake shook Crete that is known to have destroyed Gortyn (Papadopoulos 2011, 109 f.). Both events forced Cretan coastal settlements into an economic decline which caused their end. The urban centre of Itanos died with the disruption of its maritime trade network, which represented the loss of the most important resource on which the social and economic identity of the city was founded.

Nadia Coutsinas
Postdoctoral Research Fellow
Laboratory of Geophysical – Satellite Remote Sensing & Archaeoenvironment
FORTH – Institute for Mediterranean Studies
Melissinou & Nikiforou Foka 130,
Rethymno 74100, Crete, Greece
nadia.coutsinas@ims.forth.gr

10 For an interesting discussion on the study of maritime connectivity in Antiquity see Leidwanger et al. 2014.

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Mariachiara Franceschini

Flowing Resources

Socio-Natural Riverine Networks in Etruria

Keywords: rivers, network, Etruria, landscape, flowscape

'[…] a network of connectivity, that changes, is updated, 'breathes', in line with the historical events connected to the territory […]' (Bizzarri 2016, 11).

Summary

Natural elements, such as rivers, are not only necessary to human life but are also tightly entangled with every sociocultural aspect of ancient communities occupying the territory of their basins. Such a dynamic relationship is evident from the interconnection of waterways, valleys and archaeological remains, as well as from the flow of ideas, knowledge and phenomena, reflecting how ancient communities acted and reacted to the riverine agency, or better 'effectancy' (Stockhammer 2016). This creates a lively socio-natural network where all elements of the riverine landscape and its human actors are intertwined together. By rethinking the relationships between the actors involved, it is possible to understand how this network could have become a resource for ancient communities. This paper aims to reconsider the riverine networks of the two basins of the Paglia and Fiora in the Etruscan period. It is intended to emphasise the polyvalent role of the river-system as a resource for ancient communities, both affecting changes and resulting in enhancements on a microregional level, as well as acting as a *trait d'union* between broader networks and as conduit for the spread of cultural innovations on a macroregional level. Focusing especially on the influence of the interaction between rivers and society, on settlement and communication strategies and basing the analysis on the archaeological materials connected to these factors, it will be illustrated how riverine networks can become powerful resources, improving social and cultural mobility, and affecting cultural history on a multiscale level.

1. Introduction

In the usual schematic representation of networks, we tend to visualise them as a linear grid of edges and nodes. This is, of course, merely a simplification that responds to the necessity of abstraction and the need to visualise complex concepts in the form of summary mental maps.[1] Nevertheless, it gives the impression that the entangled relationships of a network are linear connections linking nodes with straight lines. What we have to deal with instead are mostly relations which are anything but linear. This discrepancy in the visualisation of networks is most evident when dealing with natural networks. If the relationship we want to model and illustrate through the metaphor of a network is shaped by the socio-natural geometry of rivers, we need to be mindful of two aspects: not only does the visual representation need to follow the irregular course of the flows; but also, the abstraction of their entanglement has to be conceptualised through a flowing network between riverine landscapes and social activities.

1 On the visualisation of networks in archaeology and the abstraction of their representation, see Collar et al. 2015, esp. 4 f., 12–14. On the term 'mental map' and its implication in defining spatial concepts, see Grunwald et al. 2018, esp. 9–11.

If the edges connecting sites, communities and people, power dynamics, and productive and economic relationships are riverine branches, the connection itself is a flowing one. Nevertheless, the nodes are not only clearly defined material evidence, settlements or social groups, they comprise all material and immaterial elements which coalesce to define the socio-natural relationship within the riverine landscape. Thus, in this case, the nodes can also be represented by ideological or ritual aspects connected to the rivers. One could say that a riverine network in some ways resembles more a 'meshwork of interwoven lines' (Ingold 2011, 63; see also Teuber/Schweizer 2020, 14) and in this sense corresponds to a flowscape (Edgeworth 2011, esp. 83–106; more precisely below), or rather, it rests on the same elements, principles and mechanisms. Moreover, riverine networks are necessarily multidimensional, which means that human agency is not the only one managing the network, but rather, that the rivers' effectancy (Stockhammer 2016, 336; see also below) plays an important role in shaping it. In this sense, I do not intend to use networks only as a formal analytical category *per se*,[2] but rather, on an ontological level, as an analytical metaphor of all linear and non-linear relationships through which human activities, material evidence and natural elements are entangled.

In this study the concept of flowscape will be applied to an Etruscan context, developing a new methodology for a comprehensive analysis of riverine landscapes.[3] This is based on the clustered consideration of four factors (infrastructures, settlements, sepulchral and sacral places) which are recognisable in the archaeological evidence, and which will allow the complex socio-natural relations to unfold themselves in the flow. Three main aspects are the focus of the investigation: living in a flowscape, moving within the flow, and the perception of the riverine landscapes. Regarding the rivers as more active agents in these relations will rebalance our perspective on ancient riverine landscapes from a less anthropocentric point of view. Taking the landscape of central and southern Etruria as a case study, the paper aims to develop an exemplary theoretical and methodological framework to provide an analytical lens that could eventually be applied to other landscapes of classical antiquity. In this regard, spatial analysis[4] is only one of several means of interpreting the landscape and will appear complementary to the archaeological discussion.

With this background, the reciprocity of all (human and non-human) agents involved in the socio-natural riverine network is the key to understanding how this network became a resource and worked as such for ancient communities. The riverine network provides not only a frame for connecting and relating people and goods, but, most importantly, reveals itself to be perceived as a resource for the ancient communities entangled in it and consequently, to be exploited by them both in a material and in an ideological way. Considering resources as 'means to create, sustain and alter social relations, units and identities within the framework of cultural ideas and practices',[5] it will be highlighted how riverine networks can be understood as immaterial resources affecting the socio-natural development involved in the network.

First, a theoretical and methodological framework has to be defined through which it will be possible to discuss how rivers could become co-agents[6] of history and how the active and lively network drawn by ancient riverine landscapes became a resource. In the considered research area, comprising the basins of the Paglia and Fiora rivers in central and southern Etruria, the focus will be on two specific examples. The first is the sector related to the source of the Paglia by Monte Amiata. The second example is the area under the influence of the centres of Pitigliano, Sorano

2 About the discussion regarding the relation between formal network analysis and ontological approach, and the possibility to conciliate them, see Da Vela et al. in this volume.

3 This paper is just a part of my wider ongoing project on riverine landscapes in Etruria at the University of Freiburg; thus, some case studies and partial results will be presented here.

4 For brevity, in this study just a few GIS analyses will be presented to provide a proper visualisation for the argumentation.

5 As properly formulated in the collaborative research centre SFB 1070 RessourcenKulturen in Tübingen (see Hardenberg et al. 2017, 14; see also Teuber/Schweizer 2020).

6 On the agency of rivers see esp. Strang 2009; 2014b; Edgeworth 2014; see also below.

Fig. 1. The basins of the Paglia and Fiora rivers with cited places (GIS elaboration by M. Franceschini; DEM based on TINITALY; Tarquini et al. 2007; Tarquini/Nannipieri 2017).

and Sovana, strategically placed along the tributaries of the Fiora and particularly characterised by the phenomenon of rock necropoleis along the arms of ditches and smaller waterways (*fig. 1*).[7]

Both will be shortly presented, since the goal of this paper is not to show different small areas in detail, but rather to display the complexity of a riverine landscape by considering various elements in their reciprocal relations. A comprehensive analysis of numerous analytical factors entangled together will offer a glimpse of the functioning of a flowscape as a lively network (or meshwork) of socio-natural relationships within river basins – as a dynamic system itself – and will emphasise the reciprocal reactions between humans and

7 The DEM was kindly provided by TINITALY, <http://tinitaly.pi.ingv.it/> (last access 09.01.2021), see Tarquini et al. 2007; see also Tarquini/Nannipieri 2017. All the GIS elaborations are by the author. Rivers are depicted after the algorithm: 'saga:strahlerorder'; 'saga:channelnetworkanddrainagebasins' with threshold parameter 4; also shown in fig. 2–4.

the natural riverine landscape in the Etruscan period. They will also lend themselves to an evaluation of how the river network was perceived and exploited as a resource in relation to settlement strategies, to burial practices and to ideological self-representation for the communities involved.

2. From Water to Flowing Network: Theoretical Framework

The role of water and rivers as living and life-giving material resources in antiquity – providing water, food, cleaning and communication possibilities – seems obvious and, in some sense, a premise to a riverine network. A glimpse of the ancient perception of water and rivers can be gained by looking at written sources. The flowing motion of rivers – implied in both the Greek word ποταμός and the Latin *flumen* (Dan 2018, 38, 40) – convey a sense of eternal movement, evoking the metaphor of flowing water as the endless resource of life. For Homer and Hesiod, the explanation of water as the origin of the world is subordinated to an etiological interest.[8] However, a cosmological approach (von Kutschera 2018, 11–13) manifests itself in the natural philosophy of the Presocratics, especially Thales,[9] when water as a physical element (von Kutschera 2018, 10) became equally the origin and essence of reality. Not only in classical antiquity, but also in many distinct traditions of quite different cultures, water, and the phenomena associated with it (especially flows and floods), bring life and are related to the origin of the world. The frequency of such legends proves a close and generalised understanding of water as resource (Ball 2001, 3–4, 51–56). More than half a century after Thales, the manifestation of water as a river also began to shape historiographical and cartographic perceptions. Starting with Akusilaos of Argos' description of the birth of 3000 rivers,[10] flowing waters gradually became a means for mapping the world and connecting regions and countries (Purcell 2012, 375), thus becoming branches of sociocultural networks. Consistently, rivers appear in descriptions of the world as concise landscape elements and reference points of the known lands,[11] equally contributing to the perception of local identities (Campbell 2012, 48).

Focusing on Etruscan culture, thus looking more accurately at iconographical sources, water and rivers have always had a strong sacred connotation.[12] In Etruscan imagery, riverine waters are mostly a metaphor of borders and boundaries between different kinds of changes of status, especially acquiring a chthonian connotation while referring to the afterlife river Acheron (Gilotta 2003, 26). Riverine water appears to be a vital element in which both negative forces and positive energies converge, being strongly connected to heroes and gods in the local mythology (Gilotta 2003, 26–30). Furthermore, springs – as synecdochal representatives for entire rivers – enjoy a sacred, almost theophanic character as living water and a vital resource (Maggiani 1999, 187–190; 2003a, 39; Giontella 2006, 9).

This brief overview shows that, in antiquity, rivers were not only important resources producing life and providing for living necessities, but also built connections between different communities, serving as reference elements to delineate social groups and identities. Finally, they affected human consciousness on an ideological level, allowing access to the afterlife and the mythological world. The ancient perception of rivers reflects a developed awareness of the importance of the

8 Thus, the gods are responsible for natural phenomena and orchestrating their processes and phenomena (on rivers, see Houlle 2010, 25–35).

9 See Houlle 2010, 96–112; Linton 2010, 76 f. According to Thales of Miletus, the primordial beginning and life-creating principle of all things (the ἀρχη) was water (ὕδωρ). About water in the Greek philosophy in general see Ball 2001, 118–128, especially on Thales 118 f.; Houlle 2010, 115–188.

10 FGH 1, 101, 11a; Didymus apud Macrob. Saturn. V, 18; see also Purcell 2012, 373, 375. The birth of the rivers from Okeanos and Thetis is also handed down, among others, in the 'Theogony' of Hesiod (Hes. Theog. 337–362; see Houlle 2010, 31 f.).

11 For example, the one after Hecataeus of Miletus (Prontera 2003, 19, fig. 1) or the one after Strabon (Prontera 2003, 25 f., fig. 10–11; Campbell 2012, 47–49). Also, in the 'Tabula Peutingeriana' (in general, see Prontera 2003; Rathmann 2018), rivers appear as reference points for orienting human perceptions of the world and as arteries of communication.

12 The bibliography on the sacred meaning of waters and rivers in Etruria is rich (see especially Torelli 1991; 2014; Prayon 1993; Maggiani 1999; 2003a; Gilotta 2003; Zinelli 2003; Giontella 2006; 2012).

rivers and of their intertwined network in the social processes resulting from the enhanced connectivity of different countries and cultures. This reveals a certain consciousness of the relevance of river-networks as immaterial and conceptual resources.

Up to now, the point of view of human activity, using rivers for specific purposes and exploiting them, their supplies and properties, has prevailed in the archaeological narrative of riverine research. Rivers are used to transport goods, to provide food or to serve as flexible boundaries between cultural areas or as defensive borders between communities.[13] However, if we aim to understand river networks in their entirety, a change of perspective is needed. Recent historical, anthropological and ecological studies analysing the influence of water on modern and contemporary societies have shown that, in order to understand the history of rivers, we have to consider all of their material, political and ideological aspects (Tvedt/Oestigaard 2010, 3) and highlight the entanglement and interdependence between social and natural networks.

Anthropologists such as Veronica Strang (see esp. Strang 2004; 2005; 2014a; 2014b; Strang/Garner 2006; Krause/Strang 2016) and archaeologists like Matt Edgeworth (see esp. Edgeworth 2011; 2014; 2017; 2018), have stressed the important role of rivers in creating relationships and meanings in society and their function in shaping social and historical networks; in a word, their agency. Following the actor-network theory, according to which humans and nature act equally on an identical ontological level (Latour 1993; 2005; 2014), even rivers become fully-fledged active and generative protagonists of history. Their active force results from their effectancy, which, according to Philipp Stockhammer (and, in this case, providing a better definition for rivers' agency), means that they act by provoking an effect or a reaction (Stockhammer 2016, 336; see also Stockhammer 2015, 29 f.). Edgeworth's concept of 'flowscape', including material remains, ideological and symbolic implications of the human-river entanglements (Edgeworth 2011, esp. 83–106; 2017, 252, 267; 2018, 250 f.), is the theoretical frame that will be applied for the comprehension of such a dynamic relationship. The flowscape is useful to comprehend all material and immaterial aspects involved in the definition of a riverine network. By speaking of flowing networks, or meshworks (see above), it is meant to comprehend all different elements involved in the human-river relationship and to analyse them in a flowing perspective, *id est*, in their vicissitudinous and dynamic entanglement, considering both diachronic and spatial aspects. Human and natural forces as both equally active agents in the flowing network, surely with different, but interdependent roles.

3. Flowing Networks as Resources: Methods and Means

Assuming the influence of rivers on history and society via their own effectancy, the riverine flowing network can no longer be seen as a mere consequence of the exploitation of material resources connected to water,[14] but rather, exists independently and at the same time is entangled with human actions and reactions. The more appropriate question is how this network was perceived as a resource by the communities affected by and entangled with it. In order to understand this, we need to investigate how social communities and their relations are affected by networks from an emic perspective (Teuber/Schweizer 2020, 6). In this case, that means how they react to and interact with the riverine network.

Considering the river basins as microregional, geographical and cultural, limits will allow a coherent analysis of the internal relationship between landscape and material culture within a precise environment. The basins are the geographical background and define the dimensions of the network, where all exemplary cases are given with the aim of evaluating wider outcomes affecting the whole area.

13 For example see Cifani 2003 about the Tiber or Franconi 2017 about the general role of rivers in Roman history (see also Campbell 2012; 2017).

14 About water as a resource, see Teuber et al. 2020; about water as a ResourceComplex, see esp. Teuber/Schweizer 2020, 15 f.

By incorporating the material evidence of four archaeological key factors (infrastructures, settlements, sepulchral and sacral places)[15] into a Geographic Information System (GIS, on the use of GIS in network analysis, see Collar et al. 2015, 6), the groundwork is laid for a comprehensive spatial analysis, relating the human sphere to hydrological landscapes. All the information gathered in this way will combine to define the performance of the river networks in all their different aspects. As mentioned above, there are three main aspects resulting from the entangled performance of all agencies operating in the flowscape: the respective ways of living and moving in and within the flow, and how the flowscape was perceived. In this regard, the network perspective – especially while thinking the network more like a meshwork (Ingold 2011, 63–65) – will enhance our understanding of the riverine landscape not only as necessary setting, influencing different socio-natural activities, but also as a breathing active part itself of this 'web of life' (Ingold 2011, 63), where different agents are entangled together and cooperate to create and shape a precise environment.

By evaluating how certain elements are integrated and staged by people in the riverine landscape, it should be clarified how and to what extent the networks were perceived, conceptualised and exploited as resources. Showing how the network became a resource will furthermore help to understand sociocultural dynamics related to its exploitation (see Teuber/Schweizer 2020, 3). For example, the intentional staging of power expression and self-representation components on certain strategic routes along the rivers, as well as the adaptation and manipulation of communication routes in relation to the efficacy of the riverine network, will show how the entanglement with natural elements was used as a resource for an effective deployment of representation strategies or for a successful communication and exchange schedule.

4. Flowing Networks in Etruria

The two river basins cover an area which runs through the modern Italian regions Tuscany, Latium and Umbria. Both rivers flow from the Monte Amiata in Tuscany in opposite directions, since the Fiora flows towards the Tyrrhenian Sea, the Paglia towards the Tiber, of which it is still one of the largest tributaries. The Paglia (in antiquity probably Pallia, as in the 'Ravennatis Anonymi Cosmographia'; RC IV, 36, 286) is today 86km long, has a highly seasonal flow and an average discharge of 11.2m³/s; its catchment area, which also includes the river Chiana (the ancient Clanis), is about 1186.3km². The Fiora (in antiquity Armina or Armenta)[16] is 80km long with an average discharge of 12m³/s and a catchment area of 825km². The basins border each other and show some similar environmental conditions and exploitation strategies. The two rivers are not only connected by the same spring region, but also because together they formed one of the main communication systems between the coast and the hinterland in central and south Etruria. We have also evidence that this connection between the rivers was clearly recognised even in ancient times. For example, in the Tabula Peutingeriana they are depicted as if they were one and the same river.[17] This perhaps suggests that the rivers were perceived as belonging to the same system and, by flowing in opposite directions, allowed the connection between the

15 For details see Franceschini in press. The georeferenced sites and findings are based on a bibliographical survey of different publications, above all, the volumes of Studi Etruschi, Notizie degli Scavi, Fasti Online and the Annali della Fondazione per il Museo Claudio Faina; other sources include the Carta Archeologica (esp. Gamurrini et al. 1972; Cambi 1996b; Botarelli 2004; Torelli 1992; Palmisano et al. 2018; Stoddart et al. 2020).

16 The Fiora is also mentioned as Amine together with the port at its estuary in the 'Itinerarium Maritimum' (Itin. Marit. 499, 4–5) and as Armenta in the 'Ravennatis Anonymi Cosmographia' (RC IV, 32, 276).

17 See Prontera 2003, seg. IV, 5-V, 1: at the confluence with the Tiber, 'Fl. Pallia' is noted, at the confluence with the Tyrrhenian Sea one reads 'Armenita Fl.'; see also Paulus 1866, 10, who, in emphasising the important role of the rivers in the map, had already noted that some rivers are not correctly depicted. Interestingly, both the Etruscan cities that lay on these rivers, Velzna and Velch, are not depicted in the Tabula Peutingeriana: Velzna had long since been destroyed by the Romans at the time of the Tabula and replaced by Volsinii Novii (Camporeale 2013, 31, 41); Velch, which had a Roman phase, seems to have been no longer relevant in the Roman road network and in late antiquity (Nonnis/Pocobelli 1994/1995, 265 f.; Bianchi 2017, 153).

Tyrrhenian coast and the Tiber. Thus, the mental map designed in the 'Tabula' offers a glimpse into the ancient view of rivers, where their connectivity – given by springs, confluences and points of traffic and passage – was the more important aspect (Magini 2003, 10). In this regard, it must be highlighted that both rivers were – at least in some part – navigable.[18] Evidence of infrastructure and particularly river harbours,[19] offering landing at the mouth of the river and possibly near the main settlements to allow transport by different kinds of ships or barges (Bizzarri 2016, 11 f.; Pasieka 2021, 69, 71), as well as toponyms (Bizzarri 2016, 14) prove that the rivers were exploited as navigable communication routes.

In the following, the focus will lay on two areas that will be exemplary for the analysis: the area near the Monte Amiata and the 'triangle' of Sorano, Sovana and Pitigliano (*fig. 1*). The first area is a well-known and studied mining district at the source of the Paglia, where rivers, torrents and creeks play a crucial role in defining settlement strategies and in relation to mining activities. The second area is profusely characterised by the phenomenon of rock necropoleis (*fig. 5*), whose facades carved in the rock are located along streams and ditches often in sight and in relation to river routes. By combining the consideration of the four factors (infrastructures, settlements, sepulchral and sacral places; see above) in the analysis, it will be possible to present a paradigmatic picture of how the agent entangled in the flowscape shaped life, movement and perception of the riverine environment. This allows for an evaluation of the ideological impact of the exploitation of the river network as a resource for power communication and eventually, representation strategies.

4.1. Resources and Settlement Around the Monte Amiata

The Monte Amiata (in general Cambi 1996b; Botarelli 2004) has often been considered a homogeneous geographical unity, in which the mountain and its rivers are configured as supply basins, directories for settlement and possible boundaries between the territories of Rusel (Roselle), Clevsin (Chiusi), Velzna (Orvieto) and Velch (Vulci).[20] The exploitation of mineral resources in the area is attested from prehistoric times to the Middle Ages (Zifferero 1991, 202–213; Farinelli 1996, 39–55). This, accompanied by a rural economy based on agricultural and farming activities, and the exploitation of logging (Cambi/de Tommaso 1988, 472 f.; Rossi et al. 2004, 171), has been interpreted as a reason for shaping settlement strategies in the region (*fig. 2*).[21] While the prehistoric and protohistoric settlements confirm a widespread and continuous occupation of the area (Ciacci 1996, 151 f.), the Etruscan settlements were sparser and their topographic distribution appears to be motivated by the need to exploit natural resources. The Roman remains are mainly distributed along the valleys of the Paglia (affected first by a probable Etruscan road and later by a secondary branch of the Cassia) and its tributaries, or on the surrounding hillocks (Cambi/de Tommaso 1988, 472 f.; Cambi/Meniconi 1996, 105 f.).[22] Except for a few larger nuclei, only small agglomerations, houses or isolated huts are known from Etruscan times. Both these and the documented roads, as well as cult places (De Vincenzo 2015), are clearly oriented along water courses. It is possible to recognise main settlements such as Radicofani[23] and isolated stations, probably used for transhumance and strategically located along the route connecting the Paglia Valley with Monte Cetona and the territory

18 See for the Paglia: Bizzarri 2016, 11 and newly Pasieka 2021, 69–71 (with further literature); for the Fiora: Cristofani 1989, 38, 125; Pettena 2002, 81 and newly Pasieka 2021, 67, 72 note 5 (with further literature).

19 For the harbour of Pagliano: Stopponi 1999, 45 f.; Bizzarri 2016, 12 f.; for a probable harbour at the mouth of the Fiora: Pasieka 2021, especially 65, 67. These harbours, attested in different sources in Roman time, served as landing spots most probably already in the Etruscan period (in general on Etruscan harbours, see Michetti 2017, especially about the Fiora 396–398).

20 Ciacci 1996, 151; Cambi 1996a, 15 f. The Etruscan names of the cities will be used.

21 Distance from rivers at 200m, 500m and 1000m created with the algorithm: 'native:buffer' (QGIS 3.14); ancient Etruscan roads based on Lucia Botarelli in Rossi et al. 2004, 186 f., fig. 23.

22 Especially about the Etruscan and Roman viability, see Cambi/de Tommaso 1988, 472 f.; Rossi et al. 2004, 186 f.

23 The presence of a larger settlement is justified by the discovery of votive offerings and cult sites, as well as burial areas that can be related to it (Rossi et al. 2004, 179 f., 183).

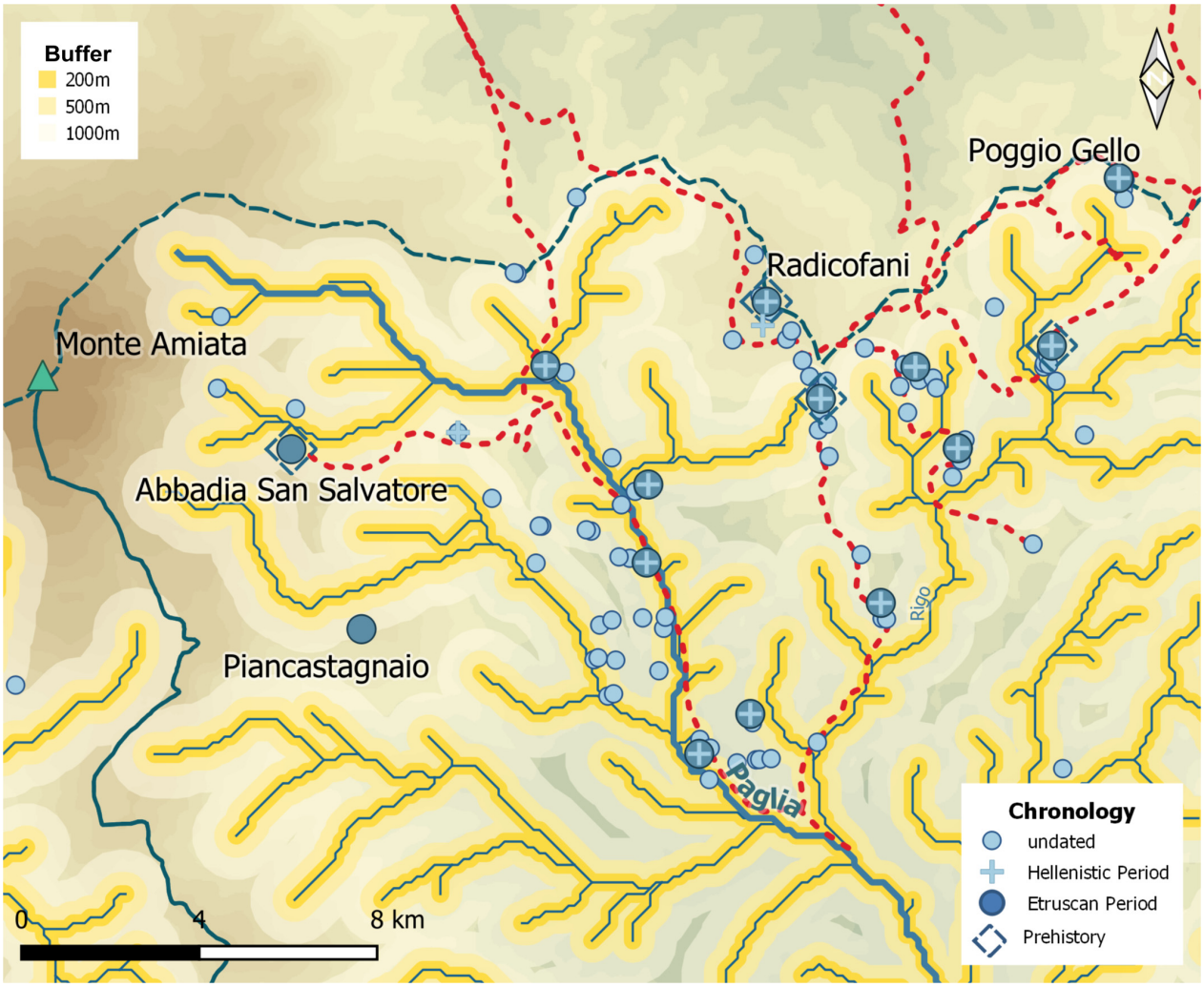

Fig. 2. Settlement at the Monte Amiata, with chronology, reconstruction of ancient streets (after Lucia Botarelli in Rossi et al. 2004, 186 f., fig. 23) and buffer of distance of 200m, 500m and 1000m from the rivers (GIS elaboration by M. Franceschini; DEM as *fig. 1*).

of Clevsin.[24] In regard to the geographical condition of the area, proximity to water was assumed to be a crucial factor for settlement. This is because it could serve as a resource itself for maintenance and for the exploitation of mining, transhumance and logging, which seems to justify the small site in inland and mountainous areas (Rossi et al. 2004, 179–182, 185 f.).

Looking at this data diachronically, the continuity of occupation underlines the role of rivers in the long term. This highlights the centrality of the riverine network, allowing reconsideration of the strategies of landscape occupation and regulation. Most of the sites aligned with the Paglia Valley or followed the Rigo, its tributary towards the north, or eventually other secondary valleys along the more direct path towards Radicofani.

Nevertheless, evaluating other aspects, such as the analysis of visibility[25] from the main centres, reveals that different components in relation to rivers determined the settlement choices: the visual control over main valleys appears to be a key factor. A closer look at fig. 2 reveals that Radicofani and the surrounding sites, for example, were relatively distant from the water, but laid along a route that was clearly visible from

24 As the material founds around Radicofani also prove, see Rossi et al. 2004, 171–173, 180 f.

25 On the use of visibility calculations in network analyses to integrate sites into a linked network see Collar et al. 2015, 13.

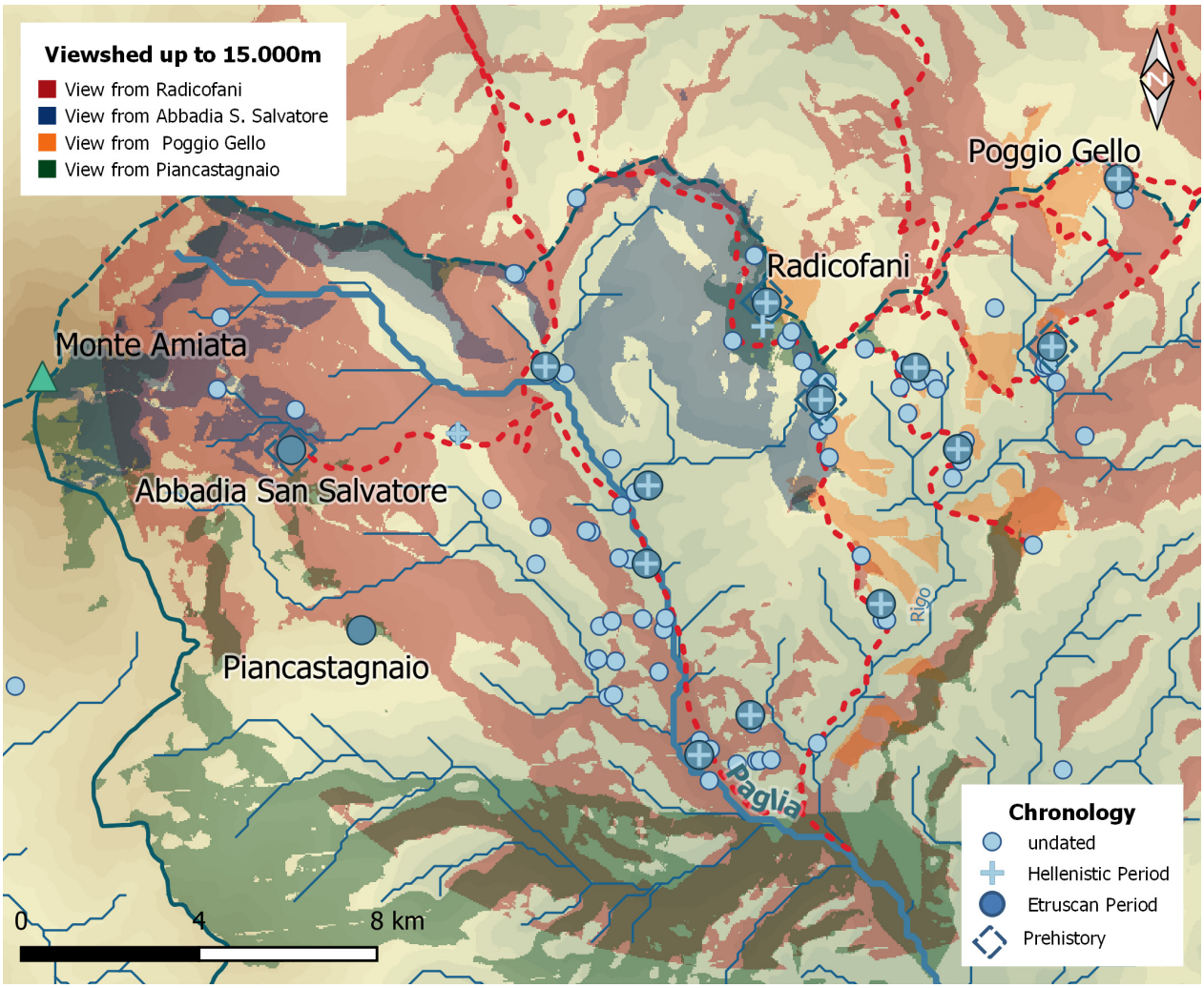

Fig. 3. Settlement at the Monte Amiata, with chronology, reconstruction of ancient streets and visibility up to 15,000m from the main sites (GIS elaboration by M. Franceschini; streets as *fig. 2*; DEM as *fig. 1*).

and controlled by the main sites located by Abbadia San Salvatore, Poggio Gello and Piancastagnaio (*fig. 3*).[26] These settlements seem to be strategically located to have a wide view over the river valley, so that occupants could see both movements and events along the ways, as well as each other. This gives the impression that there was a closed, carefully designed environmental network in which the local communities acted as an ideologically cohesive entity, connected by mutual visibility and by their common interest in sharing the riverine landscape. The priority was therefore not only the sites' proximity to the water and the exploitation of transhumance routes, but equally, the possibility of controlling the valleys and the ways of communication. In other words, the main concern was partly the exploitation of those physical and immaterial aspects of the riverine network that assist the movement and the flows of people and goods within the network. Thus, the communities react to the riverine landscape by adopting a settlement strategy which provides the positions that are safest and easiest to monitor.

The example of the settlement structure around Monte Amiata, therefore, illustrates that rivers are not only an important resource, but that the river network proved to be an even more consistent resource for the intertwined communities.

26 Visibility from the fourth settlement up to 15000m created with the algorithm: 'visibility:create_viewpont'; 'visibility:viewshed' (QGIS 3.14). See also Lucia Botarelli in Rossi et al. 2004, 185 f., fig. 22, with 'viewshed' calculated from the sanctuaries and sacred places.

The natural flowing network allowed the planning of a safe and controlled road system for the exploitation and transport of raw mineral materials and finished products that, once they had entered the Paglia circuit, could move towards both Velzna and Clevsin. It also influenced the settlement patterns along the valley, defined their mutual relationship and helped to ensure long-lasting prosperity. Control over river resources meant controlling life and movement in the area and reflected the perception of the local communities over themselves and the flowscape. Thus, the conscious design of a settlement and road network demonstrates how the river system was understood and exploited as a resource, guaranteeing exchange and interconnection between the sites.

4.2. Resources and Burial Landscape Between Pitigliano, Sorano and Sovana

The three settlements of Pitigliano, Sorano and Sovana were under the influence of Velch, with fluctuating fortunes. Geographically, they were located between the Fiora and the Paglia, and between Velch and Velzna. Thanks to their border position and their proximity to the river branches, they were predestined to become relevant nodes within the communication system between the two river basins.

Based on the distribution of settlements, outposts and infrastructure,[27] as well as the spread of objects of various origins, a path can be reconstructed for the Archaic period, connecting the river basins of both Paglia and Fiora rivers. This went along the Fiora up to approximately Sovana and Pitigliano. Here, the way deviated eastwards, following the tributaries of the Fiora (the Calesina near Sovana and the Lente near Pitigliano and Sorano, whose dependence on Pitigliano is proven at least for the archaic phase).[28] Near Aquapendente, the road ran alongside the tributaries of the Paglia and then the Paglia itself, which it followed up to Velzna and the Tiber.[29] The reconstruction of the route is not unambiguous, as the route may have followed several deviations; the most important is the one that passes through Sovana (which was probably also the linking node to the Albegna valley in the east and the Bolsena Lake in the southwest, see Maggiani 2003b, 87) instead of Pitigliano. It is, indeed, interesting that, calculating the 'least cost path' between Velch and the Paglia to Velzna, the easiest route seems to have been the one leaving the Fiora in the direction of Pitigliano and Sorano (red in *fig. 4*).[30] Since the route through Sovana (orange in *fig. 4*) is not the easiest nor the direct one to reach the neighbouring valley, the effort to involve Sovana in this exchange route appears even more significant. Apart from their navigability,[31] the rivers provided the conditions to enable both overland routes, favoured by the lower valleys in the hilly landscape. Thus, the rivers acquire (again) a central role in creating and maintaining the communication network.

Being central nodes along the route (following the course of the Fiora, the Paglia and their tributaries) that connects the important Etruscan metropolises of Velch and Velzna, the valley of both rivers and the mining region with Etruria Tiberina (Maggiani 2003b, 55; Amann/Ruggendorfer 2014, 407; Bianchi 2017, 16 f.), Sovana, Sorano and Pitigliano gain great importance through the centuries. Thus, the prosperity and development of the settlements depended on the exploitation of the route along this riverine network (Bianchi 2017, 55).

27 For example, bridges which are well known on the route; see, for the Paglia, the Ponte Giulio, the bridge in Loc. Colonnacce and the one by the harbour of Pagliano (Stopponi 1999, 45 f.; Bizzarri 2016, 12).

28 About this route and its commercial importance for the communities of the tree settlements, and especially for Sovana and Pitigliano see Pellegrini 1989, 137 f., 140; Ciacci 1996, 153; Pellegrini/Rafanelli 2004, 57 f.; 2007, 210–212.

29 The presence of such a route along the Paglia is attested until the Middle Ages (see Rossi et al. 2004, 214, fig. 55). Other routes derived earlier from the Fiora and flanked Pitigliano to the south, reaching Lake Bolsena and then Velzna (Pellegrini/Rafanelli 2007, 211 f. note 119); another way, further south and leaving the Fiora at Ischia di Castro, is also attested (Salamone 2011, 14 f., fig. 4.4).

30 'Least cost path' created with the algorithm: 'cost distance analysis:Least Cost Path' (QGIS 3.14). The route through Sovana has been calculated first from Velch to Sovana and second from Sovana to Velzna. The forced resulting path differs only in the detour to Sovana (orange in *fig. 4*).

31 Which is attested at least for some parts of the Paglia and the Clanis (Bizzarri 2016, 11) and for the Fiora (see Cristofani 1989, 38, 125; Pettena 2002, 81); see also Cifani 2003, 32 f. and Pasieka 2021, 65, 67, 72 note 5 (with further literature).

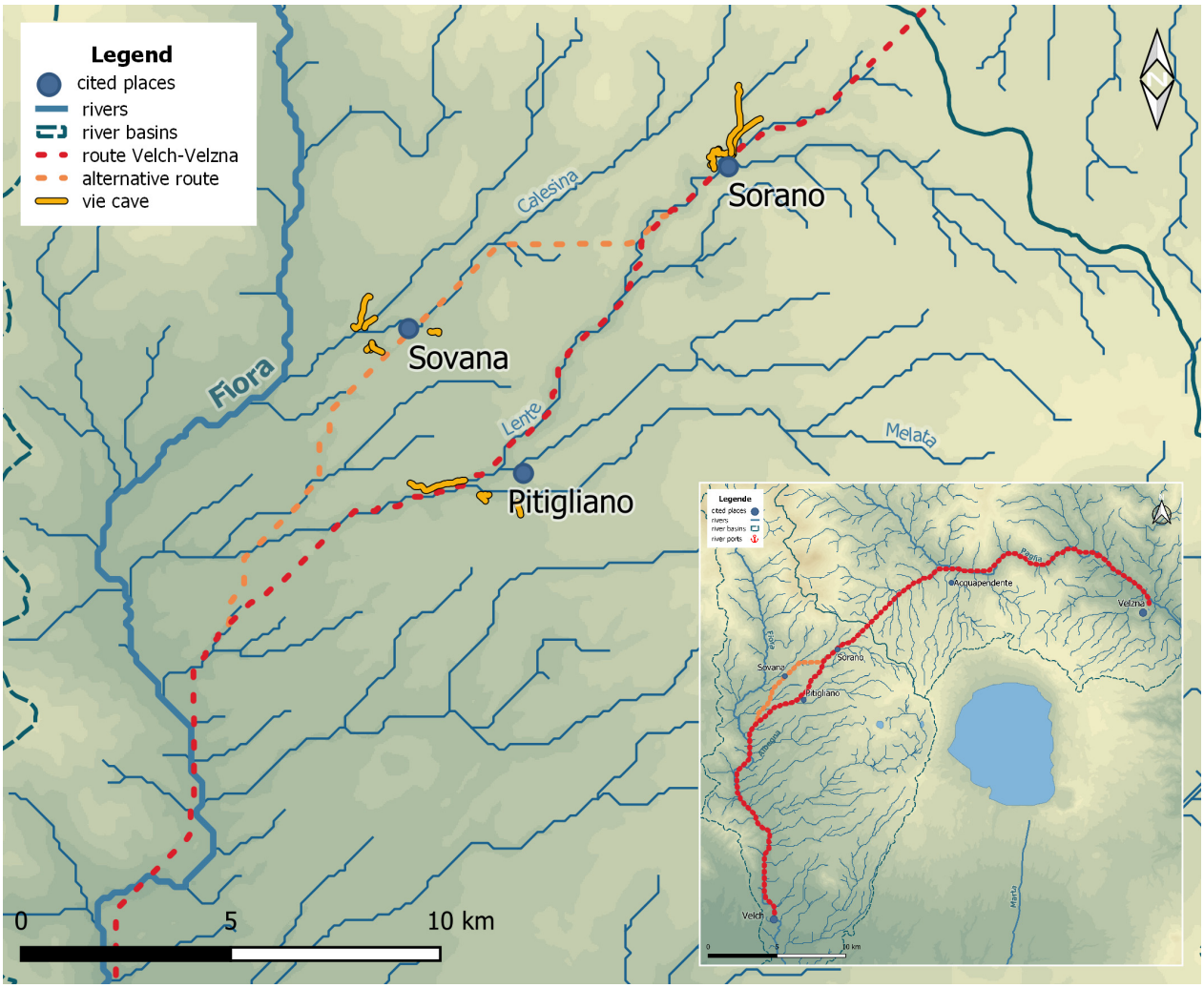

Fig. 4. The way between the Fiora and Paglia Valley calculated via 'least cost path'; some of the *vie cave* are shown in yellow (GIS elaboration by M. Franceschini; DEM as *fig. 1*).

The oscillating of the commercial route over the centuries between Pitigliano and Sovana also highlights the competition between the settlements controlling the routes, following the valleys of the tributaries of the Fiora, thus exploiting the riverine network. This is clear by adding another factor to the analysis and considering the sepulchral landscape. Along the route are numerous *vie cave* (excavated roads, see amongst others Germogli/Nanni 2005; Barbieri 2011b; yellow in *fig. 4*) and *necropoli rupestri* (necropoleis carved into the cliffs). The wealth seen in the tombs is determined both by the positive economic situation, due to the control of the river routes and by the symbolic use of the route as a stage for power representation (Amann/Ruggendorfer 2014, 407 f.). The sumptuous burials and the grave goods coming from both Velzna and Velch suggest the alternating phases of the network of exchanges associated with the river routes (for an overview see Maggiani 2003b). This allows one to follow and understand the changing fates of various routes and attests to the economic importance of this network for the control of inland trade. Pitigliano flourished from the Orientalising period (Maggiani 2003b, 77–81) and Sovana from the Archaic period (Maggiani 2003b, 81–83; Turchetti/Maggiani 2019). Both settlements enjoyed great fortune due to their position on the trade routes until the reorganisation of the territory under the influence of Velch, which saw their consequent decline between the 6th cent. BC for Pitigliano and the second quarter of the 5th cent. BC for Sovana (Maggiani/Pellegrino 1985, 68–94; Maggiani 2003b, 87; Bianchi 2017, 56–60).

Fig. 5. Sovana, Tomba della Sirena (Universitätsbibliothek Heidelberg, Dennis 1848, 480; <https://doi.org/10.11588/diglit.785#0588> [last access: 09.01.2021] CC-BY-SA-3.0).

During the 4th cent. BC, when the area recovered economically and commercially, Pitigliano lost its dominant role along the road in favour of Sovana (Munzi 2001, 43; Maggiani 2003b, 90; Bianchi 2017, 111 f.). Here, during the Hellenistic period, the funerary architecture reached its peak with monumental constructions (*fig. 5*), reminiscent of funeral architecture and semantics known from Macedonia and Asia Minor (Maggiani 1994, 138, 142, 145; Amann/Ruggendorfer 2014).[32] It seems likely that, from then on, the emerging social groups of Sovana controlled the trade routes to the hinterland (Maggiani/Pellegrino 1985, 97 f.).[33] The tombs were built along communication and commercial routes and were planned to be visible, to show the prosperity of their owners (Amann/Ruggendorfer 2014, 408). Their precisely considered and convenient position proves the importance of the chosen route within the different valleys and the relevance of the communication routes, both in practical and ideological ways.[34] In this sense, the riverine network can be read as a resource, not only because it makes exchange possible and facilitates movement in the hilly landscape, but also because it provides the setting for an effective display of power and economic superiority, and for staging self-representation strategies.

The rivers remained the central element dictating the direction of the road, to which disparate infrastructure had to adapt. The rivers were certainly navigable, even if only partially, as evidenced by literary sources and river ports (see above); in part, the valleys carved by the waterways themselves provided a backdrop to comfortable roads, sometimes the only ones in a hilly and fractionated landscape. The *vie cave* between the valleys are witnesses to the anthropic manipulation of the landscape, to guarantee, among other things, the connection between secondary valleys, thus improving the accessibility and visibility of the necropoleis. It is precisely this network of social and commercial connections enabled by the river network that allowed the sites which depended on it to flourish. The awareness of the importance of the river network for the entangled communities is made evident by the arrangement of *vie cave* and necropoleis. Such an intentional and massive alteration of the landscape to connect the valleys to the river, and thus to ensure the visibility of the burials in and from strategic points, reveals a clear and lucid understanding of the role of the riverine socio-natural network as an indispensable ideological resource for the community, able to ensure connectivity and regulate the exchange network.

5. Conclusions

Focusing on the microregional example of the basins of the Paglia and Fiora rivers in the Etruscan period, it is evident how the entangled network of social and natural actions and reactions – created and affected by the rivers – became itself a

32 To be mentioned are, for example, the Tomba Ildebranda and the Tomba Pola (both with a columned façade, see Maggiani 1994, 122 f., 135–137, 148 f.), the Tomba dei Demoni Alati (Barbieri 2010) or the Tomba della Sirena (*fig. 5*; Franzoni 2014, with further literature).

33 Sovana prospered further in the 3rd cent. BC, probably thanks to its political proximity to Rome (Maggiani/Pellegrino 1985, 104–106; Barbieri 2011a, 116 f.).

34 As, for example, has been pointed out by Rajala regarding the territory of Nepi (Rajala 2015, esp. 112 f., 119 f.).

resource for ancient communities connected with it. By summarising the results obtained from the analysis of factors related to the strategies of settlement and movement, to the local communities' perception of the landscape as well as to the ritual evidence, which in turn responds to very specific representative and self-representative needs, a more complex picture emerges. The indissoluble relationship that exists between these aspects is epitomised in a flowscape in which life, movement and thought are entangled in the flow. Human and natural agents as well as landscape elements cannot exist in the flowscape independently of each other, but rather act and react reciprocally. Therefore, the ways of living and moving in and with the flow result in shaping the riverine network both practically and ideologically, revealing also how the local communities perceived themselves as part of a broader entity and as part of a breathing landscape. Furthermore, thinking about and within the flowscape also means understanding its representative potential linked to various ritual expressions (in this case, sepulchral) and to power dynamics.

With special emphasis on the influence of the interaction between rivers and society on settlement and communication strategies, riverine networks unfold great potential and reveal themselves as powerful resources. These resources served to improve social and cultural mobility, and affect cultural history on a multi-scale level, thus emphasising the polyvalence of the rivers. The settlement strategies and the manipulation of the surrounding landscape clearly show that local communities perceived the river network as a vital resource and therefore adopted strategies to intensify its exploitation. River systems modelled and defined the landscape, eventually enabling good living conditions and comfortable routes for exchanges of materials and ideas. In this way, rivers practised their effectancy on communities, which consequently perceived the possibility of controlling and manipulating river networks as desirable resources. The more important the route and the more intensive the control, the clearer the value of this socio-natural network, establishing it as an ideological resource, a catalyst of social and power dynamics. Placing the river network at the centre of the analysis, not as a mere receptor, but as a medium of human action, allows us to evaluate its potential as a resource. It seems evident that the active role that rivers played in shaping the landscape was understood and exploited as such by ancient communities, whose natural and social networks were inextricably intertwined in defining their history.

Mariachiara Franceschini
Albert-Ludwigs-Universität Freiburg
Institut für Archäologische Wissenschaften
Abteilung Klassische Archäologie
Friedrichstraße 39 (Fahnenbergplatz)
79098 Freiburg, Germany
mariachiara.franceschini@archaeologie.uni-freiburg.de
ORCID-iD:
https://orcid.org/0000-0003-1768-4720

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Francesca Fulminante

From Interlocking Regional Networks to Globalised Polity

Secondary Settlements as Middle Ground in Resource Networks of Ethnic, Social, Economic, and Political Change in Pre-Roman and Roman Italy

Keywords: Network analysis, pre-Roman Italy, Romanisation, Latium, Etruria, material culture

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Summary

Cities are fast developing into extensive webs of interaction, supported by rapid transport and real-time communication networks that become resources for economic, social, and political change. Therefore, urban networks and networked cities are becoming an increasingly dominant theme of research and international political planning.

This paper adopts a network approach and uses affiliation networks to analyse trade and exchanges in central Italy (1000 BC–100 BC/AD), indicated by the circulation of different types of objects (pottery, metal objects, ornaments of precious metals and materials) and architectural decoration styles, to assess the respective and alternate role of primary and secondary settlements in these regional and interregional networks, which constitute essential resources for pre-Roman communities first and Romanised communities later.

In this way, this paper connects with previous works by the author on the emergence of early Rome (Bronze/Iron Age) to recent perspectives on Roman Italy, and sheds new light on the specific role of secondary settlements within emerging integrated networks of interaction. Such networks represent resources and agents of ethnic, socio-economic, and institutional changes in the Italian peninsula, which led from the creation of interlocked networks of regional nucleated, more or less hierarchical districts, organised in the different pre-Roman cultural groups, to the emergence of Rome and the progressive Romanisation of these peoples into a wider globalised polity.

1. Introduction: The Approach of Networks to Roman Globalisation

Urban networks and networked cities are becoming an increasingly dominant theme of research and international political planning. For example, J. P. Taylor and D. Derudder (2003) have adopted an interlocking network structure model to evaluate the importance of leading world cities as resources of contemporary globalisation. As noted in the introduction to this volume, however, conceptualising networks as resources of change is a framework only recently brought to attention in international agendas, especially with reference to the ancient world.

Adopting a structural network perspective, recent work by the author as a Marie Curie Researcher at the University of Roma Tre addressed structural relationships among settlements in central Italy during the Early Iron Age to better understand the formation of the first cities in Europe. This work conceptually relates to structuralist and constructivist perspectives in that it is not only the attributes of agents that are important for understanding their social actions but also their relationships and their reciprocal position within wider structures (Bourdieu's 'reality is relational' see Bourdieu [1994] 2009), or Latour's Actor-Network Theory (Latour 2005).

The author investigated terrestrial and fluvial transportation networks both as natural resources and as resources of commercial, political, and socio-economic integration. By taking a comparative perspective on Etruria and Latium vetus, two competing and neighbouring cultural and ethnic groups in central Italy, located respectively to the north and to the south of the Tiber (*fig. 1*), and by analysing the efficiency of fluvial and terrestrial network infrastructures in these two regions, our understanding of the rise of Rome in Italy has been advanced. Through an interdisciplinary collaboration with some physicists (Luce Prignano, Sergi Lozano, and Ignacio Morer), we have been able to show how a smaller, more compact, and hierarchical region like Latium vetus had a structural advantage over the larger but more heterarchical Etruria (Fulminante et al. 2017; Prignano et al. 2019; Fulminante 2020; in press; forthcoming).

By using innovative modelling techniques, we have revealed how Etruria adopted an apparently co-operative model in which no single city was able to dominate the others; in contrast, Latium vetus was characterised by harsh competitive behaviour that can be explained by the dominant political and military policies of Rome (Fulminante et al. 2017). Interestingly, by departing from the opposite perspective of the analysis of the Etruscan settlement system and countryside, a number of scholars, such as Simon Stoddart and other authors (Stoddart et al. 2020; Stoddart 2020), have developed a similar understanding of the power dynamics within and between the two regions.

At the same time, recent work on Romanisation, especially adopting new post-colonial perspectives, has shifted the focus from the conqueror and the dominator and has highlighted the role of middle-range and local settlements in the success of Roman policy and their importance in the wider supra-regional and even global network of the Roman economy. This has been shown clearly in the book 'The Economic Integration of Roman Italy. Rural Communities in a Globalizing World' edited by Tymon de Haas and Gis Tol (2017). In this volume, Willem Jongman shows how the passage from pre- and proto-urban to urban setting in Italy is characterised by steady demographic growth, both urban and rural, incrementation of consumption of meat and production of larger animals, use and consumption of both fine ware and common ware, all trends with a peak around the 1st cent. BC/AD, and especially in the Augustan Era (Jongman 2017; see also Patterson 2006). To some extent, all these improvements could be explained with better technology and advances in agricultural techniques that would allow greater productivity. This is certainly true but, as Jongman puts it, these are not subsistence activities: 'these goods were produced for a market, and often the urban market. That presupposes a network of market integration, of transportation and information, and occasionally of rural manufacturing. Without the connection provided by minor centres that would have been harder' (Jongman 2017, 27).

In the same volume, Tymon de Haas takes a supra-regional perspective and analyses demand, distribution, circulation, and production processes

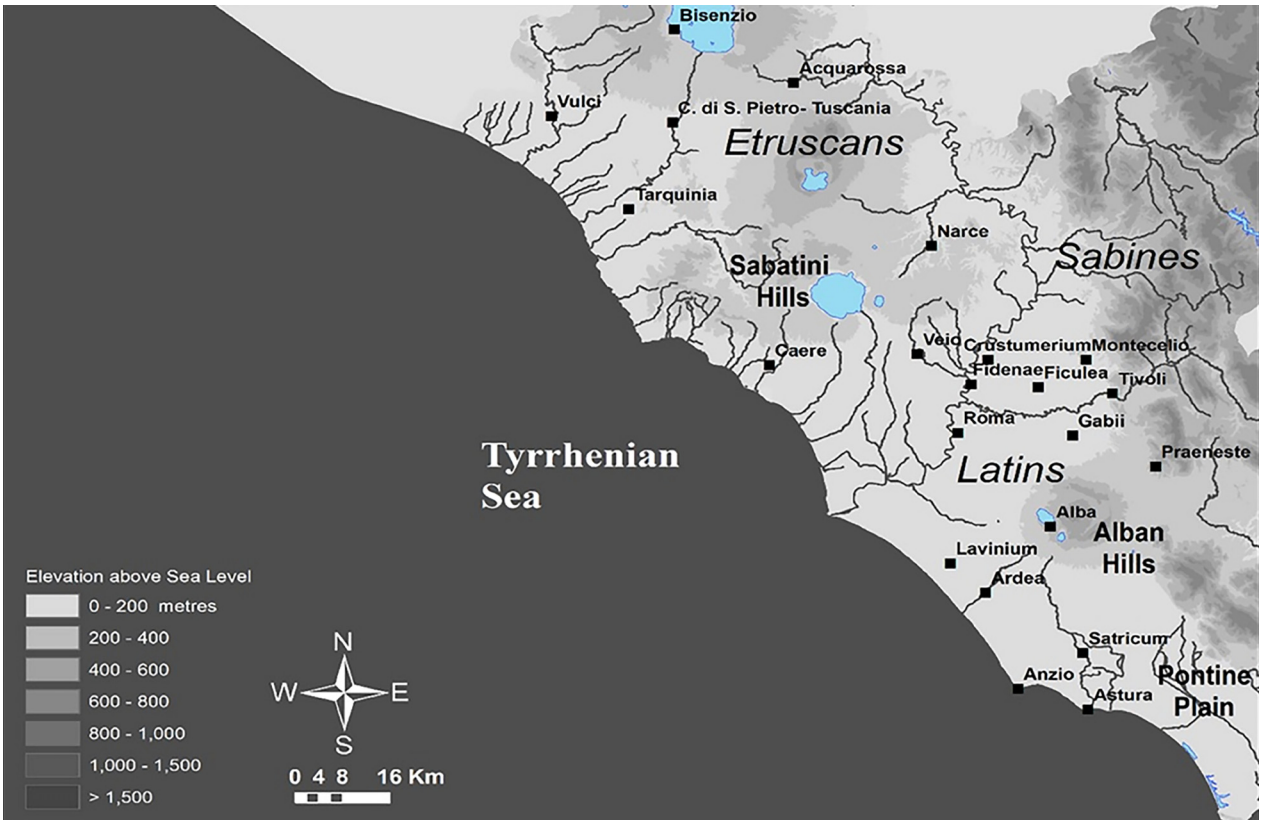

Fig. 1. Southern Etruria and Latium vetus in Central Italy (drawn by F. Fulminante).

and their role in the development and integration of rural economies in Roman Italy. Among other points, he concludes that urban demand was unevenly distributed in Roman Italy, and that often urban markets were too far away to serve the needs of rural populations. Minor centres such as *vici*, roadside stations, sanctuaries, and other nucleated settlements therefore served as marketplaces, on a temporary basis or also permanently. In highly urbanised areas (where rural densities were also high), demand may have been so substantial as to stimulate the development of minor centres, as secondary or tertiary marketplaces (de Haas 2017).

Robert Witcher and other authors within the re-evaluation of the pioneering South Etruria Survey, as part of the broader Leverhulme Tiber Valley Project, have also emphasised the integral role of local centres and markets in the development of the regional settlement network which underpinned the emergence of the first Mediterranean metropolis – imperial Rome and their integration in the wider global economy of the Roman empire (Witcher 2017a, 2017b; Patterson et al 2020). Recently, Cristopher Smith (2020) has further discussed these previous perspectives.

This paper aims to assess the role of these minor centres, by means of formal quantitative analysis to provide further data for this discussion and further proof for these viewpoints. To do this, the present contribution adopts a network structure approach and uses affiliation networks to analyse trade and exchanges in central Italy (1000 BC–100 BC/AD), indicated by the circulation of different types of objects (pottery, metal objects, ornaments of precious metals and materials) and architectural decoration styles, to assess the respective and alternate role of primary and secondary settlements in these regional and interregional networks through time. This will permit a long-term perspective on the complex dynamics of central Italian settlement structure as a resource of change and evolution across the 1st mill. BC, tracing the transformation of Rome from a village to a metropolis and the changing dynamics among local hierarchies.

2. Historical and Geographical Context: Settlement Dynamics in Central Italy from Prehistory to the Roman Era

When considering settlement dynamics (*table 1*), a process of nucleation and centralisation of settlements between the end of the Bronze Age and the beginning of the Early Iron Age in southern Etruria and Latium vetus on the large plateaus later occupied by the cities of the Orientalising and the Archaic periods is now well established (di Gennaro/Peroni 1986; Pacciarelli 2001, 119–136; 2017; Vanzetti 2002; 2004; di Gennaro/Guidi 2009; Bonghi Jovino 2005; Guidi 2006; 2008; 2010; Bietti Sestieri 2010; Fulminante 2014, 44–47).

The process is generally considered more rapid and revolutionary in southern Etruria, where small, dispersed villages of the previous Bronze Age (average of 5–6ha and sometimes up to 20–25ha) were abandoned during the Final Bronze Age 3 (between the second half of the 11th and the first half of the 10th cent. BC). At the same time, the big plateaus (usually between 100 and 200ha), that would become the sites of the future historical cities (Veio, Tarquinia, Caere, Vulci, Bisenzio, and Orvieto), were extensively occupied by a patchwork occupation with hut compounds interspersed with gardens and allotments. It has been calculated that an average of 15–20 villages were abandoned for the formation of each large proto-urban centre (di Gennaro/Peroni 1986; di Gennaro/Guidi 2009; Guidi 2008, 176 f.; Pacciarelli 2001, 128–136).

In Latium vetus, the process was more gradual and slightly delayed. Occupation of the large plateaus occurred during Latial Phases IIA and IIB (between the second half of the 10th and the first half of the 9th cent. BC), plateaus often on the side of the small Acropoleis already occupied during the previous Bronze Age (di Gennaro/Guidi 2009; Pacciarelli 2001, 119–128; Guidi 2008). Recent studies, however, have emphasised that in both regions there were more varied and different specific cases and exceptions to the general trends than previously thought, and therefore the two regions are probably more similar than previously assumed (Fulminante/Stoddart 2012). Later, during an advanced stage of the Early Iron Age (Early Iron Age 1 Late, around the first half of the 9th cent. BC) in both southern Etruria and Latium vetus, satellites and secondary centres were founded by proto-urban centres. This created a settlement hierarchy of 2–3 tiers with primary settlements generally larger than 100ha in Etruria and generally larger than 40–50ha in Latium vetus, but sometime also between 25 and 50ha, and small secondary settlements always smaller than 15–20ha (Pacciarelli 2001, 115–136; Fulminante 2014).

Following this, during the Early Iron Age 2 (second half of the 9th and first half of 8th cent. BC), a series of changes occurred that enabled a better definition of the limits and internal organisation of large proto-urban centres progressing towards urbanisation. In particular, around the mid of the 8th cent. BC it is possible to detect:

(1) demographic growth of emerging urban centres, testified by an increased intensity of settlement sites on surveyed plateaus (for example, Cerveteri: Iaia/Mandolesi 2010);
(2) a progressive definition of the limits of emerging urban centres with a) the concentration of sites within the limits of the plateaus and the abandonment of sites on the external slopes (for example attested at Gabii: Guaitoli 1981), and b) the realisation of symbolic (as in the case of Rome: Carandini/Carafa 2000) or more functional fortifications (Fontaine 2002/2003; Fontaine/Helas 2016; Moretti Sgubini 2006; Boitani et al. 2008; Cataldi et al. 2008); and
(3) the internal organisation of these emerging urban centres with the creation of communal spaces for assemblies and communal foci of cult activity and special larger residencies probably occupied by royal families or aristocratic elites (for Tarquinia: Bonghi Jovino/Chiaramonte Treré 1997; Bonghi Jovino 2008; for Rome: Carandini 2007).

At this time, around the mid of the 8th cent. BC, there is also a more dense and widespread occupation of the territory by urban elites, with small aristocratic settlements dispersed around the countryside that lead the settlement hierarchy to 3–4 level tiers with primary settlements (various orders, generally larger than 100ha but sometimes between 25 and 100ha), secondary settlements (always smaller than 15–20ha), and small high status settlements in the countryside generally indicated by small burial grounds (De Santis 1997;

Pre-urban	Pre-urban/ proto-urban	Proto-urban		Proto-urban/ urban	Urban		
Final Bronze Age 1–2 (Proto-villanovan)	Final Bronze Age 3 (Latial period I)	Early Iron Age 1 Early (Latial period IIA)	Early Iron Age 1 Late (Latial period IIB)	Early Iron Age 2 (Latial period IIIA–IIIB)	Early and Middle Orientalising period (Latial period IVA)	Recent Orientalising period (Latial period IVB) & Archaic period	Republican period
1325/1300–1050/1025 BC	1050/1025–950/925 BC	950/925–900 BC	900–850/825 BC	850/825–750/725 BC	750/725–640/630 BC	640/630–509 BC	509 BC–100 AD
Dispersed Villages	Nucleation and centralisation of settlements	Large proto-urban centres		Definition of limits or emerging urban centres and internal organisation	Urban realisation	Urban monumentalisation	Urban intensification and globalisation
-	-	-	Foundation of secondary centres	Capillary colonisation of the countryside			Increased and growing density of occupation of the countryside
Settlement hierarchy 1/2 tiers	Settlement hierarchy 1/2 or 2/3 tiers	Settlement hierarchy 2/3 or 3/4 tiers		Settlement hierarchy 3/4 or 4/5 tiers			Settlement hierarchy 4/5 or 5/6 tiers

Table 1. Settlement dynamics in central Italy between the end of the Final Bronze Age and the end of the Republican period (by F. Fulminante).

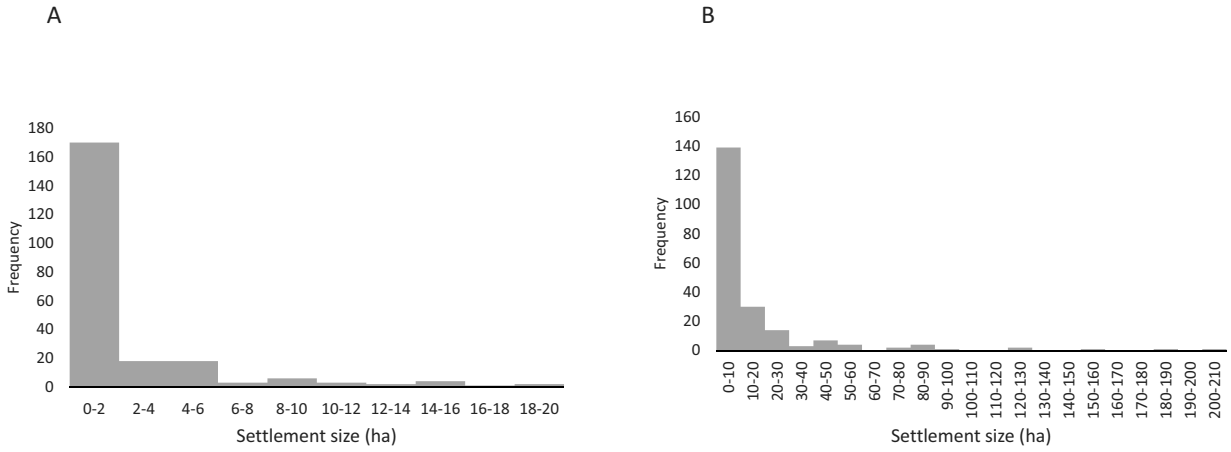

Fig. 2. Examples of Size Frequency Diagrams: A) Final Bronze Age 1–2; B) Early Iron Age 2 (graph by F. Fulminante).

Iaia/Mandolesi 2010; Fulminante 2014, 47). By the end of the 8th cent. BC, urban centres are fully defined and they will only be consolidated and monumentalised with the later Orientalising and Archaic periods (7th to 6th cent. BC) (Carandini 2003; 2007; Fulminante 2014, 249–260; Cifani 2008; 2014; Hopkins 2014; 2016).

Leaving aside the different opinions on the 5th cent. crisis[1] (Colonna 1990; Patterson et al. 2004), what follows, as already mentioned in the introduction, is a period of prosperity and growth of the Roman economy in Italy in varying dimensions (Jolivet et al. 2009; Jongman 2017), favoured by the conquering but also unifying polity of Rome (for a recent review of Roman early history up to the Republican period see Bradley 2020). This saw a growing and ever denser activity in the rural areas (Patterson 2006; for the northern hinterland of Rome see Patterson et al. 2020; Carafa 2000) and a growing market integration with a rise of the role of secondary centres (de Haas 2017).

3. Data: Settlements and Artifacts

For this study, southern Etruria and Latium vetus settlements between the beginning of the Early Iron Age and the end of the Archaic period have been analysed. Latium vetus settlements had already been examined in another work by the present author (Fulminante 2014) and other works on the same region by Luca Alessandri (2007; 2013). For southern Etruria, the Repertorio dei Siti Preistorici e Protostorici della Regione Lazio (Belardelli et al. 2007), the Dictionary of the Etruscans (Stoddart 2009), and the work by Marco Rendeli (1993) on the territorial organisation of southern Etruria in the Orientalising and Archaic period have been fundamental. In addition, the list of settlements has been updated on the basis of more recent publication in 'Studi Etruschi' and most important conference proceedings (e.g. the series 'Preistoria e Protostoria in Etruria' and 'Annali della Fondazione per il Museo 'C. Faina'') and exhibition catalogues (e.g. Della Fina/Pellegrini 2013). These settlements are primarily known from either excavation or survey, although geophysical prospection has also been used in recent years (teams led by the British School at Rome and the University of Siena).

Firstly, Latin and Etruscan settlements were classified as central places or secondary centres according to their size because historical and archaeological knowledge of the region has already established a correlation between size and importance of the settlement. For the Bronze Age,

1 Some authors, who based their opinions mainly on the funerary evidence and the material culture, identify a time of crisis and degeneration in the 5th cent. BC (Colonna 1990); the evidence of surveys, however, is ambiguous, indicating a decrease in the number of sites according to Quilici/Quilici Gigli (1980; 1986; 1993), on the contrary a growth is claimed by Carafa/Capanna (2009) and Carandini (2009). Finally, the results of the re-evaluation of the south Etruria survey seem to suggest, if not a crisis, at least an interruption of growth and a stasis in the number of settlements (Patterson et al. 2004; 2020).

Reference	Period	Class/ Material	Region
Barbaro 2010	FBA	Pottery/Decoration	Etruria
Ampolo et al. 1980	EIA	Pottery	Latium
Bartoloni et al. 1987	FBA–EIA	Pottery	Central Italy
Ten Kortenaar 2011	OP	Pottery	Central Italy
Neri 2010	OP	Pottery	Central Italy
Biella 2014	OP	Pottery	Faliscan Area
Micozzi 1994	OP	Pottery	Central Italy
Giovannelli 2015	OP, AP	Luxury Goods	Central Italy
Szilagyi 1992–1998	OP, AP	Pottery	Central Italy
Winter 2009	OP, AP	Architectural Decorations	Central Italy
Shoe Meritt/Edlund-Berry 2000	AP/RP	Architectural Decorations	Central Italy
Michetti 2003	RP	Pottery	Central Italy

Table 2. Pottery productions from the Final Bronze Age to the Republican period and luxury items and architectural decorations of the Orientalising and Archaic periods considered in this study. FBA = Final Bronze Age; EIA = Early Iron Age; OP = Orientalising period; AP = Archaic period; RP = Republican period (by F. Fulminante).

settlements larger than 6ha were considered central places while for subsequent ages settlements larger than 15–20ha were considered primary. These thresholds have been established on settlements size distribution frequency diagrams (*fig.* 2) and on similar thresholds established by Barbara Barbaro and Francesco di Gennaro for Etruria in the Bronze Age (di Gennaro 1986; Barbaro 2010; di Gennaro/Barbaro 2008) and by Marco Pacciarelli and Alessandro Guidi for Etruria and Latium vetus in the Early Iron Age (Guidi 1985; Pacciarelli 2001). These thresholds are also coherent with studies of comparative urbanism and economic geography according to which a density and 'urbanity' threshold between first order and lower order settlements can be generally established between settlements larger and smaller than 10–15ha (Fletcher 1995).

The distribution of pottery and metal productions from the end of the Bronze Age to the end of the Archaic period as well as luxury items and architectural decoration for the later periods (Orientalising and Archaic periods) have been used to reconstruct cultural interactions in the two regions in the considered periods. Comprehensive synthetic works concerning various classes of materials detailed in table 2 and 3 have been fundamental sources in establishing cultural and economic links among the settlements. Only materials published in these sources have been considered, and therefore distribution patterns could be biased by unpublished material and by uneven density of study or excavation among sites. However, these biases are relatively less important when looking for general trends comparing the two regions because, when considering the whole datasets, both regions would be affected by these biases in a similar way.

4. Methodology: Two-Mode Networks, Affiliation Networks, Centrality, Density, and Distance

The first step in network analysis is the creation of a dataset. A fundamental feature of how the nodes relate to one another is the network's mode (i.e. one-mode and two-mode graphs). A one-mode graph establishes connections between comparable types of actors, namely connections between people, connections between cities, and connections between texts, etc. In a one-mode social

Reference	Period	Class/Material	Region
Savella 2015	FBA	Bronze	Italy
Bianco Peroni 1979	FBA, EIA, OP	Bronze	Italy
Bianco Peroni 1970b	FBA, EIA, OP	Bronze	Italy
Bianco Peroni 1970a	FBA, EIA, OP	Bronze	Italy
Carancini 1975	FBA, EIA, OP	Bronze	Italy
Carancini 1984	FBA, EIA, OP	Bronze	Italy
Iaia 2005	EIA	Bronze	Central and North Italy
Ampolo et al. 1980	EIA, OP	Bronze	Central Italy
Sciacca 2005	OP	Bronze	Italy
Geiger 1994	OP	Bronze	Italy
Tomedi 2000	OP	Bronze	Italy
Marzoli 1989	OP	Bronze	Italy
von Hase 1969	EIA, OP	Bronze	Italy
Woytowitsch 1978	FBA, EIA, OP, AP	Bronze	Italy

Table 3. Metal production from the Final Bronze Age to the Orientalising period considered in this study. FBA = Final Bronze Age; EIA = Early Iron Age; OP = Orientalising period; AP = Archaic period; RP = Republican period (by F. Fulminante).

network, actors or cities connect directly to other actors or cities. Two-mode graphs do not measure such direct connections between actors, individuals or cities, but rather measure connections between actors and events. For the purposes, actors and events can be defined quite broadly. For example, it may be assumed that if two places adopt the use of the same style of object or create objects with the same style of production, some sort of connection exists between them.

This assumption, on which most traditional theories of trade and contacts are based, might seem simplistic and reductive and has been subject to revisions and critical assessment (see for example the discussion in the classic archaeological manual in Renfrew/Bahn 2004, 357–390). However, the focus of this analysis is not cultural transmission but measuring the degree of activity and contacts of different types of settlements: primary and secondary. Therefore, the traditional assumption that two places which have the same object/style/technology must have been in contact somehow (even if the means and possible middle points of these contacts cannot be identified) is still valid and sufficient for the purpose of this paper. Therefore, in this paper, networks are reduced from bi-modal to uni-modal through affiliation networks. These are called this way because they link social actors or cities through the social event in which they are affiliated, in our case using or producing the same type of pottery/object/architecture. Then it is possible to measure the resulting uni-modal networks and classify them according to different characterising indexes and measures detailed below and discussed in the following section.

To obtain the Latin and Etruscan cultural networks, in the first instance bi-modal networks of sites and types of objects[2] have been created for the Etruscan and Latin region together. In bi-modal networks, each type of object is linked by a line to the site in which it has been attested (*fig. 3A*). Secondly, bi-modal networks of object types and sites have been reduced to uni-modal networks (*fig. 3B*) using the function NET>TRANSFORM>2-MODES to

2 The different classifications and typologies created by the different experts of different types of material culture have been used. For more details see the mentioned volumes in table 2 and 3.

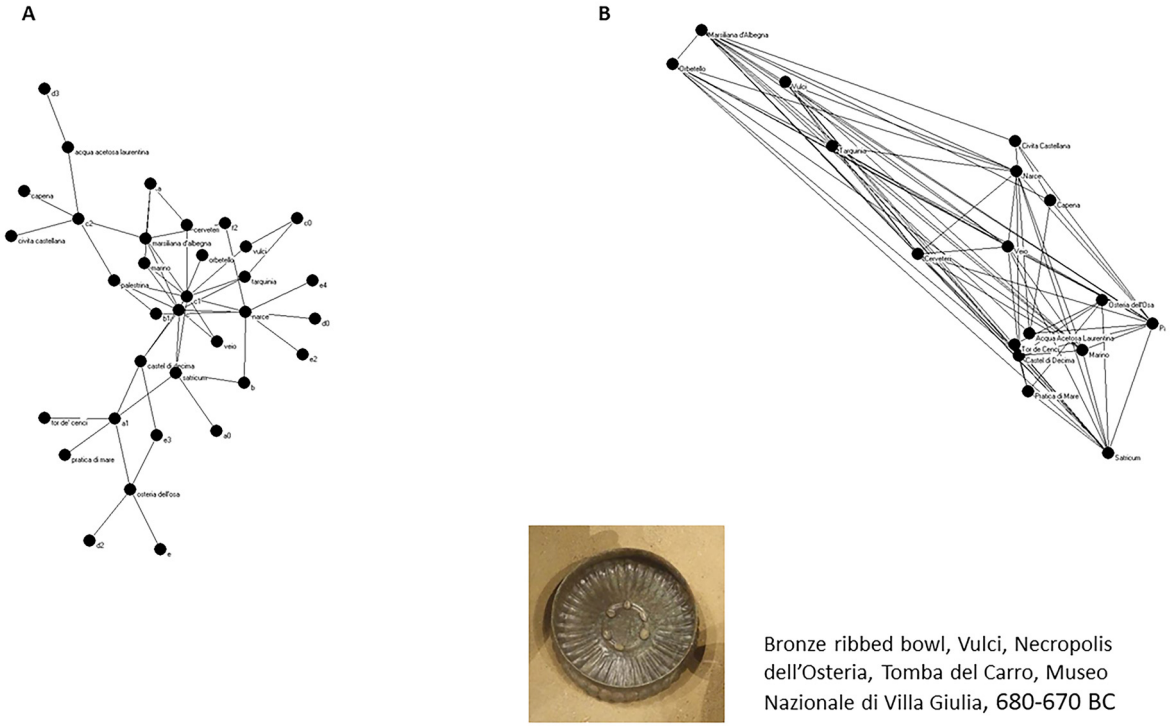

Fig. 3. Etruscan and Latin Network of orientalising bronze ribbed bowls: A) bi-modal energised with the Kamada-kawai algorithm free; B) uni-modal derived from bi-modal and georeferenced (graphs by F. Fulminante).

1-MODES in Pajek (De Nooy et al. 2012, 122). This function produces a link among those settlements that have the same type of pot or object in common, which, as explained above, is a sufficient assumption for the purpose of this paper.[3]

Following the significance of the development of settlement patterns in the region as detailed above, the time slices considered for the cultural networks are the Final Bronze Age, the Early Iron Age, the Orientalising period, the Archaic period, and the Republican period. The Early Iron Age is considered as a single phase because we did not want to fragment the evidence too much; however, a more refined distinction between Early Iron Age 1 and Early Iron Age 2 could also be possible in future works. To compare the two regions through time, all types of objects related to each time-slice period were grouped together for each region separately so that for each slice there was, respectively, an Etruscan and a Latin network based on all different types of objects considered.

The interest here is to assess the specific role of primary and secondary settlements within the networks as resources of change, and therefore the degree and the normalised degree of each node was calculated. Also the centrality, the density, and the average distance of the networks in the different regions and in the different time slices to compare them were calculated. In addition, a network of only primary centres from a network of only secondary centres to check the interaction of centres with other centres of the same order of hierarchy was extrapolated. The degree indicates the number of neighbours that each node has, and therefore is an indication of its activity and degree of interactions. The normalised degree takes into consideration the total number of nodes because obviously if in a network of five nodes a node has three neighbours, it is a significant proportion of the total network, but a degree of three in a network of fifty nodes does not indicate high activity.

3 In different papers focused on studying cultural transmission and identity creation (including religious behaviour), Raffaella Da Vela has used the similarity coefficient of Jaccard to create uni-modal networks of settlements from bi-modal networks of settlements and objects/cultural behaviours (Da Vela 2014/2015; 2019).

Degree centralisation is the variation in the degrees of vertices divided by the maximum degree variation that is possible in a network of the same size. A network is highly centralised if one actor or a small number of actors have considerably higher centrality than other actors of the network. This sort of measure can clarify the hierarchical nature of the settlement organisation. Betweenness centralisation is the variation in the betweenness centrality of vertices divided by the maximum variation possible in a network of the same size. Closeness centralisation is the variation in the closeness centrality of vertices divided by the maximum variation in closeness centrality scores possible in a network of the same size. Similarly to degree centralisation, high betweenness centrality and high closeness centralisation indicate more hierarchical networks with few nodes highly central and all the other nodes with low values of centrality. The density of the network is the number of lines in a simple network, expressed as a proportion of the maximum possible number of lines, in other words the ratio of actual connections to potential connections.

The distance is simply the number of steps it takes to go from point A to point B in a network. The notion that 'six degrees of separation' exist between everyone on this planet refers to distance and asserts that the average distance between any given pair of humans is six. Calculating the degree of separation between a node and the rest of the network reveals how many steps are necessary for a specific member of the network to connect to all others and how many members of the network are reached with each step. Averaging the results for each member of the network allows us to calculate the average 'degree of separation' or distance that exists between each member of the network. If calculating social distance reveals wide gaps in levels of connectivity, then we are dealing with a relatively more hierarchical society and less dense network. If the gaps are narrow, or non-existent, the network density is high. For an explanation and technical discussion of all these concepts see De Nooy et al. (2012), for their application to historical archaeological case studies it is very useful to refer to their application to Byzantine Egypt and the Oxyrhinx estate made by Ruffini (2008).

5. Discussion of the Analyses and Results

Table 4–6 show the results of the analyses. Firstly, the assessing measures illustrated above have been calculated for Etruria and Latium vetus, separately, but including both primary and secondary centres (*table 4*). Secondly, to assess the specific activity of secondary settlement, the Latin and Etruscan networks have been separated into two different networks of primary and only secondary settlements respectively. This allowed us to assess specifically the activity of the different order centres, primary and secondary respectively, with centres of the same hierarchical order. If the importance of secondary centres rises as we assumed in the introduction, we would expect them to have more interactions with other secondary centres and not only with primary centres. Table 5 and 6 show the results of the analyses respectively considering Etruria and Latium vetus as one single network (*table 5*) and Etruria (*table 6*) and Latium vetus (*table 7*) as separate networks.

When considering average distance and network density respectively in Etruria and Latium vetus (*fig. 4A–B*), we noticed that the first diminishes more sharply in Latium and is more stable in Etruria, while the density increases in both but is generally higher in Latium. Wide gaps in level of connectivity generally mean more hierarchical societies and less dense networks, so these results seem to imply the persistence of a more traditional and hierarchical society in Etruria and more mobility and a less hierarchical society in Latium as time goes by. A growing value of both betweenness centralisation and degree centralisation (*fig. 4C–D*), however, indicates a greater variability in the centrality of the centres, with few centres with a high degree of centrality and many centres with a lower degree, which overall points to a tendency towards greater complexity and hierarchy.

However, we are interested in assessing specifically the role of secondary settlement within the networks as resources of change, and to achieve this we must distinguish between networks of primary and secondary centres. As mentioned, Etruria and Latium are considered together. The average distance and the network density (*fig. 5A–B*)

Network	Age	Unreachable pairs	Average distance	Maximum distance	Average degree (with loops)	Network density (loops)	Average degree (no loops)	Network density (no loops: allowed)	Network density (no loops: not allowed)	Betweenness centralisation	Closeness centralisation	Degree centralisation (all)
Latium vetus	FBA	66	2.175	4	4.333333	0.222222	3.666667	0.203704	0.215686	0.219291	NA	0.286765
	EIA	90	1.29437	2	14.25	0.579861	13.58333	0.565972	0.59058	0.041125	NA	0.351779
	OP	0	1.48736	2	15.6	0.507778	14.86667	0.495556	0.512644	0.09554	0.576612	0.485222
	AP	0	1.66667	3	4	0.37	3.4	0.34	0.377778	0.37037	0.656732	0.638889
	RP	0	1.37778	2	6.8	0.62	5.6	0.56	0.622222	0.161008	0.598687	0.472222
Etruria	FBA	0	2.13684	4	5.5	0.2475	4.4	0.22	0.231579	0.373961	0.374575	0.327485
	EIA	164	1.70175	3	6.434783	0.257089	5.391304	0.234405	0.245059	0.180317	NA	0.478355
	OP	932	2.00134	4	9.873016	0.151675	9.238095	0.146636	0.149002	0.136222	NA	0.445796
	AP	100	1.70204	4	18.23529	0.349481	17.41176	0.341407	0.348235	0.162974	NA	0.49102
	RP	0	2.00833	4	5.625	0.328125	4.875	0.304688	0.325	0.431111	0.429484	0.390476

Table 4: Results of the analyses for Latium vetus and Etruria considered as separate networks but including both primary and secondary centres. FBA = Final Bronze Age; EIA = Early Iron Age; OP = Orientalising period; AP = Archaic period; RP = Republican period (by F. Fulminante).

Network	Age	Unreachable pairs	Average distance	Maximum distance	Average degree (with loops)	Average normalised degree (with loops)	Network density (loops)	Average degree (no loops)	Network density (no loops: allowed)	Network density (no loops: not allowed)	Betweenness centralisation	Closeness centralisation	Degree centralisation (all)
Primary	FBA	0	1.87654	4	4.105263	0.22807	0.185596	2.947368	0.155125	0.163743	0.180616	NA	0.375817
	EIA	0	1.49474	3	11.6	0.610526	0.545	10.2	0.51	0.536842	0.087332	0.302203	0.280702
	OP	48	1.48913	3	13.44	0.56	0.512	12.16	0.4864	0.506667	0.071974	NA	0.355072
	AP	0	1.36842	3	13.4	0.636842	0.6375	12.1	0.605	0.636842	0.083239	0.419859	0.345029
	RP	0	1.4381	3	9.333333	0.666667	0.577778	8	0.533333	0.571429	0.095761	0.483506	0.412088
Secondary	FBA	160	1.92308	4	3.894737	0.216374	0.188366	3.263158	0.171745	0.181287	0.189119	NA	0.418301
	EIA	414	2.15054	5	3.04	0.126667	0.112	2.56	0.1024	0.106667	0.103991	NA	0.336957
	OP	1226	2.57947	6	5.462687	0.082768	0.078191	5.014925	0.07485	0.075984	0.18984	NA	0.280886
	AP	450	1.96471	5	8.195122	0.191463	0.193337	7.658537	0.186794	0.191463	0.127682	NA	0.429487
	RP	28	3.23077	8	3.2	0.228571	0.191111	2.533333	0.168889	0.180952	0.358713	NA	0.203297

Table 5: Results of the analyses for Etruria and Latium vetus unified in one single network, but distinguishing a network of primary and secondary centres. FBA = Final Bronze Age; EIA = Early Iron Age; OP = Orientalising period; AP = Archaic period; RP = Republican period (by F. Fulminante).

Network	Age	Unreachable pairs	Average distance	Maximum distance	Average degree (with loops)	Average normalised degree (with loops)	Network density (loops)	Average degree (no loops)	Network density (no loops: allowed)	Network density (no loops: not allowed)	Betweenness centralisation	Closeness centralisation	Degree centralisation (all)
Primary	FBA	72	1.22222	2	2.8	0.311111	0.21	1.4	0.14	0.155556	0.024691	NA	0.222222
	EIA	0	1.30556	2	7.333333	0.916667	0.716049	5.555556	0.617284	0.694444	0.121652	0.498995	0.392857
	OP	0	1.23636	2	8.5	0.772727	0.645833	7	0.583333	0.636364	0.170437	NA	0.327273
	AP	0	1.17949	2	11.38462	1.163636	0.816568	9.846154	0.757396	0.820513	0.045244	0.297425	0.212121
	RP	0	1.21429	2	6.75	0.964286	0.765625	5.5	0.6875	0.785714	0.285714	0.375	0.285714
Secondary	FBA	34	1.75	3	3	0.377778	0.3	2.6	0.26	0.288889	0.243827	NA	0.333333
	EIA	148	1.25	2	1.076923	0.089744	0.059172	0.461538	0.035503	0.038462	0.015152	NA	0.151515
	OP	886	2.54859	6	4.32	0.088163	0.082	3.88	0.0776	0.079184	0.155535	NA	0.278912
	AP	432	1.96986	5	7.85	0.201282	0.18875	7.25	0.18125	0.185897	0.136255	NA	0.452092
	RP	42	1.28571	2	1.5	0.214286	0.171875	1.25	0.15625	0.178571	0.095238	NA	0.333333

Table 6: Results of the analyses for Etruria, considered as a separate region and distinguishing a network of primary and secondary centres. FBA = Final Bronze Age; EIA = Early Iron Age; OP = Orientalising period; AP = Archaic period; RP = Republican period (by F. Fulminante).

Network	Age	Unreachable pairs	Average distance	Maximum distance	Average degree (with loops)	Average normalised degree (with loops)	Network density (loops)	Average degree (no loops)	Network density (no loops: allowed)	Network density (no loops: not allowed)	Betweenness centralisation	Closeness centralisation	Degree centralisation (all)
Primary	FBA	2	0	0	0.666667	0.33333333	0.111111	0	0	0	0	NA	0
	EIA	0	1.12727	2	9.818182	0.98181818	0.842975	8.727273	0.793388	0.872727	0.041481	0.221272	0.155556
	OP	0	1.35897	3	8.923077	0.74358974	0.64497	7.846154	0.60355	0.653846	0.368062	0.177757	0.310606
	AP	0	1.47619	2	4	0.66666666	0.510204	3.142857	0.44898	0.52381	0.511111	0.765556	0.666667
	RP	0	1.42857	2	4.571429	0.76190476	0.571429	3.428571	0.489796	0.571429	0.327778	0.70627	0.6
Secondary	FBA	78	2.27273	4	3	0.23809524	0.2	2.666667	0.177778	0.190476	0.279435	NA	0.192308
	EIA	22	1.50909	2	4.833333	0.43939396	0.388889	4.5	0.375	0.409091	0.347107	NA	0.6
	OP	0	1.71324	3	5.764706	0.36029412	0.32526	5.294118	0.311419	0.330882	0.498585	0.753211	0.6875
	AP	-	-	-	-	-	-	-	-	-	-	-	-
	RP	0	1.33333	2	2.666667	1.33333333	0.666667	1.333333	0.444444	0.666667	1	1	1

Table 7: Results of the analyses for Latium vetus, considered as a separate region and distinguishing a network of primary and secondary centres. FBA = Final Bronze Age; EIA = Early Iron Age; OP = Orientalising period; AP = Archaic period; RP = Republican period (by F. Fulminante).

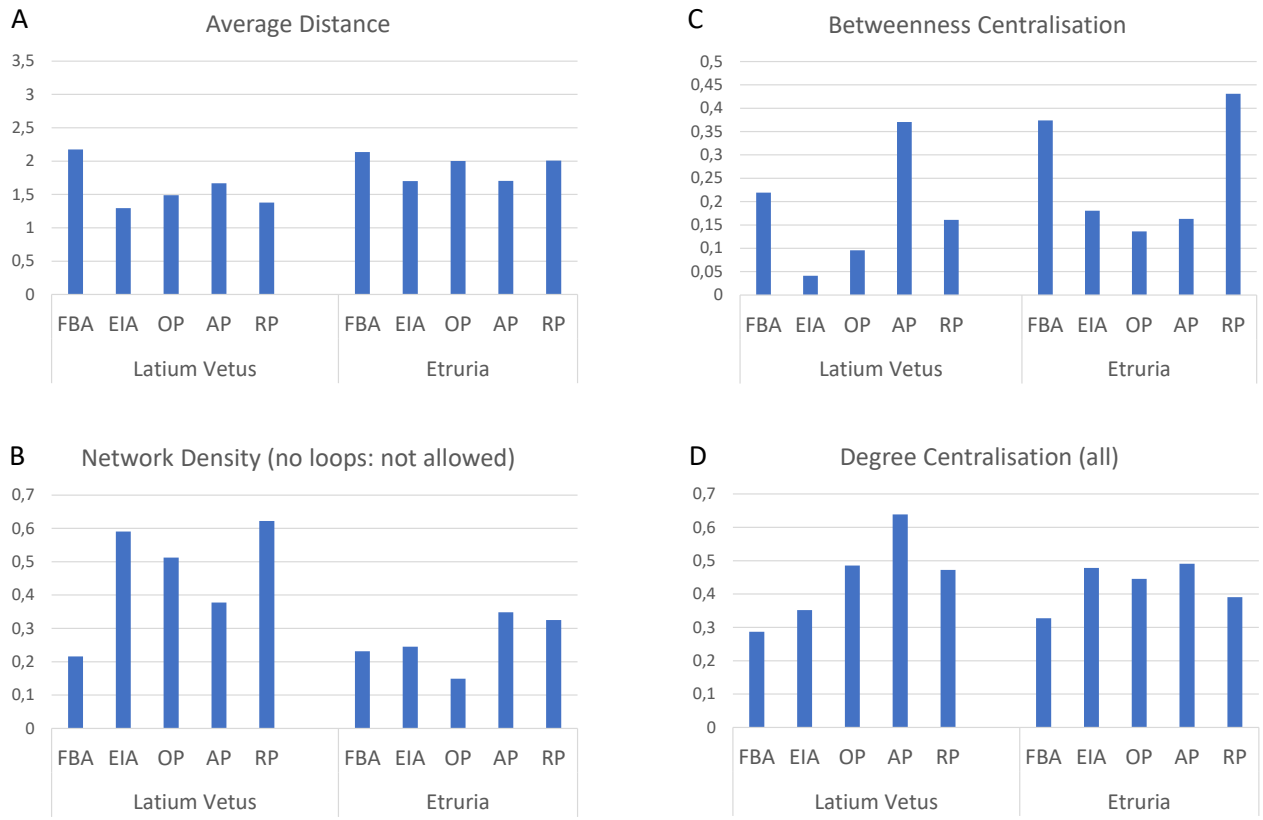

Fig. 4. Average distance (A), network density (B), betweenness centralisation (C), and degree centralisation (D) in Etruria and Latium vetus. FBA = Final Bronze Age; EIA = Early Iron Age; OP = Orientalising period; AP = Archaic period; RP = Republican period; for the dates of the periods see table 1 (graphs by F. Fulminante).

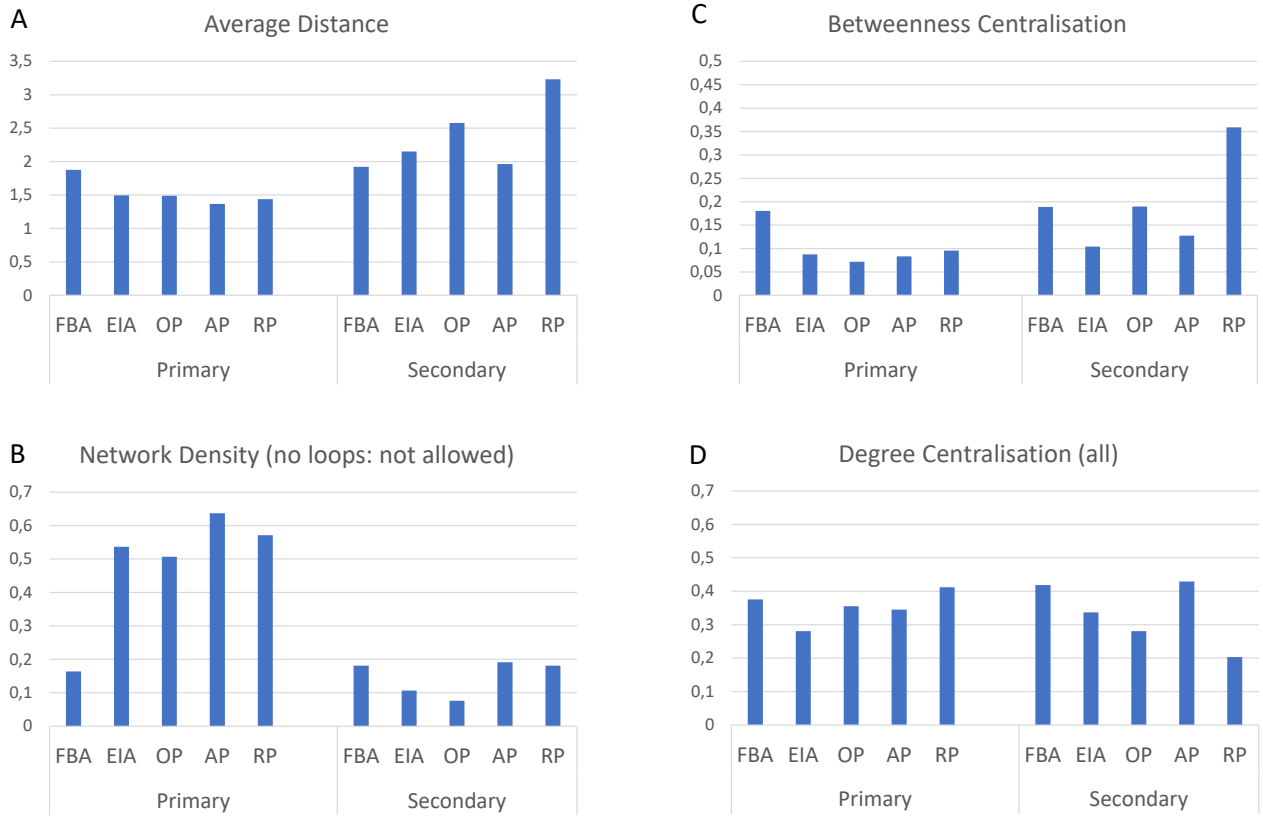

Fig. 5. Average distance (A), network density (B), betweenness centralisation (C), and degree centralisation (D) in Etruria and Latium vetus considered together but distinguishing between primary and secondary centres; for the dates of the periods see table 1 (graphs by F. Fulminante).

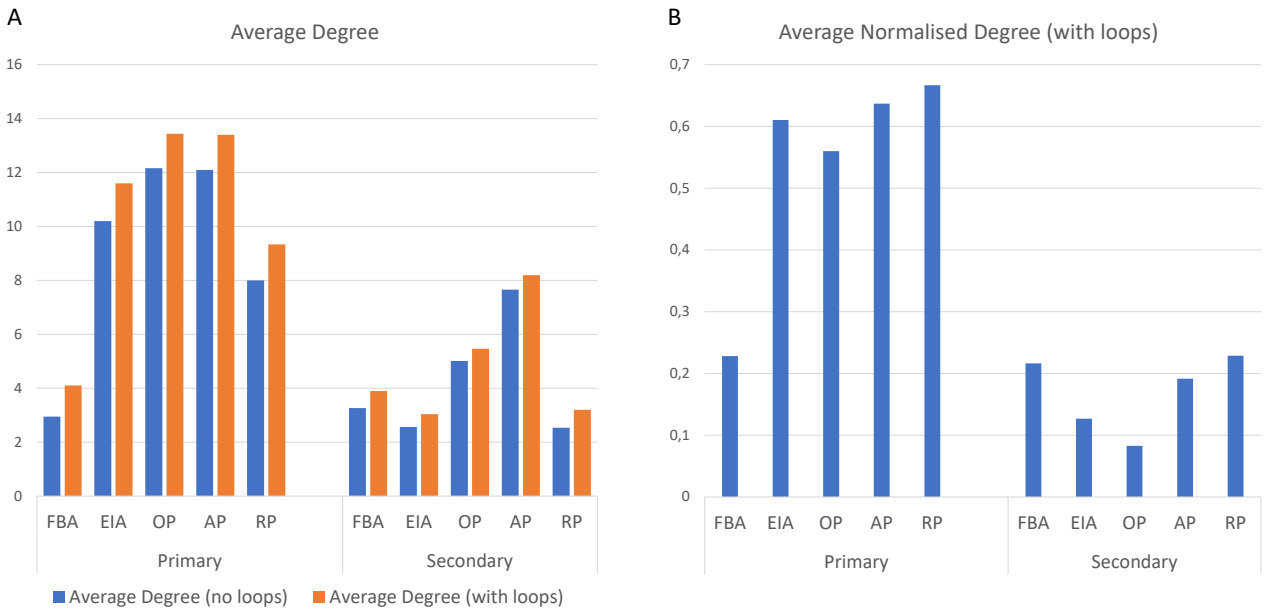

Fig. 6. Average degree (A) and average normalised degree (B) in Etruria and Latium vetus, considered together but distinguishing between primary and secondary centres; for the dates of the periods see table 1 (graphs by F. Fulminante).

indicate that there is less internal hierarchy (less distance and more density) among the primary centres and more internal hierarchy (higher distance and less density) among the secondary centres, which indicates how these are becoming more articulated and differentiated in their function. The betweenness and degree centralisation (*fig. 5C–D*) show higher and growing variability in the betweenness for the secondary centres, which indicates that there are more hubs and bottlenecks in the circulation of products and potentially people and ideas, while the degree centralisation shows less variability among the different periods and, rather surprisingly, a decrease in the later periods for secondary settlements, which is in contrast with the results from the average distance and density.

When considering specifically the average degree, which is the number of neighbours of each node and is representative of the degree and intensity of interaction of each centre, we see that values are growing both for the primary and the secondary centres, although values are generally higher for the primary centres. As we mentioned in the previous section, however, the degree of a node might have different significance in relation to the overall size of the network. Therefore, we calculated the average of the normalised degree, and this showed a sharp rise of activity in the later Archaic and Republican periods (*fig. 6*).

If Etruria and Latium vetus are compared as separate regions, we get an even more detailed and nuanced picture, although the data are more fragmented, and sometimes it is not possible to calculate all assessing measures for all phases. The average distance and the network density (*fig. 7*) seem to indicate that there is more hierarchy (more distance and less density) among secondary settlements both in Etruria and Latium. In addition, in Latium there seems to be a growing hierarchy, while in Etruria primary settlements seem to maintain a more equal rank through time. This is consistent with other analyses and assessments made on the two regions which recognise a more hierarchical settlement organisation in Latium vetus and a more heterarchical organisation in Etruria (e.g. Guidi 1985; Fulminante/Stoddart 2012; Stoddart et al. 2020).

The betweenness centrality and degree centralisation (*fig. 8*) generally points to a greater variability and growing trends among secondary settlements rather than primary settlements both in Etruria and Latium vetus, probably indicating again the growing role of these settlements in the

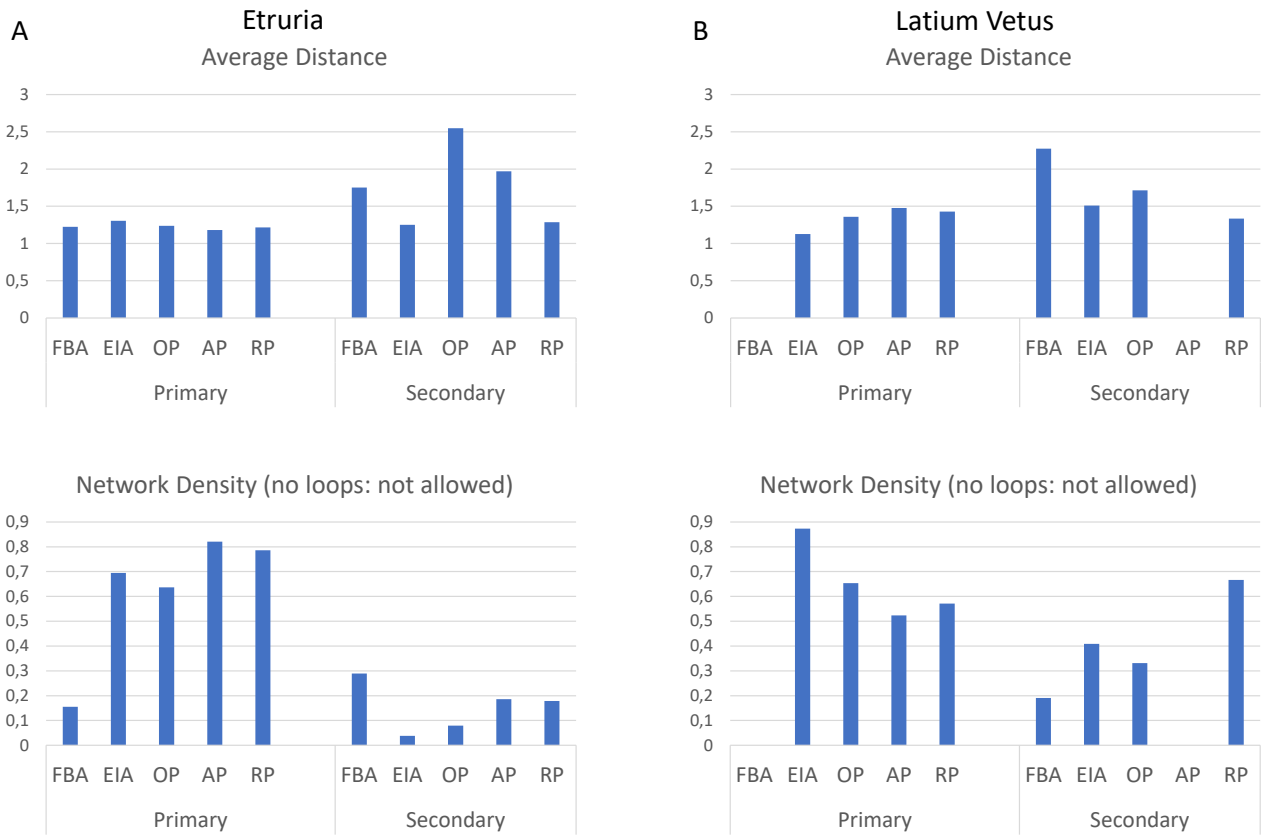

Fig. 7. Average distance and network density in Etruria (A) and Latium vetus (B) considered separately and distinguishing between primary and secondary centres; for the dates of the periods see table 1 (graphs by F. Fulminante).

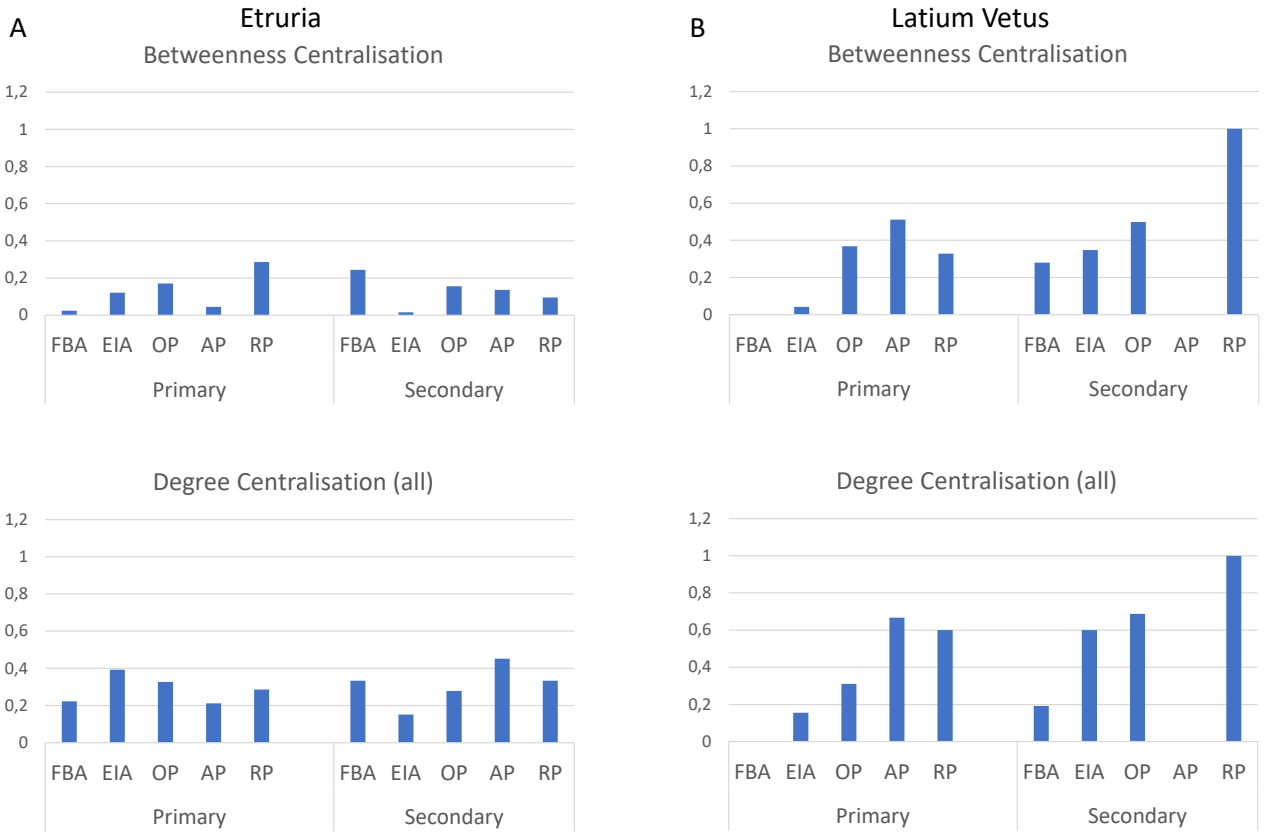

Fig. 8. Betweenness centralisation and degree centralisation in Etruria (A) and Latium vetus (B) considered separately and distinguishing between primary and secondary centres; for the dates of the periods see table 1 (graphs by F. Fulminante).

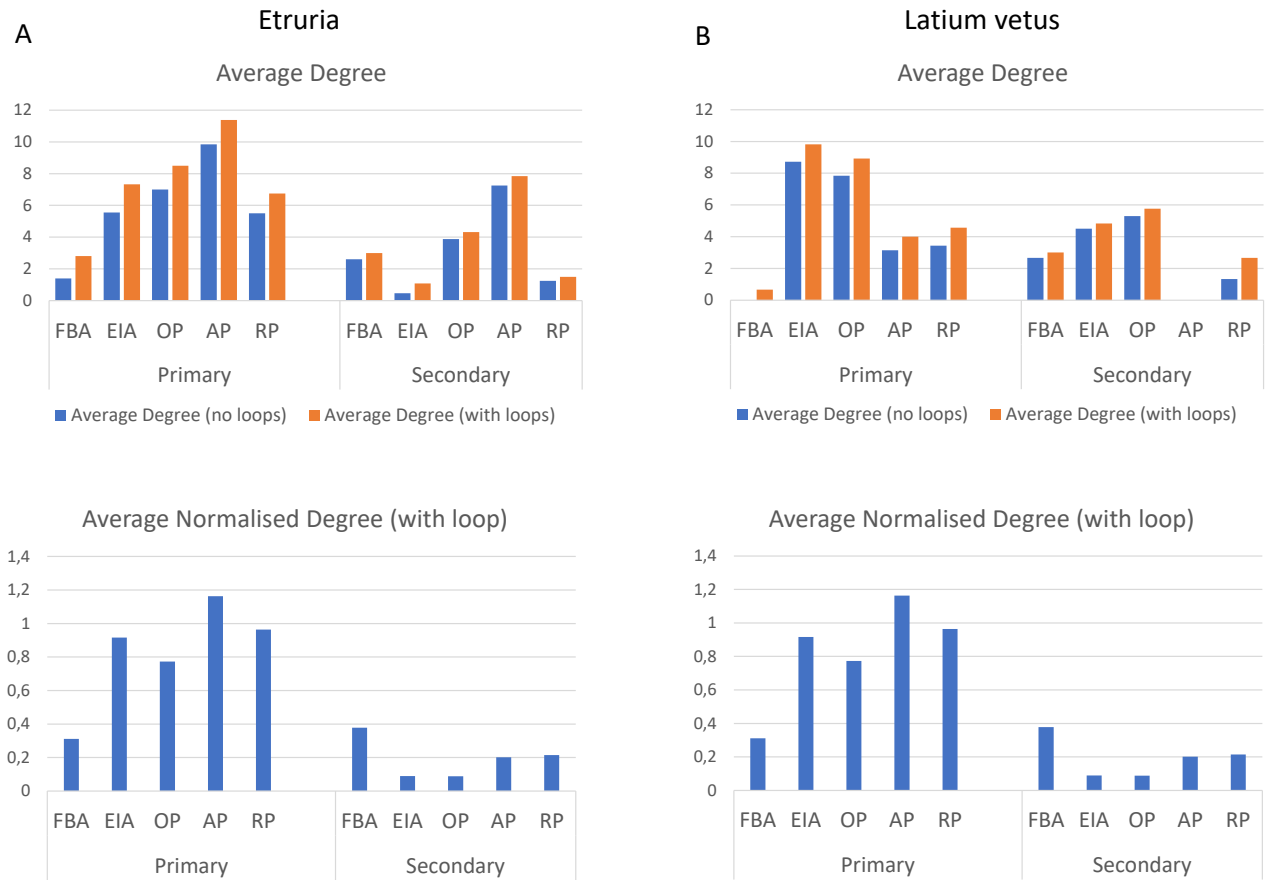

Fig. 9. Average degree and average normalised degree in Etruria (A) and Latium vetus (B) considered separately and distinguishing between primary and secondary centres; for the dates of the periods see table 1 (graphs by F. Fulminante).

degree of trade and interaction in both regions. However, in Etruria betweenness centrality is declining among secondary settlements, probably suggesting that there are fewer hubs and bottlenecks, and settlements are more of equal centrality in relation to the control of flow of goods and information. Finally, the average degree (*fig. 9*) both in Etruria and Latium vetus shows growing trends among the secondary settlements, which are even more evident in Latium vetus when considering the average normalised degree centrality. Differing across primary centres, the trend is growing among Etruscan settlements but is declining among Latin settlements. Combining this element with the result of the degree centralisation, which is growing, it might indicate a sharper distinction between the activity of Rome in relation to other Latin primary centres, which are declining in importance while secondary and smaller hubs grow in importance and degree of activity.

6. Conclusions

Hundreds of years of research and study and especially the last few decades of survey and landscape research in central Italy have suggested a general trend in settlement nucleation and centralisation during the Bronze and Iron Ages, and then a growing and ever more capillary occupation of the countryside in the Orientalising and Archaic periods with a final intensification of density and activity in the rural territory during the Republican and Early Imperial periods. Recent research has also suggested the growing role of middle and secondary settlement as resources of change within networks of interaction and the growing integration of the markets in Italy at the time of the rise of Rome in the peninsula, during the Republican period, and their primary role and integration in the wider globalised economy of the Roman world. However, there has been no investigation

for the earlier periods and only limited quantitative analysis to substantiate this hypothesis.

The present work was aimed at filling this gap, analysing formally the degree of interaction of secondary centres in central Italy from the Bronze Age to the Republican period. For this purpose, different synthetic works on pottery and metal productions and architectural decoration have been used to create affiliation networks (bi-modal networks) of settlements and specific types of objects or style of architectural decorations, establishing a link between each type of object/decoration and each settlement in which it has been attested. Secondly, these affiliation networks have been reduced to one-mode networks based on commonality of the same object/decoration among two settlements. Finally, characterising measures have been calculated on these networks and on networks separated according to region and hierarchical position in the settlement organisation. Etruscan and Latin networks have been distinguished but also primary and secondary settlement networks have been separated to assess the degree of activity on centres in relation to centres of the same order of hierarchy. It is expected that if secondary settlements gain in importance, their activity and interaction with other secondary settlements should grow rather than only interacting with higher or lower order centres.

The analyses conducted confirmed that the degree of activity and connections of secondary settlements increases with time, confirming their growing importance as resources of change within networks of interaction. The analysis also showed that the internal hierarchical organisation of secondary settlements, indicated by greater variability in the different measures of centrality, often grows with time. It also seemed to confirm previous analyses according to which in Latium there is a greater increase of hierarchical settlement organisation among primary settlements, while in Etruria primary settlements maintain a more heterarchical equilibrium. On the other hand, the internal organisation of society seems to be more traditional and hierarchical in Etruria, whereas in Latium a greater vertical mobility seems to emerge.

In this way, this paper connects work by the author on the emergence of early Rome (Bronze/Iron Age) to recent perspectives on Roman Italy and sheds new light on the specific role of secondary settlements in networks as emerging resources of change and integration at a time of crucial ethnic, socio-economic, and institutional changes in the Italian Peninsula. This led from the creation of an interlocked network of nucleated, hierarchical, regional districts, organised in the different pre-Roman cultural groups, to the emergence of Rome and the progressive Romanisation of these peoples into a wider globalised polity.

Francesca Fulminante
University of Bristol
Department of Anthropology and Archaeology
43 Woodland Road
BS8 1UU Clifton Bristol, England
Francesca.fulminante@bristol.ac.uk
Francesca.fulminante@uniroma3.it

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Networks of Power and Knowledge

Isabella Bossolino

Networks and Social Power in Archaic Kamiros (Rhodes, Greece)

Keywords: networks, social history, Iron Age Mediterranean, Archaic Greece, funerary archaeology, Greek archaeology, Archaic Rhodes

Summary

Between the second half of the 19th cent. and the beginning of the Second World War the site of Kamiros, on the west coast of the island of Rhodes, was the subject of many archaeological ventures, which brought to light one of the best-preserved Hellenistic-Roman sites in Greece. The exploration of numerous funerary contexts, in particular, contributed to our partial understanding of the life of the city between the Bronze Age and the Hellenistic period.

A crucial phase of the urban development of Kamiros was the transition from a disrupted and nucleated urban composition into a well consolidated, real *polis*. In such a context, the burials of the Iron Age and the Archaic period can provide us with some fundamental data.

Through the illustration and analysis of the contexts related to the period between the 10th and the 6th cent. BC, this paper aims to identify methods and processes that led to the configuration and development of dominant social groups. This paper will discuss how the choices made with regard to grave goods and the modes of self-representation employed by the different social actors were strongly connected to the creation of medium and long-range networks, implemented from both temporal and spatial perspectives, namely control over the past and contacts and relations with other Mediterranean cultures, respectively. As already highlighted for crucial sites of the Greek world such as Lefkandi, Eretria, Cuma, this paper will illustrate the value of the creation and exhibition of networks in funerary contexts, in order to obtain and maintain a political predominance within the archaic society of Kamiros.

1. Introduction: Networks as an Interpretative Tool for the Archaic Mediterranean

In recent years, networks have become a welcome research tool and perspective in various disciplines, even ones quite different from one another, such as physics, economics, neuroscience, sociology – and, of course, archaeology. Within these different contexts, there are nonetheless some common elements that concern most of these network-based approaches to the sciences. Most interestingly, these approaches all assume 'that the relationships between entities like people, objects or ideas matter. Rather than focusing on such entities in isolation, network scientists claim that relationships between entities should be examined explicitly if we are to understand the behaviour of these entities [...] relationships are everywhere, they influence people's decisions, and through them information and objects spread and evolve' (Brughmans 2013a, 625). We can easily understand how this emphasis on relationships and exchange between people, objects and ideas can be useful and valuable to the interpretation of archaeological contexts: if we start to consider the links between entities and what these connections could create and generate in the ancient world, our comprehension of the past can clearly be enhanced. This is particularly true if we think of a period and time extremely rich in meaningful and consequential relationships such as the Archaic Mediterranean.

Even a standard definition of a network – like the one that is possible to find in the Cambridge Dictionary – provides relevant elements for a few thoughts on the importance of relationships and exchanges in the Archaic world: 'a large system consisting of many similar parts that are connected together to allow movement or communication between or along the parts, or between the parts and a control centre'.[1] As we will see in the next few pages, the promotion of movement and communication, as well as the absence of a specific control centre, are key elements to our understanding of Iron Age and Archaic Greece – and elements that are better explained through an analysis of network type.

In the vast domain of network approaches to the humanities and the social sciences, it is normal to expect various degrees of implementation of these particular approaches to the different realities of archaeological contexts. If on the one hand it is possible to find quite formal and quantitative analyses of interactions in space and of cultural evolutions (Henrich/Broesch 2011), it is equally possible, on the other, to run into more qualitative, figurative uses of networks, which tend to adopt the vocabulary and key features of network science and to apply them to a series of historical examples (Malkin 2011; Hodder 2012; Brughmans 2013b, 146; Knappett 2013, 13; 2016, 21 f.). This latter option is also the one preferred and applied to this paper. In view of the scarcity of quantitative data available for the case study presented here (number of contexts, grave goods and comparable data coming from external contexts and so on), a qualitative analysis of the possible networks offered by the context seemed the optimal approach.

The inspiration for this paper came from reading a much-discussed book: Irad Malkin's 'A Small Greek World' (Malkin 2011). The book approaches the phenomenon of the formation of Greek identity and of Greek colonisation from the perspective of network theory. For Malkin, the concept of the network 'is not just a metaphor but a descriptive and heuristic term' (Malkin 2011, 16), while the goal of the study is 'to identify the phenomenon of network formation', together with 'an interpretation of its implications' (Malkin 2011, 16). The main idea behind the book is that Greek civilisation as we know it (i.e., the birth of the *polis*, the spread of the Homeric poems and the alphabet, literary, artistic and architectural conventions etc.) – and the process of recognition of various, specific commonalities that united different Greek communities – was formed during the Archaic period through 'a process of convergence through divergence' (Malkin 2011, 5), 'not in spite of distance but because of it' (Malkin 2011, 34). Network connectivity played a crucial role in this process, shaping the ancient Greek Mediterranean as a *decentralised network*. In other words, the conception of space in his volume is not that of a simple container, but rather that of a space 'that is relative and rational, a *historical* space that is both formed by connectivity among its proliferating nodes […] and simultaneously shaping their particular development, interconnections, and civilizational commonalities in the process' (Malkin 2011, 12).

There is a large number of concepts and ideas in this book that are of great value to anyone interested in the history of the Archaic Mediterranean. This paper, however, will only focus on some key issues that will be useful for the analysis of the case study discussed.

The first point concerns the notions of **multidirectionality** and **multiplicity** (Malkin 2011, 18 f.) – as well as those of multidimensionality and multitemporality. As part of the study of Archaic Greece, it is important to focus on the characteristics of the content that moves along the connecting lines of a network, the so-called flows. More particularly, the idea that these flows move not only along multidirectional network lines, but also that each node involves a different circle of identities (see Malkin 2011, fig. 1.6) must be emphasised: every individual network is multifaceted and implicates various other networks, and hence identities. Within these circles, it is possible to move and circulate with great flexibility, due to their continuous expansions and contractions, sometimes operating on several planes at the same time.

The second point involves the two laws that govern real networks: **growth** and **preferential attachment** (Malkin 2011, 39 f.). As Albert-László Barabási (2003, 86) explains: 'each network starts

1 Cambridge Dictionary, s.v. Network, <https://dictionary.cambridge.org/it/dizionario/inglese/network> (last access: 10.07.2021).

from a small nucleus and expands with the addition of new nodes. Then these new nodes, when deciding where to link, prefer the nodes that have more links'.

The third point relates to one of the main characteristics of the actors involved in this network-oriented investigation of the past: 'the *inability* to dictate […] the **lack of a hegemonic power**' (Malkin 2011, 46). In his discourse, Malkin links these characteristics to various types of colonial experiences, highlighting the importance of this absence for the conquest of vast territories. But as will be seen, the issue can be closely connected to that of social negotiation.

In my opinion, these are the three main points and ideas that are crucial for the analysis that will be carried out in this paper. In particular, Malkin's recommendation about what may be done today by intersecting network theory and Mediterranean history will be followed. He identifies four main tasks for anyone studying Archaic Greek and Mediterranean history (Malkin 2011, 25):

(1) 'The identification and recognition of historical networks'.
(2) The 'understanding of the implications of network theory and of the specific network characteristics of the Archaic Mediterranean'.
(3) The recognition of 'those problems that are better served by a network approach'.
(4) The examination of 'the implications of the network approach for Archaic Greek history', with special attention given to the formation of Greek identities.

Even though the focus of the book was the colonisation process towards the west (Italy, France, Spain and North Africa), I strongly believe that these guidelines can be very useful to identify other possible case studies.

This is the principle that guided me in the analysis of the Kamirian context and allowed the identification of some processes that will be discussed in this paper.

2. The Case of Kamiros

Even though the area has surely been inhabited at least since the Bronze Age, the ancient city of Kamiros (*fig. 1*), located on the northwestern coast of the island of Rhodes (Bossolino 2017, 723), is best-known today for its well-preserved Hellenistic and Roman city. This site – partially investigated already by British and French archaeologists during the 19th cent. (Coulié 2014) – was extensively excavated by an Italian archaeological mission between 1928 and 1933 (D'Acunto 2014; Bossolino 2018b, 11–14), that is to say, during the middle years of the military occupation of the Dodecanese (Santi 2018). Of interest are the cemeteries discovered there, which span from the Protogeometric and Geometric periods until the late classical era.[2]

To be precise, this paper deals with the data collected in Kamiros. Through the analysis of some of the burials, the richest in particular, it is possible to notice how the concepts illustrated previously might help us to envisage and, hopefully, understand some of the dynamics linked to particular funerary customs, notably tomb layout and the selection of grave goods. In addition, I believe that this perspective of analysis can be useful to highlight different aspects than those normally stressed by traditional archaeology of death.

As is well known, so-called funerary archaeology is not neutral, actually it is far from it. After an initial, almost complete lack of interest in the cultural and social implications of funerary choices in archaeological contexts (a notable exception is Fustel de Coulanges 1864), the 1970s brought funerary data newly into consideration, in particular through the works of New Archaeologists such as Lewis Binford (1971) and Arthur Saxe (1970), who, with their positivistic approach, tended to directly link funerary variability and social complexity (O'Shea 1984). Our view on burials composition and meaning today is significantly different due to the work of post-processual archaeologists and Italian and French anthropological historians (see, *inter alia*, Gnoli/Vernant 1982; D'Agostino 1985; Morris 1987; 1992; Parker Pearson 1999; Houby-Nielsen 2000; Cuozzo 2003; Hofmann 2013). They proposed a rigorous contextual approach to funerary data, in contrast to the statistical and

2 As part of my postgraduate thesis (Bossolino 2018b) and doctoral research (Bossolino 2020), I had the chance to study the contexts related to the Iron Age phases of the city, as well as the two major Archaic cemeteries, namely Checraci and Papatislures.

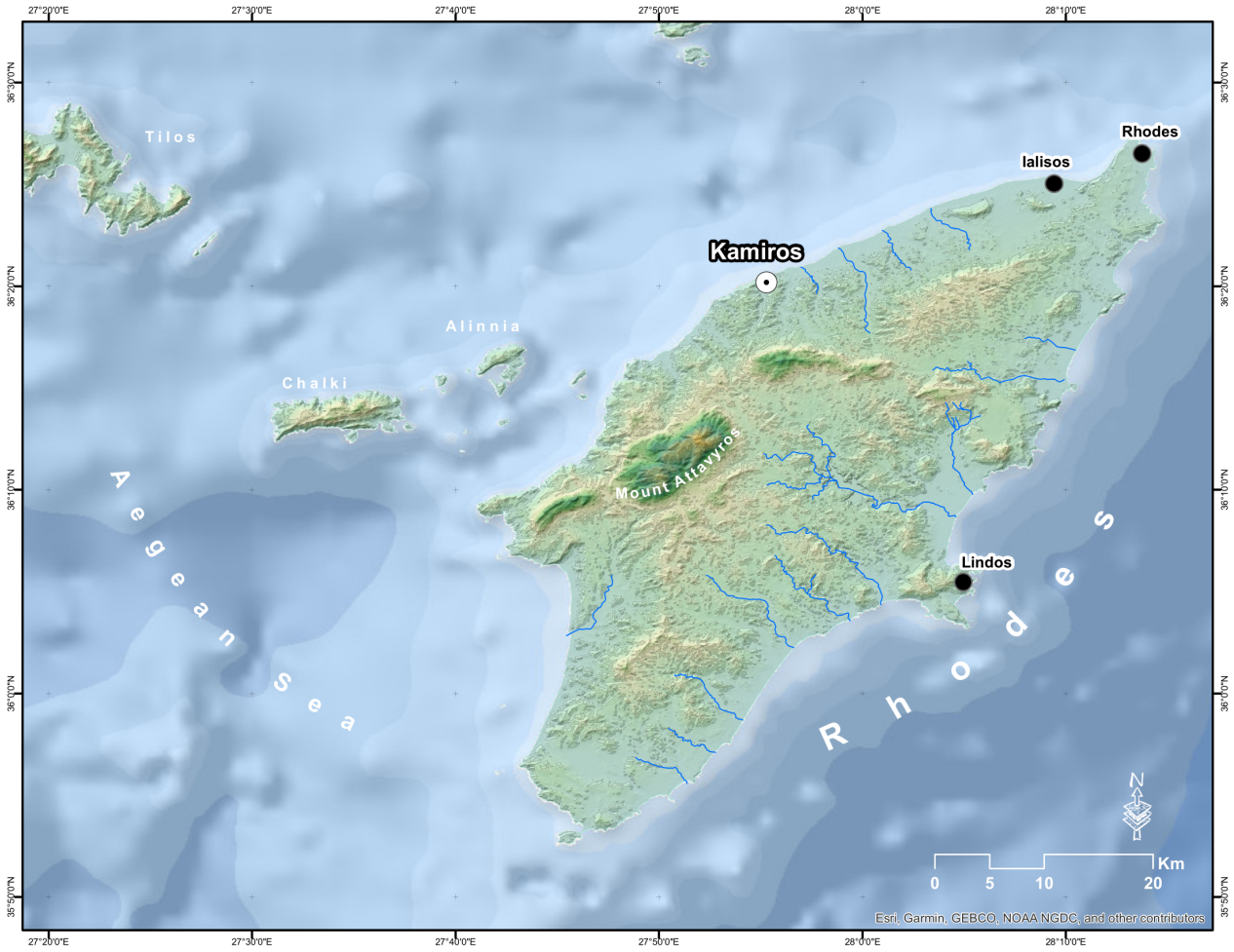

Fig. 1. The island of Rhodes with the sites mentioned in the text (map by I. Bossolino).

generalising approach typical of processual archaeology, and the understanding of death as a cultural phenomenon.

As clearly illustrated in several archaeological contexts, funerals were rarely a private, family event conceived in order to bid farewell to a loved one, but rather 'a public event that took place in the midst of the local community' (Toplak 2018, 68). In this sense, funerals and burials have to be interpreted less as a spiritual obligation in order to please the deceased and more as an opportunity to exhibit the wealth of the family and the (often desired) position of the deceased within the society (D'Agostino 1996, 436 f.).

Having illustrated by this introduction the theoretical framework in which the data obtained from the contexts of Kamiros will be analysed, the case studies that will be presented in this paper can now be discussed.

3. Control over Space and Time

The case studies in this paper derive from two principal phases of the story of the cemeteries of Kamiros: the Geometric (ca. 900–700 BC) and the Orientalising (ca. 700–600 BC) periods. In both cases, the focus will be on prominent tombs and burials that, due to their unique characteristics, have already been recognised as unusual.

The Iron Age of Kamiros has yielded three contexts of particular significance: they consist of two chamber tombs, T LXXXII (2) and T LXXXIII (3), and one *enchytrismos* inside a *pithos*, T VII (9). I have discussed elsewhere the elements that make these tombs exceptional in the Rhodian context (rich burial goods, *keimelia*, weapons, thin gold tiaras; see Bossolino 2018b, 85–89). Here, I would like to focus only on those elements that can be analysed through the lens of network approaches,

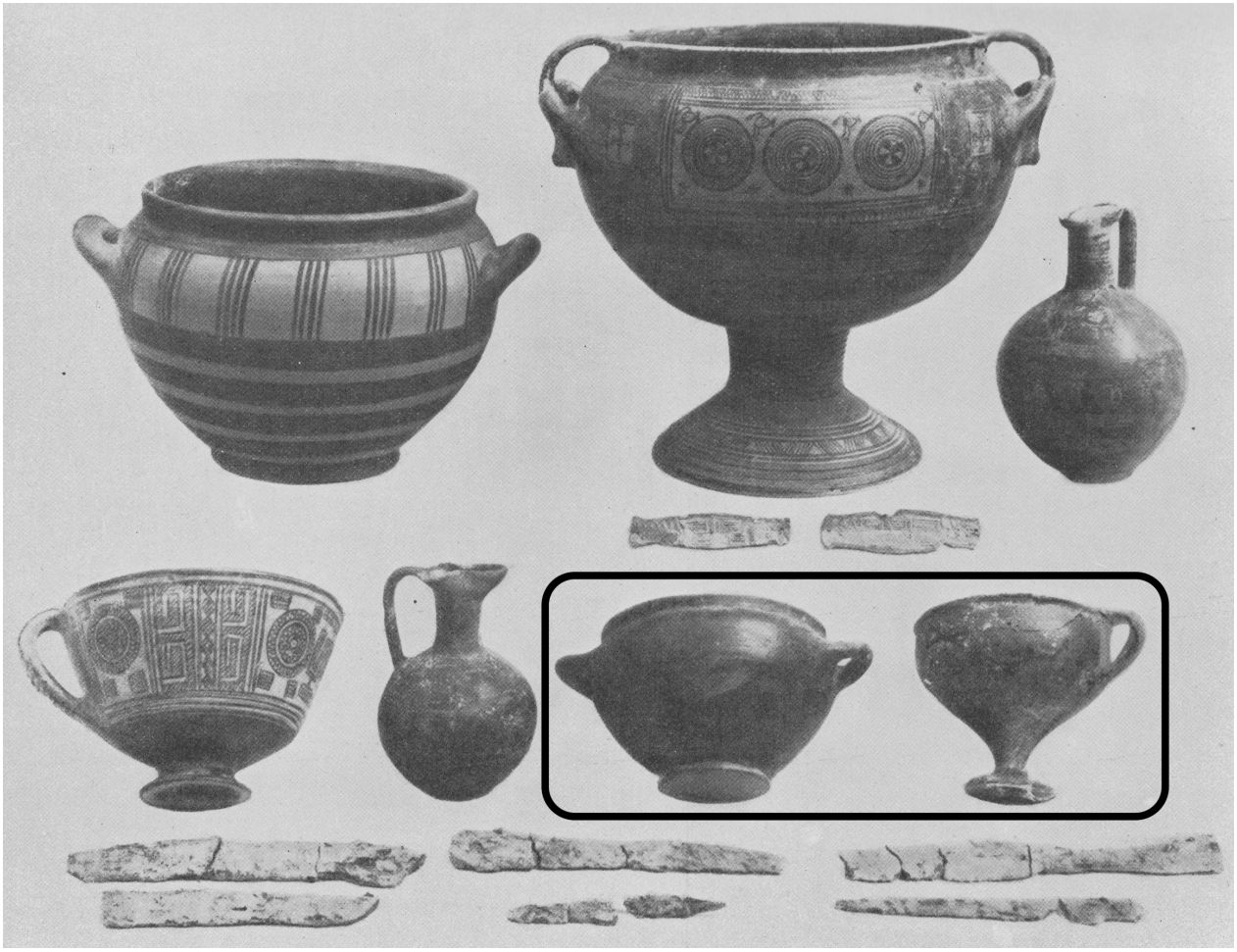

Fig. 2. Kamiros, Tomb LXXXII (2). Grave goods with indication of the objects mentioned in the text: at the bottom right, Mycenaean *kylix*; a little further to the left, Euboean black *skyphos* (modified after Jacopi 1932/1933, 195, fig. 232).

however metaphorical, to the ancient world. The main commonality that emerges from these burials, and that really sets them apart from the rest of the funerary contexts, is the presence of exotic or exotic-inspired objects and pottery. In the general picture of a community that usually buries mostly locally made pottery with its dead, the presence of a black *skyphos* of Euboean production (T.LXXXII(2).6, *fig. 2*; see Bossolino 2018b, 45), some Cypriot inspired vessels (of the Red Slip type: a *lekythos* T.LXXXIII(3).2, an *oinochoe* T.LXXXIII(3).3 and a hemispherical bowl T.LXXXIII(3).4, *fig. 3*; see Bossolino 2018b, 36, 38, 43) and a Proto-Corinthian *pyxis* (T.VII(9).4, *fig. 4*; see Bossolino 2018b, 39 f.) appears as an important novelty.

Although rare, the occurrence of exotic artefacts among grave goods is not completely unknown in the Iron Age Mediterranean. Jan Paul Crielaard (2016) has gathered examples of extraordinary Iron Age and Orientalising burials, connected to each other by the shared practice of collecting the cremated bones of the deceased in metal urns. Remaining with these same burials, however, I would like to shift the focus to something different.

A famous example is surely the so-called Toumba building (see, *inter alia*, Catling/Lemos 1991; Popham et al. 1993; Morris 1996, 2; Crielaard 2016, 56–59), dated to the first half of the 10th cent. BC, in which the cremated remains of a man, wrapped in cloth and stored in a large bronze amphora, were buried alongside the inhumation of a richly adorned woman. Among the grave goods, the amphora itself and a bronze bowl were imports from Cyprus: a gold pendant, a faience necklace and an iron knife came from further east, the Levant.

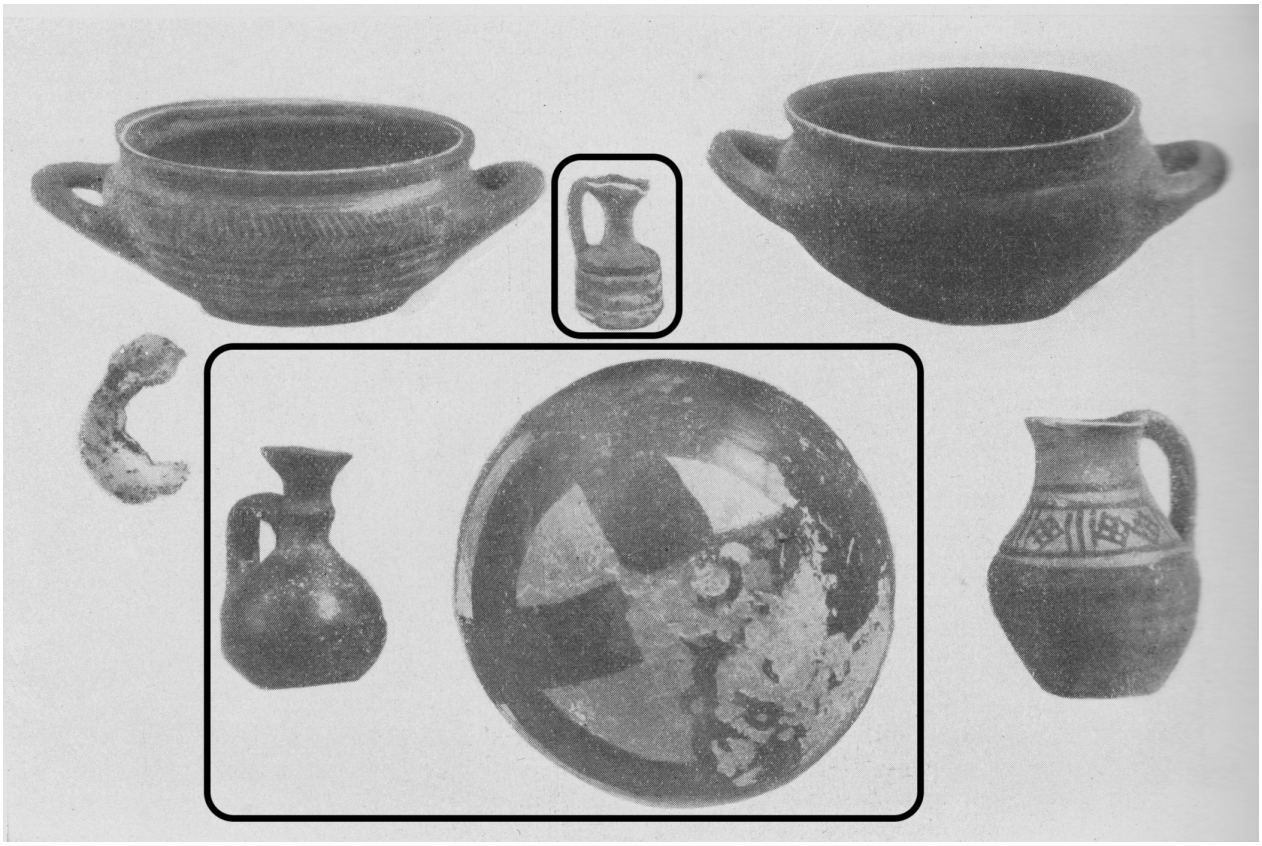

Fig. 3. Kamiros, Tomb LXXXIII (3). Grave goods with indication of the objects mentioned in the text: at the top, small *oinochoe*; in the lower centre, *lekythos* and hemispherical bowl (modified after Jacopi 1932/1933, 200, fig. 240).

Fig. 4. Kamiros, Tomb VII (9). Grave goods with indication of the objects mentioned in the text: at the top left, Mycenaean *kylix*; in the lower centre, Proto-Corinthian *pyxis* (modified after Jacopi 1932/1933, 41, fig. 33).

A second burial from the area, Toumba tomb 79 (Popham/Lemos 1995; Crielaard 2016, 59–62) – a shaft grave dated to the second quarter of the 9th cent. BC – contained Phoenician and Cypriot flasks, a north Syrian seal and 16 stone weights, together with the likely remains of a weighing balance. Because of these finds, this grave has been nicknamed 'tomb of the warrior-trader'. Another example comes from the well-known cremations near the West Gate of the city of Eretria: eight metal urn cremations datable to between 720 and 680 BC (Blandin 2007, 43–49, 53, 73 f.; Crielaard 2016, 62–64). Tomb 6, probably the earliest, has yielded a great number of weapons, among which especially remarkable is a bronze spearhead that has been finally recognised as an import from central Italy (Bettelli 2001). Looking west, the final example can be found in Cuma (southern Italy), where tomb 104 of the Fondo Artiaco – dated to the last quarter of the 8th cent. BC (Buchner 1979, 130; Crielaard 2016, 64–69) – was covered by a Villanovan bronze shield and yielded various grave goods (ornaments of precious metals in particular) with parallels in the Villanovan world.

It is hoped that this list of examples has proven in particular one critically important point regarding the value of networks and network analysis in the historical reconstruction of the Archaic Mediterranean. What appears to be the most evident commonality among the Kamirian burials and other prominent Mediterranean contexts? I believe these examples indicate strongly, emphasise even, medium and long-range networks – if not of the commercial type, surely of an exchange and elite nature.

The types of connections that the contexts from Kamiros seem to highlight, though, are not exclusively spatial. Together with objects of foreign origin or inspiration, it is possible to point out another common element. If the grave goods seem to indicate a sort of control over space – in particular, over the eastern part of the Mediterranean and the connections with distant communities – some other features seem to suggest a strong link with earlier periods of the Greek world. As suggested earlier, each case study can involve several, multiple circles of identity.

The first element of continuity with earlier burials on the island of Rhodes – dated to the Bronze Age in particular – regards the case of the chamber structure of two graves, T LXXXII (2) and T LXXXIII (3). These two burials, dated to 800–750 BC (Middle Geometric II of eastern Aegean, see Coldstream 2008, 330, 356), constitute the only recorded evidence of the period in Kamiros (Bossolino 2018a, 151). T LXXXII (2) consisted of a small square chamber (1.85 x 1.75 x 0.95m) with a short *dromos* carved into the bedrock in front, completed with a step. Even smaller is T LXXXIII (3), just 0.55 x 0.38 x 0.42m (Jacopi 1932/1933, 193; Bossolino 2018b, tav. 45c–d). These two contexts form unique cases as regards Iron Age Dodecanese, in which chamber tombs are no longer attested after the Bronze Age. Moreover, this type of burial seems very reminiscent of the latest Bronze Age examples on the island, located at Agia Agathi in the area of Lindos (Late Helladic IIIC, see Zervaki 2011; D'Acunto 2017, 439).

On closer inspection, this is not the only characteristic that connects the three selected burials to the island's Mycenaean past. Single-handled and two-handled *kylikes* (T.LXXXII(2).8 and T.VII(9).5, *fig. 2, 4*; Bossolino 2018b, 42 f.), included among Geometric grave goods, are actually dated to the Late Helladic IIIA period (Benzi 1992, 19, 145). The presence of antiques or Mycenaean vessels in later burials is not an isolated event in Greece. In the prominent burials presented before (Crielaard 2016), virtually every case study has yielded older artefacts together with its chronologically coherent grave goods. Mycenaean vases can, on the other hand, easily be found in contexts around Rhodes, Kos and Cyprus (Bossolino 2018a, 153).

All the exceptional features identified in the previous paragraphs indicate burials of great value, clearly not comparable to other local graves that were rarely equipped with more than a few vessels (Bossolino 2018b, 17–30). But what, then, is the meaning of these elements? How can these contexts be interpreted?

The laying down of earlier objects in later tombs suggests a reference to the Mycenaean past of the island, perhaps already imagined as glorious as a result of the creation of the Homeric poems (Bossolino 2018b, 92). On several occasions, it has been noted how the connection with the past and the control of imagery from earlier periods is essential in helping elites affirm their power

(Antonaccio 2002; 2016). Moreover, as suggested by Crielaard (2016, 73), what many rich Geometric burials seem to have in common is their connections to long-distance contacts. If Mycenaean *keimelia* serve to show control over time, the artefacts resulting from exchanges with distant societies demonstrate control over space and perform a double function: the preservation of older trade and exchange routes illustrates once more a sort of continuity with the past, plus the ability to access richer and more exotic resources (Morris 1996, 5; Crielaard 2000, 53; Antonaccio 2002, 29; Matthäus 2017; Babbi 2018; Crielaard 2018).

These features, provided with strong, symbolic meaning individually, appear even more significant if observed in the broader Mediterranean context. Comparisons with other Greek contexts allow us to include the examples from Kamiros into a sort of shared strategy that seems to bring together various power groups to the two shores of the Aegean Sea. Through the appropriation of the Mycenaean past and the ostentation of long-range contacts, the adherence to an ideology that appears to be common to different areas of the Greek world reveals itself in the juxtaposition to the figure of the 'wandering hero' (Crielaard 2016, 77). A figure that precisely during the first decades of the 1st mill. BC, together with the formation of Homeric imagery, started spreading and gaining authority in the Greek world.

4. Archaic Networks

The second case study is about Kamiros during the Archaic period. This era played a fundamental role in the history of the Mediterranean in general, but in particular in the life of Rhodes. The island was indeed thriving in that period, becoming an unavoidable crossing point on the route between the Levant and the West and actively taking part in the colonial process that brought many Greeks to Italian and Sicilian shores. In his general discourse regarding networks, recognising the importance of the case of Rhodes, Malkin (2011, 34) states: 'It is not enough to observe what was happening at Rhodes; we must also understand what Rhodians were doing in Egypt, Phoenicia, the Aegean, and especially Sicily'. By the beginning of the 7th cent. BC, the eastern Aegean, land of exchanges already during the Bronze and the Iron Age, had become a hyperconnected area, involved in every Mediterranean movement and trade.

The richest Archaic burial in Kamiros is T XXVII (35), dated to the last quarter of the 7th cent. BC (*fig. 5*; Jacopi 1932/1933, 84–98). In a context where the average tomb presents five or six grave goods, T XXVII (35) with its 29 objects clearly stands out. The Archaic period was a time of great exchanges, long-distance mobility and extensive trade routes. Most of all, these were the years of civic expeditions towards various Mediterranean coasts. Elements linking to all these issues can be traced in the objects selected to accompany the deceased on their last journey.

A primary feature as regards the selection of grave goods is the high incidence of products of Ionian origin. Three trefoil *oinochoai* (Jacopi 1932/1933, 85, nos. 1–3; Kerschner/Schlotzhauer 2005, nos. 76, 80) and one fruit stand (Jacopi 1932/1933, 94, no. 9) were produced in Miletus; various other cups and footed plates appear as local products with Ionian influences. Frequent contacts with Asia Minor's neighbouring coasts are already identifiable before the middle of the 7th cent. BC, when the first bird bowls (Coldstream 2008, 298–301) were imported onto the island. By mid-century, so-called Ionian *bucchero*, Ionian cups and Wild Goat Style creations were regularly traded in Kamiros (Bossolino 2020, 206). The precocity of connections between the island and the Anatolian shores should be pointed out; these are supposed to be the years of foundation of the so-called Dorian *hexapolis* (later *pentapolis*, Herodotus 1.144). Moreover, Rhodians must have gathered and organised at the beginning of the century in order to establish the city of Phaselis on the Lycian coast (Malkin 2011, 72).

The second major innovation that can be highlighted in this burial is the appearance of a great number of faience objects: small ointment bottles, flasks, amulets and figurines. The presence of the so-called *aegyptiaca*, made of stone or tin-glazed pottery, was not a complete novelty in Kamiros' cemeteries, but their occurrence becomes stable in the second half of the 7th cent. BC. Among T XXVII (35)'s grave goods, it is possible to identify genuine Egyptian imports, such as the

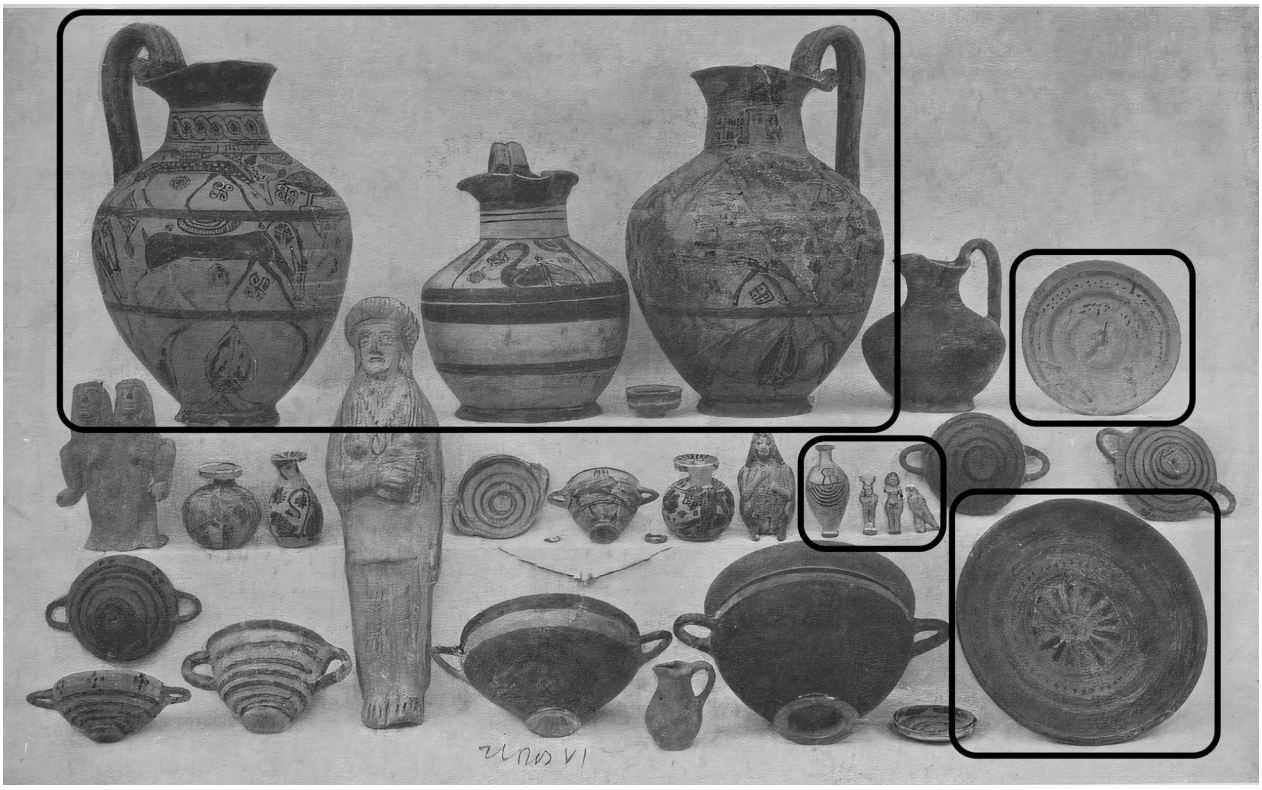

Fig. 5. Kamiros, Tomb XXVII (35). Grave goods with indication of the objects mentioned in the text: at the top left, Wild Goat Style *oinochoai*; in the middle, faience objects of Egyptian origin or inspiration; to the right, Ionian stemmed plates (modified after Jacopi 1932/1933, 80, fig. 91).

three amulets in the forms of a hawk, a woman and the young god Khonsu, equipped with an authentic hieroglyphic inscription (Jacopi 1932/1933, 98, no. 20; Webb 1978, 69, no. 255), together with Egyptian-inspired objects, probably produced elsewhere (Webb 2017, 71), such as a miniature faience *oinochoe* (Jacopi 1932/1933, 97 f., no. 19; Webb 1978, 69, no. 255). These materials are important because of the widespread nature of the contacts that they bring to light. One fact stands out very clearly, Rhodes' role as a thriving and active trading centre. From this time, the special relationship between this side of the Mediterranean and Egypt (Kourou 2004, 20–23; Malkin 2011, 83) becomes apparent – a fact that results macroscopically in the founding of Naukratis, a port city of crucial importance (Herodotus 2.178–179; Strabo 17.1.18).[3]

Now that the main features of the burial have been illustrated, it is possible to ask some questions about the context and what message it conveys. What does the analysis of the networks considered reveal? What can be understood in addition to the standard considerations offered by funerary archaeology? Why did these networks matter for the social group responsible for the burial? Why was it important to highlight those particular connections at the time of the funeral through the composition and the selection of grave goods?

As noted earlier, the 7th cent. BC was a period of great maritime exchanges and, most of all, of the foundation of settlement overseas. Rhodes itself, besides Phaselis and Naukratis, was heavily involved in the founding of the *apoikia* of Gela in Sicily (688 BC), that in turn would go on to found, approximately a hundred years later, the city of Akragas (Ross Holloway 2000, 45; De Angelis 2016, 71). Even though we now know that a number of *apoikiai* will become some of the most powerful cities of the ancient Mediterranean,

3 The date of foundation is still debated among scholars: around 630 BC (Webb 2017, 71), 620 BC (Boardman 1999, 138), or towards the end of the century (Villing 2015, 8 f.). Afterwards, Rhodes and its cities will be one of the nine poleis to establish the Hellenion shrine (Herodotus 2.178; see also Malkin 2011, 79, 81–87; Demetriou 2012, 105, 109).

the situation did not look so positive at the beginning of the process.

Hesiod describes his father's migration from Aeolic Cyme to Ascra in Boeotia (Hesiod, Works and Days, 618, 631–640). He points out that his father had been involved in maritime trade but was unable to overcome his economic difficulties through his work; because of that, he was urged to move to a place which turned out to be less attractive than it had initially seemed (Mele 2007, 4). Archilochus offers a similar insight for the first half of the 7th cent. BC (F 102 West). Even though the land on which to settle should be chosen for its appeal, Thasos seems to be under-appreciated, since it is likened to a donkey's back, covered with woods. 'It is misery that drives colonists from all over towards the island of Thasos, and it is poverty that urges [Archilochus] to do the same, leaving the island of Paros and a diet of figs and fish' (Mele 2007, 4).

On an archaeological level, Ian Morris interestingly notices how the average size of the earliest houses in Megara Hyblaea, Naxos and Syracuse was very small: typically, 4 x 4m, 'suggesting that life was harder for the first colonists than for Greeks who stayed in the Aegean' (Morris 2009, 69).

All these factors led to my hypothesis. The way in which these privileged networks are highlighted in the composition of grave goods seems to suggest exactly what Morris noted about the different sizes of houses on one side or the other of the Mediterranean. Clearly, connections with Greek or Hellenised settlements located on different coasts were still a source of pride and maintained their value, just like in the previous centuries. The perspective, though, was probably different in the 7th cent. BC. If at the beginning of the Iron Age these networks were the testimony to a preserved memory, of the ability to maintain old relationships and exchange routes even after a time of serious disruption (such as the end of the Mycenaean world), in the Archaic period this emphasis on interregional connections would have represented a statement of power.

At the beginning of this paper, the lack of a hegemonic power, the inability of any social group to dictate, and the growth that networks constantly bring to the environment in which they operate were discussed. I believe that the constant social negotiation typical of Archaic societies in Greece, this absolute impossibility to maintain an individual or dynastic power for more than some decades (Duplouy 2015), combined with the weakness of more democratic and inclusive forms of government at the time – that is, these constituent parts of Archaic Greek cities made these networks, and their exploitation in particular, of great importance for any social group with political ambitions.

The scenario that has been illustrated must remain, for the moment, speculative in the absence of any conclusive evidence. However, another clue that might support the proposal of this paper is provided by Plato (De Legibus 708b), when he talks of the economic or political needs that can force an individual clan or even an entire state to flee their homeland. It is my opinion that the combination of the archaeological and textual data collected here can make the idea – that network privileges without the need for migration could give some kind of prestige to the ruling groups – seem less far-fetched.

5. Conclusions: What Have Networks Ever Done for Us?

This paper opened with a brief description of network theory applied to social sciences, its often-metaphorical use in the Humanities, and Malkin's suggestions concerning its potential as regards the study of the Archaic Mediterranean. By illustrating a particular case study, it is hoped that some new elements have been contributed to the discussion.

The application of the metaphorical concept of network to the analysis of the ancient world and the use of the vocabulary and key concepts of network studies are valuable tools that are able to offer different perspectives and insights, thereby opening new routes for the exploration of past societies. As the Rhodian examples have shown, one of the greatest potentials of this line of study lies in the archaeology of death and burial, where the theoretical model can help in the investigation of several aspects. The attention to networks and their value for social groups of the past has also proven to be a useful tool to understand societal dynamics at various times in the past.

The case study related to Iron Age Kamiros focused on foreign and prestige objects deposited in graves. Through the analysis of three exceptional contexts – T LXXXII (2), T LXXXIII (3) and T VII (9) – clearly distinguished from the other burials discovered in the same cemeteries because of their nature or of the quality and quantity of their grave goods, the application of some key concepts of network theory allowed me to highlight at least two main processes that likely took place in the preparation and in the grave goods' selection of the concerned tombs. As the analysis of the finds has shown, the possibility to display some external connections through imported or exotically inspired objects was clearly conceived as a strong ideological tool for the most important social groups to affirm their power. In the same contexts, a second tool connected to the exploitation of networks was probably employed to reinforce the claims of prominent families: the presence of ancient objects – Mycenaean *keimelia* – and the choice of a rather traditional type of graves seem to evidently allude to a hypothetical control over the Mycenaean past of the island, linking the various contenders for power to an epic idea of the past that was probably gaining consensus in different areas of the Mediterranean, thanks to the diffusion of the Homeric poems.

The case of Archaic Kamiros has proved to be equally telling. In a context deeply changed by the wide movements of objects and people, the needs of groups aspiring to social power have developed as well. If the presence of exotic goods in the burials is not a rarity anymore – considering the ever-growing role of Rhodes as an island of commerce and exchange – their abundance and quality in a few graves exclusively appear to highlight a different approach to maritime mobility and connections. In a Mediterranean world that seems to become smaller and smaller because of merchants' travels and colonial foundations, the exhibition of medium and long-distance networks, without the necessity to leave the *polis* of provenance, appears to be an important element in the display of wealth that accompanies social and political claims.

In both cases, analysing whether or not networks were exploited in the contexts illustrated allowed us to single out new and previously neglected elements that help us to comprehend some aspects of Archaic societies. In particular, this analysis of prestige networks was able to display, I believe, their importance as resources to obtain and, possibly, maintain strong social relevance.

Isabella Bossolino
isabella.bossolino@gmail.com

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Wulf Frauen and Sabine Klocke-Daffa

Valuation and Value Creation of Mineral Resources in *Kermān*, Southeastern Iran

Keywords: *Kermān*, Jiroft, Garnet, Identity, Resources, Cultural Anthropology, Iran

1. Of Stones and History

The Jiroft region is one of the most fertile areas in southern Iran. Cultivation of wheat and date palms as well as pastoral goat herding are the basis of an economy which can be traced over thousands of years, as revealed by archaeological evidence (Pfälzner/Soleimani 2017, 136). Mineral resources show an equally long record. Referring to the archaeological findings resulting from the famous excavations at Tepe Yaja 1967–1975, archaeologists pointed to the fact that particular kinds of stone – mostly chlorite – were found installed in ancient Mesopotamian temples as early as the Bronze Age (Kohl 1975, 30 f.; 1978, 464). The use of stone resources was not limited to mining and exports of raw materials but gave rise to elaborate craftwork known today as a distinctive feature of the so-called 'Jiroft culture' (Muscarella 2004;[1] Pfälzner/Soleimani 2017, 127).

Tracing the history of inter-regional relations dating back 5000 years, it becomes apparent that there must have been some kind of early long-distance trade which was most probably combined with an exchange of material and immaterial resources such as objects, knowledge and persons. How was this possible considering the limited technical infrastructure of the time, and how long did it last? Recent investigations of the SFB 1070 archaeology project A 03 indicated that the early mining with stone resources continued over centuries but was interrupted by lengthy periods of inactivity (Pfälzner/Soleimani 2017, 136). Just because archaeological evidence is not available it does not signify that the area had been abandoned or even totally depopulated. The nomadic population of southern Iran may well have crossed the plains with their herds and movable inventory, leaving no traces of former dwellings. However, it shows that even after decades and centuries of negligence, there has always been a renaissance of mineral resources, which at its time gave particular impetus to the economic and social development of the area. This is still the case today, as can clearly be demonstrated in micro-studies of single settlements. The history of mineral resources continues with its ups and downs of value creation and devaluation, economic changes, and social transformations. But how are worthless stones turned into valuable resources and how can we interpret processes of devaluation of resources? What exactly is needed to activate this kind of latent potential – which can have far-reaching effects, as we can see from the archaeological records? These open questions gave rise to this anthropological project associated with the archaeological research, aiming at shedding some light on otherwise obscure historical contexts.

1 Muscarella, however, remarks that '[f]or archeological accuracy the terms "Jiroft" or "Jiroft culture" employed to define a specific ancient Iranian culture and its artifacts should only be cited within quotation marks' since '[v]ery few objectively determined facts about the "Jiroft culture" are known' (Muscarella 2004). The recent surveys in the area, however, provide '[…] a strong argument in favour of an autochthonous evolution of the Jiroft culture of the 3rd mill. BC' (Pfälzner/Soleimani 2017, 127). We hence employ the term 'Jiroft culture' here following P. Pfälzner and N. Soleimani.

2. Research Questions, Theoretical Framework and Methods

2.1. Resources and ResourceComplexes

We argue that the use of resources is subject to time and culture-specific processes that turn 'sources', in the sense of potentialities, into valuable 'resources'. Following Ingold (2018), we define the term 'potentialities' in the sense of perceived 'affordances' of the environment in regard to human-nature interaction. We also argue that resources seldom come as singular entities but in complexes, which need to be activated by networks supported by stable framing conditions in order to be applicable and meaningful to those in charge. The guiding research question of this paper therefore focuses on the connection of value creation, economic effects and social developments of one particular mineral resource at a given site: how are stones transformed into a valuable economic and social resource, in what kind of complexes are they integrated and how are the accompanying networks constructed in order to generate significant effects?

Based on a case study, this paper aims at a more comprehensive statement:

It seems unquestionable that mineral resources had a significant effect on the development of the region during some periods while they disappeared from the scene entirely in others. Hence, to understand the development of the region it seems to be crucial to understand the cultural dynamics connected with resources, i.e. the value creation and validation processes, the entanglements within the networks needed for exploitation and utilisation, and the transformations brought about. The results will allow us to achieve a deeper understanding of recent changes clearly visible in the area today, which might also permit a better understanding of historical facts together with a tentative reinterpretation of archaeological data.

To start with, it may be helpful to provide a brief overview of the theoretical framework regarding resources developed within SFB 1070. In accordance with the research question of the present paper, we will show how the interplay between ResourceComplexes, activating networks and framing conditions can be crucial for the value creation of mineral resources, thus shifting the focus to the heuristics of ResourceComplexes.

The most significant aspect of the SFB's concept of resources is its constructivist interpretation (Hardenberg et al. 2017, 14). As argued elsewhere, this widens the established essentialist understanding of resources, which has its roots in the capitalist logic that shaped western societies (Frauen forthcoming). According to our understanding, resources do not possess any intrinsic value, but are subject to cultural ascriptions of meaning that convert them into resources in the first place. It is hence the cultural context that turns a stone into a resource depending on shared views, perceptions and values of a given social unit. This context is not static but in constant flux '[…] not only because ideas and values change but also because new technologies, new practices and new social contacts emerge' (Hardenberg et al. 2017, 15).

The term ResourceComplexes refers to the basic fact that resources, given the explanations above, never occur isolated but only in combination with other resources (Hardenberg et al. 2017, 15). These other elements include not only material aspects (tools, weapons, infrastructure etc.) but also immaterial aspects (knowledge, regulations, organisational requirements, perceptions etc.), which are at least equally important. The various elements of a given complex are related to each other since they serve a particular purpose.

2.2. ResourceComplexes, Networks and Frames

Depending on the research question, it appears helpful to further differentiate between ResourceComplexes, activating networks and framing conditions (Klocke-Daffa 2017, 254–256). These three spheres merge into one large network of interrelated persons, practices, objects and inventories of knowledge. We argue that this kind of differentiation allows for understanding processes of value creation of mineral resources in certain contexts, such as the one occurring in remote areas where other resources have been predominant. Drawing

on Bruno Latour's concept of the 'actant' (2005), the actants of a given network interact but might not communicate; they affect each other but may not be dependent upon one another. What is essential is the prevailing set of relations, which may or may not change in the course of time.

Networks may be significant to activate a ResourceComplex and to keep it running, such as traders, infrastructure and institutions. They may be needed to valorise a particular resource that subsequently becomes the centre of a ResourceComplex on a local level, not only because networks connect the complex with external elements but also because they transport ideas. These ideas might be crucial for the emergence of the ResourceComplex in the first place and are often connected to framing conditions. We understand frames as being broad concepts such as religion, world politics, environmental conditions and technological inventions. These elements are not directly dependent on the elements of the inner spheres but can nevertheless have a distinctive influence on the entire structure. It is the interplay of these three spheres that causes processes of value creation, which potentially change the life of a local community, and in turn can cause processes on a broader scale.

2.3. Methodological Challenges

This research was carried out between 2018 and 2019 as part of the SFB project A 03 'Stones of the South' in the area around the city of Jiroft. Whereas the team of German and Iranian archaeologists focused on the immediate surroundings of Jiroft for surveys, the anthropological project reached out to the mountainous landscape west of the city. One of the villages in the mountains was chosen as a field site for subsequent research: *Bāġ-e Borǧ*. The location was deemed ideal for two reasons: one is that there are indications of a nearby prehistoric site of mineral resources which is nowadays abandoned; the second is that another mineral resource has been in use for the past 50 years, with all the accompanying effects of a ResourceComplex activated by an emerging network of material and immaterial elements.

The villagers allowed for participant observation on site and a succession of semi-structured interviews. In addition to this, and in close collaboration with colleagues of the Teheran-based Iran Cultural Heritage, Handcrafts and Tourism Organization (ICHHTO), narrative interviews were carried out focusing on the history of the settlement and the village community. The focus was on identifying the basic economic units and furthermore to understand the role that social relationships (marriage, kinship) play in the process of production, use and distribution of resources. Hence, in addition to interviews, genealogies were also recorded and personal networks analysed.

The subsequent section will introduce the community under study and the ethnographic context in which it is embedded. It seems to be essential to have a more detailed look at the geographic features in order to understand why mineral resources may – or may not – become economically and socially important.

3. Ethnographic Context

3.1. A Village in the Mountains of *Kermān – Bāġ-e Borǧ*

3.1.1. *Kermān*

The province of *Kermān* is located in the southeast of Iran. In the north and northwest, it borders on the Yazd province and in the northeast on the South Khorasan province, while it is bounded in the east by the province of Sistan and Baluchestan and in the south and southwest by the provinces of Hormozgan and Fars (*fig. 1*). The 'Plain of Emptiness' (*Dašt-e Lut*), a salt desert that is possibly the hottest and driest place on the planet, in which temperatures up to 70° Celsius were measured, forms a natural barrier between *Kermān* and the provinces to the east. Patches of wasteland (notably the *Kavir-e Namak-e Sirjān*, which locals refer to as *Kafa-ye Qaṭru*) separate *Kermān* from the Fars province in the west (Abbott 1855, 66; Borjian 2017). Given these natural boundaries, it seems only logical that archaeologists expect the relatively easily passable corridor to the Gulf in

Fig. 1. Map of Jiroft area with the South of Jiroft Survey Area (SOJAS); Archeological Survey Area South (by A. Ahmadpour).

the south to have been of vital importance since prehistoric times (Pfälzner/Soleimani 2017, 106).

Kermān shows an interplay between mountain ranges and plains of different altitudes which is typical for the Iranian Plateau that separates the subtropical, trade wind-dominated deserts of Arabia from the wide steppes of Turkmenistan and Central Asia (Bobek 1952, 65). Although *Kermān* is Iran's largest province and covers roughly 11% of its area (Borjian 2017), it is not very densely populated with less than three million inhabitants (census of 2011 in SCI 2014). In comparison to the rest of the country, the urbanisation rate is remarkably below average (58% to 68%), although in some rural areas a flow of outmigration can be seen (Zanjani/Nejatian 2017). Most of *Kermān*'s nomads have both their summer and winter quarters within the province (with only a few exceptions who spend the winter in Hormozgan) and the total of the tribal population remains surprisingly stable judging from two censuses conducted in 1987 (109,405) and 2008 (109,360) respectively (Zanjani/Nejatian 2017, Table 15). Like most of the Iranian Plateau, *Kermān* suffers from a shortage of rainfall and water.

The fundamental key to understanding the climate and accordingly the modes of living on the entire Iranian Plateau, and especially in *Kermān* province, is the binary division in zones of warm climate (referred to as *garmsīr*) and zones of cold climate (*sardsīr*). *Sardsīr* dominates the upland north around the cities of Sirjān, Rafsanjān and *Kermān*, while the downlands in the south around Kahnuj, Manujān and Jiroft are in a zone of *garmsīr* (Borjian 2017). In the zones of warm climate, extensive agriculture is carried out, especially with *ẖormā*, date palms, that have been grown here for thousands of years. Their importance is so significant that Bobeck defines the border from *garmsīr* to *sardsīr* in terms of them: *sardsīr* starts where date palms cannot be grown anymore

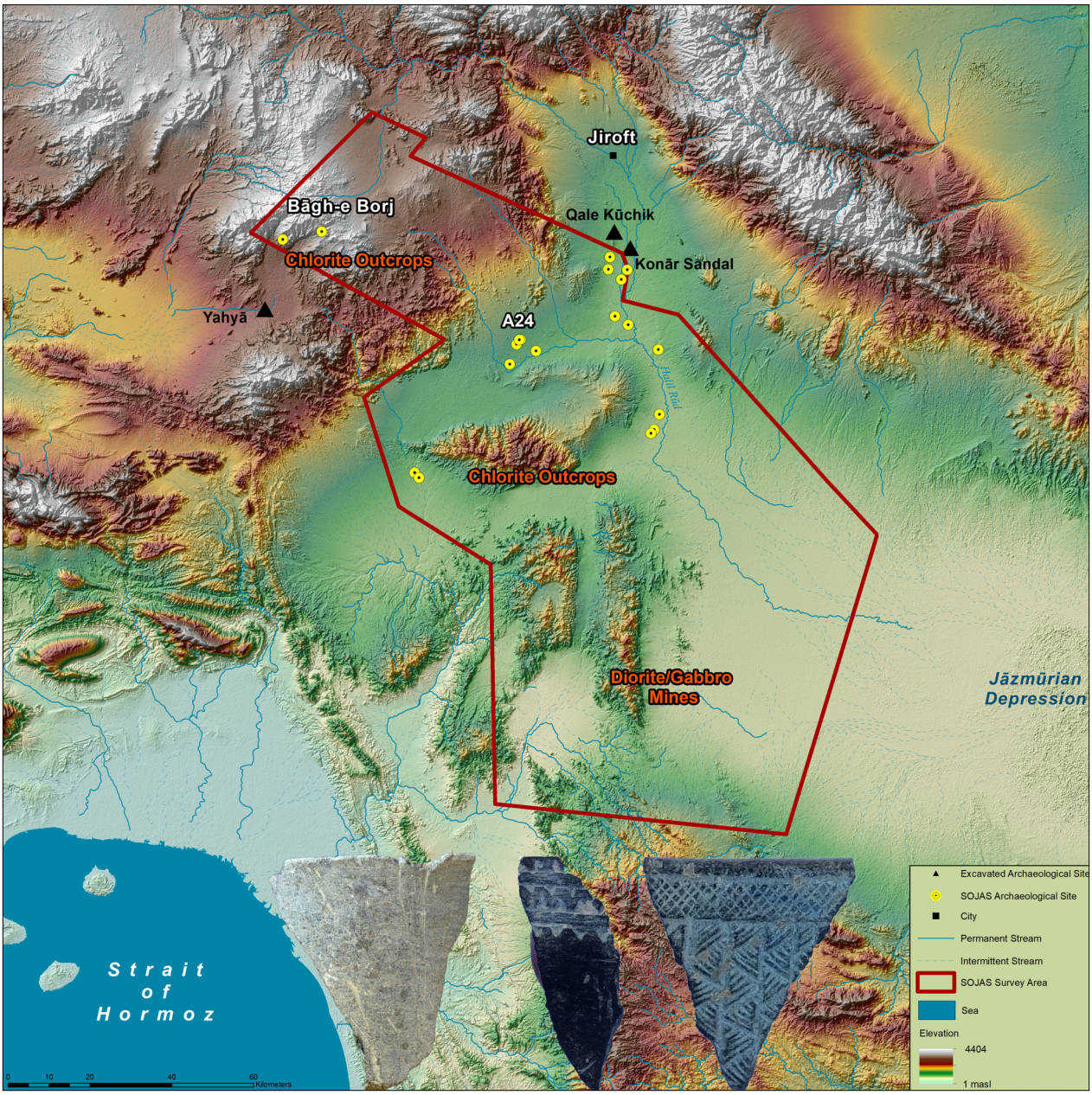

Fig. 2. The Jiroft area and *Bāġ-e Borǧ* (by A. Ahmadpour).

(Bobeck 1952, 75). In the highlands, trees and shrubs like pistachio and almond can be found and also grain is occasionally grown (Bobeck 1952, 75). *Sardsīr* can hence be seen as bounded by a third zone called *sarḥadd*, in which arable farming is not possible anymore and only pasture farming can be conducted (Bobeck 1952, 75). The distinction between *sarḥadd* and *sardsīr* is less clear-cut and additionally not made everywhere, although *sarḥadd* is an indigenous term as well. *Garmsīr* and *sardsīr* are the crucial categories.

The town of *Kermān* lies in a V-shaped highland basin formed by two mountain chains that run parallel, collide south of the city and part again thus constituting a lowland basin in the center of which the town of Jiroft is located. The mountains to the west of Jiroft are in the literature sometimes referred to as Sardouiyeh.[2] The people

2 For example in the Encyclopædia Iranica (Fouache 2008).

Fig. 3. View of the village of *Bāġ-e Borǧ* (photo by S. Klocke-Daffa).

who live there, however, would refer to the mountains as the mountains of *Bāġ-e Borǧ* (*kūh-hā-ye Bāġ-e Borǧ*) (*fig. 2* and *3*).

3.1.2. *Bāġ-e Borǧ*

Following a local chronicle with the name *Ǧoġrāfīā -ye ṭabīʿī-e Esfandaqeh* (Natural Geography of Esfandaqeh), the highest summit of the mentioned mountains has an elevation of no less than 3715m above sea level (Ibrāhīmī et al. 2017, 95). This summit is sometimes referred to as the 'Tower' (*Borǧ*; Ibrāhīmī et al. 2017, 95), which offers a potential explanation for the name of a small village at the foot of the mountain that lies at an elevation of 2300m: 'The Garden of the Tower' (*Bāġ-e Borǧ*). *Bāġ-e Borǧ* is, like many villages in Iran, divided into two parts called '*Bāġ-e Borǧ* up' (*bālā*) and '*Bāġ-e Borǧ* down' (*pāyīn*), which are 3km away from each other. In a census conducted in 2006, the two parts were considered to be two different villages with respective populations of 118 and 48 people.[3] The villagers, however, would reject the notion of two different settlements, primarily because the two form one social unit: all villagers belong to the same extended family with the name Eskandery. To avoid the lengthy discussion whether the term 'tribe' (Gingrich 2015, 645-647) can be used in this context we will refer to the Eskanderies as *ṭāyefa*, which is an

3 Interestingly, the smaller part of the village is called *bāġ-e ḫarāb* in the census, which is not its name but a Persian wordplay occasionally made by the villagers: *ḫarāb* means 'broken', 'not working' and the villagers use the term *bāġ-e ḫarāb* in an ironical way to state that the place is not really suitable for a garden. The term usually used however is '*Bāġ-e Borǧ* down' (*pāyīn*).

indigenous term often used by the villagers to describe themselves. In the rare literature on *Bāġ-e Borǧ*, however, they are usually referred to as *ʿašīra/ʿašāyer* (Ibrāhīmī et al. 2017, 96).[4] For the present work it seems to be more fruitful to mention that the latter one, *ʿašīra* and its plural *ašāyer*, not only refers to a social group based on kinship but additionally gives a hint about their mode of living: *ašāyer* are often people who depend on stock breeding and follow a seasonal migration pattern from *garmsīr*, where they have their winter quarter (*qešlāq*), to *sardsīr*, where they have their summer quarter (*yeylāq*). The Eskanderies of *Bāġ-e Borǧ* are a kinship-based group whose identity is fundamentally based on common descent from an ancestor who can be traced back from the single households via the male line. The *ṭāyefa* is endogamous and marriages outside of the group are only rarely, if ever, permitted to girls and never to boys. It is argued elsewhere that these kinship patterns have to be understood as being connected with stock breeding, since they create informal dependencies for otherwise independent households and regulate the population of the *ṭāyefa* – the result is a stable social unit that has a suitable size for the seasonal migration with its herds (Frauen 2021). The Eskanderies, however, have gradually given up their seasonal migration since 1950, and changed their tents for solid houses that have considerably changed the appearance of the village, just like the social life of the group was affected by the new *modus vivendi*.[5] Today *Bāġ-e Borǧ* looks like a loose composite of small houses that contains some basic elements of infrastructure (an elementary school and a mosque, situated in the same building), while lacking others (shops, asphalt roads). While stock breeding and small-scale agriculture on a subsistence level continues to be of importance for the village, a third basis of existence has become crucial and is often mentioned by the villagers to have caused their sedentarism, although it has to be assumed that other factors have also contributed to this change. Since the 1950s, the villagers have been working with stones that they mine and sell. One of these stones is garnet.

3.2. Garnet in *Bāġ-e Borǧ*

When we first saw what was presented to us as 'garnet'[6] in *Bāġ-e Borǧ*, we were slightly confused since the name and also some apparent characteristics (shiny and to some extent transparent) indicated that this stone was other than the German *Granat*, a commonly known red gemstone. The colour, however, indicated otherwise: garnet can occur in a variety of different colours, like red, green, blue or black, since the colour of minerals usually depends on small amounts of trace elements which are present in the crystal lattice as an impurity (Neukirchen 2012, 5). The green colour of the *Bāġ-e Borǧ*'ian garnet (*fig. 4*) is hence a result of the surrounding soil that contains chromite (Neukirchen 2012, 6).

Like most gemstones, garnet is not mined through big open-pit or underground operations, but via artisanal mining with hand tools. The stones are sold directly as raw material rather than being processed in the village. The most crucial point is hence not the mining of the stones, but finding them prior to that. For that reason, the villagers call the work with garnet *šānsī* – a gamble. Nevertheless, the work with garnet has become a crucial economic factor in the village in close connection with a complex interplay between resource specific complexes, surrounding networks and framing conditions that will be analysed in the following section.

4 Both terms are commonly translated as 'tribe' when used in English texts and a discussion on whether this is appropriate or not can be found elsewhere (Frauen forthcoming).

5 See Frauen forthcoming for a detailed description of the changes in the social life of the group.

6 The Persian term is indeed 'garnet', just like in English. Or, to be more precise, the *Bāġ-e Borǧ*'ian term for the material is 'garnet'. There is also a technical Persian term but it is not used by the villagers and not even known by most of them. It hence would be wrong to employ this term in an article that deals with the people of *Bāġ-e Borǧ* instead of garnet.

Fig. 4. Green garnet found in *Bāġ-e Borǧ* (photo by W. Frauen).

Fig. 5. Rings with gemstones in silver settings (photo by S. Klocke-Daffa).

4. Value Creation of Garnet

4.1. The Emergence of a ResourceComplex around Gemstones in *Bāġ-e Borǧ*

Although most gemstones possess certain characteristics in both, outer appearance (transparent or shiny) and inner condition (hardness), their value is subject to social construction which changes over time (Rapp 2019, 343). The fact that we consider garnet to be a gemstone is because of its use in the Middle Ages when deep-red almandine garnet was used to decorate religious artefacts – it is the same mechanism that causes us to consider garnet to always be red (Rapp 2019, 330). Subsequently these gemstones served as prestigious goods, which displayed the status of a person. Here Simmel's important idea also needs to be mentioned that value basically emerges from the tension between desire and accessibility (Simmel 1930, 16, 20, 25). In other words: in order to become valuable, a material does not only need to be shiny and/or hard but also to be rare (not easily accessible).

Garnet did not possess any value in *Bāġ-e Borǧ* in the past, because the villagers there showed relatively little social stratification, and hence prestigious goods were not needed as much as in other contexts. Garnet was not particularly rare and was easily available (Frauen et al. 2021). The villagers often said that they did not know about the garnet, but on closer examination they would qualify their statement: they did not know that the stone was *qeymat dāre* (possessing a value).

At the beginning of the value creation of the mineral in *Bāġ-e Borǧ*, there was the notion that the mineral was a desired good. This idea arrived with a man called Amiri, who came to the village 25 years ago. Amiri did not come to the village to look for stones, but coincidently happened to be *Mašhadī* – coming from the city of Mashhad. Since Mashhad is, so to speak, Iran's gemstone-capital, with more than 16,000 registered artisans that manufacture gemstones and sell them subsequently on the city's *bāzār*, he noticed the garnet. Soon after, the first traders appeared in the village and asked for garnet.

Since the villagers did not know what an adequate price for their garnet would be, they sold it for prices way below the market value. This is reflected nowadays in the village by stating that a lot was given away for *moft* ('for nothing' with a very negative connotation), and that the people who took it were accordingly what is called in Persian, with a very negative emphasis, *moft-ḫūr* (people who take without giving). The village, at the time, seemed to have fallen into the jaws of the dubious gemstone-industry in which the stones pass through a maze of brokers, wholesalers etc., and very little money goes to the people who actually mine the stones while others make huge profits (Cross et al. 2010, 5). The second aspect that needs to be mentioned is that this initial idea coincidently corresponded with a phase of uncertainty and reorientation in the village since a chromite-mining company, which had previously employed roughly 90% of the villagers on site, had stopped its activities, following a revision of the Mining Act of 1983. The revision privatised parts of the state's mining industry and forced the villagers to either establish their own contacts to transport and sell

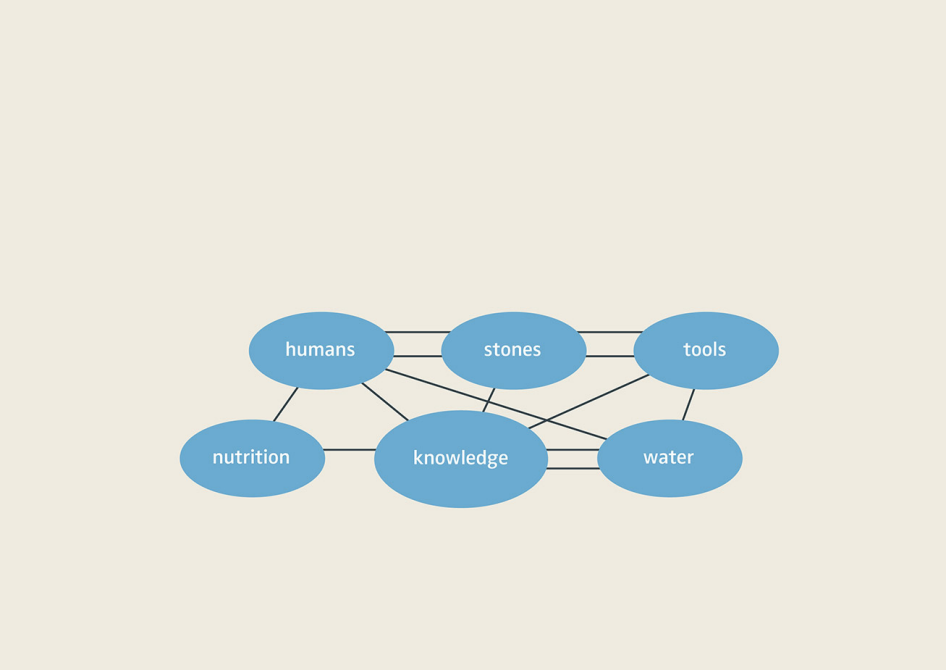

Fig. 6. Reduced diagram of the ResourceComplex in *Bāġ-e Borǧ* (by W. Frauen).

the chromite or to look for an alternative source of income. The result was that some of the villagers indeed focused more on stock breeding, which regained importance,[7] while others went to cities like *Kermān*, Bandar Abbas and even Teheran to do what they referred to as *taḥqīq kardan* ('doing an investigation'). In the course of (re)establishing a network to sell chromite, they also noticed that they had been outsmarted and established their own contacts to sell the garnet. Nowadays, whoever comes to the village to buy garnet must pay an appropriate price for it. As for other gemstones, when processed into jewellery (*fig. 5*), it may achieve considerable prices at urban bazaars.

5. Analysis: The Cultural Dynamics of Garnet as a Resource

Looking at resource creation, it becomes clear that the process cannot be reduced to persons and minerals. It is rather a complex network of interrelated actors (or 'actants') interacting with one another with varying degrees of dependency. The inner circle of this network, the ResourceComplex in *Bāġ-e Borǧ*, consists of the following basic elements: stones, humans, tools, knowledge, nutrition and water. These elements are meaningfully related to each other: stones are mined by humans (with tools), who need nutrition to survive. Water is also needed by humans to survive, and is additionally used in the mining process. A diagram which reduces complexity to the basic elements shows the structure of the ResourceComplex (*fig. 6*).

The element 'knowledge' requires additional clarification. It contains the knowledge of where the stones are to be found and how to mine them, as well as the knowledge necessary to survive in the mountains, which is essential although not directly connected with stones. Another crucial point is lacking in this listing: the basic knowledge that is required is that (1) stones can possess a value (*qeymat dāre*) and (2) that garnet is one of the stones that fall under this category. As shown above, this crucial information did not originate in the village itself but came from an external contact. Here the 'gemstone-industry' comes into play (*fig. 7*).

The 'gemstone-industry' serves as a kind of 'black box', since it not only provides some basic information but also covers additional essential

7 It should be mentioned that stock breeding never fully disappeared from the village, although it temporarily lost most of its economic significance. For the importance of stock breeding and the collective identity of a social group that used to live as pastoral nomads for centuries, see Frauen forthcoming.

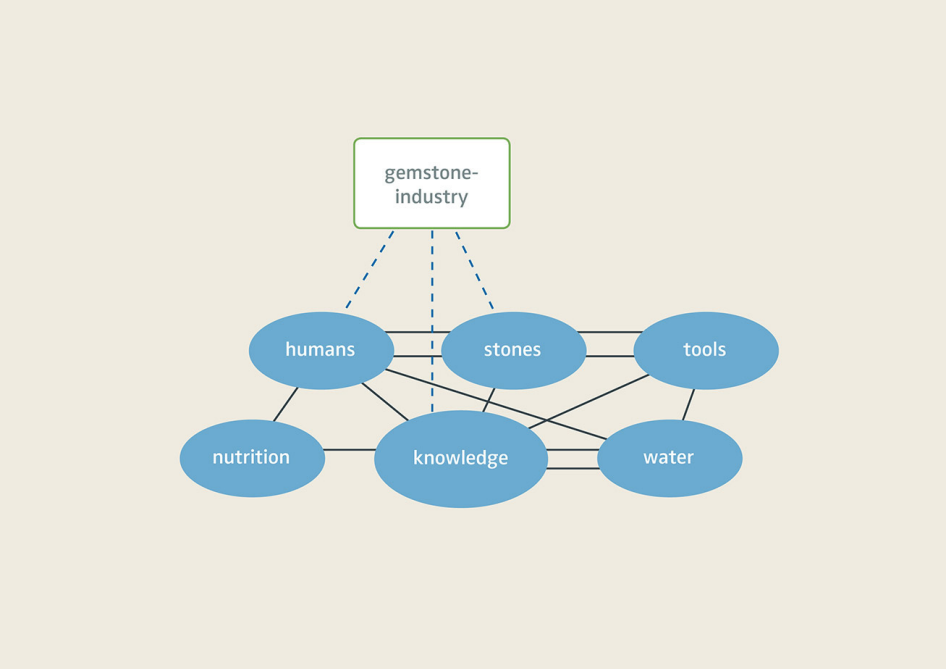

Fig. 7. ResourceComplex in *Bāġ-e Borğ* with gemstone-industry serving as an activating element of the outer network (by W. Frauen).

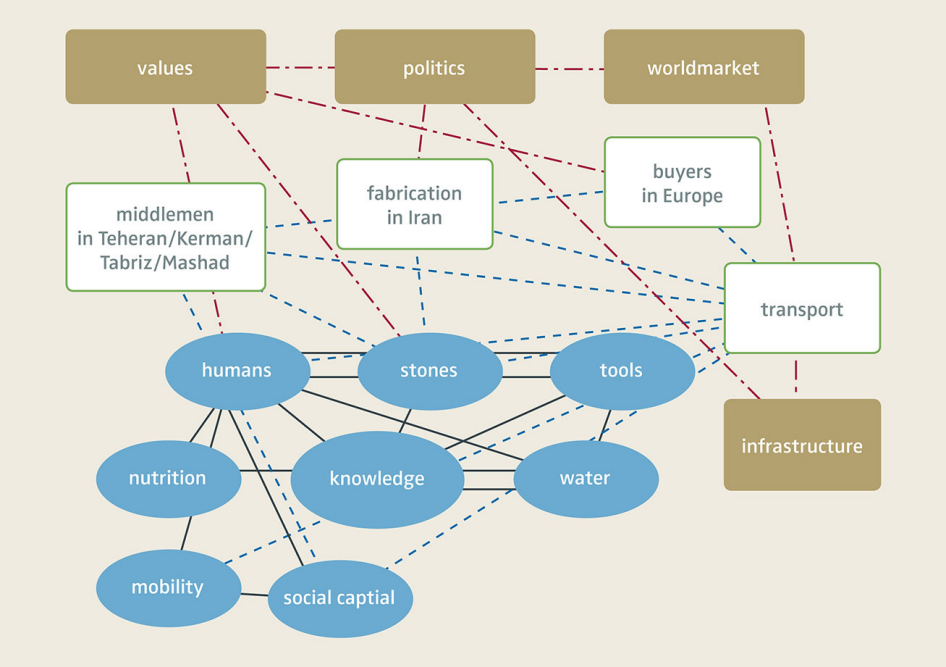

Fig. 8. ResourceComplex in *Bāġ-e Borğ* with networks and framing conditions (by W. Frauen).

aspects: transportation, contacts and relationships (social capital in the sense of Bourdieu's categorisation of social 'fields', Bourdieu 1986), fabrication etc. The villagers do not need to worry about these aspects as long as they sell to the traders who show up in the village to buy stones.

The network which gradually evolved around the ResourceComplex shows the following characteristics (*fig. 8*).

It is apparent that the structure becomes more complex over time. 'Social capital' comprises the established contacts to the markets in cities like Teheran or Mashhad. The people buying the stones are, however, not the end of the chain, but constitute a group of *wāsṭe* (middlemen) while the *moštarī* (buyer) may not even be located in Iran. The villagers are aware of that. Of course, if they could sell directly to the *moštarī* they could get an even better price. This, though, is not possible due to their lack of external contacts. The important point for them is that they managed to get access to the interregional market of Iran. This is

sufficient to get at least a fair price for the unprocessed material. It can be seen, furthermore, that the complex is surrounded – and activated – by a second sphere needed to keep the ResourceComplex running. Since the initial impulse of value creation came from here, it also can be argued that it played a crucial role in the emergence of the complex. Both are influenced by framing conditions such as values, political developments and the dynamics of the world market. Changes in this sphere could result in a collapse of the entire structure, for example if garnet falls out of fashion or political decisions disrupt market access. What could happen in such a scenario, if garnet lost its importance in the village altogether, will briefly be addressed in the last chapter.

The value creation of garnet also had remarkable effects on the social structure of the village community: it offered a much-needed alternative or addition to animal breeding. As such it had a positive effect on the village economy. On the other hand, it generated tensions between the households for two reasons: (1) the material can only be mined once, and the more garnet was mined, the harder it became to find deposits close to the surface; (2) not all households were equally successful in establishing contacts to traders. This resulted in some becoming brokers for others, which created dependencies and inequalities that did not exist before, so that the community became economically and socially more stratified: some actors in the network thus became dependent on others with the means and the knowledge of successfully acting within the network. The value creation of a new resource thus led to a social segmentation, which was hitherto unknown. Knowledge about stone prices and how to get in contact with traders is generally open to all villagers and is neither handled as an exclusive resource in itself nor precludes access to information and contacts. However, future research will show whether a kind of hierarchisation of human actors within the network emerged that promotes social stratification within the village.

A last point should be highlighted: the villagers were able to change the network structure shown above in quite a drastic way to their advantage. Hence the question arises where in this diagram the necessary agency to do so can be found. We define agency, following Andre Gingrich, as the 'ability to act socially in the medium-term' (Gingrich 2005, 40).[8] In this particular case, this capacity to act independently is constituted through a combination of the elements of the ResourceComplex in the centre. All of them are to be found in *Bāġ-e Borǧ* and some crucial aspects are only possessed by the villagers, for example the knowledge of where exactly to find the stones and how to survive in the harsh environment of the mountains. This knowledge can be seen as cultural capital, again in the sense of Bourdieu (1986) – and it makes a very 'fine distinction' in comparison to somebody who comes to the mountains to find garnet without any knowledge about the environment. We argue, therefore, that the often-stressed dichotomy between local populations and global influences, which reduces the first to mere victims of processes beyond their control, is not always accurate.

6. Concluding Remarks

With regard to our research question raised at the outset of this paper of how stones can be turned into a valuable resource and in what kind of complexes they are integrated, we could demonstrate how the hitherto worthless-appearing garnet became a much sought-after resource by external ascription of economic and social value. The transformation was made possible by the coexistence of a supporting complex of other resources which are part of a more or less tightly knit network of relations comprising human as well as non-human 'actants', material and non-material elements. Analysing our empirical data, it became apparent that the value creation of a resource may well be triggered by an impulse coming from the outside. However, it needs a complex of interconnected resources (what we call a ResourceComplex) and an activating network that turns a 'source' into a socially validated resource in the first place, up to the point that the network itself becomes an indispensable resource. This process of validation and value creation was essential to many of the

8 Translation from German by Wulf Frauen.

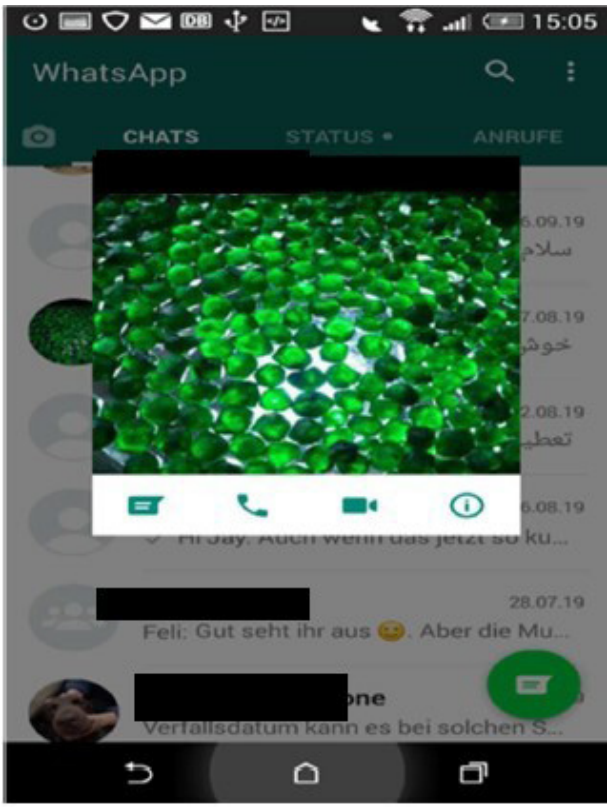

Fig. 9. Garnet on WhatsApp wallpaper.

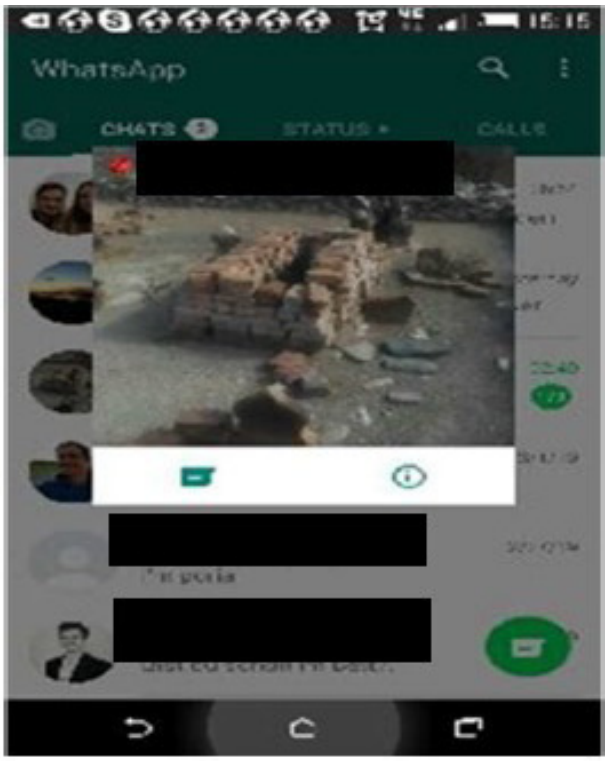

Fig. 10. *Karbalāʾ Bārānī* on WhatsApp wallpaper.

subsequent social and economic changes. Analysing the interplay of ResourceComplexes, surrounding networks and framing conditions has proven to be a valid tool for understanding processes of value creation of mineral resources. A perspective focusing merely on local processes would have been as inadequate as the unilateral perspective on national policy or globalised markets. Both would lead to inaccurate conclusions. It is the interplay of these spheres that can provide the full picture. The valorisation of certain mineral resources in *Bāġ-e Borǧ*, one of them garnet, has already had a distinctive effect on the village community. The villagers even started to identify with the material, as can be seen from details like the fact that it became popular to use garnet (or other stones) as a motif for WhatsApp wallpapers (*fig. 9*). To give an idea of the role such representations can play in identity construction, another example of a popular motif used by villagers serves well: the motif shows the tomb of Karbalāʾ Bārānī – the common ancestor of the *ṭāyefa* Eskandery (*fig. 10*).

It must also be mentioned that the villagers today refer to their village and its environment as a place in which 'the best stones of Iran' can be found – and not as a 'broken garden' (*bāġ-e ḫarāb*) anymore. There is a certain pride in these descriptions. The stones have become something the villagers **identify** with – a potential source for **collective identity**.

Depending on the robustness of the network construction, the quality of inter-network relations and the stability of framing conditions, resources may indeed promote unforeseen dynamics. In the case of *Bāġ-e Borǧ*, it has been demonstrated that the stones generated far-reaching relations that did not exist previously. It has been argued elsewhere that the mining of stones has the potential to connect communities in mountain regions with the institutions of the lowlands since it causes mutual dependencies and potentials (Frauen forthcoming). As such it can act as an 'amalgam' that holds high- and lowland regions together.

The loss of one or more basic elements of such an entangled complex may well cause developments in the opposite direction: from the downfall of regional economies, deterioration of infrastructure and re-organisation of social hierarchies, right

up to the redefinition of identities. More research is necessary to trace processes of rejection or devaluation of resources, and whether there is something like a point of no return where a Resource-Complex breaks down. What did become evident is that the investigation into the cultural dynamics of resources proved to be a valuable tool for the understanding of social and economic changes in a region with a tradition of resource-use stretching over several millennia. This approach may also provide a deeper understanding of historical processes attested until now only by archaeologically valuable material remains. With regard to the general discussion on the importance of networks in ancient communities, the results of this anthropological research focusing on current processes of value creation and network construction shed light on some central aspects that are difficult to grasp in archaeological analyses. On the other hand, anthropology does not provide the tools to look far enough into history. We therefore strongly support the idea of interdisciplinary ethno-archaeological approaches which will allow for a somewhat more comprehensive coverage of the cultural dynamics of resources.

Sabine Klocke-Daffa
Eberhard Karls University of Tübingen
Asien-Orient-Institute, Department of Ethnology
Schloss Hohentübingen
72070 Tübingen
SFB 1070 ResourceCultures
Gartenstraße 29
72074 Tübingen, Germany
sabine.klocke-daffa@ethno.uni-tuebingen.de

Wulf Frauen
Eberhard Karls University of Tübingen
SFB 1070 ResourceCultures
Gartenstraße 29
72074 Tübingen, Germany
wulf-marten.frauen@uni-tuebingen.de

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Dominik Maschek

Resources, Knowledge, and Power in Late Republican Roman Architecture

A Network Approach

Keywords: Roman architecture, Roman concrete, Roman economy, Roman social history, slavery, Late Roman Republic

Abstract

Traditionally, histories of Late Republican Roman architecture have focused on matters of design and typology. In such accounts, dominated by an emphasis on the diffusion of architectural styles and processes of acculturation (such as 'Hellenisation'), resources are mainly identified with building materials. By contrast, it is the aim of this paper to significantly widen the definition of 'resources' by looking at knowledge created through the process of construction. The study conceptualises the construction site as a horizontal network of social relations, whilst at the same time acknowledging the crucial role played by individual agents and particular materials. Ultimately, this leads to the distinction between two different types of knowledge which served as invaluable resources in Late Republican architectural practice: on the one hand, the 'vernacular knowledge' of commissioners, users, and viewers of Late Republican buildings; and, on the other hand, the 'expert knowledge' of architects, builders, and craftsmen active in the building industry. Both types of knowledge, far from being neutral, come with particular power relations which play out before, during, and after the process of construction. Through the discussion of a particular building technique (*opus incertum* and *opus reticulatum*), the paper demonstrates how this new concept changes our understanding of Late Republican architecture and its role within the wider socio-economic and political canvas of the 1st cent. BC.

1. Introduction

The Late Republican period can be understood as a profoundly transformative moment in the history of Roman architecture. The traditional range of building materials, dominated for centuries by local and regional stones, timber, and terracotta, now gave way to a proliferation of mortar-rubble masonry, and in particular *opus caementicium* based on the usage of lime, sand, various building stones, wooden formwork, and pozzolanic aggregates, alongside imported marble from the wider Mediterranean (Torelli 1980; Bernard 2010; Mogetta 2015; Davies 2017; Mogetta 2021). Construction projects in Rome and throughout Central Italy therefore became increasingly dependent on highly complex supply chains, which relied on different seasonal patterns of procurement and production (DeLaine 1995; Lancaster 2005; Jackson/Kosso 2013; Lancaster/Ulrich 2014; Van Oyen 2017; DeLaine 2018).

This changing nature of the building trade provided new opportunities and patterns of occupation for unskilled and skilled workers: labourers active in construction projects using *opus caementicium* were most probably employed only on a seasonal basis, whilst stonemasons working in traditional ashlar masonry could have stayed on the construction site virtually all year round (Anderson 1997, 119–127; Bernard 2016, 64–75;

Erdkamp 2016; Maschek 2016; 2020, 52 f.). Despite the widespread assumption that the 2nd and 1st cent. BC boom in concrete building would have mostly relied on the availability of a large number of slaves (e.g. Coarelli 1977; Torelli 1980, 1983), more recent studies have put forward arguments in favour of a mixed workforce, including the short-term employment of unskilled workers from the agricultural sector, therefore creating new synergies between the urban and the suburban as well as rural labour market (e.g. Mogetta 2015; Hawkins 2016b, 23–65; Maschek 2016; Mogetta 2016; Bernard 2018, 160–181; 2019; Mogetta 2019; Maschek 2020).

Within this wider process of vigorous building activity and concomitant socio-economic change, resources played a crucial role. In modern studies of Graeco-Roman architecture, such 'resources' are conventionally conceptualised in two ways: first, in terms of raw materials required for the process of construction, tied to activities such as extraction (e.g. quarrying), production (e.g. brick-making), and transport (overland or via rivers and sea routes); and second, in terms of the workforce and its composition. It is therefore generally assumed that resources are acquired strategically, shipped to the construction site, processed, and ultimately transformed into the finished building, through the collective input of the additional resource of 'human labour'. Consequently, scholars such as Richard Goldthwaite have postulated that the cost and value of resources in pre-modern construction projects basically represent the necessary labour for their extraction, transport, and processing (Goldthwaite 1980, 399; *contra* Wilson 2012, 151 f.). In this view, the construction site can be understood as a crucible where resources are gathered, manipulated, and ultimately forged into something new.

The aim of this paper is to fundamentally challenge this notion of the construction site as a mere receptacle and transformer of raw materials and human energy. Instead, the process of architectural creation in and of itself, similar to the quarry producing building stone or the kiln producing fired bricks, must be seen as a generator of a genuine and substantial, albeit largely immaterial, type of resource: knowledge.

2. Knowledge as a 'Resource' in Roman Architecture: Individual Agency, Social Hierarchies, and Networks

Following Tim Ingold (2013), it can be postulated that 'making' and engaging in constant 'conversations' with materials is an intrinsic part of human existence. Although, for various reasons, we should be cautious about assuming boundless 'object agency' (Fernández-Götz et al. 2020), it is nonetheless true that human creators have always been and will always be challenged by the materials they want to bring into a desired shape or form (Sennett 2008; Ingold 2013; Van Oyen 2017). In the case of building, it is particularly important to acknowledge the individual's interaction with materials, in shaping and transforming them, and grappling with them, learning and gaining knowledge and experience in doing so. Knowledge, as a resource, is therefore vital for the process of successful creation.

In his work on the peculiar and complex ways in which humans develop and sustain their understanding of the world, Michael Polanyi drew a distinction between 'personal' and 'articulate' knowledge (Polanyi 1966). Whilst the latter refers to the outcome of processes of reflection, formalisation, and abstraction, the former, in the words of Tim Ingold, 'both grows from and unfolds in the field of sentience comprised by the correspondence of practitioners' awareness and the material with which they work. Relative to articulate knowledge, then, personal knowledge is not buried deep down in the psyche rather than raised up at the forefront of consciousness' (Ingold 2013, 111; Sennett 2008). When dealing with Roman architecture and the process of construction, this has important implications, as it needs to be assumed that each of the builders working on a Roman construction site had their own personal knowledge which allowed them to fulfil their assigned tasks, with varying degrees of expertise and competency (Tran 2016).

However, large Roman building projects were never undertaken by individuals who were entirely free to explore their creativity and materials: there were constraints in terms of space, time, and outside pressures. On the most basic level, a family group building a house is already under some sort

of pressure regarding completion; as the builders supposedly need the house for shelter, the work should be completed before the onset of the wet and cold season, or there should be at least some inhabitable and roofed rooms as soon as possible. Therefore, there will always be specific expectations associated with a given building project, regardless of its scale. These expectations matter even more when the social relation between the ones doing the work and those who want to see it completed are not based on equality, but on contractual agreements and the exchange of goods or money. Thus, construction, with the possible exclusion of Robinson Crusoe building his first hut after having been washed ashore, is always intrinsically embedded in and therefore strongly conditioned by social organisation. This is the context in which the builder's knowledge emerges.

Contrary to Ingold's view (2013, 73), the crucial type of resource on a construction site is not Polanyi's 'personal' knowledge. Instead, the building process stands for a type of 'articulate' knowledge which is collectively produced, handled, and preserved. By involving craftsmen with specific skills and experience, it can be stimulated and strategically employed. In this process of verbal, written, or performative exchange, we should expect the introduction of a certain degree of abstraction and formalisation, albeit ranked on a scale of degrees, from very low-level formalisation to abstraction on a very high level. Even if builders may also acquire knowledge individually, for example by means of texts and books, these texts must have been written by another individual, either in the present or in the past, thus establishing a form of social interaction. As a resource, the articulate knowledge of construction can therefore be consumed, transferred, or eradicated. It is sustained through social institutions such as intergenerational education, rites of passage, or contexts of production and consumption (Monteix/Tran 2011; Rebay-Salisbury et al. 2014; Garmann Johnsen 2016; Riggsby 2019, 9, 208).

In order to reach a deeper understanding of how and under what conditions this knowledge was created, mobilised, and used on a Roman building site, it is therefore crucial to think about social organisation (Anderson 1997; Taylor 2007; Zuiderhoek 2016; Bernard 2019; Gerding 2019). In the building process, social hierarchies and networks were of fundamental importance for the collaboration of workers of different social status (Benneworth et al. 2014; Gerding/Östborn 2017). When it comes to the creation of knowledge, networks organise, distribute, and share knowledge horizontally, whereas hierarchies are essentially vertical in their organisation. Although there can be very hierarchical networks, the key difference between networks and hierarchies is that the former tend to have multiple nodes of importance (Nieves/Osorio 2013; Tur/Azagra-Caro 2018). This is particularly pertinent as the way in which construction projects are organised has an obvious bearing on the finished building. The aims and constraints under which Roman builders were working directly relate to the wider social and temporal organisation of the construction site and the aims and motivations of those involved in the building works. In order to gauge the role of knowledge as a resource in Roman architectural practice, it is therefore necessary to understand the hierarchies and networks in which Roman builders operated.

3. Conceptualising the Network: Contracts, Wages, and Inequality

These hierarchies and networks on the construction site and beyond were regulated by a framework (*fig. 1*) which is often surprisingly unfamiliar to archaeologists and architectural historians: The provisions of Roman contract law (Martin 1989; du Plessis 2012; on regional variation of legal practice in the Roman empire, see Czajkowski et al. 2020). There are two basic forms of contracts which regulated building works: the first, *stipulatio*, was comparatively rare, as it was not more than a formalised verbal exchange between the employer and the employee, in the form of question and answer; nothing was written down, and the *stipulatio* was considered unilateral, which means that the employee was liable to perform the work, but the employer was under no obligation to pay for it. Payment depended on goodwill or on a second *stipulatio* by the employer.

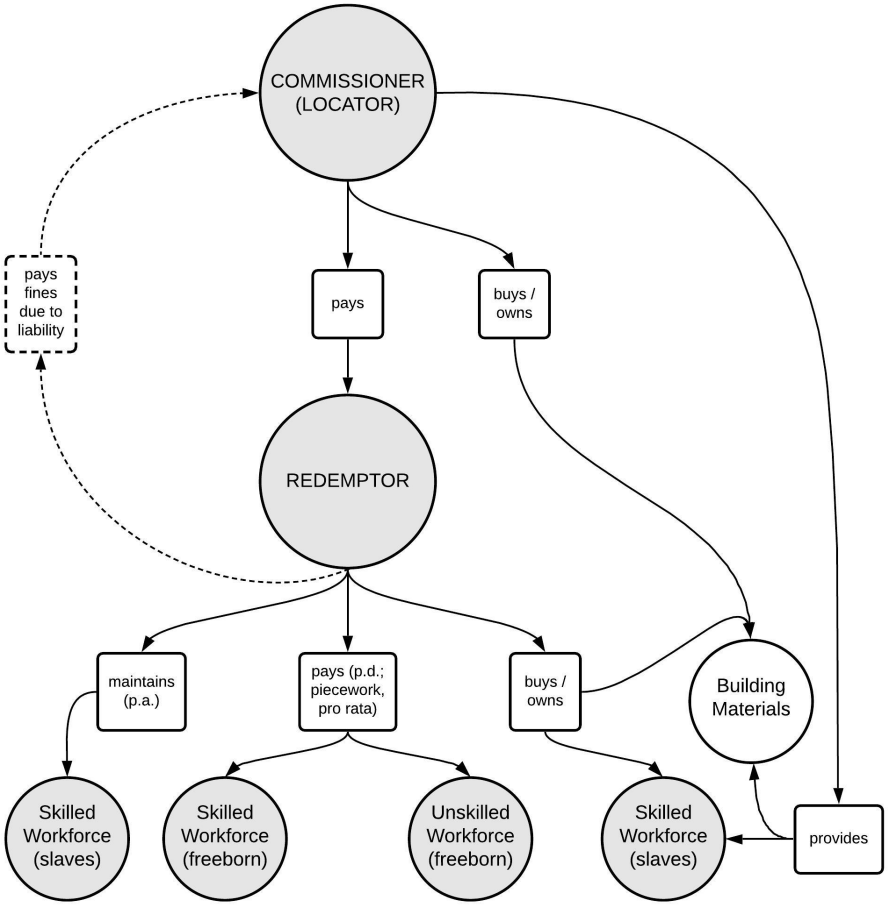


Fig. 1. Organisation of a Roman construction project based on the contractual framework of *locatio conductio* (elaboration by D. Maschek).

Consequently, a second type of contract was much more common in Roman building: the so-called *locatio conductio*, a contract involving hire and lease between two parties: the *locator*, which means the commissioner, and a *conductor*, ranging from the single, individual craftsmen or supplier to powerful entrepreneurs (*redemptores*) who offered the services of several specialists. The two parties came to a specific agreement on all the precisely defined terms of a previously drawn-up contract, agreeing on a fixed price to be paid at least partly in advance or in multiple instalments. Crucially, *locatio conductio* also allowed for further subcontracting along the same lines, as long as this led to the satisfactory completion of the project which could only be achieved by means of a final inspection called *probatio*, undertaken by the commissioner. The *conductor* was fully liable for any delays, deviations from the original plan, or damage caused to materials and equipment in the commissioner's possession (on *stipulatio* and *locatio conductio*, see Martin 1989, 22–41; Anderson 1997, 68–75; du Plessis 2012, 74–81; Bernard 2016, 70–72).

Moreover, Roman construction sites also relied on other types of social ties and obligations which were not, or only in part, regulated by contracts (Liu 2016; Terpstra 2019, 14 f.). The two key factors here are social status and outright ownership. In the widely monetarised and urbanised society of the Roman Empire, as we see it across the Mediterranean from the 2nd cent. BC, and later also in large parts of northwestern Europe, wage payments for construction workers created hierarchies of income on multiple levels, thus producing differences in status and standing (Domingo 2013; Tran 2013/2014; Freu 2015; Groen-Vallinga/Tacoma 2016). Specialisation of tasks contributed to this by further accentuating the differences between skilled and unskilled labour as well as increasing differentiation amongst the higher-skilled workers based on age and experience (Bernard 2016, 2019).

There has been a certain temptation amongst modern scholars to assume that this would have, in some way, levelled the social playing field on Roman construction sites, as for instance expressed

by Christel Freu, who, with respect to wages in imperial Egyptian papyri, states that 'some [helpers], however, were paid at the same scale as their masters […]. Their employee status did not thus hinder them from receiving wages similar to those of their masters. Thus, in this context of construction sites labour statuses were not rigidly set; the relationship between master craftsman and helpers could be on more equal terms' (Freu 2015, 165).

This notion seems rather optimistic as it ignores the habit of structural coercion and exploitation between master and apprentice or helper (Hawkins 2016a, 48–51). Masters probably exploited their superior status by creaming off a surplus from their helpers, for example by making them pay for board or expenses, thus reducing the assistants' income quite significantly whilst increasing their own (du Plessis 2012, 67–70; Hawkins 2016a; 2016b, 198–202). A case in point is the 2nd cent. AD Egyptian contract between Antonia Asclepias and a group of skilled stonecutters who do not work for a *redemptor*: these experienced workers offer their assistance to other builders, *oikodomoi*, but they specify their wage per person for each day of work (four drachmas) and, again for each of them, *pastus* – one loaf of bread and other food – per day of work (Oxyrhynchus Papyri 3.498 ll. 33–40; on *pastus*, see Bernard 2016, 81–83). This means that, as part of the contract, they make sure that the *locator*, Antonia Asclepias, guarantees their daily wage and board, probably to safeguard them exactly against the type of exploitation from which younger workers, dependents, or social inferiors were not protected on a contractual basis (contracts for miners and quarry workers: Hirt 2010, 208–213; du Plessis 2012, 110–113).

Based on such considerations, networks and hierarchies on Roman building sites are not simply expressed in wage scales and contractual obligations, but also in the differences in social status amongst Roman construction workers (Tran 2013/2014, 1003, 1016, 1024; Freu 2015, 167, 175). Along the lines of Brent Shaw's model of Roman society, these differences can be understood as a nexus of dependency relations and status definitions (Shaw 1982, 31–38; largely ignored by Cline 2018 in her analysis of 5th cent. BC construction at Athens). In such a model, skilled slaves, based on their experience, are superior not only to unskilled slaves, but also to unskilled freeborn workers; and a skilled slave has direct control over unskilled slaves of the same household, whereas a skilled freeborn worker, although more experienced and thus higher in status, only has indirect control over an unskilled freeborn worker when such bonds of direct ownership do not exist (Bodel 2011; Gardner 2011). Skilled and unskilled slaves are taken to be owned by *redemptores*, their suppliers, or even individual workers; therefore, the model assumes an internal hierarchy of skilled slaves over unskilled slaves, with the former being under the direct orders of their owner and endowed with his immediate authority.

4. Building and Analysing the Network: Connectedness, Dependency, and Control

The links between social organisation and knowledge creation can be established through a network of social relations amongst the key agents involved in an ideal Late Republican construction project (*fig. 2*). The network follows the principles of Actor-Network Theory (ANT, see Collar et al. 2015; Cline 2018, 521–523). The key assumptions are that the project, of considerable size and including the use of Roman concrete (*opus caementicium*), is based on contractual agreements of *locatio conductio* and/or *stipulatio* (see above). There is one commissioner who acts as the principal *locator* (Anderson 2014; Wescoat 2015) and one *redemptor* as the principal *conductor* (Anderson 1997, 95–113; Bernard 2016, 70). One *architectus* is mostly responsible for the design (on the various roles of Roman architects: Gros 1983; Anderson 1997, 3–67; Masterson 2004; Taylor 2007, 9–14; Anderson 2014; Siwicki 2019), and one *machinator* manages the works (Anderson 2014, 135; Siwicki 2019, 209). Moreover, the network extends well beyond the construction site by including the supply and transport of building materials and equipment: there are marble, tufa, limestone, and pozzolana quarries, a sand extraction pit, brickyards, and production sites for quicklime and slaked lime, which are all assumed to be owned by third parties (DeLaine 1995, 2000; Lancaster 2005, 12–21; Graham 2006; Lancaster/Ulrich 2014; DeLaine 2015). Equally, it is assumed

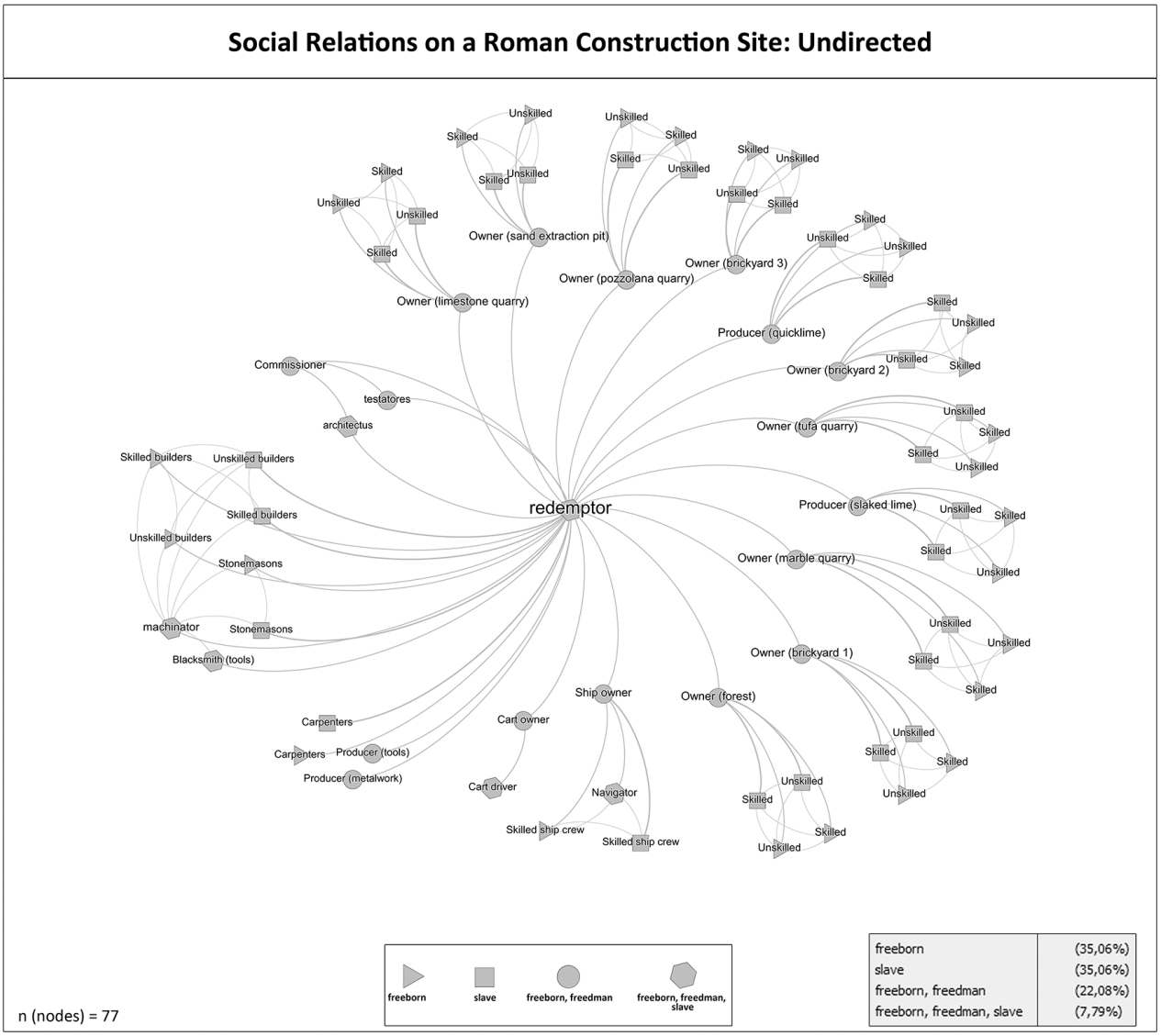


Fig. 2. Social relations on a Roman construction site (undirected) (graph by D. Maschek).

that woodcutting, as well as transport by ship and cart, were subcontracted (for legal texts referring to this practice: du Plessis 2012, 82–94), and that metal objects and tools were largely produced off-site (the usage of imported steel tools at the quarry of Mons Claudianus: Mons Claudianus, ostraca graeca et latina inv. 4852 & 5398; Hirt 2010, 212 n. 64). The construction site itself comprises builders, stonemasons, carpenters, blacksmiths, skilled and unskilled workers, and there are three basic social categories involved, namely freeborn citizens, freedpeople, and slaves (DeLaine 1997; Taylor 2014; Bernard 2016). The category of freeborn foreigners has not been included, but can in many respects be considered similar to the legal status of first generation freedpeople.

As with any model, this social network is not meant to constitute an exact representation of 'historical reality', whatever this may mean; rather, it is about testing plausible scenarios of power distribution and social inequality on Roman construction sites (on the principles of this methodology, see Collar et al. 2015). One such situation is the relationship between freeborn citizens and slaves, which the network conceptualises according to the framework of Roman law (Gardner 2011). Of course, this does not mean that different and more amiable types of relationship would not have been possible between slaves and freeborn workers on construction sites. However, the crucial point for modelling the freeborn/slave relationships is that, by law, the balance of power was

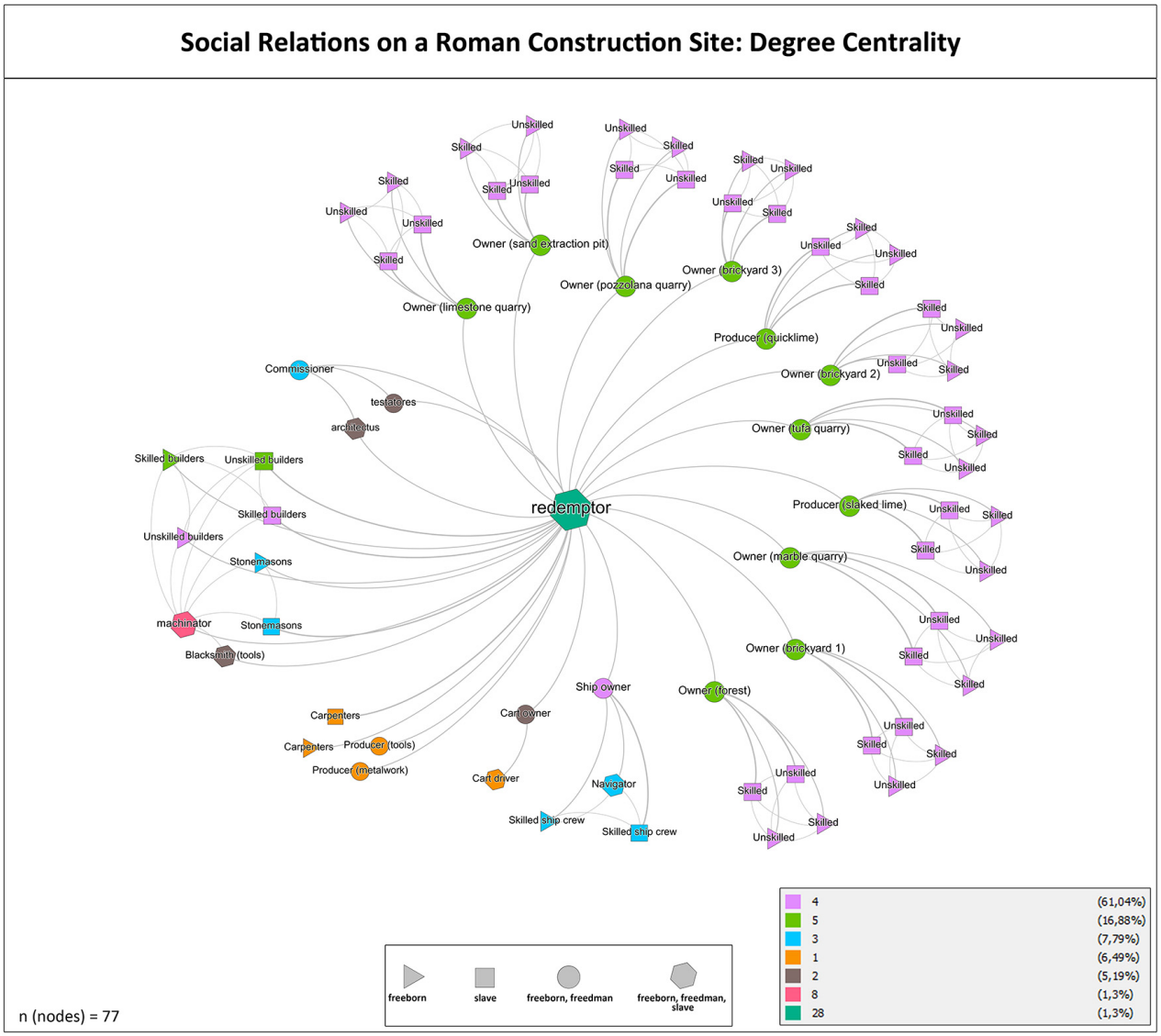
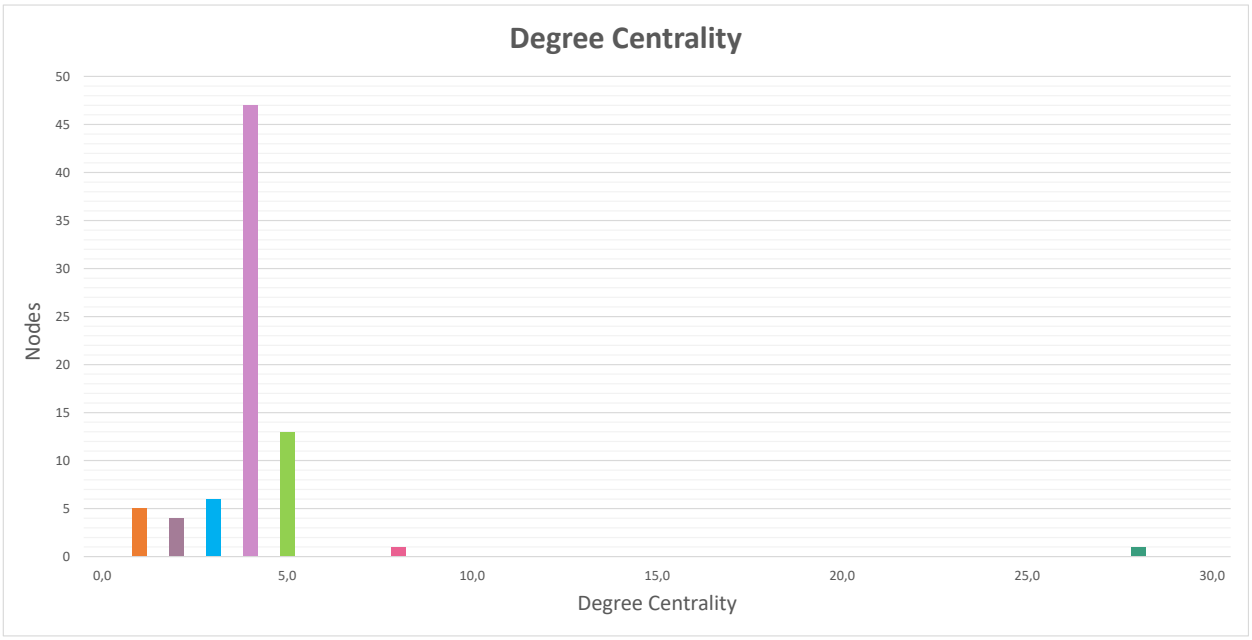
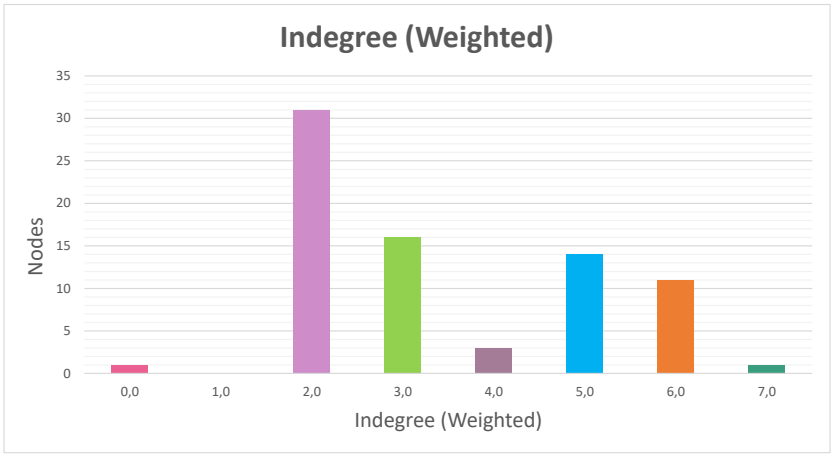


Fig. 3. Social relations on a Roman construction site (degree centrality; indicating overall connectedness) (graph by D. Maschek).

deliberately asymmetrical, thus leaving the door wide open for acts of systemic discrimination, exploitation and abuse. In order to represent these asymmetries, the connections (edges) between the nodes of the network are directed and weighted in order to express social control and dependency. The edges carry three specific weights, depending on the status of their origin and their target node: a weight of 1 denotes control based on social status, such as freeborn over freedman over slave, or senior over junior, and skilled over unskilled. Future models could also include other possible scenarios for the composition of the workforce in terms of age and gender. A weight of 2 stands for control based on contractual obligation, such as *locator* over *conductor*, but also other forms of contract law like *stipulatio*, formalised apprenticeship, and arrangements of wage labour. Ultimately, a weight of 3 indicates social control based on outright ownership, which means the power wielded by an owner over their slave. Crucially, and in contrast to the practice on most modern building sites, this helps to represent the particular mode of slave labour in which owners are in direct control of their slaves' work through means of extreme physical coercion.

The first way in which we can interrogate the network is by looking at the so-called 'degree centrality' (Cline 2018), basically showing us who has the most connections (*fig. 3*; *diagram 1a*). There is one node (the *redemptor*) with 28 connections, and another one, the *machinator*, with





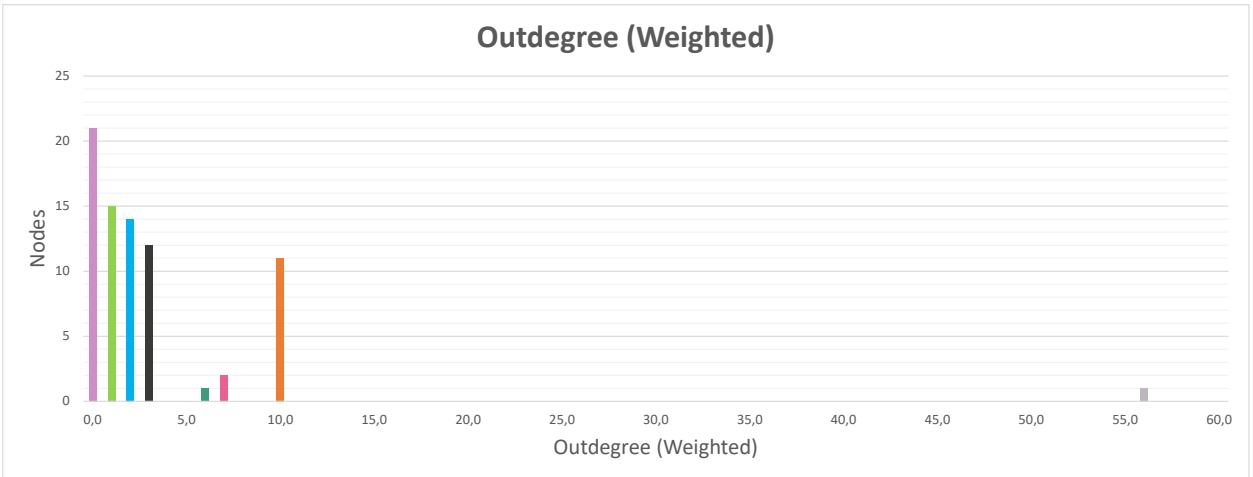


Diagram 1. Distribution of nodes in the network *fig. 3–5* according to a) degree centrality, b) indegree (weighted), and c) outdegree (weighted) (graphs by D. Maschek).

eight, followed by 13 nodes with five connections; the overwhelming majority, 47 nodes (61%), have four connections. This clearly demonstrates the key role of the *redemptor* in the organisation and contractual framework of any building project organised along such lines, but it equally attests the importance of the experienced *machinator* on the building site. The nodes with five connections are the suppliers of building materials, whose degree of centrality can be classified as medium. The 47 nodes with four connections demonstrate the low to medium centrality of skilled and unskilled builders on the construction site and in the procurement and production of materials, for example in the quarries and brickworks. The nodes with the fewest connections comprise expert stonemasons on the construction site, but also the commissioner, the *architectus*, and other specialist providers and producers.

Although degree centrality represents general levels of connectedness, these low values for important players such as the architect and the commissioner make it clear that by no means it indicates status and influence. It is therefore necessary to look at the weighted connections within the network, which allow us to identify social hierarchies based on control and dependency. These weighted connections can be analysed with respect to two different values. First, the so-called 'indegree': this provides the number of edges directed to any given node and thus gives a measure of social **dependency**, adjusted by the weight of all social ties. Second, the so-called 'outdegree' will be analysed, which is the number of edges that any given node directs to others. This can be taken as a measure of social **control**, again adjusted by the weight of all social ties.

Focusing on indegree first (*fig. 4*; *diagram 1b*), we see that there is one node (the commissioner) with a value of 0, followed by 31 nodes with a value of 2 (40.26%), 16 nodes with a value of 3 (20.78%), and three nodes with a value of 4, amongst them the *redemptor* and the *architectus*. This shows that the role of the commissioner in Roman construction projects based on contractual agreement carried weight but did not entail any social dependency in the building process. Equally, low social dependency can be postulated for the suppliers of resources and materials as well as for skilled freeborn workers and contractors, whereas medium social dependency characterises unskilled freeborn workers, slaves directly owned by the *redemptor*, and for the *architectus* and *redemptor* (if they were of freeborn or freedman status). Moving down the social hierarchy, there are 14 nodes (the skilled slaves) with a value of 5; eleven nodes (the unskilled slaves working in production and transport) with a value of 6; and one node (the unskilled slave builders on the construction site) with the highest value of 7. Interestingly, this shows that slaves working in Roman construction were not simply slaves, but that there were actually at least **three** degrees of high social dependency for slaves: a slightly lower social dependency is characteristic for skilled slaves on production sites, in transport, and on the construction site, contrasted by higher social dependency for unskilled slaves on production sites, and the highest social dependency for unskilled slave builders on the construction site. This can be explained by the role which skilled slaves frequently played in acting as foremen or overseers of less skilled, often perhaps also junior, slaves. This hierarchy is also reflected in funerary inscriptions of elite Roman households, including the imperial family, where a few senior slaves with a specific skillset often directed and coordinated the work of a number of other slaves (e.g. Bodel 2011, 324–327).

Looking at the outdegree value offers the opportunity to measure degrees of social control and to see who was in charge, whose aims were important, and whose wishes had to be taken into account (*fig. 5*; *diagram 1c*). There is one node (the *redemptor*) with an extremely high value of 56; followed by eleven nodes with a value of 10; two nodes (the *machinator* and the ship owner) with a value of 7; and one node (the commissioner) with a value of 6. In this model, the *redemptor* therefore exerts an extremely high degree of social control due to direct ownership and contractual arrangements, such as the subcontracting of transport, the procurement of materials, and the contracting of workers on the construction site. However, it should not be forgotten that this high social control value also entailed a considerable risk for the *redemptor* in case any of his vital connections

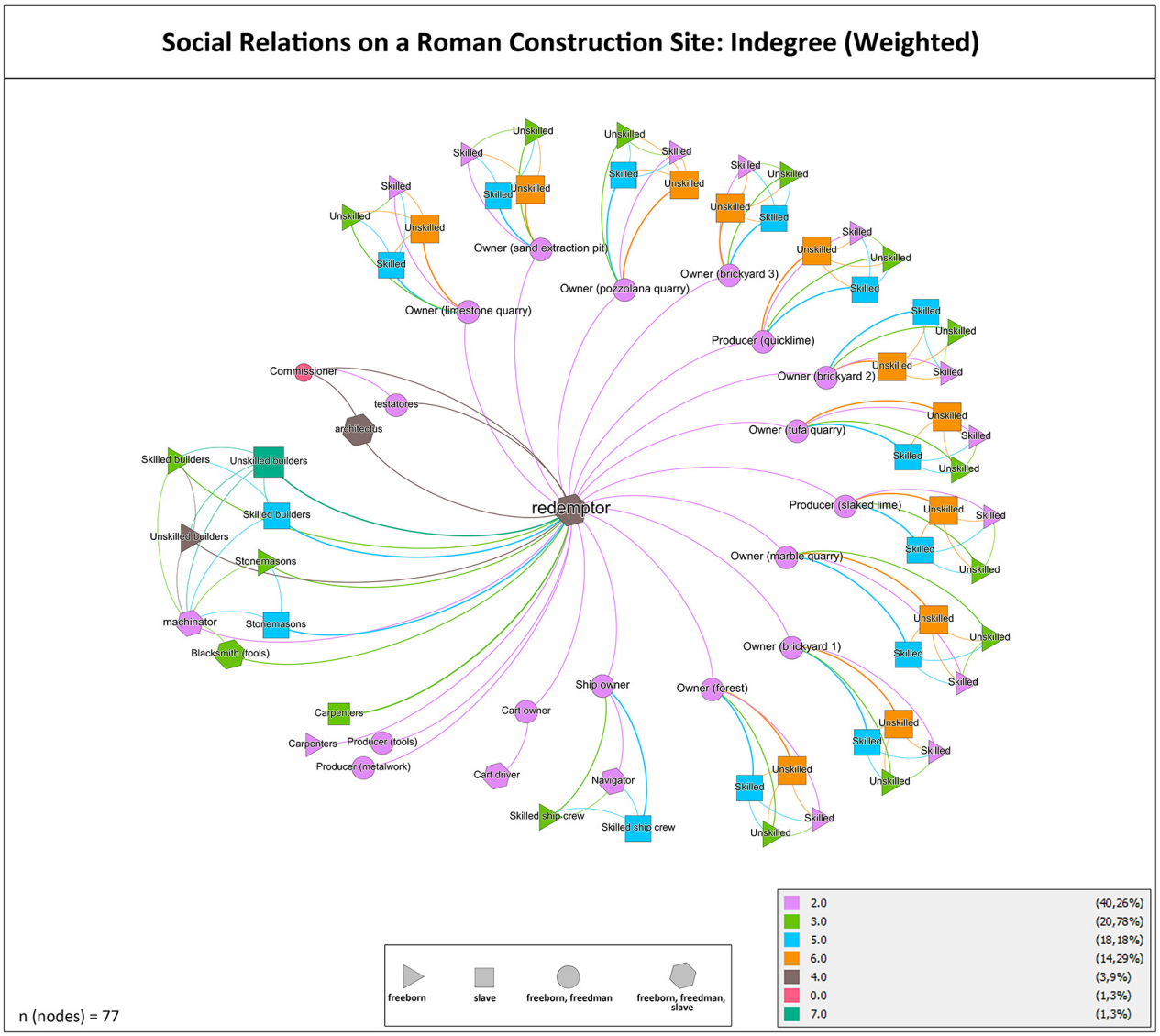


Fig. 4. Social relations on a Roman construction site (indegree, weighted; indicating social dependency) (graph by D. Maschek).

should fail. The second-highest level of social control lies with the producers of building materials, whilst the ship owner, the *machinator*, and the commissioner occupy similar places in terms of social control values.

Strikingly, the lower range of the outdegree values comprises the vast majority of nodes. There are twelve nodes (skilled freeborn workers) with a value of 3, and 14 nodes (unskilled freeborn workers, the cart owner, the ship navigator, and the *testatores* engaged in the contract) with a value of 2. No fewer than 15 nodes have a value of 1: these are the skilled slaves working in quarrying and production, the freeborn ship crew, the freeborn stonemasons, and the unskilled freeborn builders on the construction site. The largest number of 21 nodes (27% of the total) has a value of 0. These are the unskilled slave builders, the blacksmith, the carpenters, the cart drivers, the external producers and artisans, and the unskilled slaves in quarrying and production, but the group strikingly also includes the *architectus*. Overall, it is important that the last four groups have low to very low social control values and include both freeborn and slave workers, producers, those engaged in transport, but also the *testatores* who witnessed and guaranteed the contract: their risk was arguably the highest, as they were liable with their own money, but did not have any influence on the works (Martin 1989, 131–136 with relevant sources). The very

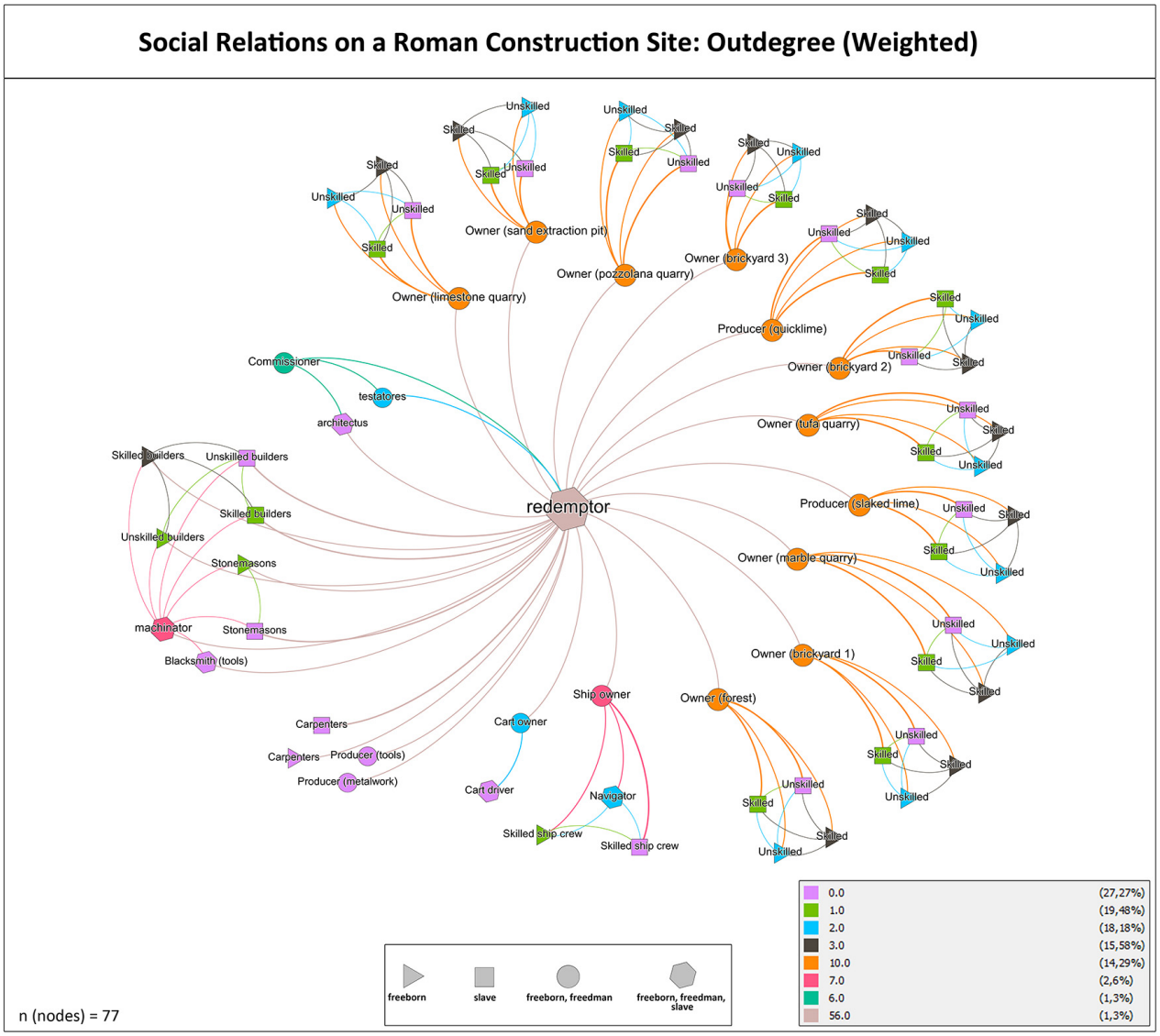


Fig. 5. Social relations on a Roman construction site (outdegree, weighted; indicating social control) (graph by D. Maschek).

low control value for the *architectus* was, in reality, probably partly compensated by higher degrees of personal involvement on site, perhaps in place of the *machinator* or if the *redemptor* also acted as architect (examples in Donderer 1996, 15–23; Anderson 1997, 103–113; 2014, 132–135).

5. The Network and the Archaeological Evidence: Late Republican Concrete Architecture

Ultimately, the applicability of this network model can be tested with reference to a specific case study: the use of particular types of wall facing for Roman concrete (*opus caementicium*) in the 2nd and 1st cent. BC. How does the network allow us to understand the conditions under which the resource 'knowledge' was produced and sustained amongst Late Republican *redemptores*, freeborn builders, and slaves engaged in the construction of buildings in *opus caementicium*?

Conventionally, *opus caementicium* has been seen as a building technology which required less skill than muscle. Its widespread adoption in Rome and central Italy over the course of the 2nd and 1st cent. BC was linked to the influx of large numbers of unskilled slaves during Rome's expansion into the Mediterranean (Coarelli 1977; Torelli 1980; Rakob 1983; Torelli 1983). Moreover, a neat

chronological sequence of different types of wall facing was postulated, progressing from the use of heterogenous facing stones (*opus incertum*; *fig. 6*) through various intermediate stages towards the development of uniformly squared stones (*opus reticulatum*; *fig. 7*). Commonly, this is interpreted as an expression of deliberate rationalisation with the aim of increasing speed and efficiency on the building site (Adam 1984, 79–90; Pfanner 1989, 172–174; Anderson 1997, 145–151; Davies 2017, 83–99; Van Oyen 2017, 136–150). The Roman builders' alleged underlying rationale is succinctly summarised by Andrew Wilson: 'The introduction of concrete construction [...] enabled some de-skilling of the workforce – unskilled or semi-skilled labourers could put the core of a building together under the supervision of skilled foremen, while the removal of supply bottlenecks meant that the workforce could work in larger and more numerous gangs than could skilled masons dressing and laying ashlar blocks' (Wilson 2006, 229).

However, more recent studies by Marcello Mogetta have not only revised the date for the beginnings of concrete architecture in Rome and Central Italy (Mogetta 2015, 2016, 2021), but they have also explored new scenarios concerning the workforce engaged in the production of *opus caementicium*, including the possibility of collective and communal building works in urban settings such as the Roman colony of Cosa on the Etruscan coast (Mogetta 2019). Moreover, in an attempt to identify potent strands of individual agency behind the anonymising concepts of rationalisation and efficiency, Hélène Dessales has drawn attention to the personal knowledge of masons and workers in the selection of building stones and bricks for walls in Pompeii (Dessales 2011; 2017, 83–88).

Recently, Catalin Recko and Michael Heinzelmann have published the first results of archaeological experiments aimed at measuring the construction time of Roman wall facing types (Recko/Heinzelmann 2018). Although, on a general level, these experiments confirm the basic estimate for the daily output of a mason working in *opus incertum*, *opus reticulatum*, and *opus testaceum* (brickwork) as proposed by Janet DeLaine (DeLaine 2001, 234 f.), they also shed important light on some highly significant differences in the time required for more specific tasks.

The average time for laying a facing stone in *opus incertum* was measured at 38 seconds, whereas laying a brick in *opus testaceum* took 31 seconds, and a stone in *opus reticulatum* 33 seconds. This discrepancy between *opus incertum* and *opus reticulatum* is not caused by different ways of handling the stones or integrating them into the facing, but mostly by the judicious selection of fitting stones by trial and error: due to the irregular shape of the stones, masons spent more time on selecting the best fit for *opus incertum* walls. By contrast, finishing work on the mortar joints of *opus reticulatum* (23 minutes for 1m^2 surface) proved to be much more time-consuming than for *opus testaceum* (6.44 minutes) and *opus incertum* (18 minutes), which makes *opus reticulatum* significantly more time-consuming than *opus incertum*. This is interesting as it contrasts with the time needed to build the mortar-and-rubble core of the respective walls, which in all three experiments was basically identical: the difference in effort thus emerges only in the final execution of the wall facing, which was undertaken by experienced masons (Recko/Heinzelmann 2018, 148–152). Overall, the experiments show that the introduction of reticulate facing, when compared to *opus incertum*, did not make the building process any shorter or more efficient, but it rather **increased** the average working time from 1.37 hrs to 1.86 hrs per m^2 of wall facing, which means a net rise of 36%.

The social network provides an opportunity to further contextualise these experimental data, based on the varying degrees of social control, dependency, and liability amongst the actors on a Late Republican Roman construction site. From these, it is possible to tentatively reconstruct at least **two** very different models in order to explain how the choice of particular wall facing styles can be linked to the interests and aims of builders, leading to their usage of personal and articulate knowledge as a strategic resource. In the first model, with concrete building being organised along the lines of *locatio conductio* or *stipulatio* between a *redemptor* and a mason, hiring freeborn citizens or freedmen as casual workers increased the overall risk due to their liability and the imponderable consequences. By contrast, delegating tasks to one's slaves or apprentices provided a higher

Fig. 6. *Opus incertum* facing from the sanctuary of Terracina in Latium (early 1st cent. BC) (photo by D. Maschek).

Fig. 7. *Opus reticulatum* facing from the so-called Villa of Tiberius at Sperlonga in Latium (second half of the 1st cent. BC) (photo by D. Maschek).

level of control and reduced the risk of liabilities, although upkeep had to be deducted from the mason's own contractually agreed wage, which therefore had to be sufficiently high in order to guarantee a profit. It also enabled contractors to maintain established working groups with a particular set of skills, level of training, and group synergy across longer periods of time.

Personal and articulate knowledge of how to increase the output of completed wall facings helped the mason fulfil the stipulations of the contract within the given time period, thus avoiding fees for late completion. If the number of facing stones or wall surfaces to be finished was agreed in advance, increasing the output helped to shorten the time period of work and perhaps free up capacities for other employment (on piecework, see Bernard 2016, 71). Knowing how to produce more footage of wall more quickly therefore provided an advantage to freeborn or freedman masons when it came to securing more substantial jobs at the construction site; this also helped them to reduce the number of days on which they had to employ casual labourers. However, if daily wages were to be paid to the expert masons, this model was actually detrimental as it reduced their time of employment and, thus, their income. Therefore, developing and sustaining this type of specialised knowledge first and foremost made sense for *conductores* who worked for a *redemptor* on short- to medium-term construction projects, and who also employed a small number of apprentices or slaves, including perhaps occasionally hired freeborn wage-labourers from the urban or suburban population (see Brunt 1980; Bernard 2016, 66 f.; Erdkamp 2016; Maschek 2016; Bernard 2019). For *redemptores*, this model could have been attractive due to the guaranteed speed of production and the quality of the end product. Through collaboration, articulate knowledge was mostly created and transmitted by the masons working on site, and, if necessary, re-calibrated in the light of their contractual obligations.

The second model assumes direct ownership of the workers on the production line by a freeborn or freedman *redemptor*. Again, paying freeborn casual workers for finishing the wall facing increases the risk due to those workers' liability and the resulting imponderable consequences. However, owning and training the rest of the workforce significantly reduces the risk of third-party liability as it massively increases control over the production line (Bernard 2016, 74); in this scenario, only casually hired freeborn wage-labourers were liable for damage or mistakes. The *redemptor*'s many links with experts and suppliers as well as his collaboration with the *machinator*, the architect, and the suppliers of raw materials provided the necessary information and ideas to make such a business model viable. However, maintaining such an extensive web of collaborations over time was both risky and costly (Tur/Azagra-Caro 2018, 426), in spite of the *redemptor*'s extraordinarily high value of social control in the network. Owning an *architectus* and *machinator* alongside a core group of skilled workers helped to sustain the quality of articulate knowledge in the system. Equally, in this model, fees for late completion do not apply to the facing stones and walls completed by the masons; however, such fees were of course relevant for the entire building project under the control of the *redemptor*. The slaves on the production line did not receive payment, but their upkeep must be taken into account by the owner over the course of the entire year, not only the season suitable for construction work (Bernard 2016, 65 f.; Maschek 2016, 325–327).

Therefore, this second model can be profitable if slaves can be kept busy for a substantial part of the year, for example on long-term building projects or when preparing the standardised facing stones for *opus reticulatum* outside the building season. Moreover, this model is advantageous if additional casual labour can be found. By contrast, under this model, speed and output are less important with respect to generating a profit. Adopting and implementing it therefore made sense for *redemptores* who could reckon with a large number of projects coming their way on a regular basis. However, their primary rationale for establishing this degree of specialisation would **not** have been to increase output and speed (because this would have undermined their business model) but to guarantee uniform standards of quality.

6. Conclusion: 'Expert' and 'Vernacular' Knowledge as Key Resources in Late Republican Architecture

The accepted, common-sense view is that the development of concrete and standardised facing styles on Late Republican construction sites reflected a general human drive towards maximising profit and, if possible, increasing speed and efficiency. Both the field experiments conducted by Recko and Heinzelmann and the social network analysis presented in this paper, however, show this interpretation to be insufficient to explain the underlying motivations and constraints of Roman building contractors and workers. This is also corroborated by Vitruvius who, writing in the early Augustan period, famously characterised the two principal types of wall facing in the following terms: 'The different species of walls are, the *reticulatum*, a method now in general use, and the *incertum*, which is the ancient mode. The *reticulatum* is the most beautiful, but is very liable to split, from the beds of the stones being unstable, and its deficiency in respect of bond. The *incertum*, on the contrary, course over course, and the whole bonded together, does not present so beautiful an appearance, though stronger than the *reticulatum*' (Vitruvius, De architectura 2.8.1; transl. J. Gwilt).

In the light of our previous analysis, it is quite revealing that Vitruvius does not refer to the impact of these facing styles on the speed or the organisation of construction. Instead, he focuses on structural and aesthetic aspects which seem to reflect both the experience of the practitioner and the perspective of a potential commissioner. This combination can ultimately provide two overarching categories for further conceptualising knowledge as a resource on the Roman construction site (*fig. 8*): **expert knowledge** such as of a master builder, a stonemason, or a carpenter, and **vernacular knowledge** such as of an average commissioner who was not an expert in construction (Deetz 1996, 125–164; Cline 2018, 523 f.).

Expert knowledge might manifest itself on two levels: firstly, on the **macro level** of the entire building, for which builders had to consider structural issues in the use of certain materials. Such

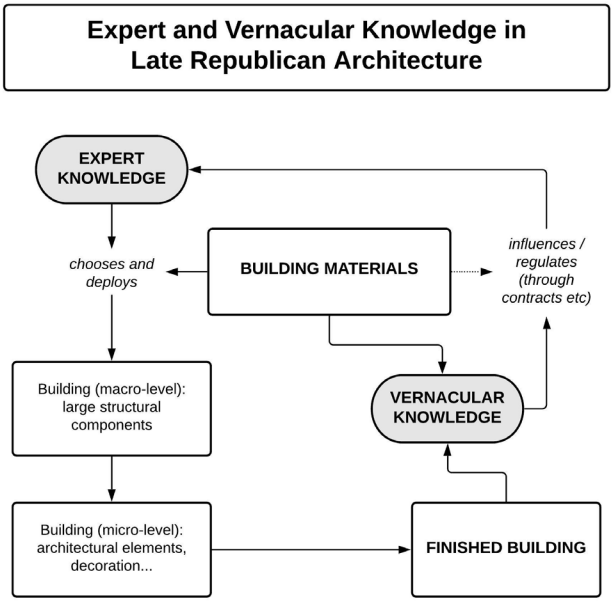


Fig. 8. The role of expert and vernacular knowledge in Late Republican architecture (elaboration by D. Maschek).

considerations usually pertained to an entire set of structurally important components like the colonnade or podium of a temple. Moreover, knowledge on the macro level also encompassed the understanding that a particular material is especially prone to damage by water or fire, or resistant to it. Secondly, expert knowledge was at work on the **micro level** of particular architectural elements, for example when it came to the rendering of decoration, mouldings, or roofs. In executing these details, stonemasons, carpenters, and other craftsmen followed a code of practice which was transmitted through trans-generational processes of education and might have significantly varied from task to task (Dobres 2000, 2010; Dessales 2011). Micro level knowledge therefore introduces a strong undercurrent of tradition which may even, at least partly, run counter to the expert knowledge applied on the macro level: for example, certain stones with strong structural properties might not have been suitable for fine finishing, whilst others which were easy to carve could have been deficient in terms of solidity. Thus, far from being a homogenous set of ideas, the application of expert knowledge on the construction site would always oscillate between the macro

and the micro levels, leading to solutions on what one could call an **intermediate level**, where both the macro and the micro intersect (Jackson/Kosso 2013; Bernard 2018, 198 f.).

Vernacular knowledge, on the other hand, was present on various levels, which could be partly (but not necessarily) linked up with those of expert knowledge: here, aspects like colour and coarseness of a building material were related to specific qualities, but, more importantly, to other buildings and structures which constituted the world of those who perceived them. One could call this a **horizontal** system of meaning, which expands from the core of the individual structure or material under consideration to all other structures and materials known to the commissioners, users, and viewers of certain buildings at particular times. This intersected with, but did not neatly map onto, the largely **vertical** and hierarchical system of meaning which was used and, through its usage, constantly recalibrated by the experts. In this context, it is also worth looking at loanwords for building types and architectural decoration (e.g. *peristylia*, *pinacothecae*, *epistylia*), alongside the presence or absence of similar loanwords or latinised terminology for particular building materials such as *marmor* or *minium* (vermilion). These are of particular importance as they indicate the partial adoption of a different knowledge system, a different framework of reference, not in terms of a wholesale acceptance but rather as a strategic code that could carry the flavour of exoticism, higher value, deeper learning, or cultural sophistication (for example: Varro, De re rustica 2.3; Cicero, De finibus 3.5; De oratore 1.155; Partitiones oratoriae 16; Vitruvius, De architectura 5.4.1; Rawson 1985, 323 f.; Nichols 2010, 45–57; Callebat 2013; Nichols 2016, 322–327). The same applies to certain strands of philosophy, first and foremost Epicureanism as popularised by Lucretius in the first half of the 1st cent. BC, or Stoicism, all of which offered their followers a new relational framework of sense and meaning. To this, one might finally also add the notion of *decorum* as that which is socially and politically appropriate (Cicero, De oratore 2.71–79. 320–321; 3. 210; Horn-Oncken 1967; Grüner 2004, 252–256; Nichols 2017, 112–114, 120–123).

In terms of its implementation on the construction site, the vertical system of expert knowledge was elaborated in **direct** relation with the built structure. It guided the entire building process, from the selection of materials through the various stages of their processing to the state of the finished end product. This whole *chaîne opératoire* entailed a high degree of experimentation, which contributed to a slow and incremental adaptation of expert knowledge over time (Dobres 2000, 2010; Rebay-Salisbury et al. 2014; Maschek 2017, 40–42).

By contrast, vernacular knowledge always stood in an **indirect** relation with the built structure. The commissioner's aims were formulated in conversation with the builders and formalised via contracts in which the commissioner either asked for specific materials or even put himself under the obligation to provide them (Martin 1989; Anderson 1997, 98–118). Vernacular knowledge therefore had a constant and powerful, albeit oblique, impact on the process of construction: it was applied by individuals outside the group of expert builders, both before and during the building process, and the demands emanating from it became the legally binding conditions for successful completion of the contract.

One of the most important documentary sources for the importance of the convergence of expert and vernacular knowledge as resources in Roman construction is the famous 'lex Puteolana', first comprehensively analysed by the German archaeologist Theodor Wiegand, whose doctoral thesis, published in 1894, was essentially an edition and commentary on this inscription (CIL I² 698 = CIL X 1781 = ILS 5317 = ILLRP 518; Wiegand 1894). Here, one can easily identify all of the key institutions which conditioned public building in a Roman republican colony, and presumably also in the city of Rome itself. The text is also called the 'lex parieti faciendo', and it is basically a construction contract within the legal framework of the *locatio conductio*, which means a consensual and binding agreement in which a person has to do work for another person at a certain price and within a certain period of time.

The contract was drawn up by the two highest magistrates of the colony of Puteoli, the *duoviri* Numerius Fufidius and Marcus Pullius, and it is

dated to the consulate of Publius Rutilius Rufus and Gnaeus Mallius Maximus, which is the year 105 BC. Next, the scope of the building works is identified: basically, the contract is about the rebuilding of a wall surrounding the sacred precinct of the temple of Serapis plus the creation of a new gateway within an already existing wall of the same precinct. From the fact that there is no mention of the town supplying any resources, it can be inferred that the contractors had to provide all the necessary building materials. However, it is highly revealing to see that the *duoviri* did not leave them much choice regarding the nature of these materials: the text is extremely specific when it comes to the materials which should be used in the new wall. The *lex* prescribes the use of a particular building technique with *caementa* and lime mortar; moreover, it specifies the particular quality of the mortar – as aggregates, the contractors are under the obligation to use three parts of sand and pozzolana and one part of slaked lime. The same ratio of three to one can also be found in Vitruvius (De architectura 2.5.1). In terms of the building stones used for the wall, the *duoviri* defined a maximum dry weight of 15 pounds. This can probably be read in the context of the widespread use of volcanic rock in the Bay of Naples: as tufa tends to absorb water, larger chunks of volcanic stone would weaken the mortar by draining it too quickly, therefore destabilising the whole wall. And again, this is also what Vitruvius tells us about large stones and mortar in the second book of his 'De Architectura' (2.8.2).

In the 'lex Puteolona' we therefore see how crucial, by the late 2nd cent. BC, articulate knowledge had become for Late Republican Roman building projects. The knowledge created and transmitted through the social network of construction workers of different status was indeed a vital resource for the building process: it informed decision making both at the planning stage and during the process of building, and it did so across the full range of the social hierarchy, from the unskilled worker in the quarry to the highly qualified mason on the construction site. In the dialogue between commissioners and builders, a common and increasingly formalised vocabulary was developed and adopted into institutional frameworks, as expressed in regulations and prescriptions (Dessales 2016). The aim of this paper has been to explore precisely where in the social network of the Roman construction site, and under which conditions, these various types of knowledge were produced. The results clearly demonstrate that we are only at the beginning of much-needed further research into the socio-economic dimensions of construction works in the Late Republican period. Despite important archaeological studies on the logistics and energetics of Roman building projects, scholars working on Roman architecture still see the organisation of the workforce in predominantly utilitarian terms, as a means towards a specific end. By contrast, this paper has focused on the Roman construction site as a social organism, underpinned by the crucial resource of socially produced knowledge. The sheer complexity of this organism teaches us that we will never be able to fully understand the implementation and usage of particular building techniques and materials without a proper reconstruction of the social networks and hierarchies which structured Roman architectural practice in ways that differed fundamentally from our own modern preconceptions of 'efficiency' or 'rational economic behaviour'.

Dominik Maschek
Leibniz-Zentrum für Archäologie
Kompetenzbereich Römische Archäologie
Ludwig-Lindenschmit-Forum 1
55116 Mainz, Germany
dominik.maschek@leiza.de

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Ulla Rajala

The Cemetery Areas and the Changing Networks in Central Italy ca. 800–100 BC

The Role of Funerary Architecture in Defining Identity and Mental Distances

Key words: Actor-Network Theory, Social Identity Theory, funerary areas, tomb types, Central Italy, identity

Summary

This paper will take a long-term approach to the study of a set of cemetery areas in Central Italy in order to analyse the effect social networks had as a resource in changing burial customs. This paper will look at tomb types in different communities along the Tyrrhenian and Adriatic Seas and how this category of evidence can act as a proxy in defining identities and belonging to different socio-political networks or not. The study will analyse the burial grounds in Etruria, Latium, Umbria, Campania, Samnium and Picenum in order to consider the mental distances, the relative closeness and distance, reflected in the regional and supraregional networks. As part of the theoretical and methodological discussion, the usefulness of the Social Identity Theory as the framework for such an analysis will be assessed. The study will explore the effect of human landscape in forging contacts and try to discover the effects of the cultural change related to the expansion of the Roman state.

Introduction

In his article on network analysis in archaeology, Brughmans (2010, 298) stated that network analysis does not require a quantitative approach, as was shown by Sindbæk's (2007) study on the emergence of towns in Scandinavia. However, Brughmans pointed out that qualitative network analysis ought to be critical when using network terminology, defining the possible network types and considering all structural consequences of network patterns. Before carrying out a proper network analysis that will be published in a wider study, one can thus carry out a qualitative analysis of distributions.

This paper will be looking at the distributions of Central Italian tomb types from the Early Iron Age to the end of the Hellenistic period. It will consider the beginning of the Early Iron Age and the distribution of the Villanovan pit burials as a starting point in the discussion on the 1st mill. BC in Etruria, Latium, Umbria, Campania, Samnium and Picenum. Tomb architecture is seen as a proxy for closeness or distance, and networks as a human resource when (re)defining their funerary identities. Firstly, the paper will review the types of network analysis carried out in archaeology and define a series of key concepts. Then the paper will briefly discuss human landscapes. The core analysis will explore the ways funerary architecture was shared and reveal different types of funerary networks.

The material for this article has been collected from Italian publications that give enough information to accurately define the tomb type. Thus, not all publications and sites have been included; only those that describe the structure of individual

tombs. The pit tombs have been collected from 46 centres (2151 individual tombs), Iron Age trench tombs from 44 (2713 individual tombs), Orientalising and Archaic trench tombs from 58 (5419 individual tombs), chamber tombs from 86 (2972 chambers), Hellenistic tombs from 72 centres and Late Republican tombs from 34 sites. The last category is problematic, since the many known structures are very badly dated and have been omitted, but the coverage gives an indication of the change from the previous periods.

1. Archaeological Network Analysis, Group Identities and Mental Distances

Networks can be defined as underlying architecture within complex systems that are governed by shared organising principles (Barabási/Bonabeau 2003; *fig. 1*). The basic architecture is formed by points called nodes and lines that represent social relations. Originally, the networks were considered random, with most nodes having an equal number of links. The study of the WWW (Barabási et al. 2000) led to the realisation that some nodes called 'hubs' are well connected, with a high number of less connected nodes linked to them and thus 'scale-free'. The hubs are the difference between random and scale-free networks. Scale-free networks are defined by growth and preferential attachment. Preferential attachment is a factor when assessing archaeological networks.

Sindbæk (2007) defined his network scale-free, but Brughmans (2010, 278) suggested that it may have been a 'small-world'. In a small-world network (Watts/Strogatz 1998) nodes form a one-dimensional lattice, where each node is connected to its two nearest and next-nearest neighbours. The long-range links decrease the distance between the nodes and create a small-world phenomenon (Milgram 1967; Kochen 1989), often called 'six degrees of separation' (Guare 1990). In archaeology Malkin (2011) saw long-distance Greek colonisation as a small world network, because the colonies allowed fewer degrees of separation, creating 'short-cuts'. It is also clear that small-world networks connect regions, whereas a scale-free network joins all centres in one wider region connected to a hub. Apart from random, scale-free and small-world networks, Barabási defined centralised, decentralised (hierarchical) and distributed networks (*fig. 1*; Malkin 2011, fig. 1.4). These networks allow for the flow of information between different centres.

The mathematical Social Network Analysis (Scott 2000) was the first network theory to be adopted in archaeology (Brughmans 2010, 298; e.g. Graham 2006a; 2006b). The 'graph', a linked sociogram depicting the network, can be analysed using mathematical graph theory (Cartwright/Harary 1956). Many archaeologists have used the concepts, but the proper exploratory use of Social Network Analysis with the calculation of centrality indexes, such as degree centrality, closeness centrality and betweenness centrality (Freeman 2004; see Fulminante 2012, 6 f.), is rarer. Blake (2013; 2014) successfully analysed Bronze Age Italy and Fulminante (2012; Prignano et al. 2017) road networks in Latium and Etruria. Social Network Analysis is mathematical and processual and as such may be avoided by more interpretative archaeologists.

The so-called Actor-Network Theory, advocated by Knappett (2011) and Van Oyen (2014), is a network theory that can incorporate material culture by permitting both people and things to be 'actants' in social relations. As suggested by Knappett (2011, 7 f.), Actor-Network Theory is a heuristic device that guides relational thinking. Actor-Network Theory is one of the non-binary measures suggested in the manifesto of symmetrical archaeology (Witmore 2007). Siapkas (2015) considered Actor-Network Theory as neo-empirical, whereas Gad/Bruun Jensen (2010, 75) saw it as an intellectual resource successful in particular constellations in specific time and place (Law/Mol 2002; Cresswell et al. 2010). According to Actor-Network Theory, actors can only act in association with others and in constellations that give them the possibility of acting (e.g. Law/Mol 2002).

Van Oyen (2016, 358) used Actor-Network Theory as network thinking in order to define different ways relations are ordered. By applying a *chaîne opératoire*, she characterised pottery manufacture and circulation sequences, defining three constellations. A fluid constellation, the manufacture

of the pre-*sigillata* pottery, created space for adaptation by copying different Roman finewares but producing all pottery types in the same units. A categorical constellation, *terra sigillata*, is internally homogeneous with its own production line. A rooted constellation, the production of so-called 'Rhenish wares', is based on local knowledge, following personalised choices and relations, such as existing trade connections. These concepts can be applied in funerary studies when a tomb is considered a product of actors interacting in a constellation. However, Van Oyen lacks an 'independent' constellation among her categories, a situation where production creates a unique type.

In this study Malkin's example is followed in using distribution maps in the analysis. Similarly to Van Oyen, Actor-Network Theory ia applied here as a vehicle for analysis and interpretation. When reading Latour (2005) it becomes clear that Actor-Network Theory is a very pragmatic theory that is ontologically based on the presumption that studied phenomena exist and can be studied, hereby by comparing different distributions to different types of distribution and constellations. In a funerary network the tomb types are at the same time a resource for the communities in the centres, but the analysis of their distributions can help to interpret how they were formed and how the networks acted as a resource for the communities.

The theoretical framework of this study is the Social Identity Theory (Tajfel/Turner 1986), which explains well the process of creating a social identity. It has been underused in archaeology (although see Wiessner 1984; Campbell 2014). Social Identity Theory explains intra- and intergroup relations (Hogg et al. 1995, 255). Tajfel/Turner (1979; 1986) have defined 1) Social Categorisation, that happens after interaction with others, 2) Social Identification, the acknowledgement of one's own belonging, and 3) Social Comparison, the wider acknowledgment of similarities and differences, to describe the attachment of individuals to different identities. Tajfel/Turner (1979, 40 f.; 1986, 15 f.) suggest that Social Categorisations are cognitive tools for defining Social Identification, and Social Identification is evaluated through positive or negative Social Comparisons with value-laden attributes. In this study Social Categorisation, Social Identification and Social Comparison are applied to describe both identity formation in the past and different stages in a research process, that is the classification, identification and comparison of different potential archaeological identity markers in the absence of direct information on past identities.

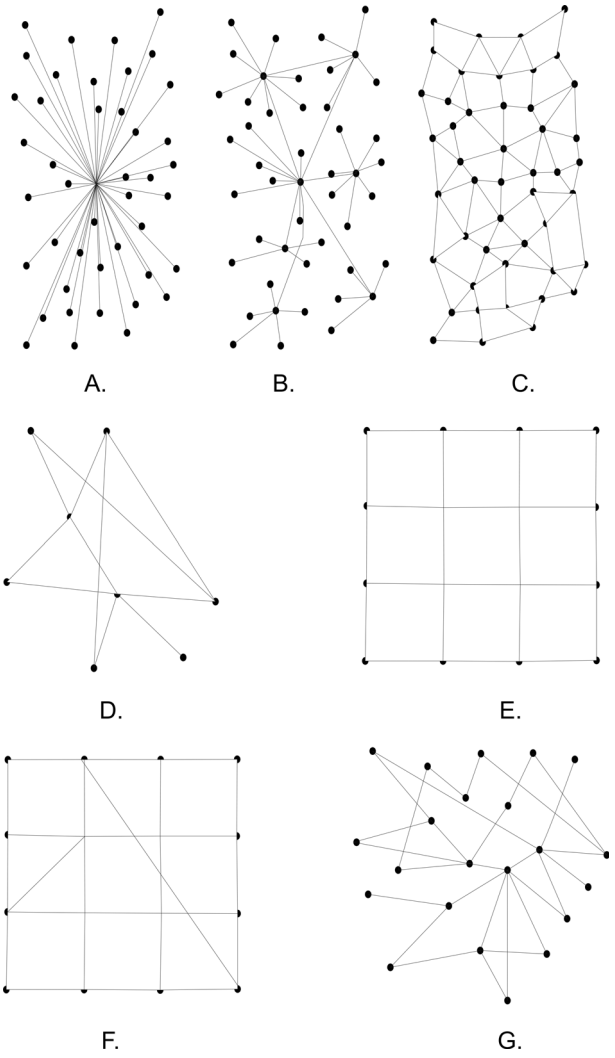

Fig. 1. Different kinds of networks: A. Centralised, B. Decentralised, C. Distributed (after: Malkin 2011, fig. 1.4), D. Random, E. (Regular) lattice, F. Small-world, G. Scale-free (after: Lloyd/Valeika 2007, fig. 2).

Social Identity Theory can be viewed in the terms of Latour's (2005) three duties: 1) deployment, 2) stabilisation, and 3) composition. Latour's Actor-Network Theory asks scholars to follow the evidence and create different constellations. For Latour, sociology is group formation: first we have to characterise assemblages and then manage research processes by building frameworks and

standards. Finally, scholars should compare new assemblages to existing collectives. The core of Latour's philosophy is allowing any entity to act as an 'actor'. Actor-Network Theory may be considered very postprocessual, but it can be considered a theoretical position. However, Actor-Network Theory is ultimately empirical, as following the evidence, or induction, shows.

Law (1992) saw actors in patterned networks of heterogeneous relations, including power and organisation, or as effects produced by such a network. He emphasised the essence of network packages (routines) as resources. He also used the concept 'punctualisation' to describe the successful execution of an artefact, organisation or idea. Punctualised resources can be performed, reproduced in and spread through the networks. A tomb can be seen as a product of punctualisation, brought about by a distribution network that masks the past human interaction.

Jones (1997, 25) pointed out how the transmission of cultural traits and/or ideas in cultural historical archaeology was seen as a function of interaction between individuals or groups. A high degree of homogeneity was regarded as a product of regular interaction, whereas discontinuities were assumed to result from social and/or physical distance. This principle can also be formalised with the concept of mental distance (Rajala 2016).

Van Houtum (1999; 2001) observed that people's mental distance across a cultural boundary significantly affected the outcomes of relationships. Thus, Bjerring Olsen (2004, 4) suggested that collective values, shared norms and beliefs, and individual values, based on people's history, can result in differentiated identities, partly due to their nested nature (identities related to empire, state, region or locality; Kaplan 1999). This notion can be used in interpreting the variation in funerary architecture. The different outcomes are the result of belonging to different systems of socialisation and having different shared values. Culture's relativity means that a mental distance between two parties can be positive or negative and not necessarily uniform (Bjerring Olsen 2004, 5). In a situation such as Latium Vetus or Etruria, with a federation of independent city-states, neighbouring centres or individuals within the centres may have chosen to adopt or not a custom or a design. If the group allowed deviations from the norm, different alternatives could be present. Thus, mental distances present habitual dispositions and experiences of different cultural practices at the community and regional level (Bourdieu 1977; Bentley 1987). Social Identity Theory culminates in mental distance, the study of which requires defining Social Categorisations, the categories that existed; Social Identifications, the choices in a city-state; and Social Comparisons, comparisons between different city-states and regions, to define closeness and distances. Here, the observation of distributions and their conformation to different network types is used as the empirical study method.

A distance can be real or mental, and the neighbouring communities may present closeness or distance depending partly on their perception of what the boundary represents. The Tiber in Central Italy may represent a natural boundary between the Latins, Etruscans, Sabines and Faliscans (see Titus Livius 1.3.6), but different crossings (e.g. Quilici Gigli 1986) may have acted as a resource for relations. Mental distances between actors can explain the strength or weakness of interaction and closeness can be seen as a resource. Closeness can also be seen as preferential attachment in a network. The archaeological finds can be used to evaluate the networks of closeness or distance in a regional setting, even if the ethnic boundaries do not directly follow cultural boundaries (Hodder 1982).

Social Identity Theory, Social Network Analysis and Actor-Network Theory all aim at describing cultural relations and identity formation by characterising assemblages and managing comparative research processes. Actor-Network Theory's preferential attachment and punctualisation can be explained in terms of mental distances. In this case tomb architecture is assessed to define how different tomb types were used in (re)constructing social identities and networks in different communities supraregionally. Since different tomb types seem typical for different Etruscan city-states (e.g. Izzet 2007), one can consider tomb architecture as a key proxy in the study of different group identities and Social Comparison as a resource for communities for strengthening or weakening those local or regional identities, creating demonstrated closeness or distance from their neighbours.

2. Funerary Rituals and Tomb Types

This section is not intended to be a review of literature, but a selection of studies that may help to try to understand the reasons behind choosing a particular funerary custom. The major problem is that one ultimately does not know **why** certain burial rituals and tomb types were chosen, a feature essential in understanding Social Categorisation and Social Identification. For example, Parker Pearson (1999, 124) has outlined **how** to study funerary customs. First, the relationship between the living and the dead is judged: are the dead integrated or separated spatially? Second, landscape position may reveal how the dead were incorporated into cosmologies and social practices. We may find physical or symbolic barriers against the dead and certain locations connected with them. Third, architecture and spatial organisation may show how material culture bound or separated the living and the dead. This is all part of the empirical observation and Social Categorisation in Central Italy.

Since tombs are monuments of rites of passage they can be entangled with many different identities (see Díaz-Andreu et al. 2005), part of which are related to individual's standing in the community (sex, age, gender, social persona) and part to ideologies (politics, religion). A few ethnoarchaeological studies shed light on the variability of burial customs. Tainter (1978, 106 f.) pointed out how Binford (1971) discovered through ethnographic comparative analysis that the diversity in practices has to be understood in the terms of the organisation of social systems. In Italy Guidi et al. (1995) studied the relationship between the cost of a burial slot and the socio-economic position of the deceased in early 19th cent. AD Verona. They tested the archaeological interpretation that the richest burials were for the highest classes. To their dismay, this could not be proven.

Pihlman (1989) studied the 18th and 19th cent. AD burial customs in two rural parishes in southwestern Finland. Naturally, like in the Italian study, the criteria for the direct use of ethnographic analogy (e.g. Currie 2016) are not fulfilled due to the distance in culture and time. However, if one wants to study **why** certain tomb types and customs were chosen, these examples can guide us in understanding the complexities and potential solutions. The Finnish study showed that church boards, the authority that managed the cemetery and decided the cost of burial slots, saw the social classes as clear-cut. However, in death class was not an insurmountable barrier, since the rural middle class, craftsmen and tenant farmers, could purchase a prestigious burial slot. The remarkable conclusion was that the cemeteries did not reflect the contemporary social changes or religion, but an individual or group identity and the idea of, and demand for, an appropriate burial for that identity.

Ethno-archaeological studies suggest that there were two different discourses in negotiating the right type of burial: the understanding and guarding of the social boundaries by the powerful and the aspirations of the lower classes (see also Cuozzo 2003, 5–8). An undervalued factor are those who made the tombs. Naso (1996, 331; 2019, 93; also Naso et al. 1989, 567) and Tobin (2015) have suggested that mobile artisans cut the tombs. This may suggest there was a human resource behind certain local networks, as will be seen below, especially in Tyrrhenian Italy, where the tuff landscapes allowed easy cutting of tombs.

One difficulty is defining the direction the influences travelled, since dating evidence varies. For example, the tombs at Veii in Etruria are being studied by a dedicated team at Sapienza University at Rome, but neither the numbers of different tomb types nor the dates of the single tombs have been published. Similarly, the tombs in the Faliscan area are slowly being published (e.g. Baglione/De Lucia Brolli 1997; Tabolli 2013; Cerasuolo/De Lucia Brolli 2019; Mottolese 2020).

3. The Human Geography of Central Italy

Geographically, the two coasts of Central Italy are morphologically different. Both sides have a plain along the coast, but whereas in Etruria an undulating plain continues up to the Apennines, on the rugged Adriatic side the routes followed the river valleys (*fig. 2*). The geography makes it easier to interact along the coasts and on the Tyrrhenian sides, but different passages allow contacts across Central Italy. These geographical constraints direct human contacts and allow occupation of different areas.

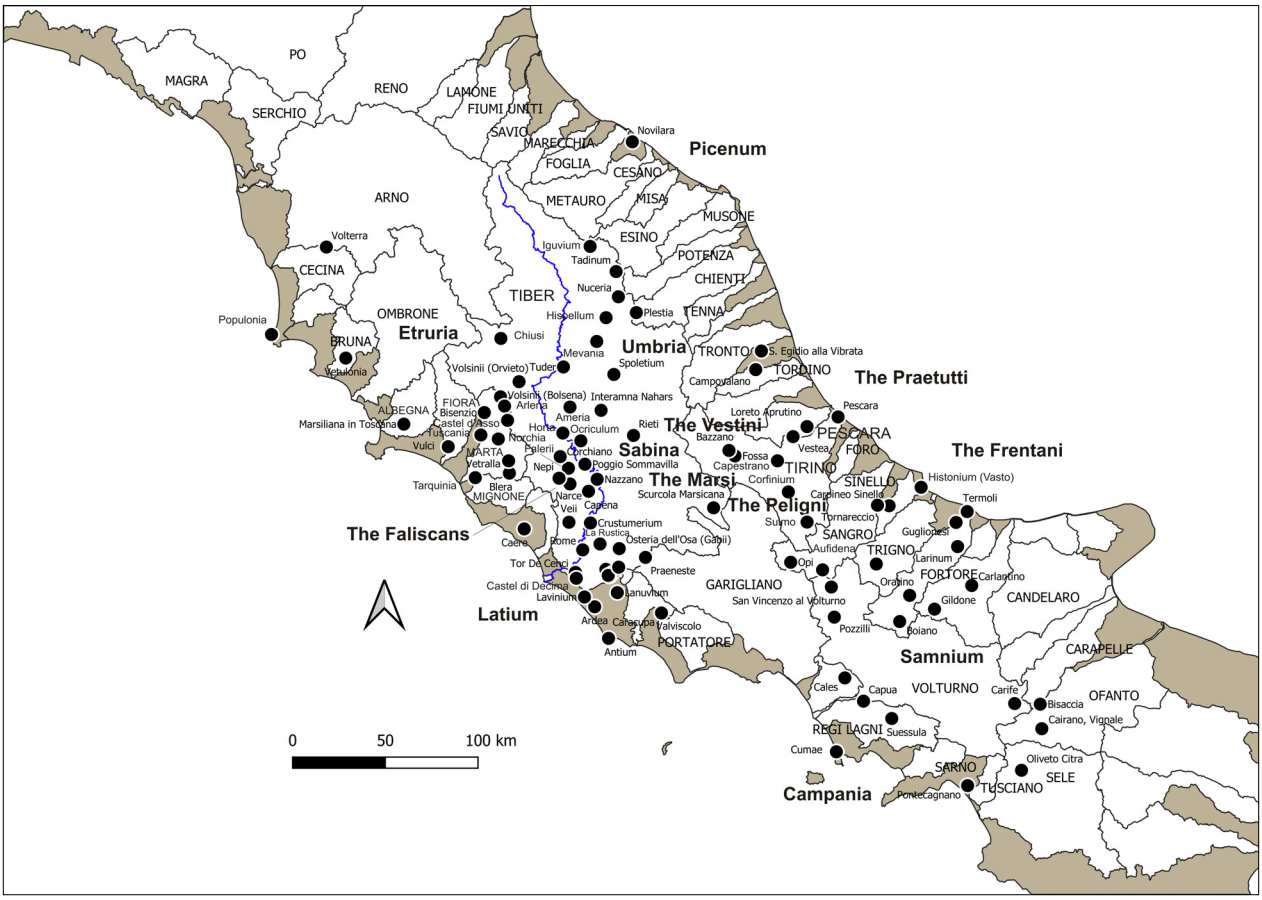

Fig. 2. The main river basins and funerary sites in Central Italy (by Ulla Rajala).

Culturally, one can assume that the peoples named by classical authors populated the different central Italian regions at least in the Hellenistic period (*fig. 2*; Bourdin 2012; Farney/Bradley 2019). Even if one wanted, one cannot get away from these names that coincide to a degree with epigraphic evidence,[1] for example, and are known from historical sources. In the northwest on the Tyrrhenian side were the Etruscans and in the northeast along the Adriatic coast the Umbrians and Piceni. Further south were the Praetuttii, Vestini Transmontani and Frentani. The Vestini Cismontani and Paeligni lived on the major upper plateaus in the Apennines and the Samnites further inland. On the Tyrrhenian coast were the Campanians in the south. On the eastern side of the Tiber were the Latins and further north the Sabini together with the less well known Hernicians, Aequi, Marsi, Sidicini and Aurunci towards Campania. On the western side of the Tiber were the Etruscans, Faliscans and Capenates and opposite to them in the north the southernmost Umbrians. The centres on the Tyrrhenian coast were urbanised, whereas on the Apennines and Adriatic coast the communities were more dispersed (Bradley 2000; Riva 2007; Scopacasa 2015). How far back these labels can be projected cannot be ascertained; however, in Latium and Etruria there is continuity from the Final Bronze Age onwards (e.g. Bietti Sestieri 1996; Fulminante 2014). Elsewhere, it is not sure that the tribal names can be taken much further back: for example along the Adriatic coast the so-called South Picene inscriptions from ca. 500 BC are encountered across a wider area than the earlier or later Piceni occupied (Crawford 2011; Macerola 2017/2018).

Of the ancient languages, Latin and Faliscan were very close to each other and their speakers may have understood each other, even if Faliscan

1 I have studied the epigraphy in Central Italy and will publish the results in a volume of the 'Monographs of the Archaeological Society of Finland' that hopefully will come out during the Academic year 2022–2023.

was written with an alphabet of Etruscan origin (Bakkum 2009). Etruscan was spoken in Etruria, but also in Campania. Both Etruscan and Faliscan were written down from the 7th cent. BC onwards (see Bellelli/Benelli 2018). However, at least from the 4th cent. BC onwards some Campanians spoke Oscan, a language present in Samnium and a relative of Vestinian, Paelignian and Marsian among other smaller languages (see Crawford 2011). Thus, the majority of the communities in Campania, Samnium and the tribal areas in the Apennines could understand each other. This created a resource for networking in this area, but we do know that around 500 BC the situation was different. We also have to remember, as Jones (1997) and Hall (1997, 2–33) have shown, that an ethnic identity, and probably a language identity, is an intersubjective reality, defined by a group itself, and not a static but a dynamic category, negotiable, situational and enhanced by conflict.

The networks of Central Italy were influenced by the Roman expansion. With new areas attached to the state and new allies added to the federation, Rome expanded, but until the Social War neighbouring areas could legally belong to different entities. Veii was the first large centre to fall in 396 BC (Titus Livius 5.21–22) and Sutri and Nepi became Latin colonies soon after (Titus Livius 6.21.4; Marcus Velleius Paterculus 1.14.2). Tusculum was the first Latin centre to get Roman citizenship in 381 BC (Titus Livius 6.26.6). Caere received a special status (probably *civitas sine suffragio*) in 353 BC (Sordi 1960, 107–122). Lanuvium, Aricia and Nomentum got Roman citizenship (*sine suffragio*) in 338 BC (Titus Livius 8.14.2–3). Campania and Sabinum got theirs in 338 BC and 290 BC (Titus Livius 8.14.10–11; Marcus Velleius Patrculus 1.14.6 respectively). The Aequi were conquered in 304 BC (Cornell 1995, 357; Roselaar 2010, 309, footnote 49), the Vestini in 302 BC (Titus Livius 10.3.1) and the Praetuttii in 299 BC (Frontinus De controv, 19).

The Ager Gallicus on the Adriatic coast, once an Umbrian area, was incorporated into the Roman state in 283 BC (Polybius 2.19.9–12; Roselaar 2010, 314, footnote 73). In Umbria, Fulginiae and Plestia fell under Roman rule in 296 BC or thereafter, probably also Interamna Nahars (Humbert 1978, 222, footnote 54). Tadinum, Nuceria, Spoletium and Capena were incorporated in 290 BC (see Afzelius 1942, 181). The Tarquinii lost areas to Roman colonists in 281 BC (Roselaar 2010, 315, footnote 79) and near Vulci the Roman towns of Heba, Saturnia and Statonia were founded in 280 BC (Beloch 1926, 621). In the Faliscan area, Falerii Veteres fell in 241 BC and was moved to Falerii Novi (Joannes Zonaras 8.18; Harris 1971, 117, note 8, 168; Keay et al. 2000, 1 f.). The displacement of Falerii had a precedent in the capture of Volsinii in 264 and its removal from modern Orvieto to Bolsena (Joannes Zonaras 8.7.4–8). This 4th and 3rd cent. BC expansion, as is seen in the following, however, did not see the diffusion of particularly Roman tombs, but local developments and the reuse of older tombs. This means that the local identities in Social Identification were stronger than any Roman influences brought about by the networks and Social Comparison only resulted in the strengthening of local identities, no matter if the new political situation would have encouraged new networks. This situation lasted until the Social War, the uprising of Italic peoples, apparently because they did not get Roman citizenship (see Mouritsen 1998).

4. The Resource: The Network Behind the Pit Tombs, the Villanovan Burial Rituals

This section is the first of those discussing Social Identification and attempting Social Comparison with the tomb material, that is looking at the Central Italian tomb architecture at the local level and comparing it within and between the regions. Since a successful execution of a task in a network can be seen as a resource in Actor-Network Theory and the network packages (routines) facilitate the punctualisation of the task, in this study the later funerary networks are approached in the light of the Villanovan network of the Early Iron Age pit tombs that can be taken as the earliest funerary Social Categorisation. Cremation was the shared burial custom in Central Italy on the Tyrrhenian side,[2] with cemeteries placed outside the

2 Early Iron Age pit and trench tombs have also been found at Populonia and Chiusi in central Etruria (Minto 1914; Bianchi Bandinelli 1925), but the numbers were not published. Thus, they have been left out from this comparison.

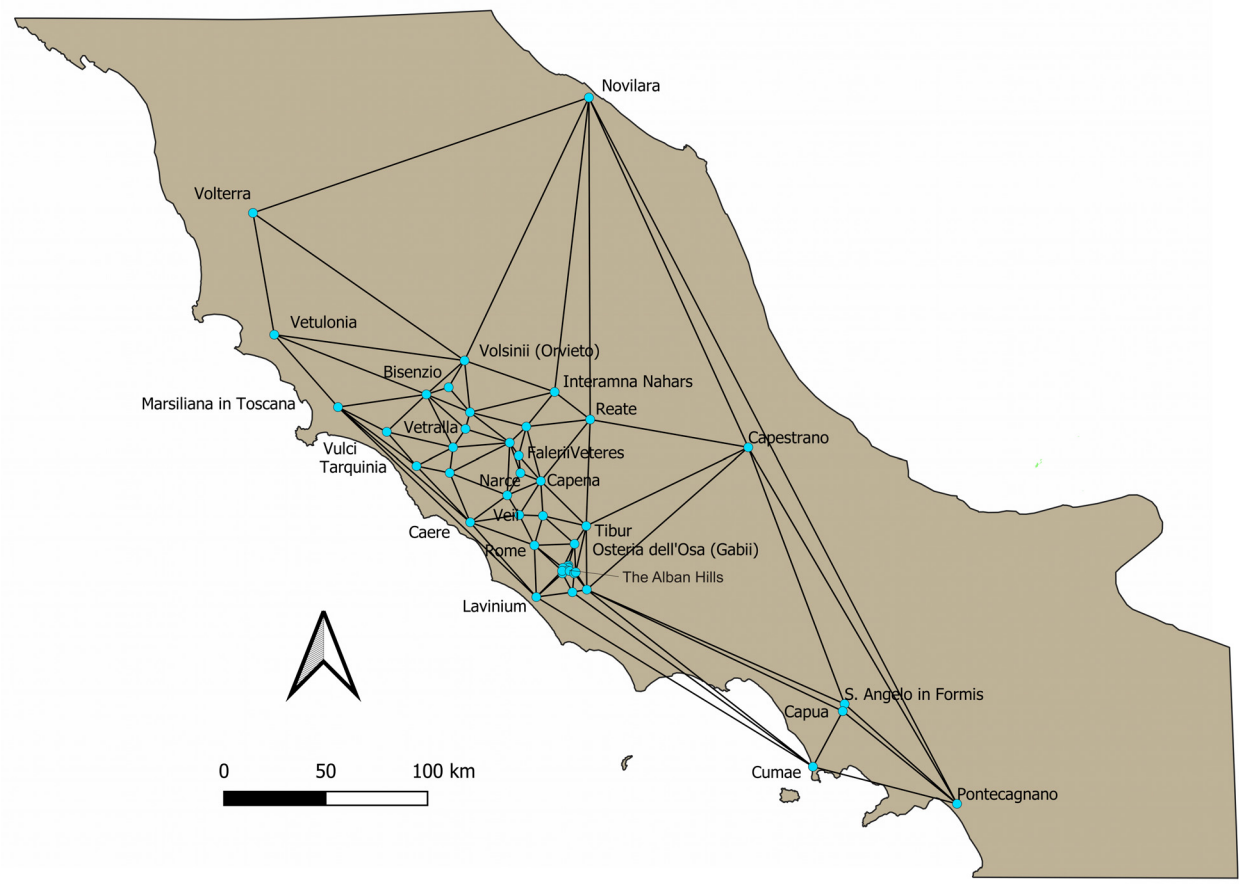

Fig. 3. Delauney network of Early Iron Age pit tombs (by Ulla Rajala).

settlement area, a practice that continued later. Even if cremation rites and pit tombs were shared, there were local preferences, partly because of local geology.

From point data one can create a line file and further a network with Delauney triangulation, but this procedure considers all points similarly, and the outliers, such as Novilara or Pontecagnano, are connected with all their nearest neighbours, even if they were distant (*fig. 3*). The Villanovan network can be best classified as distributed. However, when we look at the total numbers of pit tombs, this network is skewed by the size of the past community and the extent of the excavations. The largest numbers are in the coastal Etruscan city states: Veii, Tarquinia and Vetulonia (*fig. 4*), where the coast and the sea provide the shortcuts, making this network a small-world one.

At Veii the preferred local pit type was with a so-called *custodia* (PUT[3]; *table 1*), a two-part egg-shaped stone container; these were used in 30% of all pit tombs at Veii. In the Faliscan area the type was relatively common at Falerii Veteres at 16%. At Tarquinia the simple pits (P) were the standard tomb type. The pits covered by a stone slab (PCL) were very common at Vetulonia at 40% of all pits there. Instead of a small-world network the local network between Veii and the Faliscan area may have been scale-free, the local communities making the Veian type their own and incorporating it as a resource. Another typical tomb type at Veii

However, the Orientalising tomb types were very distinctive: constructed chamber tombs with dry walls holding the *tumulus* together at Populonia and cremation pit burials with anthropomorphic urns and funerary furniture at Chiusi.

3 Due to the sources being mostly in Italian, the abbreviations of the tomb types originate from the Italian names for different tomb types, e.g. a pit is *pozzo*, thus P, and a pit with a *custodia*, *pozzo con urna di tufo*, PUT after Cozza/Pasqui 1981.

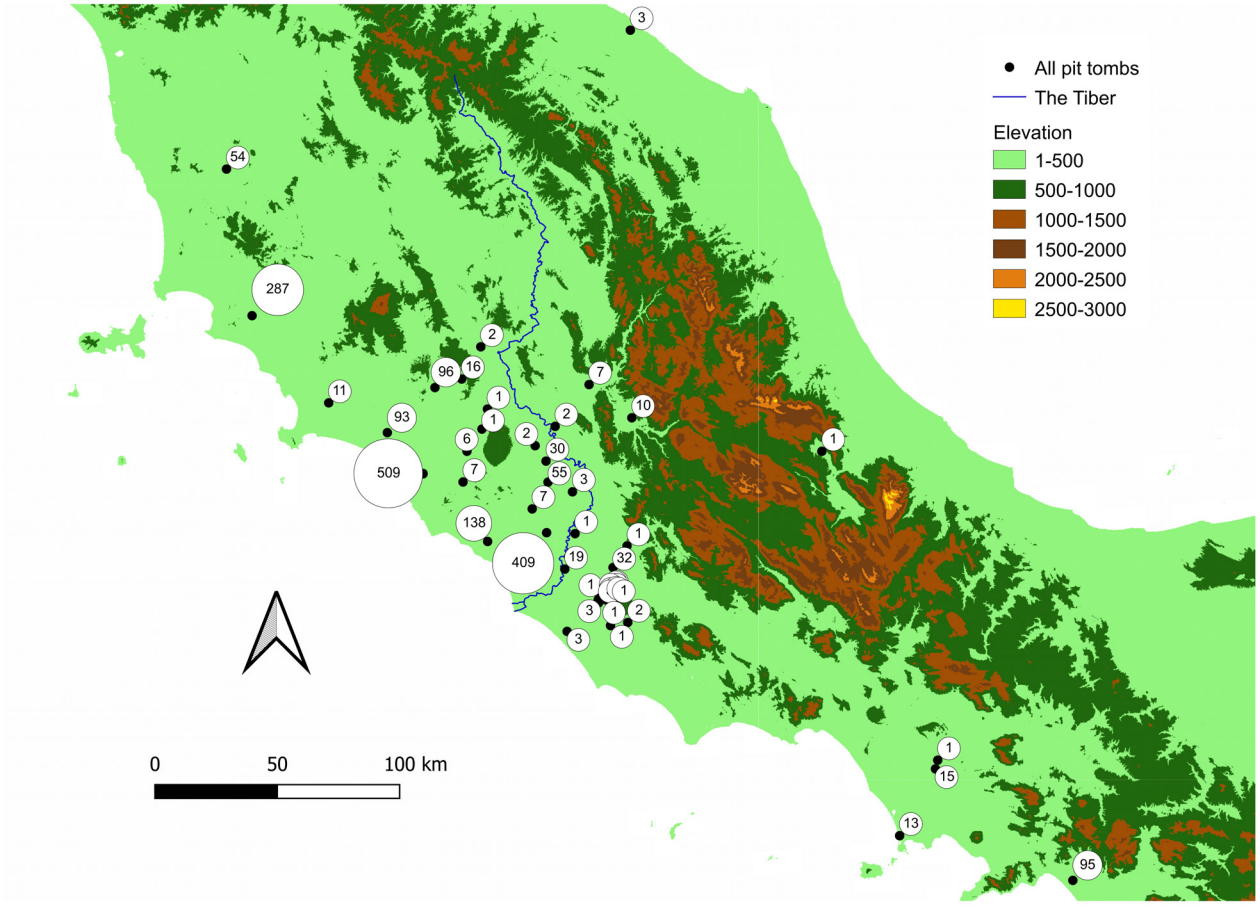

Fig. 4. Tomb distribution of Early Iron Age pit tombs (by Ulla Rajala).

were two-level pits (2P2) that were 128, 21% of all pits in that location, while in the Faliscan area they were present at Narce (10 examples, 23.6% there) and Falerii Veteres (5 examples, 16.67% there). However, the distribution as a whole suggests the tombs did not reflect local political relations, but the shared funerary identity and the interaction within the local network. Here one has a prime example of closeness between neighbours across ethnic and partly language boundaries.

In Latium the concentration of small pit cemetery areas in the Alban Hills may indicate the dispersed settlement or existence of larger cemeteries (Gierow 1964). At Osteria dell'Osa, the best-known Iron Age cemetery area in Latium (Bietti Sestieri 1992a; 1992b), simple pits (P, 18 examples, 65.3% of all pits) and two-level pits (P2P, eleven examples, 34.4%) were the most common types. At Rome the number of the pit tombs was 19 and these presented a selection of the most common types in different Villanovan centres (*table 1*). The most elaborate tombs were from the Forum Romanum and the simple tombs from the Quirinal Hill. With the multiple findspots with very similar tombs, the Latial local network was definitely a distributed small-world one.

In Campania, the pit tombs were present at Pontecagnano and Cumae, but there was a local Iron Age tomb type *tomba a ricettacolo* (TAR), a cremation tomb with a room-like cavity for the urn. It was present at 9.3% of all tombs at Pontecagnano, at 1.6% at Cumae and also at Capua (three examples), where the dominant pit tomb type was a simple pit (P, 13 examples). This is a local case of a network as a source of a tomb type and a demonstration of Campanian closeness. At Pontecagnano the circular and oval pits covered with stones (PCP and POCP) were more numerous (53.7%) than simple pits (P, 19.79%). At Pontecagnano the Early Iron Age cemetery areas ceased to be used in the Orientalising period (Cuozzo 2016, Paragraph 39). This displacement suggests a change in the occupancy and potentially in the local networks.

Place	P	PUT	PFP	PCP	P2P	P2PCP	P2PLC	PLC*	PLCCP	Total
Falerii Veteres	18	3			2					30
Corchiano	2									2
Narce	29	9			1					55
Capena	1									3
Veii	243	124			8			2		409
Monte Sant'Angelo	4		2							7
Cumae	4		2							13
Pontecagnano	19		1	27				1		95
Caere	15	16			98					138
Tarquinia	463		5	1	2		8	19		509
Vulci	84				1			1		93
Volsinii (Orvieto)	2									2
Civita del Fosso d'Arlena			16							16
Bisenzio	46		1	2				7		96
Viterbo							1			1
Vetralla	4						1			6
San Giovenale	4	2								7
Ferentium										1
Castel De Paolis								1		1
Via Cavalletti	1									1
Il Fico	1									1
Boschetto								1		1
Vigna Capri-Onorati								1		1
Vigna Meluzzi	1									1
Vigna delle Piccole Suore	2									2
Riserva del Truglio	1				1					3
Campofattore		1								3
S. Lorenzo Vecchio	1									1
Vigna d'Andrea										2
Campi d'Annibali NW				1						1
Campi d'Annibali NE										1
Tibur	1									1
Lanuvium								1		1
Lavinium		1	1	1						3
Rome	3		2	2		2	1	3		19
Crustumerium	1									1

Place	P	PUT	PFP	PCP	P2P	P2PCP	P2PLC	PLC*	PLCCP	Total
Interamna Nahars	1		1	2						7
Ocriculum										2
Reate	4	6								10
Osteria dell'Osa (Gabii)	18				11					32
Novilara										3
Capestrano										1
Marsiliana in Toscana			5	1				2		11
Vetulonia	84		11	2				115	5	287
S. Angelo in Formis				1						1
Capua	13			1						15
Volterra	46									54

Table 1. Selected Early Iron Age pit tomb types and numbers (P = simple pit, PUT = Pit with a stone custodia, PFP = pit lined with stones, PCP = pit covered with stones, P2P = pit on two levels, P2PCP = pit on two levels covered with stones, P2PLC = pit on two levels covered with a slab, PLC* = pit covered with a slab, PLCCP = pit covered with a slab and stones, * = any further attributes; by U. Rajala).

On the Adriatic coast in Picenum at Novilara the pit tombs were a marginal tomb type. This may be a chronological question. In addition, it may have stronger contacts with the northern Villanovan centres in the Po valley, not discussed in this article. In any case, as with the earlier pottery in Van Oyen's study, we may say that the network was a fluid constellation where the universal type was produced locally.

It was first thought that the pit tombs were earlier than the trench tombs, but inhumation and trench tombs were already present at Caere and Populonia in the 9th cent. BC (Bietti Sestieri 1996, 306). Osteria dell'Osa showed that the chronology is more complex: in the 8th cent. BC the choice of the ritual was connected to the social persona of the deceased. Even if the cremations with miniature grave-goods belonged to male warriors, rich female cremations were a phenomenon in 770–730/720 BC (Bietti Sestieri 1996, 309–318).

Iron Age trench tombs, a Social Categorisation, had a slightly smaller distribution network (*fig. 5*) than pit tombs (*fig. 3*). Similar to a pit tomb, one can assume they were created locally in a fluid constellation (*table 2*). In Etruria, unlike in Latium, the density was lower, since the change to the chamber tombs, another Social Categorisation, had already started. Trench tombs were present in Campania at Cumae and Pontecagnano and later became the dominant tomb type there. Trench burials, and cremations in pits, were also present in Umbria and Sabinum along the Tiber, showing the importance of the river valley in sharing a punctualised funerary resource within the local network. The Iron Age trench burial network with its high numbers at Veii and Osteria dell'Osa (*fig. 6*) could perhaps be best described as decentralised with a string of major centres along the Tyrrhenian coast. However, trench tombs were not present in the Apennines or on the Adriatic coast. There the Early Iron Age inhumations were placed underneath mounds or in the middle of stone circles (Cosentino et al. 2001; Chiaramonte Treré et al. 2004; *fig. 7*). This shows a distance from the Tyrrhenian side and a local result of Social Identification.

5. Distributions as Networks: From the Orientalising to the Archaic Periods

The tomb distributions are all skewed by the extent of archaeological excavations. The well-studied cemetery areas, such as those at Interamna Nahars in Umbria (Terni; Pasqui 1886; Pasqui/

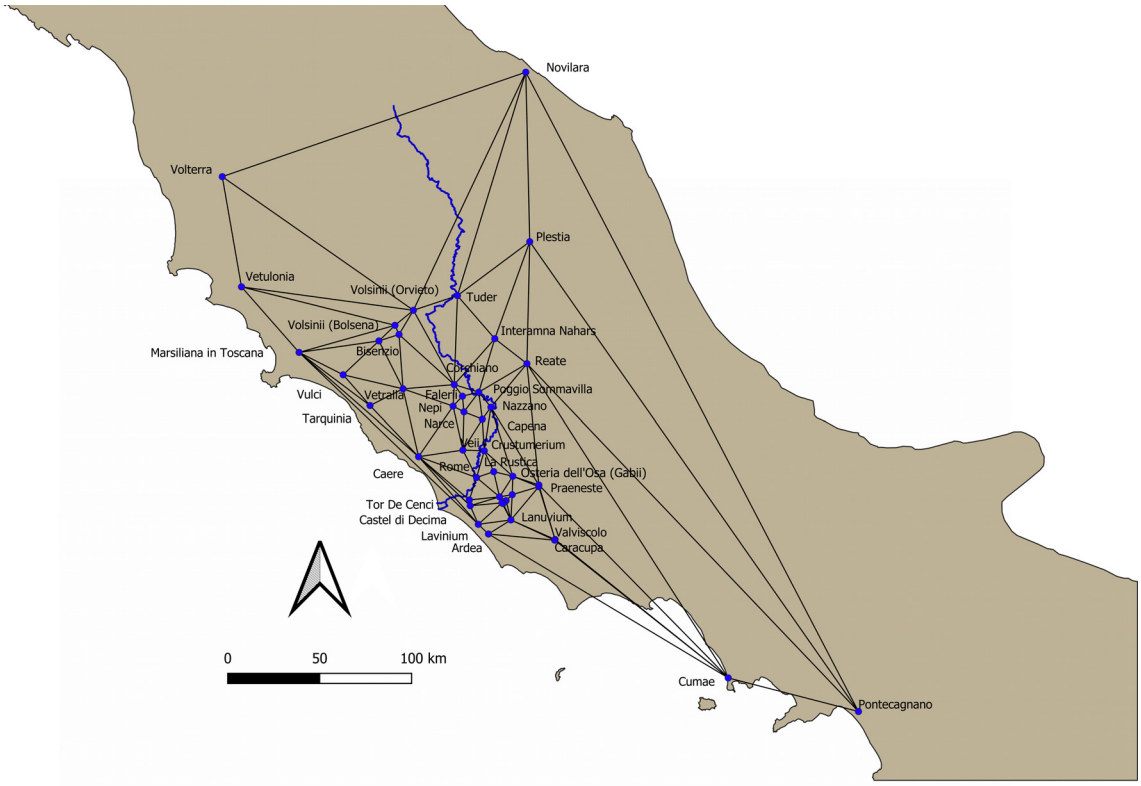

Fig. 5. Delauney network of Early Iron Age trench tombs (by Ulla Rajala).

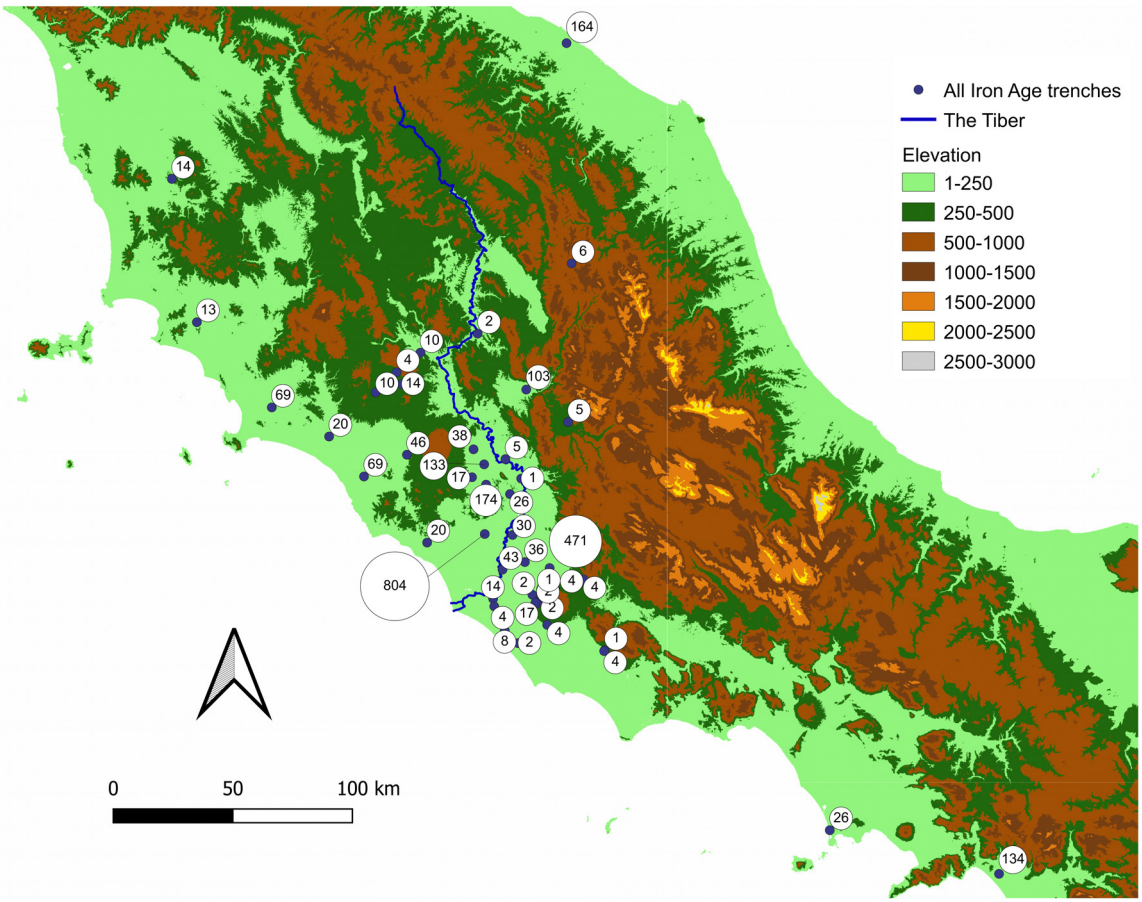

Fig. 6. Tomb distribution of Early Iron Age trench tombs (by Ulla Rajala).

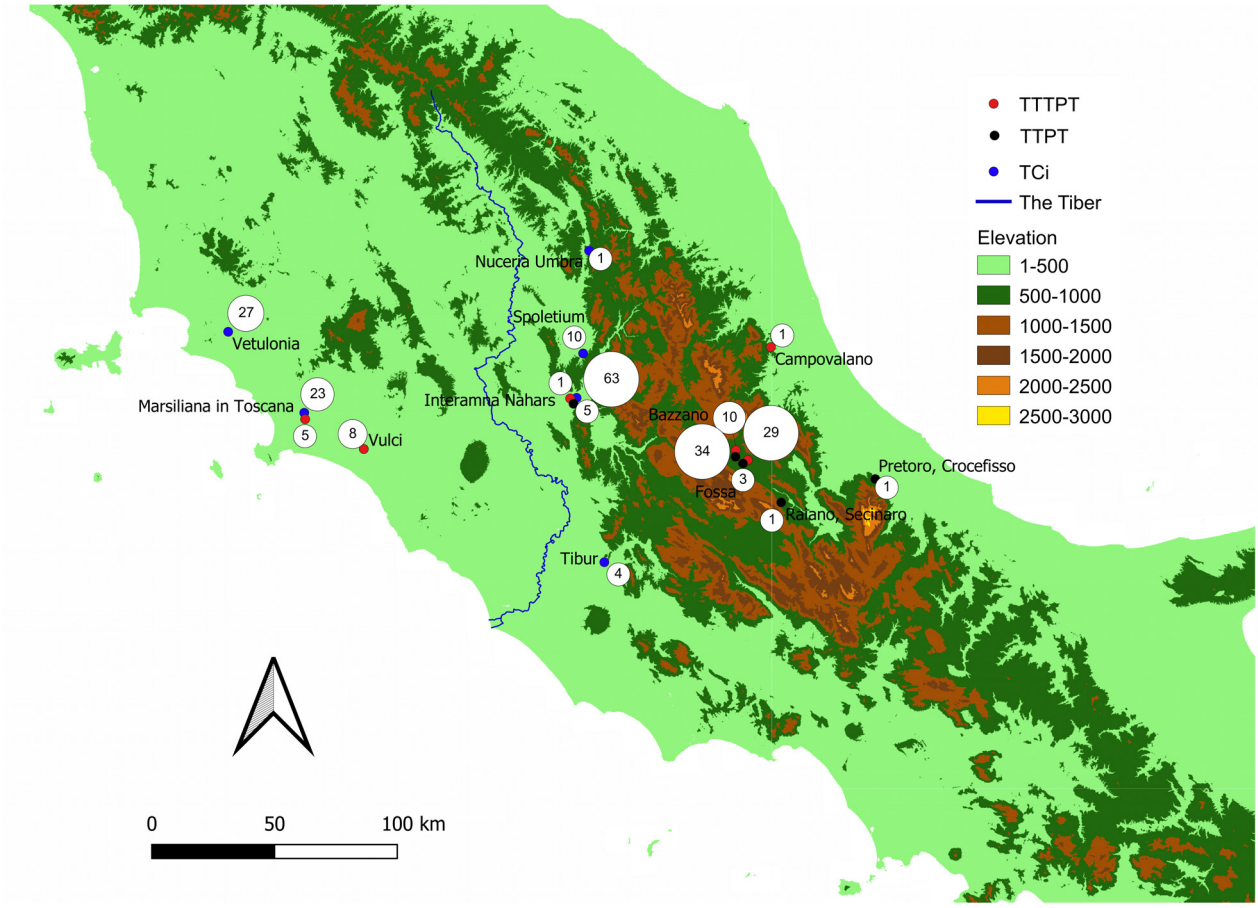

Fig. 7. Circular tomb numbers (TCi/ TTTPT/TTPT) in the territory of Veii (by Ulla Rajala).

Lanzi 1907; Stefani 1914; Leonelli 2003) or Fossa in the Vestine area (Cosentino et al. 2001; 2004), are key sites with many different tomb types. For example, all main types of circular features erected over trench burials were present at Interamna Nahars. In the case of a stone circle with a trench (TCi; *fig. 7*), the direction of the closeness is known: the existence of the types with a pit in the centre shows that Interamna Nahars was a hub in a scale-free network that was a resource for the inner communities.

In southern Etruria the centres continued to share tomb types during the later Iron Age (*table 2* and *3*). The *tomba a loculo tipo Narce* (TLN) was present at Veii, the Faliscan area and also at Caere, Vulci, Capena and Poggio Sommavilla in Sabinum. The *tomba a loculo tipo Montarano* (TLM) had very similar distribution, but was restricted to Veii, Capena and the Faliscan area. These scale-free distributions (*fig. 8*) have been used as a proof that the Agri Faliscus and Capenas were part of the territory of Veii (Cifani 2005). In any case, the distributions show closeness between neighbours in southeastern Etruria and shared funerary identity based on the mutual resource brought by the network. During the Orientalising period these types were also known from Crustumerium, Capena and more distant Campovalano (*fig. 9*; *table 3*) showing the width of the network.

Of the Iron Age trench types (*table 2*), the one with a small central *loculus* for the grave-goods (TLPC) had wider distribution than the *tomba a loculo tipo Narce* (TLN) and *tomba a loculo tipo Montarano* (TLM) types. It was present in the Faliscan area and Veii, but also at Tarquinia and Vetralla, and in Latium at Osteria dell'Osa, Tor De Cenci and Castel di Decima. The related trench type with a small *loculus* at the end of the longitudinal side (TLPE) was rarer, but present at Osteria dell'Osa and Riserva del Truglio in Latium.

Trenches lined with stones (TFFP; *table 2*) were widely distributed. Although this type was

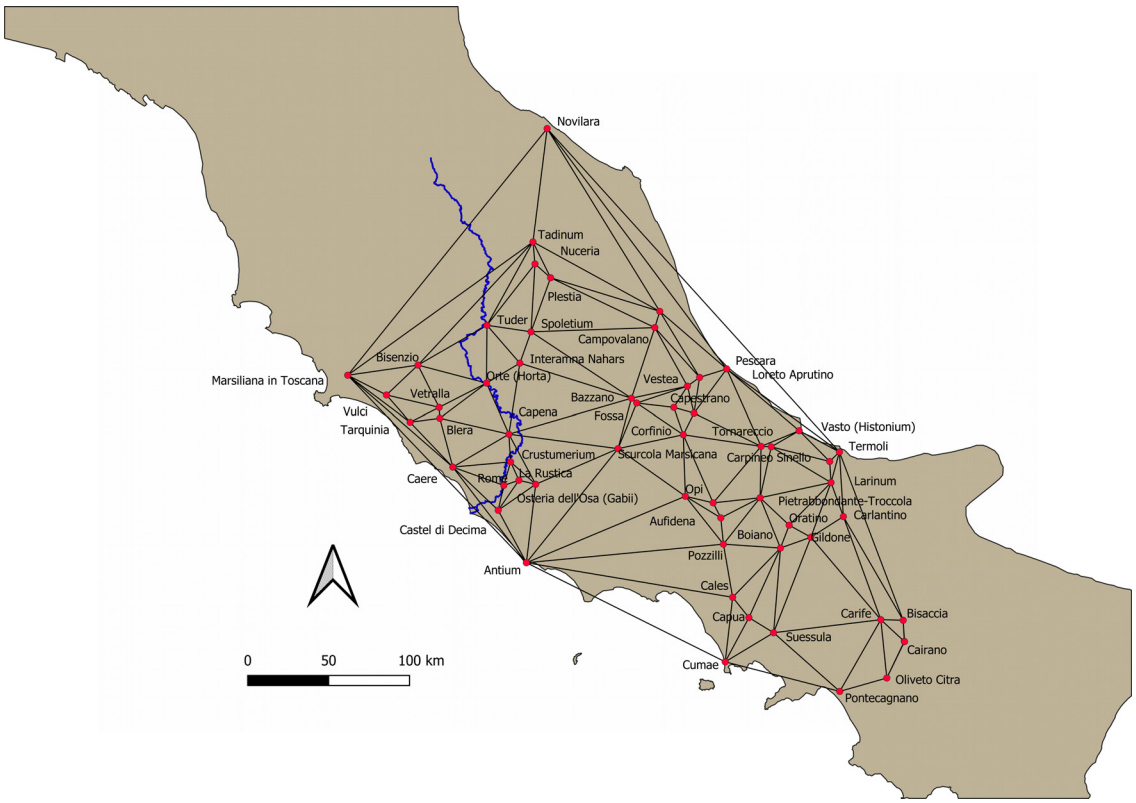

Fig. 8. Delauney network of Orientalising and Archaic trenches (by Ulla Rajala).

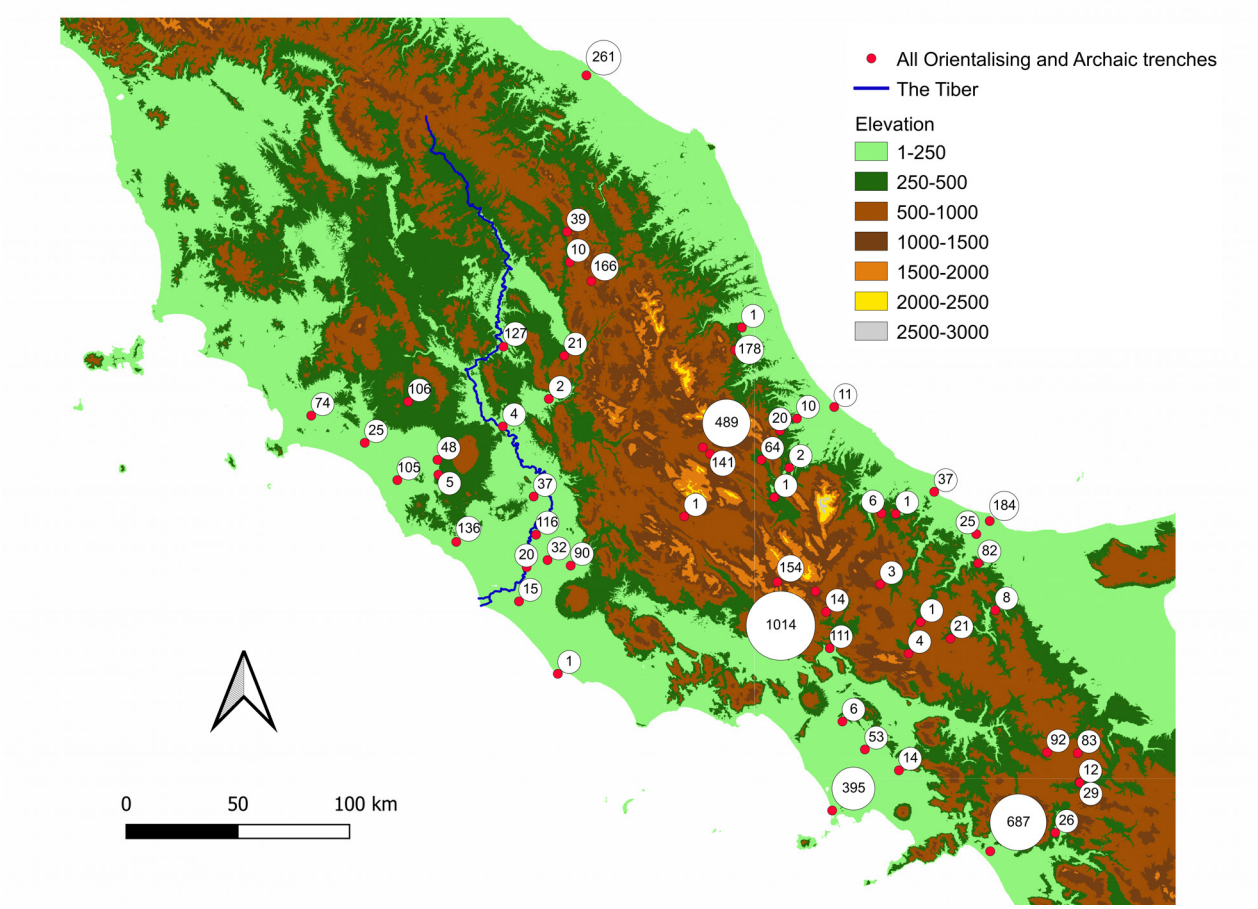

Fig. 9. Tomb distribution of Orientalising and Archaic trenches (by Ulla Rajala).

Place	TF	TLPC	TLPE	TLN	TLM	TFFP	TFCP	TFFCP	Total
Falerii Veteres	57	16	2	27	29				133
Corchiano	2	2		31	3				38
Narce	78	57	1	31	3				174
Nepi				14	1				17
Capena	1	3	1	15	4				26
Veii	536	62	66	55	3	19	2		804
Interamna Nahars	75					2	21	1	103
Plestia	37					6			43
Tuder									2
Nazzano						1			1
Volsinii (Orvieto)	1					1		4	10
Volsinii (Bolsena)	4								4
Civita del Fosso d'Arlena	1					13			14
Caere	10			1					20
Tarquinia	39	3		3		2			69
Vulci	16								20
Bisenzio	6					2			10
Vetralla	41	1							46
Marsiliana in Toscana	5					1	54	3	69
Osteria dell'Osa (Gabii)	413	4	1			34		7	471
Rome	31					5	1	3	43
Crustumerium	3								30
Poggio Sommavilla	2			1					5
Rieti	2					3			5
Tor De Cenci	13	1							14
Ardea	1								2
Castel di Decima		2					2		4
Praeneste	4								4
Vigna Batocchi	2								2
Vigna Testa									1
San Rocco, Cimitero	1						1		2
Villa Monteverde	2								2
Riserva del Truglio	1		1			2	4	7	17
La Rustica							35		36
Lavinium	1					1	1	4	8
Valviscolo	1								1

Place	TF	TLPC	TLPE	TLN	TLM	TFFP	TFCP	TFFCP	Total
Caracupa	1								4
Tusculum	1								1
Lanuvium	4								4
Novilara	156						3		164
Cumae	11					9	2	3	26
Pontecagnano	17					7	49	8	134
Vetulonia	10								13
Volterra	11						3		14

Table 2. Selected Early Iron Age trench tomb types and numbers (TF = simple trench tomb, TLPC = trench tomb with a *loculus* at the centre, TLPE = trench tomb with a *loculus* at the end of the long side, TLN = *tomba a loculo tipo Narce*, TLM = *tomba a loculo tipo Montarano*, TFFP = trench tomb lined with stones, TFCP = trench tomb covered by stones, TFFCP = trench tomb lined and covered by stones; by U. Rajala).

Place	TF	TLPE	TLN	TLM	TFFP	TFCP	TFFCP	TFS	TFC	TaC	TFFLCL	Total
Fossa	90				26	2			2			141
Bazzano	471	5			5	2						489
Capestrano	26	5								1		64
Campovalano	89		1		47	12	4					178
Aufidena	34				1				824		123	1014
Loreto Aprutino	10											10
Vestea	20											20
Carpineo Sinello	1											1
Vasto (Histonium)	12											37
Castilgione a Casauria												2
Corfinio	1											1
Pescara	11											11
S. Egidio alla Vibrata	1											1
Scurcola Marsicana	1											1
Novilara	156					3			1			261
Cumae	176							106	1			395
Guglionesi	7											25
Larinum	41								41			82
Termoli	184											184
Tornareccio						5					1	6
Opi	60								94			154
Carlantino	1				5		2					8
Gildone	19								2			21
Boiano												4
Oratino	1											1

Place	TF	TLPE	TLN	TLM	TFFP	TFCP	TFFCP	TFS	TFC	TaC	TFFLCL	Total
Pietrabbondante-Troccola									3			3
Pozzilli	111											111
Bisaccia	83											83
Cairano, Calvario	11								1			12
Cairano, Vignale	29											29
Carife	92											92
Oliveto Citra	26											26
San Vincenzo al Volturno												14
Termoli												184
Capua	41				1	9						53
Cales	3					1			1			6
Suessula						4			6			14
Pontecagnano	528				10	12	9	1	29	9		687
Capena	1	6	1	4			1					37
Marsiliana in Toscana	5				1	54	3	2	2		1	74
Blera												5
Vetralla	41											48
Bisenzio								46				106
Spoletium	10						1					21
Plestia	145				8	2	1					166
Tuder								125				127
Osteria dell'Osa (Gabii)	30	1										90
Tarquinia	34				1			41			4	105
Caere	12					77		4		26		136
Vulci	19									6		25
La Rustica	14					7		5				32
Castel di Decima	5					8						15
Crustumerium	31	8	72	5								116
Rome	7				2	2			2			20
Antium												1
Interamna Nahars												2
Nuceria	1				2	2						10
Tadinum	21										9	39
Orte (Horta)										4		4

Table 3. Selected Orientalising and Archaic trench tomb types and numbers (TF = simple trench tomb, TLPE = trench tomb with a loculus at the end of the long side, TLN = *tomba a loculo tipo Narce*, TLM = *tomba a loculo tipo Montarano*, TFFP = trench tomb lined with stones, TFCP = trench tomb covered by stones, TFFCP = trench tomb lined and covered by stones, TFS = trench tomb with a sarcophagus, TFC = *tomba a fossa con cassone* [Fossa type], TaC = *tomba a cassone* [Caere type], TFFLCL = trench tomb lined and covered with slabs; by U. Rajala).

absent from the Ager Faliscus and was only found at Nazzano in the Ager Capenas, it was present in southern, central and northern Etruria, Latium Vetus, Umbria, Sabinum and Campania. Trenches covered with stones (TFCP) were present in central and northern Etruria, Latium Vetus, Umbria, Picenum[4] and Campania. The type with both stone lining and cover (TFFCP) had a more restricted distribution, but was present in Latium, central Etruria, Umbria and Campania. The distributions of trenches with *loculi*, and those with stone lining and cover can be contrasted as mutually exclusive with *loculi* in the Faliscan area and Sabinum, and stones at Campania. In Latium both types were present and this suggests a central position for Latium and the Tiber valley in the network.

During the Orientalising and Archaic periods simple trenches (TF; *table 3*) were copious in Campania, Samnium and the smaller Apennine tribal areas. Two distinct groups, separated by an emptier north/south stretch between approximately the Tiber valley and Samnium (*fig. 9*), can be found: the western group along the Tiber in Etruria and Umbria, and the eastern one on the Adriatic coast, Samnium and Campania. However, in Umbria the best-known cemeteries are at Plestia, where all tombs were trenches. At Veii and in the Faliscan area the chronology is not clear, but the change to the chamber tombs was early. Trenches lined with stones (TFFP) were normally rare, but relatively common at Campovalano (47 examples).

Trench tombs with a *sarcophagus* (TFS; *table 3*) were present in some of the largest centres in southern Etruria, at La Rustica in Latium, Tuder in Umbria and at Cumae and Pontecagnano in Campania (*table 3*). Tibur shared the trench type, dated to the 5th or 4th cent. BC (see Faccenna 1957, 123). At La Rustica the tombs with a *sarcophagus* (TFS) together with *tombe a loculo* without finds could be Archaic (Colonna 1977, 155). Five tombs with a *sarcophagus* (TFS) were found on the Esquiline Hill in Rome, but the *sarcophagi* were also found in chamber tombs, e.g. at Via S. Stefano Rotondo (Mainecke 2016, 16, footnote 25). The different types of *tomba a cassa* (TaC, TFC, TFFCL; *table 3*) show that the same kind of slab structures was present widely in Central Italy.

Veii stood out in the Archaic period: the cremation rite was dominant with a distinctive tomb type. The distribution (*fig. 10*) suggests that the tomb architecture reflects a political entity. The Veian tomb type was present also at Narce, which shows a closeness between the centres that allowed the network to be used as a resource.

Simple chamber tombs (TC, *table 4*) are concentrated in southern and central Etruria and the Ager Faliscus. The high numbers result partly from the way the featureless chambers stood as a short-hand for unexcavated tombs in the late 19th cent. BC (Moscati 1987, 60). Apart from Etruria, the chamber tombs were present in Latium and in different tribal areas in the Apennines between the territory of the Vestini and Samnium.

Chamber tombs with *loculi* (TCLP; *table 4*) peaked in numbers in the Ager Faliscus (*fig. 11*). This tomb type was also present in Latium and in Umbria and Sabinum along the Tiber showing closeness between these areas. Cruciform chamber tombs (TCr; *table 4*) were a common type at Caere, but also present in low numbers in other southern Etrurian centres, including those in the Agri Faliscus and Capenas. The other Caeretan types (*table 4*), co-axial chambers (2CCo) and tombs with a rectangular *atrium* and two or three burial chambers (TC2C and TC3C), were more common in the larger southern Etruscan cities along the coast with TC3C present only at Caere. Like chamber tombs with *loculi* (TCLP), the tombs with one co-axial and one lateral chamber (TCCCL) followed the Tiber in low numbers in the Agri Faliscus and Capenas, Sabinum and Latium. These tombs were high-status tombs, so they show how the elites were connected and their network served as a resource in choosing a tomb type.

The tombs with funerary benches (TCB; *table 4*) were typical for Caere. Nevertheless, the whole region was influenced by these designs, mainly without the carved elements such as the legs of a *kline*. The tombs with funerary benches (TCB) were present in the large Etruscan centres along the coast, up the Tiber valley in Latium, Sabinum and Umbria Tiberina and even in the

4 At Novilara the deceased were buried in a crouched position. This funerary custom is only encountered during this period in Picenum and immediate neighbouring areas and has been considered a Picene Social Categorisation similarly to cremation or normal inhumation.

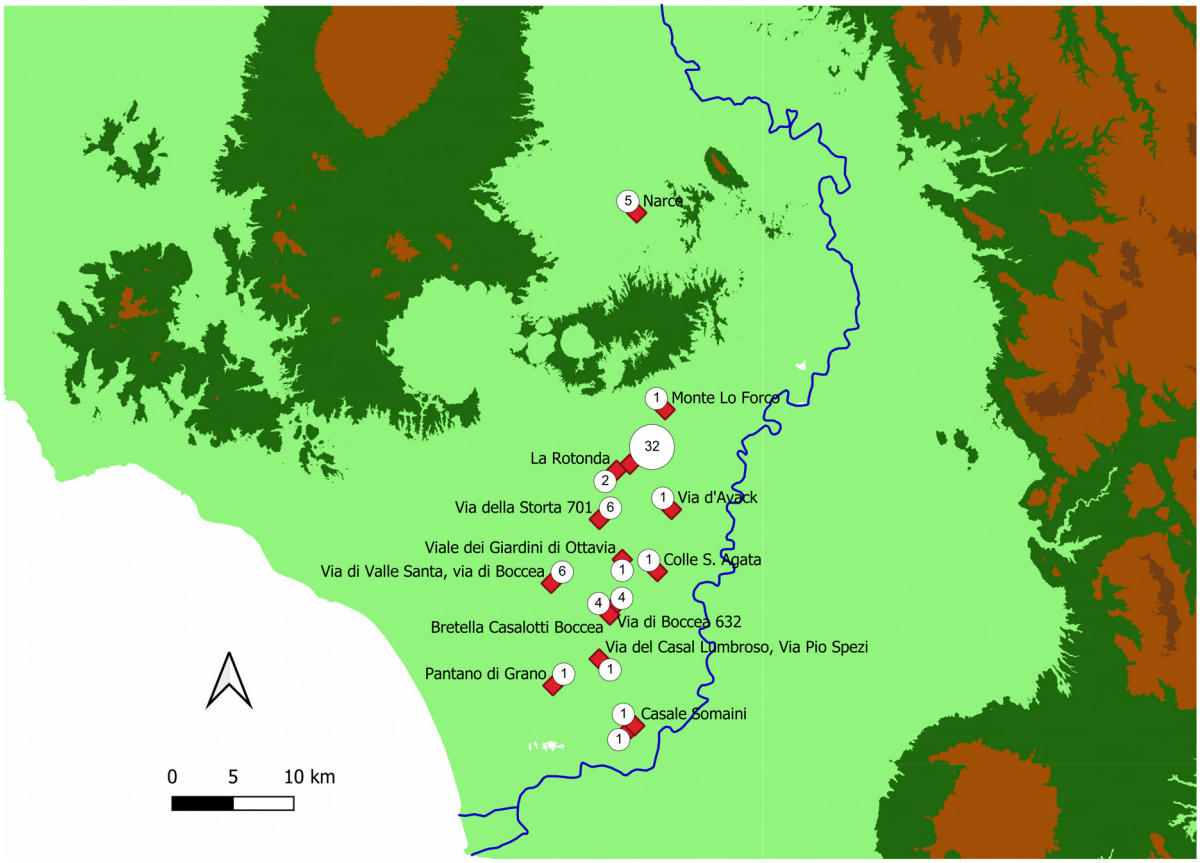

Fig. 10. Archaic cremation tombs (TFLaC and TLGr) in the territory of Veii (by Ulla Rajala).

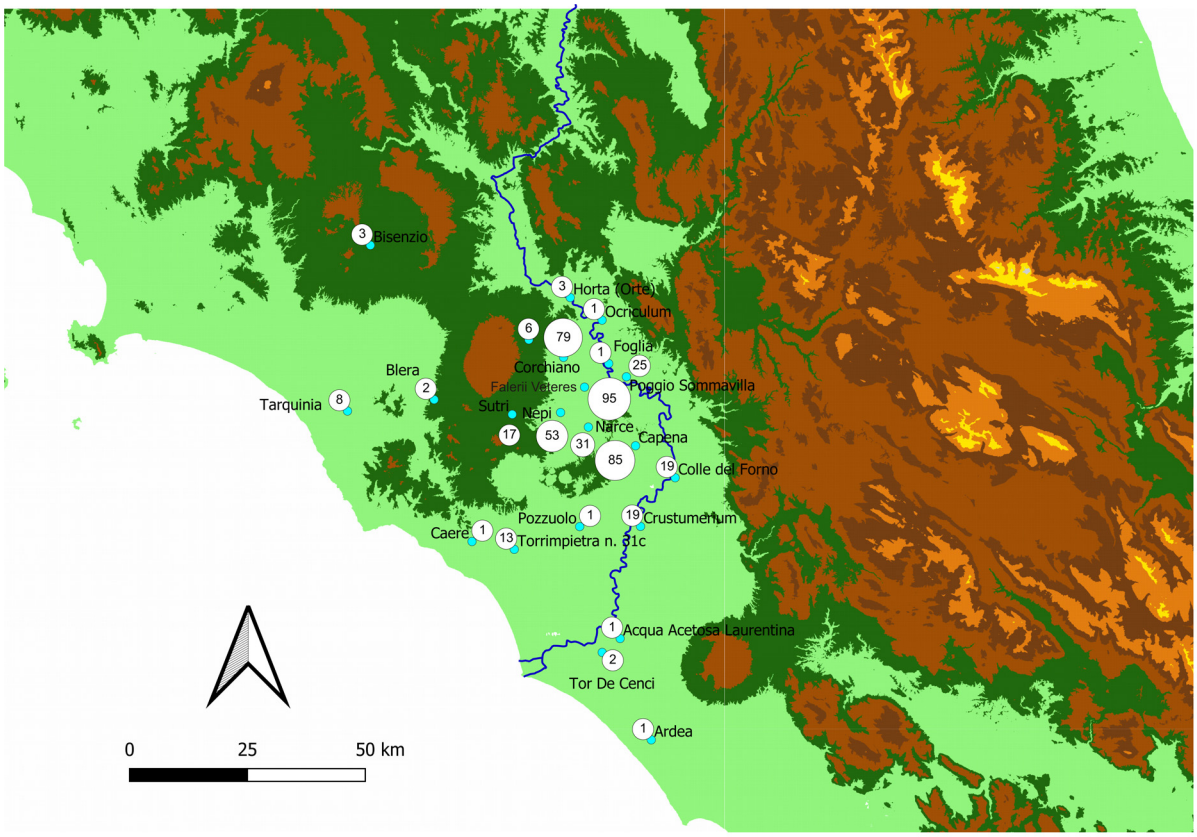

Fig. 11. Chamber tombs with *loculi* (TCLP) in the territory of Veii (by Ulla Rajala).

Place	TC*	TCLP*	TCB*	TCB*LP	TCB*RF	TCr*	TCS*	2CCo*	TC2C	TCCCL*	Total
Falerii Veteres	209	95	3	1		1	1				377
Corchiano	19	79		2						1	161
Narce	254	31	10	1		2	6			1	324
Nepi	24	53	1	2							89
Vignanello		6									13
Capena	12	85	11	6		4		1	1	2	182
Sutri	2	17	3					1			27
Veii	17		24			4	17				73
Monte Sant'Angelo (Veii)			1								1
Via d'Avack	3						1				6
Viale dei Giardini di Ottavia	4										4
Pantano di Grano											2
Pozzuolo	2	1									7
Poggioverde							1				1
Torrimpietra n. 9			1								1
Torrimpietra n. 31c		13									18
Torrimpietra n. 35	1										1
Torrimpietra n. 60	1										1
Torrimpietra n. 68			1								1
Torrimpietra n. 79	7										7
Torrimpietra n. 93	3										3
Torrimpietra n. 98											2
Torrimpietra n. 113					3						3
Torrimpietra n. 127	2										2
Torrimpietra n. 13			19								19
Torrimpietra n. 133			2		1						5
Torrimpietra n. 144	2				3						5
Torrimpietra n. 189					1						1
Torrimpietra n. 211						1					1
Torrimpietra n. 359	1										1
Torrimpietra n. 499	1										1
Ocriculum	3	1	2								6
Nazzano	2		7								9
Volsinii (Orvieto)	1		7								8
Volsinii (Bolsena)	3		25							1	30
Ferentium											3

Place	TC*	TCLP*	TCB*	TCB*LP	TCB*RF	TCr*	TCS*	2CCo*	TC2C	TCCCL*	Total
Civita del Fosso d'Arlena	13										13
Caere	72	1	54	8		61	1	16	6	26	305
Tarquinia	190	8	40	3		5	1	5	1		256
Viterbo											2
Horta (Orte)	11	3	3								40
San Giovenale	69		118		25	2		9			277
Blera	29	2	35	1	33		4	2			121
Vulci			7		8	17	7	4		3	48
Bisenzio		3									3
Vetralla					2						2
Osteria dell'Osa (Gabii)	1									1	2
Rome	3		3								6
Crustumerium	33	19	1								61
Poggio Sommavilla	12	25					1			3	47
Foglia		1	1								3
Colle del Forno		19	1								25
Tor De Cenci	1	2					17				2
Acqua Acetosa Laurentina		1					5				7
Cures			1								1
Lunghezza	1										1
Case Rosse	1										1
Fosso Benzone											1
Casale Benzone	1										2
Casale Cerrone											1
Tibur											1
Ardea		1	6								8
Capestrano, Fossascopana											12
Penna (Pinna Vestinorum)	3										3
Peltuinum											1
Poggio Picenze	3										3
Serramonacesca	1										1
Tocco Casauria	1										6
Castilgione a Casauria											3
Aielli	9										9

Place	TC*	TCLP*	TCB*	TCB*LP	TCB*RF	TCr*	TCS*	2CCo*	TC2C	TCCCL*	Total
Collelongo	2										7
Luco dei Marsi	1										1
Ortucchio	1		2								3
Venere di Pescina	3										3
Villevallelonga	1										1
Anversa											6
Castelvecchio Subequo											1
Corfinio	30		1								37
Raiano	1										1
Sulmo											12
Cumae											2
Larinum	1										1

Table 4. Selected chamber tomb types and numbers (TC* = simple chamber tomb, TCLP* = chamber tomb with *loculi*, TCB* = chamber tomb with funerary benches, TCB*LP = chamber tomb with both funerary benches and *loculi*, TCB*RF = chamber tomb with funerary benches and a shelf at the back, TCr* = cruciform chamber tomb, TCS* = chamber tomb with a sarcophagus, 2CCo* = chamber tomb with two co-axial chambers, TC2C = chamber tomb with an atrium and two chambers at the back, TCCCL* = chamber tomb with one co-axial and one lateral chamber [half cruciform], * = any further attributes; by U. Rajala).

territories of the Paeligni and in Samnium. The hybrid type with both benches and *loculi* is found in small numbers at Caere and the Agri Faliscus and Capenas. The variant with a shelf at the back of the chamber (TCB*RF) was present at San Giovenale and Blera (Quilici Gigli 1976; Tobin 2015). These examples show that, even if there is a connection between a city-state and tomb types, and political ties may have guided preferential attachment in a funerary network, the relationship was not clear cut, but closeness was most probably down to other advantages brought by networking.

The distribution of tombs with funerary benches (TCB) is hierarchically decentralised, as shown by the small cemetery sites near Caere and between Caere and Tarquinia. The pattern is linear along the Tiber. The distribution of cruciform chambers (TCr) is likely to be 'scale-free' with Caere as a hub. The co-axial chambers (2CCo) are relatively rare and the local network seems to be hierarchically decentralised, if not scale-free, with Caere as the hub. This closeness between independent centres and the different types of local networks shows how the networks were a resource across the tuff landscapes.

6. Distributions as Networks: The Hellenistic Period

At the same time as Rome was expanding, funerary architecture was becoming more elaborate (*fig. 12*). This is especially clear in inner Etruria, where large Hellenistic cemeteries were cut into tuff, and in the Vestine and Paelignian areas. This section will show how the results of Social Identification, the tomb selection, became very articulated across Central Italy, even if there were similarities when Social Comparison is carried out. However, even if these tombs may have been produced locally, they show a rooted constellation that combined any resources brought by the funerary networks with local Social Identification. This is the time of Hellenisation and these influences show in tomb designs.

In the north at Volterra the Hellenistic tombs were chamber tombs: mainly either small chamber tombs with few burials (11 examples; Rosselli 2018) or circular chambers with a low platform for urns (2 examples; Maggiani 2007). At Chiusi there were about 400 Hellenistic tombs with 25 so-called *dromos* tombs (Bianchi Bandinelli 1925, 437).

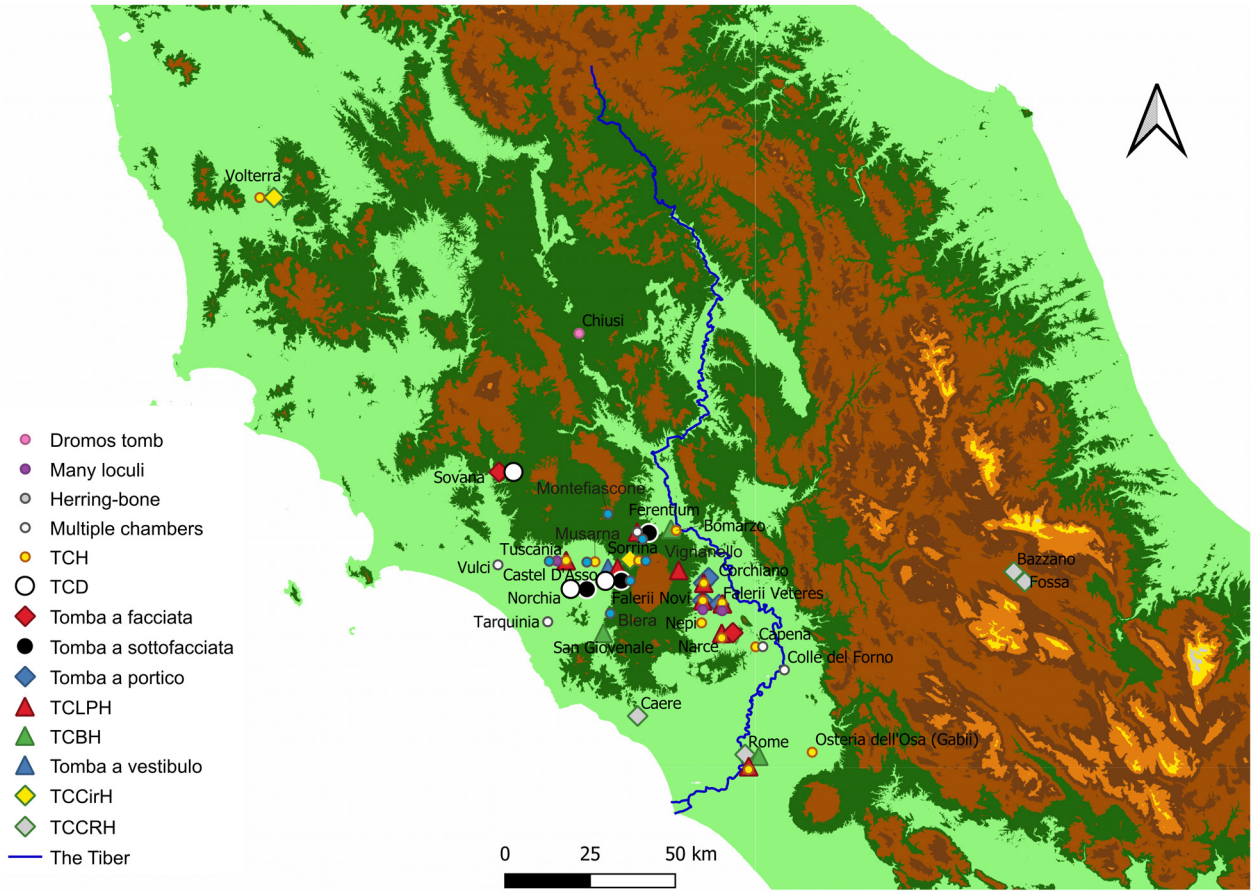

Fig. 12. Hellenistic chamber tombs (by Ulla Rajala).

At the end of the 3rd cent. BC the tombs became poorer and a *dromos* became the most important element (Daveloose 2017, 41). The 2nd cent. BC tombs included six built barrel-vaulted chambers (Daveloose 2017, 46) that were elite tombs with relatively rich grave-goods (Oleson, 1982, 32–35). During the 1st cent. BC chamber tombs only had a single chamber, although the *dromos* tombs without the chamber had already been cut at the end of the 2nd cent. BC, if not already during the first half. The *dromos* tombs had up to 40 *loculi*; a very similar type had only one niche at the end of the *dromos* (Salvadori 2014, 68 f.). Some people switched to funerary monuments, which were placed out in the open instead of in the tomb in the 1st cent. BC (Daveloose 2017, 46). The *dromos* tomb type shows the strength of local identities after Social Identification and Social Comparison and a local development in a rooted constellation creating distance between its neighbours.

Tombe a facciata (with a decorated façade; *fig. 12*), another Social Categorisation date between the second quarter of the 6th cent. BC and the 3rd respectively 2nd cent. BC (Amann/Ruggendorfer 2014, 406). The Caeretan cube tombs (Colonna 1974) were still being built and in the Archaic period the *tombe a facciata* spread to the medium and small centres in its inner territory. They spread further north in the 4th cent. BC to Norchia and Castel d'Asso (Tarquinia) and Sovana (Vulci). Amann and Ruggendorfer (2014) suggested that their construction reflected an improved economy in the large Etruscan cities.

Unlike Castel D'Asso, Norchia and Sovana, Musarna (Tarquinia) lacked *facciata* tombs (*fig. 12*). Castel D'Asso and Norcia (Colonna di Paolo/Colonna 1970, 252 f.; Colonna di Paolo 1978, 390–399) shared simple cube tombs (*dado*) and *tombe a sottofacciata*. There were 22 cube tombs and 28 *tombe a sottofacciata* at Castel D'Asso, 15 simple *facciata* (*dado*) and 13 *sottofacciata* tombs at Norchia. At Sovana *aedicula* tombs with pediments, friezes and a chamber below the façade were the local *facciata* type (Haynes 2000, 353 f.).

At Musarna the most popular tomb type were the single chambers with *sarcophagi* and/or *loculi* in the Faliscan manner (Lovergne 2014, 256). This shows that regardless of the networks, the local Social Identification defined the choice of Social Categorisation. However, Castel D'Asso, Norcia and Musarna shared a later chamber type with herring-bone *fossae*; this type, not present at Tarquinia, probably originated in inner Etruria. Amann and Ruggendorfer (2014) considered the economic downturn in the 2nd and 1st cent. BC the reason for the disappearance of local *facciata* tombs. In the mid-1st cent. BC they were replaced by *columbari* at Musarna and abandoned at Castel D'Asso and Norchia. The disappearance of the 'local' types is viewed as them being replaced by Roman tomb types related to the Social War.

The Faliscan area had its own *facciata* tomb type, *tomba a portico*, with three local types, the first being the Civita Castellana type with columns at Falerii Veteres (Colonna 1990, 131–133). The Fàlleri type with a vestibule with three arches or openings is found in the cemeteries near Falerii Novi (Colonna 1990, fig. 12). The lack of the burial chamber beneath the *portico* separates the Civita Castellana and Fàlleri types from the Corchiano type. The Corchiano type had a similar layout as the *sottofacciata* tombs at Castel D'Asso. Colonna dated the types at Corchiano and Civita Castellana to 350–240 BC and the Fàlleri type to 240–150 BC (Colonna 1990, 120, footnote 42). This shows that regardless of the common nominators brought by networks, there was a distance in tomb architecture as a result of Social Identification and Social Comparison.

The cemetery area of Cava degli Zucchi south from Falerii Novi shows Hellenistic developments. It had 186 tombs with four types: *tombe a portico*, chamber tombs, constructed tombs and *columbari*. In addition, the road cuttings were filled with *loculi* and niches with inhumations and cremations until the beginning of the 2nd cent. AD. Most chamber tombs had their earliest recorded use in the Augustan era (Caretta et al. 1995, 423–425). The main tombs of the Fàlleri type, Tombe della Regina, align with an earlier track leading from Falerii Veteres to Etruria (Caretta 2006, 94), whereas other three *portico* tombs (Caretta 2006, 94; Tomb 53, Biella/Cappellini 1996; La Farina 2017, 56) align with the Via Amerina. At the end of the 2nd cent. BC or in the 1st cent. BC a new type, a *tomba ad ara o a dado*, appeared (Caretta et al. 1995, 119; Caretta 2006, 95 f.; La Farina 2017, 56). These tombs share Hellenistic architectural elements with other areas in southern Etruria and potentially Rome (Pulcinelli 2014) and can be defined as a rooted constellation. However, chamber tombs continued the earlier local tradition. This shows that networks brought new ideas, but these could also be rejected by individuals or sections of the community.

The cemetery areas at Falerii Veteres, Tarquinia, Vulci and Capena had their own solutions to the growing populations. At Tarquinia at Scataglini (Serra Ridgway 1996; Linington/Serra Ridgway 1997) multiple chambers were cut on different levels. At Tuscana (Tarquinia) many tomb types stayed in use until the 1st cent. AD, including simple trench tombs (TF), simple chambers (TC), chambers with *loculi* (TCLP) with *fossae*, chambers with funerary benches (TCB3) and chambers with a *sarcophagus* (TCS). Later tomb types, such as the chambers with herring-bone *fossae* were shared in inner Etruria (Giuntoli 2019, 308; see also Quilici Gigli 1970, 28, fig. 11). At Vulci huge chamber tombs multiplied the plans of cruciform chamber tombs (Messerschmidt 1930, supplements 1 and 4) and at Falerii Veteres multiple rows of *loculi* were added to chamber tombs (Cozza/Pasqui 1981, 132–134). At Capena the more complex chamber tombs had five chambers (Stefani 1958). These developments show increased distance between centres and strength of local Social Identification.

Despite the popularity of chamber tombs, the dominant Hellenistic tomb type on the Adriatic side was the trench tomb (*fig. 13*), showing the continuity in Social Categorisation, Social Identification and Social Comparison. There were some trench tombs in Campania, Latium Vetus, Umbria and southern Etruria. Tarquinia had a high number of trench tombs; they were relatively small and occasionally contained cremations. Along the Tiber valley the low numbers partly result from the reuse and persistence of chamber types. However, in the Vestine area the elites were buried in constructed chambers, a new Social Categorisation there. The Vestine centres inland and the Pelignian Corfinium and Sulmona were of similar size. Thus, the Vestine network was locally

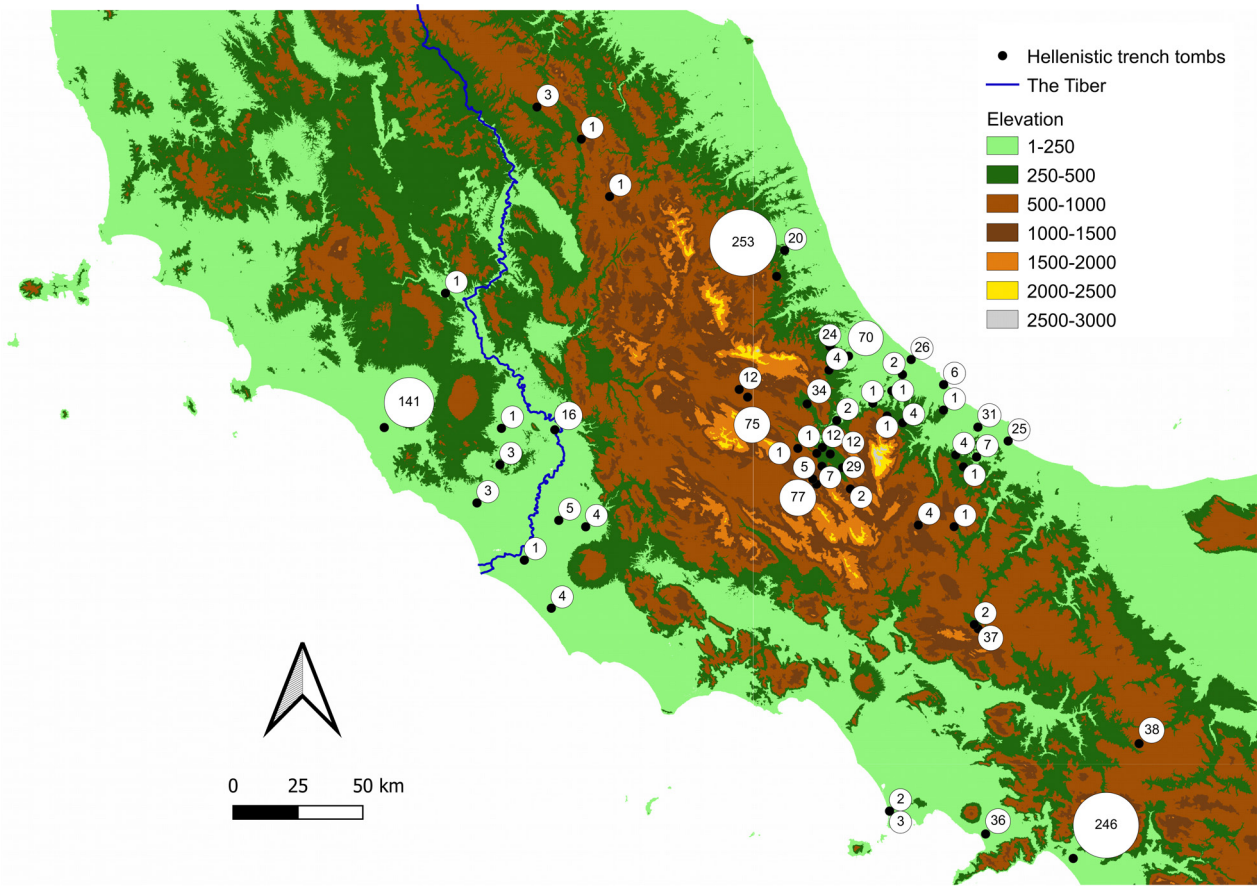

Fig. 13. Hellenistic trench tombs (by Ulla Rajala).

distributed, whereas the Paeligni may have had a decentralised one. Again, the distributions show the strength of local Social Identification and in these cases the importance of élite decisions.

Caldarini et al. (2009) showed that in Rome the number of recently excavated Republican tombs was only 64, distributed across 13 sites. Of the tombs 44% were chambers with *loculi* (TCLP), 43.5% simple trench tombs (TF), 10.5% tuff *sarcophagi* and 2% trenches lined with stones (TFFP). Approximately 80% were dated between the 4th and 3rd cent. BC and only one between the 2nd and 1st cent. BC. Almost 90% of individuals were inhumed; cremation became dominant only in the 1st cent. BC (Hope 2009, 81). Small chambers with *peperino sarcophagi* were cut on the Caelian Hill (Valeri 2010, 137). The building of the Via Appia in 312 BC resulted in the Scipiones, Metelli, Servilii and Atilii placing their family tombs there (Marcus Tullius Cicero, The Tusculan disputations 1.7.13; Valeri 2010, 138). The Esquiline cemetery area also had chamber tombs, some, such as the built Arieti tomb, with paintings (Valeri 2010, 142). With such small numbers of Republican tombs, Rome cannot be placed as a hub. In Etruria the network breaks down with so many local developments. It is clear there were relations, for example between inner Etruria and Falerii Novi that shared the Hellenised architectural elements. However, Capena, Tarquinia and Vulci showed local continuity by multiplying the existing chamber tomb types.

The trenches with *sarcophagi* continued to the Hellenistic period. At Praeneste at least 550 *sarcophagi* have been found, dating to the 4th or 3rd cent. BC (Meinecke 2016, 15), but little is known about their context (Pensabene 1983). The most famous family chamber with *sarcophagi* is that of the Scipiones at Rome, dated to the 3rd cent. BC (Meinecke 2016, 15–17). Among the few *sarcophagi* from the 2nd and 1st cent. BC the youngest is from a tomb from 180 BC and two from the Via Salaria (Meinecke 2016, 18).

The monuments such as *tumuli*, *mausolea*, towers and pyramids were developed in the

1st cent. BC (Valeri 2010, 145 f.). The placement of tombs along the Roman roads created a new network: a scale-free network with Rome as the major node and the source of different monument types copied all over Central Italy. This development post-dates the Social War and means that the result of Social Identification was a Roman identity and the network was a resource to adopt the latest fashions through Social Comparison. Like *terra sigillata* pottery, these tombs were produced according to categorical constellation. However, the development is much later than the building of Roman roads and shows the persistence of local Social Identifications.

7. Conclusions

The analysis, structured using the empirical and inductive frameworks provided by the Actor-Network Theory and the Social Identity Theory, has allowed looking for Social Categorisation, Social Identities and Social Comparisons in funerary architecture through classification, local identification and regional comparison. First, one had to define the basic Social Categorisations, that is the various basic tomb types, such as pit tombs, trench tombs, chamber tombs and more specifically later *tombe a facciata* and Roman monuments. Then one had to observe the presence of different tombs and subtypes as representations of Social Identification in different centres. Social Comparison or regional and supraregional comparison of distributions followed in order to understand the local and regional networks and to see how the closeness and distance uncovered local Social Identifications. The ethnoarchaeological studies suggested that the choice of the tomb depended on the ideas of the proper burial and economic status. Thus, the small numbers of tombs typical to other centres may result from the origins, social persona or social status of the deceased. The Villanovan Culture in the Early Iron Age brought all coastal regions on the Tyrrhenian side together, whereas the Iron Age mounds and later trenches defined the Adriatic areas. Locally unique funerary rites and tomb types, such as the crouched deceased in the Picene area, cremations at Veii in the Archaic period and the *dromos* tombs at Chiusi, show strong local Social Identification and reveal real identity markers that made the distance between them and their neighbours tangible. Caere and Tarquinia showed closeness with cruciform and other multichamber designs shared in the Orientalising and Archaic periods, and this relationship is part of the positive resource the networks brought to the funerary realm.

The existence of local tomb types, that is local Social Categorisation, and local results of Social Identification, at the centres along the Tyrrhenian coast is clear. However, there were regions where the tomb type was shared between the closest neighbours regardless of ethnicity and these areas show mental distances were close. This is true in the lower Tiber valley, where chambers with *loculi* (TCLP) and/or chambers with funerary benches (TCB) crossed the river from southeastern Etruria to Latium Vetus, Sabinum and Umbria Tiberina. In the Villanovan network the closeness already stood out. In this area the funerary networks were a true interactive resource. In Campania the dominance of trench tombs showed closeness with the Samnium and Adriatic coast. In Umbria, in the Apennines and along the Adriatic coast trenches dominated after the circular Iron Age tombs and showed the closeness and the importance of the networks there.

In this article it has been tried to follow the changes in the funerary networks from the Early Iron Age down to the Late Republican period and at the same time find clues to how social networks were a resource in the past. The regional Villanovan funerary group identity is clear and this Central Italy-wide network provided cohesion. The funerary networks showed a gradual change from localised distributed networks to decentralised patterns with the rise of the city states. The increased Roman dominance coincided with the spread of Hellenised tomb designs that were customised at different centres still within decentralised networks in fluid constellations. The herring-bone chamber tombs in inner Etruria can be considered a rooted constellation. The relatively small numbers of recorded and published tombs in Rome mean that it did not stand as a hub before the 1st cent. BC. With the Roman roads came belatedly the Roman funerary architecture that created a centralised scale-free network, where

Rome was the centre in a categorical constellation. Before the Roman funerary architecture, the connections provided the local communities with Hellenised designs.

The core of this article has been the networking of tomb types. However, behind them were the real past networks with contacts and relations between different centres. These contacts allowed the information flow of the contemporary tomb forms to spread between centres and regions. These contacts created the real network that was the resource that allowed communities to decide if they approved or rejected the tomb types available locally, and whether they looked for models from somewhere else or developed their own types. If the Tyrrhenian tombs were created by tomb cutters, they may have had model books from which to choose different designs, especially during the Hellenistic period. However, any choice had to be considered appropriate locally at the individual level in the context of local norms and allowances. Nevertheless, the contact networks allowed choice and examples and thus provided resources to the community. The past process followed the Social Identity Theory model together with the research process. First there was Social Categorisation then Social Identification and then Social Comparison, when the closeness and distance were assessed. The resources provided by the networks and the local choices are revealed by Social Comparison.

Ulla Rajala
Stockholm University
rajalaullam@gmail.com

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Networks in Sacred Landscapes

Francesca Mazzilli

A Decade of Network Studies on Religion in the Pre-Roman and Roman Periods

Keywords: religion, network, Roman period, social network, transport, landscape, time

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Summary

This paper offers an overview of the study of religion from the Pre-Roman to the Roman period (roughly from the 4th cent. BC to the 3rd cent. AD) through network thinking and analysis by re-assessing 13 projects undertaken in the last ten years.[1] It aims to provide a better understanding of the entanglement of religion with various aspects of societies. It highlights the central role of networks in shaping religion as immaterial resources intertwined with and based on interactions between social agents, which changed over time and in relation to the landscape.

1. Introduction

Network analyses have been a topic in archaeology at least since 1968 but have taken off since the early 2000s (Collar et al. 2015). According to the study undertaken by Anna Collar, Fiona Coward, Tom Brughmans and Barbara Mills (2015), publications about networks in archaeology increased dramatically in 2013 and 2014. Since their study, a large number of articles have been published (Brughmans/Peeples 2017; Zotero[2]). The reason for this remarkable increase in the last ten years can be found in the ground-breaking work by Carl Knappett (2011) in the field of archaeology, as Barbara Mills pointed out in a short historiography of social network analysis in archaeology: 'Carl Knappett's (2011) book 'An Archaeology of Interaction', was a turning point for many archaeologists in the linking of social networks, practice theory, and materiality because he was able to show how all of these concepts intersect' (Mills 2017, 381).

While some scholars use the concept of networks without any analytical application in order to discuss the significance of interactions in shaping past societies, others undertake quantitative and systematic approaches in order to assess analytically how a set of connections operated (Brughmans/Peeples 2017, 2; Knappett 2011, 9; Fulminante 2014; Knox et al. 2006; Mills 2017). Common terms for using the network as a concept are network thinking, metaphorical application, ontological approach, network as a metaphor; whereas common terms for the application of networks are network analysis, formal application, quantitative

1 This article is based on the state of publications and on information available at the time of submission. Subsequent contributions worth to mention are referred to in the footnotes but were not analysed in the text.

2 Zotero. Archaeological Networks, last updated 2021, <https://www.zotero.org/groups/824994/archaeologicalnetworks/items/IE2LZUN2/library> (last access: 08.03.2021).

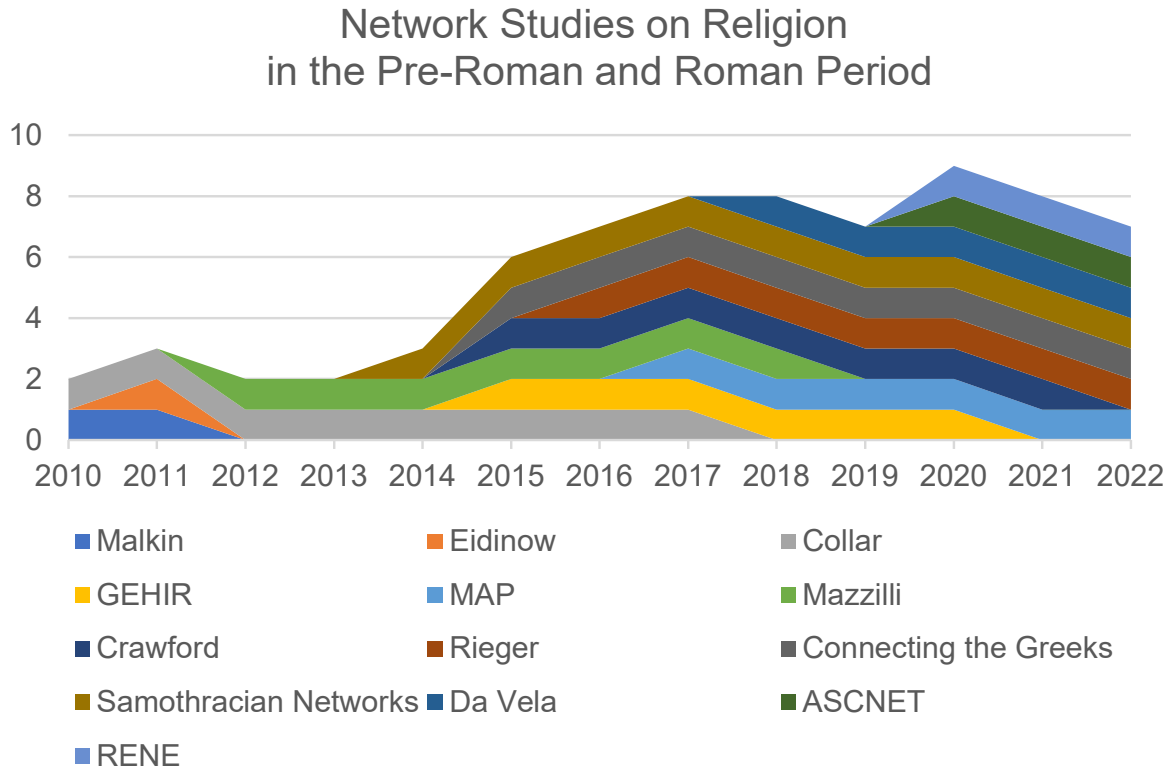

Fig. 1. The timeline of studies of religious networks includes preparation for the project from the pre-publication stage according to the project's website and during the PhD when it is known. Years 2021 and 2022 cover only studies that have started in 2020 or earlier (graph by F. Mazzilli).

or analytical tool of investigation, methodological tool, or methodological network (Brughmans/Peeples 2017, 2; Knappett 2011, 9; Fulminante 2014; Knox et al. 2006; Mills 2017). The use of network thinking and network analysis in the field of religion from the Pre-Roman to the Roman periods has shown a gradual development during the last ten years, mainly concentrated in the last five years (*fig. 1* and *3*).[3] This chapter reviews these studies. By doing so, it reveals how religion is often investigated in relation to other factors (social, geographical and temporal factors). This paper aims to see the mechanics of how the relations between these factors and the links between these factors and religion can act as resources to shape and determine religious ideas, cults and cult sites.

2. Religious Networks: A Historiography

The first half of the last decade has been characterised by a couple of short-term studies on religion using network thinking (Irad Malkin and Esther Eidinow) and the pioneering PhD project on the spread of cults across the Roman Empire by Anna Collar using network analysis combined with its ontological approach.[4]

Irad Malkin (2011) argued that movements of Greeks outside the mainland triggered the spread of 'Greekness' and strengthened Greek identity

3 Despite the variety of cults, cult practices and social-political agents moving and interacting across the Roman Empire, network analysis or thinking has been more rarely applied to the study of religion in the Pre-Roman and Roman periods than in the study of religion in later periods (for example, see Stark 1996; Ruffini 2008; Schor 2011; Preiser-Kapeller 2015; Preiser-Kapeller/Mitsiou 2019; DISSINET: Dissident Networks Project, <https://dissinet.cz/> [last access: 13.08.2021]). This makes a compelling reason to pay closer attention to the research on this narrow chronological focus.

4 Although it can be misleading or limited, in this paper the term religious network is used to broadly define the subject of studies on religion using network thinking or analysis, as it is also used in the title of Anna Collar's book (2013).

in colonies which were, nevertheless, both intermeshed with one another. He also used network thinking when discussing cults. Esther Eidinow (2011) only in one instance used the idea of a network to discuss Greek *polis* religion and binding spells. Anna Collar (2013) was the first scholar to undertake a formal application of network study to religion in the Roman Empire while still using network thinking in her book, which she derived from her PhD thesis submitted in 2008. She examined the spread of the cult of Jupiter Dolichenus, Theos Hypsistos, and the spread of new ideas about Jewish law by considering the pre-existing network of the Jewish Diaspora through proximal point analysis (PPA). PPA is modelled on the vicinity of cult sites by connecting a site to the first three closest sites. PPA was previously used to examine maritime spatial network (Broodbank 1993; Davis 1982; Hunt 1988; Terrell 1977). Collar has moved away from network analysis and theory in her research by looking at Zeus Kasios (Collar 2017) and examining Syrian gods (Collar in prep.).[5] Nevertheless, the idea of connectivity still emerges in her discussion on the cult of Zeus Kasios (Collar 2017).

The first collaborative keystone of network analysis in religion has been GEHIR ('A Generative Historiography of the Ancient Mediterranean: Modelling and Simulating the Diffusion of Religious Ideas and Forms of Behaviour'). It started in 2015 and it turned into the project 'Religions on the Ancient Mediterranean Networks: The Role of Primary and Secondary Centers in the Spread of Religious Innovations (2017–2021)'.[6] GEHIR undertook a quantitative spatial analysis of the spread of the Isiac cults, Mithraism, Judaism and early Christianity. Some of the project's results about the spread of Christianity in the Roman Empire (Fousek et al. 2018) and Isiac cults have been published (Glomb et al. 2018; 2020; Glomb 2022).[7]

The reasons for the slow development of network analysis in the field of religion in the Pre-Roman and Roman periods have been pointed out by Greg Woolf (2016). While he stressed that contact is important in the spread of religious ideas, there are other factors to consider. Understanding the spread of a cult is an arduous task due to the fragmentary nature of data about religion in the Roman world. However, any information from the past is incomplete to us. Moreover, researchers need to consider the nature of the gods in question and its implications when looking at the spread of cults through network analysis or thinking. Scholars, nevertheless, seem to manage to take these elements into account while undertaking network analysis. For instance, in GEHIR when discussing the spread of the cult of Isis and Serapis, researchers (Glomb et al. 2018) looked at the link between these gods and the royal Ptolemaic dynasty and they considered the importance of the nature of Isis as a patron of sailors, especially in the Aegean Islands, a territory where maritime trade was necessary to get access to the grain from one of the main producers, Ptolemaic Egypt.

During the last five years, there has been an increase of network studies in the field of religion and a preference for using network analysis or combining it with network thinking in search of a more analytical and systematic approach to the study of religion. This can be seen in the 'Connected Past' conference of 2017 and 2018, one of the major conferences on network science and theory in archaeology and history, where, nevertheless, only a handful of papers covered or might have covered religion based on the conference programme.[8]

This figure decreases even further when considering presentations about religion in Pre-Roman and Roman times (*fig. 2*). In the conference of 2017 the (then) PhD student Katherine Crawford looked at processional movements in the city of Ostia in the Roman period through UNA (Urban Network Analysis) and Christina Williamson

5 Anna Collar's Webpage, Research, latest update 2021, <https://annacollar.wordpress.com/research/> (last access: 08.03.2021).

6 GEHIR Project Website, A Generative Historiography of the Ancient Mediterranean: Modelling and Simulating the Diffusion of Religious Ideas and Forms of Behaviour, last updated 2020, <https://gehir.phil.muni.cz/> (last access: 08.03.2021).

7 Tomáš Glomb's book (2022) on Isiac cults has been recently published, but could not be included in the analysis.

8 The Connected Past Conference 2017 Programme, last updated 2017, <https://connectedpast.net/other-events/bournemouth-2017/conference-programme/> (last access: 03.01.2021) and the 2018 Programme, last updated 2018, <https://connectedpast.net/other-events/oxford-2018/programme/> (last access: 03.01.2021).

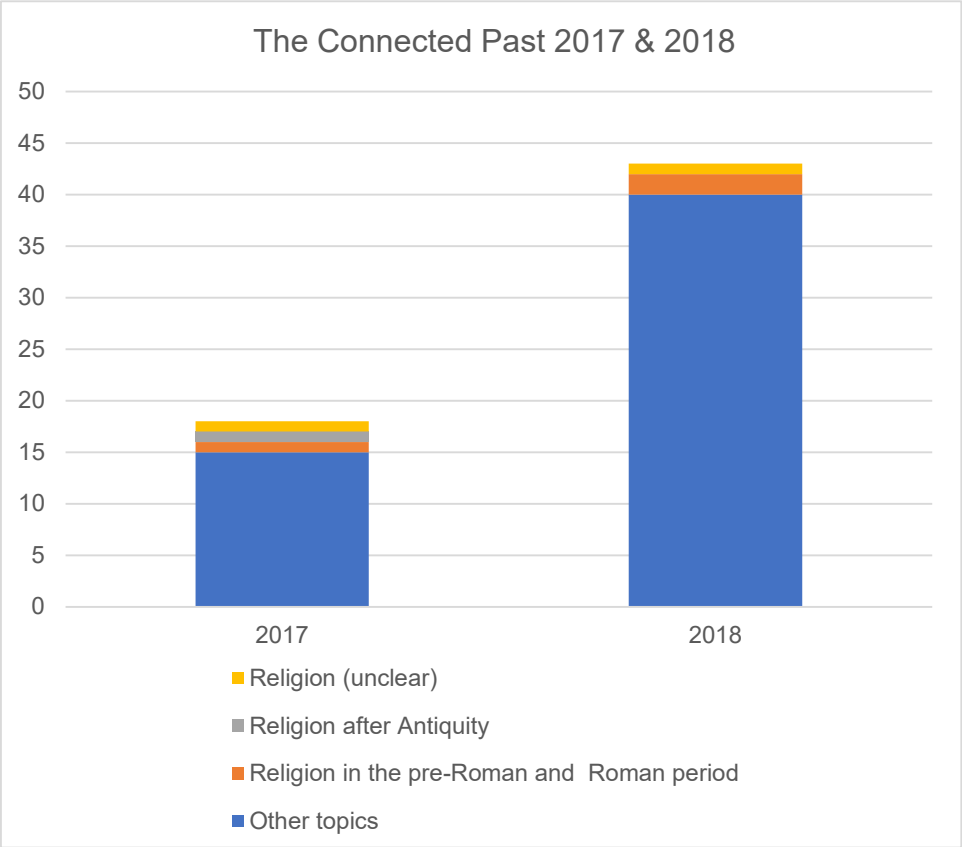

Fig. 2. Papers from the 'Connected Past' conferences 2017 and 2018 according to topics that did not talk about religion, those in which religion was the main subject and those in which religion could have been discussed based on the paper titles and abstracts (graph by F. Mazzilli).

introduced their project 'Connecting the Greeks: Multi-Scalar Festival Networks in the Greek and Roman World' with Onno van Nijf as principal investigator.[9] The latter project has produced a database of the history of athletic and other agonistic festivals from 300 BC to 300 AD, to understand networks of festivals, including religious festivals and the link between festivals and cults through a formal application of networks (van Nijf/Williamson 2016; van Nijf et al. 2019).[10] A network approach facilitates understanding of the multiple layers of a place's meaning to assess its long-term biography in relationships with people at the local, regional, and transnational level, and it reveals how festivals shaped local identity associated with these sanctuaries (van Nijf/Williamson 2016). In the 'Connected Past' conference in 2018, the PhD student Kevin Stoba looked at the application of network analysis to the tauroctony scene of Mithras in the western Roman Empire to provide a clear picture of the diversity of this iconography and relations associated with it, whereas Zehavi Husser analysed the geographical distribution of Latin and Greek epithets of Jupiter and their social

9 The Connected Past Conference 2017 Programme, last updated 2017, <https://connectedpast.net/other-events/bournemouth-2017/conference-programme/> (last access: 03.01.2021).

10 'Deep-Mapping Sanctuaries' is a sub-project of the project 'Connecting the Greeks' undertaken by Christina Williamson which specifically investigates sanctuaries as festival hubs through place-making, spatial narratives, and deep mapping, but it does not seem to apply network thinking or analysis, see Deep-Mapping Sanctuaries Website, last updated 2022, <https://deepmappingsanctuaries.wordpress.com/> (last access: 08.03.2021). Connecting the Greeks Project Webpage, last updated 2022, <https://connectingthegreeks.com/> (last access: 22.11.2022).

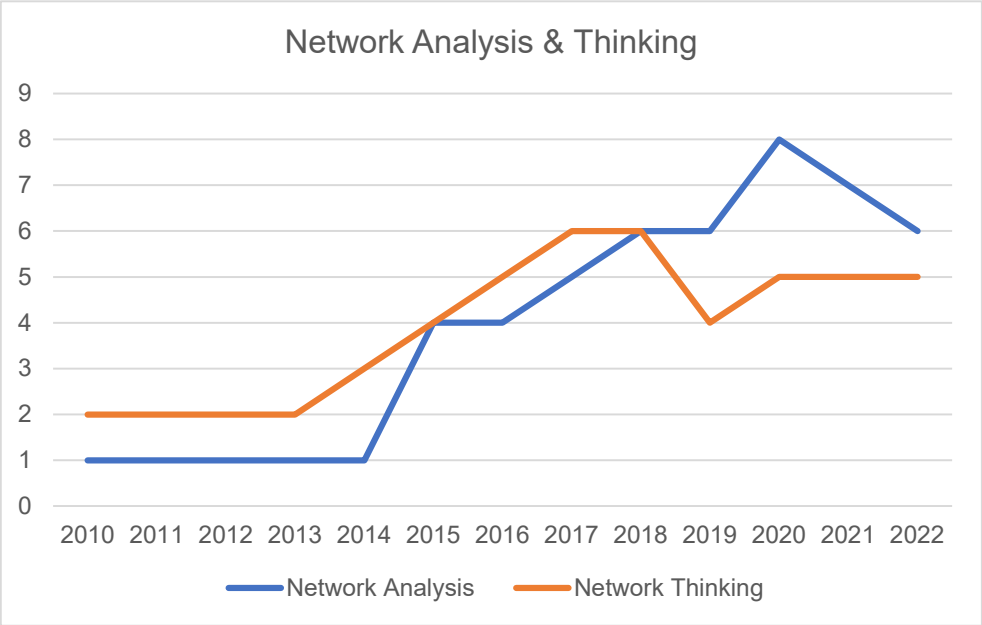

Fig. 3. Timeline of network analysis and network thinking over time (graph by F. Mazzilli).

network analysis as a proxy for studying the transmission of the god in Roman Imperial Italy.[11] The first two conference presentations in 2017 have produced initial publications (van Nijf/Williamson 2016; van Nijf et al. 2019; Crawford 2019; 2020).[12]

Further regional religious studies are the networking analysis of the development of cult sites in relation to the local elite in the Hellenistic Northern Etruria by Raffaella Da Vela (2019)[13] and the study of rural cult centres in the Hauran (southern Syria) through network thinking, derived from a PhD thesis by Francesca Mazzilli. The latter project highlighted how connectivity between local elite and neighbouring and farther afield cultures, as well as changes of political powers and elite, shaped religious traditions in cult sites (Mazzilli 2018). A further regional study in the Hauran was the work by Anna-Katharina Rieger (2020). The latter was on a smaller scale than Mazzilli's research (which looked at the whole Jebel el-Arab, as well as Leja to the north of it and Nuqrah, to its southwest), as it covered the western slopes of Jebel el-Arab.[14] Rieger's research also differs from Mazzilli's work as the former focuses on the water network (its storage and protection) and it argues how it was the main driven resource which connected (sacred) places and people.

The use of a network approach to religion, especially its formal application, occasionally combined with network thinking, has drastically increased during the last few years, with projects that are still ongoing (*fig. 3*). In a recent article Sandra Blakely (2020) first used network thinking to discuss how social networks were linked with the cult of the Great Gods of Samothrace and its rites used to protect travellers in maritime mobility, which seems to function as an introduction to her current project 'Samothracian Networks'

11 The Connected Past Conference 2018 Programme, last updated 2018, <https://connectedpast.net/other-events/oxford-2018/programme/> (last access: 03.01.2021).

12 A paper by Kevin Stoba (2022) and a paper by Katherine A. Crawford (2022) covering this topic have been recently published, but could not be included in the analysis.

13 Raffaella Da Vela for the first time presented network analysis of relational ties, including cult sites, in Etruria in the 'Unlocking Sacred Landscape II Conference' in 2018, <https://www.ucy.ac.cy/unsala/documents/Images/workshops/rethymno18/Rethymnon-Conference.pdf> (last access: 23.03.2021), which resulted in its publication in the proceedings of the conference in 2018. However, the idea of the formation of networks through multilayered networks including the religious sphere was first explained theoretically in her paper presented in the 'Connected Past Conference' in 2014, <https://connectedpast.net/other-events/london-2014/programme/> (last access: 03.01.2021).

14 This research was developed in 2016 and it was updated in 2019. The author is planning to expand this project geographically (Rieger 2020).

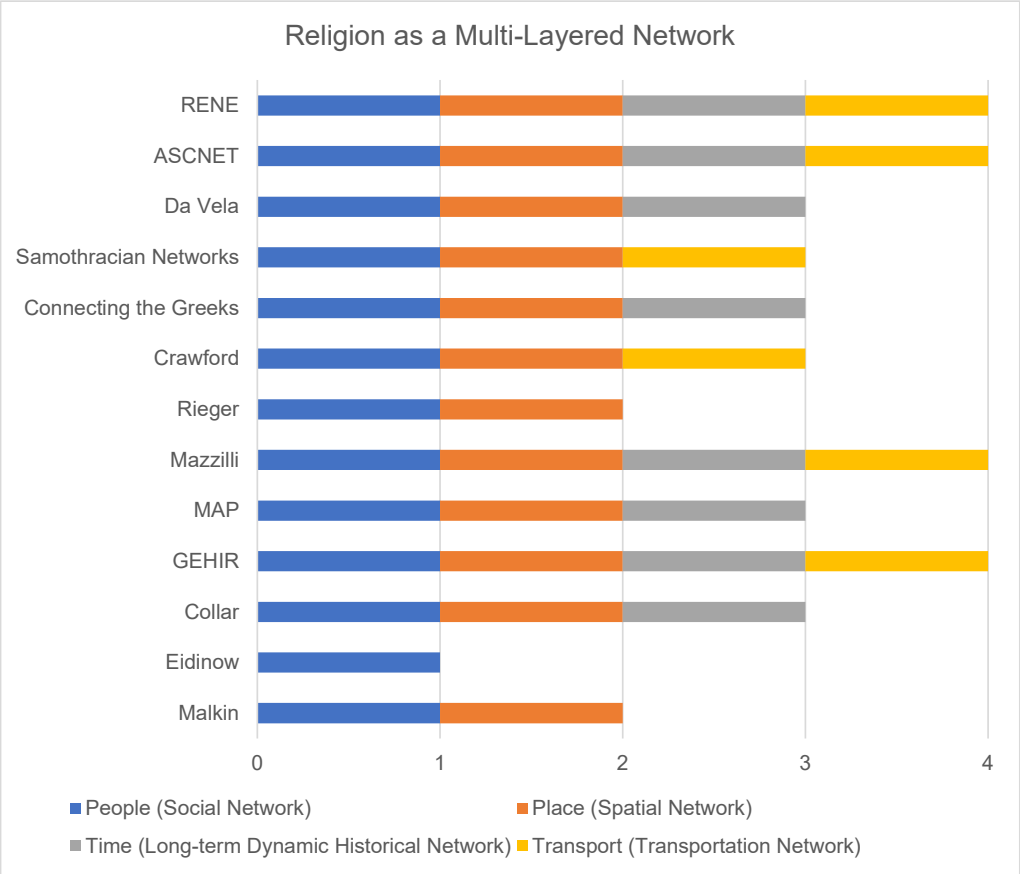

Fig. 4. Identification of study of social, spatial, and transportation networks and the temporal factor in religious network projects (graph by F. Mazzilli).

(2014–present), which also uses social network analysis. A forthcoming book will provide further details on the project (Blakely forthcoming).[15] European funding bodies financed three projects with a specific focus on religious networks in the Pre-Roman and Roman periods. European Research Council MAP ('Mapping Ancient Polytheisms, Cult Epithets as an Interface between Religious Systems and Human Agency', 2017–2023) aims to collect and study all divine onomastic sequences in inscriptions, papyri, and a selection of literary sources across the Mediterranean over a long time of period (ca. 1000 BC–400 AD) through statistic, cartographic, and mapping tools, including network analysis. This project, directed by Corinnne Bonnet, uses both network theory and analysis (Bonnet et al. 2018; Lebreton 2019; Lebreton/Bonnet 2019).[16] The Marie-Sklodowska-Curie-IF-project ASCNET ('Favorable Conditions of the Spread of the Cult of Asclepius across the Transportation Network of the Roman Mediterranean: A Quantitative Evaluation' by Tomáš Glomb, 2020–2022) is a macro-level study of the spread of the cult of Asclepius across the Roman Empire through a network and spatial analysis whereas the Marie-Skłodowska-Curie-project RENE ('Regional Religious Networks in the Roman Empire' by Francesca Mazzilli, 2020–2022) is a regional study of religious traditions associated with cult sites at the edge of the Roman Empire (the

15 Samothracian Networks Project, Introduction, last updated 2016, <https://scholarblogs.emory.edu/samothraciannetworks/> (last access: 22.11.2022); Samothracian Networks Project, The Social Network, last updated 2016, <https://scholarblogs.emory.edu/samothraciannetworks/the-samothracian-social-network/> (last access: 22.11.2022).

16 The ERC Advanced Grant MAP – Mapping Ancient Polytheisms. Cult Epithets as an Interface between Religious Systems and Human Agency. University of Toulouse – Jean Jaurès, 2017–2023, <https://map-polytheisms.huma-num.fr/> (last access: 24.11.2022).

Hauran, southern Syria, and Lusitania, roughly Portugal). RENE undertakes network analysis and spatial analysis of rural and urban cult sites in the two regional study areas.[17]

The rise of religious network studies might be due to their strength that they seem to share: their multi-layered and interconnected approach to religion because of the interdependency of religion with the following key factors: people (or human/divine agents), place (or landscape from natural topography to settlements and transports) and time, as this paper will elucidate below (*fig. 4*).

These are key elements in understanding religion as proposed by ongoing research projects, such as 'Unlocking Sacred Landscapes', which advocates for 'the diachronic study of the temporality, spatiality, and materiality of Mediterranean sacred landscapes'.[18] This can be seen in its two recently edited volumes in which landscape plays a major role as a real actor in religion, including the development of sanctuaries (Papantoniou et al. 2019; 2020). Specific examples are the cult place of Laghetto del Monsignore in Italy (van Loon/de Haas 2019) and the Cypriot sanctuary of Agia (Papantoniou/Bourogiannis 2019). Religion is dynamic over time because it is also intertwined with social groups, who build and frequent the landscape, and are entangled in objects and evidence of cults and ritual practices, which have their own biography and involve interactions between human agents but also between men and gods (van Loon/de Haas 2019; Papantoniou/Bourogiannis 2019; Papantoniou et al. 2019; 2020; Bonnet 2020).

Almost a constant feature in both metaphorical and formal applications of networks in religion in the Pre-Roman and Roman periods is the study of the spread of a cult (name of a god, his/her epithets, a cult site, or a ritual practice), in relation to the presence and movement of certain groups of people or in relation to a place, or more broadly landscape (*fig. 4*).

2.1. People (Social Networks)

Religion cannot be fully understood without considering the role of human agency in shaping it. Communication between the human (worshippers) and the divine (gods or ancestors) was what constituted religion in antiquity, as emphasised by scholars focusing on the importance of living and experiencing ancient religion (Rüpke 2011; 2015; 2018a; 2018b; Gasparini et al. 2020). The cult of a god depended on the protection that the worshipper needed. Social agents (human actors) chose the gods to worship and named the gods (active human agency). At the same time, the power of the human actors depended on the god's will, undertaking the 'right' rituals, and the nature of the gods themselves. The more power the social agent gained, the more powerful the god became and *vice versa*. Thus, the god was a system of notions and a power within the society where social actors and gods were interdependent (Lebreton 2019). For that reason, in the MAP database, there is a specific table (the Agent Table) to investigate the role of human actor, social agents and human agency in relation to and connected to a divine onomastic sequence. In particular, the project is interested in the agency of the agents (addresser or beneficiary of the inscription, in the case of a dedication, for instance), their name or designation (e.g. wife, archon, high priest), nature (i.e. human), gender, status (e.g. citizen, a family member), activity (e.g. cult, war, politics) and location (Bonnet et al. 2018; Lebreton 2019; Lebreton/Bonnet 2019, 286).[19] The MAP team has so far offered a sample of egocentric networks of the onomastic sequence or formula which constituted the theological identity of the gods (Lebreton 2019). It consists of names that are conventionally used for gods or theonyms, epithets, and other elements associated with gods, such as an attribute and epiclesis. These onomastic attributes are equally important in identifying the complexity of the theological identity of the gods (Bonnet et al. 2018; Belayche 2017). The egocentric network facilitates the comprehension of their structural and

17 Bergen Workshop 2022, Religious Networks in Antiquity, last updated 2022, <https://connectedpast.net/bergen-workshop-2022/> (last access: 22.11.2022).

18 UnSaLa, Unlocking Sacred Landscape, last updated 2021, <https://www.ucy.ac.cy/unsala/general-information> (last access: 08.03.2021).

19 ERC Mapping Ancient Polytheisms 741182 (DB MAP), Toulouse 2017–2023, <https://base-map-polytheisms.humanum.fr/> (last access: 24.11.2022).

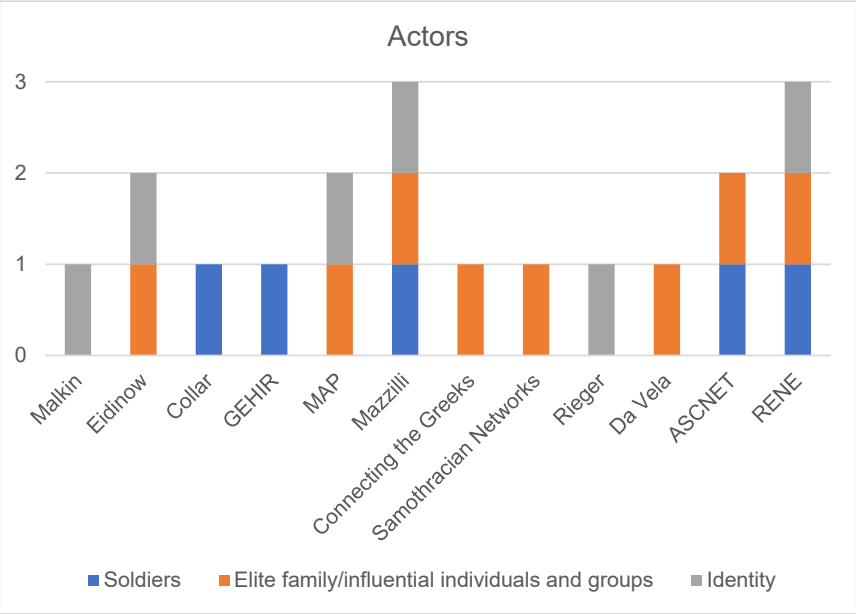

Fig. 5. Identification of main actors associated with religious network projects (graph by F. Mazzilli 2021).

dynamic complexity by creating links and measuring the weight of connections between different divine onomastic attributes, for instance, links between gods that shared the same attribute or epithet, but they had a different name and/or nature. This formal application of networks helps to unravel the complexity of the theological identity of gods before discussing it in relation to human networks (Lebreton 2019).

Apart from MAP, other works on religious networks have also considered direct communication between gods and worshippers. Maritime networks and travellers' mobility were possible and safe because individuals were protected by Samothracian gods due to the direct interaction between travellers and gods through ritual practices facilitated by civic institutions and more broadly social organisations (Blakely 2020).[20] Eidinow (2011) instead considered the tie between the humans and supernatural entities in spells, meaning the importance of choosing the 'right' god for the 'right' spell, which also depended on the personal choice of the commissioner and where he came from. These reasons explain regional variations of spells.

Soldiers were recurrent actors in the spread of cults, due to their role in the society and, thus, especially because of their mobility. They were in the Roman army for the cult of Dolichenus (Collar 2013, 79–143), the cult of Asclepius (Glomb 2021), in cult sites in the Hauran (Mazzilli 2018, 88–94; Mazzilli 2022), or Ptolemaic military forces for Egyptian cults (Glomb et al. 2018; 2020). Other equally important key actors in shaping religion were the elite or influential individuals or groups within the local communities. They have been identified with the same family names (Mazzilli 2018, 56–60; Da Vela 2019), as civic and village magistrates and communities (Mazzilli 2018, 139 f.; 2022), and/or *polis* groups and individuals (Eidinow 2011) (*fig. 5*). In these studies, sites, which can be cult sites, settlements, cities, and/or places of recovery of inscriptions, were the nodes of these networks and the ties of these religious and social networks were the cult itself, movement of actors or having a religious function within settlements (Collar 2013, 79–143; Glomb et al. 2018; 2020; Da Vela 2019; Glomb 2021). The spread of Hebrew and Jewish symbols and names across the pre-existing diaspora was related to the ethnic network of Jews, whereas the cult of Theos Hypsistos was not associated with a specific group of people over time, as his worshippers ranged in terms of status, occupation, and gender from Roman colonists to slaves. In these studies, the nodes of the networks were sites where written evidence of cults was recovered (Collar 2013, 146–286).

20 Samothracian Networks Project, Introduction, last updated 2016, <https://scholarblogs.emory.edu/samothracian-networks/> (last access: 22.11.2022).

'Connecting the Greeks' looks at the movement of *theoroi* (civic delegates who announced festivals, took ritual acts associated with festivals, and accompanied their athletes), athletes, performers, and other participants in cities where festivals and contests took place.[21] Ian Rutherford (2007) previously considered network thinking for the study of festivals, but he later raised his doubts about the subject being based on one-sided relations, like lists of invitations of *theoroi* (Rutherford 2013). These lists were incomplete, they do not seem to confirm that the delegates and their cities participated in the festivals and these lists do not inform us whether *theoroi* and athletes were also involved in games in other cities. In 'Connecting the Greeks' the network nodes were the cities where festivals took place and the cities where the *theoroi* and athletes came from. What links these nodes were the movements of these individuals because of the cult and in honour of the deity from the sanctuary that the festival was associated with (van Nijf/Williamson 2016; van Nijf et al. 2019).

'Samothracian Networks' not only discussed how the movement of individuals (Samothracian initiates, *theoroi*, and *proxenoi*, meaning city representatives) created safe maritime mobility in the Thracian Sea but also how this circulation was guaranteed by Samothracian gods by undertaking ritual practices. Safe maritime mobility was possible thanks to an additional layer of social interactions and collaboration between civic institutions (with maritime benefits of sailing in and out of the island's port, freedom from taxes and seizure) and social organisations. This additional layer of a social network was based on various immaterial resources: trust and long-distance partners, asymmetrical exchange, personal honour, elite participation, and emotional engagement (*philia*, friendship) (Blakely 2020). The nodes of the network were the cities where these individuals came from and went to.[22] The spread of the cult of Zeus Kasios on the basis of his inscriptions on anchors was seen in relation to sailors; the findspots of these dedications offer a glimpse of a mental map of divine protection for seafarers (Collar 2017).

Malkin (2011), Eidinow (2011), Mazzilli (2018), and 'Connecting the Greeks' have not only discussed the impact of specific groups and individuals in shaping religion, but also considered the idea of communal interests in religious traditions (including religious festivals) which formed a sense of belonging of a group of people,[23] what Malkin (2011, especially 53–64, 141, 218–221) called 'collective identity'. In these cases, they can be called 'religious collective identities', as these collective identities shared religious ideas. Furthermore, these studies investigated a sense of belonging among people under the same reign or empire (identities associated with political powers). The 'identities' and 'socio-political powers' which have been most sought and identified were various. They were Greek identity (Malkin 2011; Eidinow 2011),[24] external political powers, such as Ptolemaic or Roman ones, which were associated with their armies (Collar 2013; Glomb et al. 2018; 2020; Mazzilli 2018, 83–141; 2022; Glomb 2021), or external political powers correlated with historical events, such as Jewish revolts and the destruction of the temple of Jerusalem, which had a major impact on the spread of new ideas about Jewish law through the diaspora and the cult of Theos Hypsistos (Collar 2013, 288 f.). There were also other political groups, like the Nabataeans, or subgroups who were not confined to political borders (Mazzilli 2018, 27–44, 56–60). Some of these studies also look at religious identities shaped by the interactions between local communities and civic delegates and external political powers (e.g. the Romans, the Greek colonists) (Malkin 2011; van Nijf/Williamson 2016; van Nijf et al. 2019; Mazzilli 2018; 2022; Da Vela 2019). This interaction resulted in a 'middle ground', to use Malkin's terms (2011, especially 45–48, 119–142), or syncretism (Bendlin 1997, 53; Linn 2003, 274 f.), or assimilation (Drijvers 1980, 17 f.; Dirven 1999, xxi) between religious

21 Connecting the Greeks Project Webpage, last updated 2022, <https://connectingthegreeks.com/> (last access: 22.11.2022).

22 Samothracian Networks Project, The Social Network, last updated 2016, <https://scholarblogs.emory.edu/samothraciannetworks/the-samothracian-social-network/> (last access: 22.11.2022).

23 Connecting the Greeks Project Webpage, last updated 2022, <https://connectingthegreeks.com/> (last access: 22.11.2022).

24 Connecting the Greeks Project Webpage, last updated 2022, <https://connectingthegreeks.com/> (last access: 22.11.2022).

traditions from external powers and those from local actors. The cult of Heracles in Sicily, for instance, discussed by Malkin, could have created a venerable long-term mythical depth of ancestry for the people of the colony connecting their past with the mainland (being considered as a god-hero). At the same time, Heracles could have been associated with non-Greek traditions (playing as a mediator figure). He was also associated and syncretised with the Phoenician god Melqart. His cult was the result of a blend between Greeks and other cultures, both local and further afield. The connection between the Greeks and the Phoenicians can be explained because the Greeks shared their colonial experience and political and cultural similarities with the Phoenicians, despite their rivalries (Malkin 2011, 119–142).

Amongst religious network studies, Crawford (2019; 2020) did not differentiate how different groups of people might have experienced procession, as her focus was the urbanscape and how the different parts of the city, used for different purposes (e.g. residential, commercial, and productive areas), might have determined processions.[25] However, the main factor that shapes religious processions was the movement of people and their interaction with different areas, buildings of the city and streets, and the experience of devotees in this diversified environment. The circulation of people (an immaterial resource) depended on the urbanscape of Ostia, which was determined by how people used the city. Even if the social network was not fully discussed in her spatial analysis, it was indirectly the main resource that determined religious processions and triggered the development of the urbanspace which defined religious performances in the city.

According to Rieger (2020) people played a minor role in a harmonised sacred landscape on the western slopes of Jebel el-Arab as the groups of attendants were not homogeneous. Even the script used in inscriptions varied from Aramaic and Greek to 'Safaitic' in this small pocket of the Hauran, where sites were located next to each other. It was more likely that the knowledge of artisans and their transmission of forms and features created connections and a sense of collective experience.

2.2. Landscape (Spatial Networks)[26]

Most of the projects on religious networks have considered the spread of a cult or a cult site in relation to their landscape. An exception was Eidinow's work (2011) because her focus was on interactions between individuals and groups coming from different places within the city and outside, in a specific location, a Greek polis.

These projects have not merely visualised the spread of cults or temples in the landscape *per se* but have considered the study of landscape on different levels. Looking at landscape means examining how the place itself, the people inhabiting the place and their ancestors determined the religious traditions (Malkin 2011; Mazzilli 2018; 2022; Bonnet et al. 2022) based on the idea of *longue durée* (Braudel 1972, 20; Appadurai 1996, 17; Sartre 2001, 14; Sartre 2005, 2 f.; Kaizer 2008, 15). At the same time, human agents with their own religious identity, like the army, moved into the landscape, brought, introduced, and integrated new gods and religious traditions (Collar 2013; Glomb et al. 2018; 2020; Mazzilli 2018, 88–114; 2022; Glomb 2021), while also worshipping the gods of the place or those that were venerated by regional communities (Mazzilli 2018; 2022).

Furthermore, the projects on religious networks have looked at how the natural landscape

25 A recent paper by Katherine Crawford (2022) covering a similar topic has been published, but could not be included in the analysis.

26 Landscape analysis seems to be a flourishing and efficient method in examining cult places in pre-Roman times including in studies that do not involve the use of network theory or analysis. Examples are the research works on the cult place of Laghetto del Monsignore in Italy (van Loon/de Haas 2019) and on the Cypriot sanctuary of Agia (Papantoniou/Bourogiannis 2019). They consider some of the aspects of the landscape discussed in network studies on religion, such as the location of the religious place in relation to the natural landscape (e.g. water resources) and settlements. They use the Geographic Information System (GIS) which is often but not always used in network studies on religion which are reviewed in this paper (GEHIR, 'Connecting the Greeks', 'Samothracian Networks', Da Vela, Mazzilli, Crawford, ASCNET, and RENE). This paper does not discuss the use of GIS because its focus is on the main topics and factors covered in the studies on religious networks rather than the tools used to analyse them.

and a place in space were sacred because they embodied holiness and represented a god, thus becoming ideal places for cult and ritual practices. Examples are the great height of Samothrace's mountain (Blakely 2020) or the mountain associated with the cult of Zeus Kasios (Collar 2017), the several sanctuaries of Artemis Ephesia on promontories (Malkin 2011, 204), or an interesting quantity of toponymic epithets of deities in inscriptions (Mazzilli 2018, 33 f., 67; 2022; Bonnet et al. 2018; Lebreton 2019; Bonnet et al. 2022). Recently Corinne Bonnet et al. (2022) has stressed the importance of the space in shaping and defining religion, discussing the naming of deities after toponym and the regional appropriation of divine power.

The religious network projects have additionally considered not just landscape itself as a (divine) natural resource but as an infrastructural system (settlements from intra-urban ones to villages, cities, and harbours) and how this one had an impact on the spread of cult and cult sites. These settlements can be small village settlements or cities in the hinterland (Mazzilli 2018; 2022; Da Vela 2019), or on maritime straits for Greek colonists (Malkin 2011, 153). They can also be, but are not merely, coastal settlements or harbours (Collar 2013, 146–223; van Nijf/Williamson 2016; Collar 2017; Blakely 2020).[27] These case studies show that religious, social, and spatial networks are interconnected and thus cannot be dissociated one from another. As stressed by Sylvain Lebreton, a MAP member, when outlining the MAP project, 'gods are cultural constructions emanating from social agents in a given context' (Lebreton 2019). For this reason, one of MAP's objectives is to map and analyse the presence of the gods in space by having a specific table for location in the database (the Location Table) to record the location of the source (place of discovery and/or origin), the place of attestation (the place of a sacrifice to one or more deities), toponymy in the onomastic sequence or elements of a structure or a place (such as a door and a spring) in inscriptions (Lebreton 2019; Lebreton/Bonnet 2019).[28]

In the case of Rieger's work (2020) the infrastructural system and the administration behind water management and distribution are considered key elements in connecting cult sites and creating the interlink of interdependence via the distribution of water. Water infrastructure and management seem to be considered as material resources for social networks and connections between temples. So, interactions between people and networks between people and the landscape were not the main immaterial resources for the development of religious ideas and places, which seem to have emerged from other studies of religious networks instead.

Furthermore, studies on religious networks have considered the significance of the location of the place or the area under study within the broader context (Collar 2013; Mazzilli 2018; Blakely 2020). For instance, Blakely (2020) emphasised the importance of the location of Samothrace being an island within the Thracian Sea. Collar (2013, 282) considered the connectivity of Delos with other cities an important factor for the expansion of the cult of Theos Hypsistos in the Hellenistic period: It was a crossing point, a free harbour where cultures and ethnicities could cross, with long-term religious significance. Mazzilli (2018) stressed the importance of studying cult centres and the Hauran in the broader network of the Near East in the Pre-Roman and Roman periods.

Projects on religious networks have also assessed to what extent the proximity between sites might have led to the spread of religious ideas and movements of actors of religious networks. Anna Collar (2013) used proximal point analysis (PPA) to hypothesise the spread of a cult based on the proximity of sites. RENE (Mazzilli 2022) uses PPA to verify if the proximity between cult sites facilitated the spread of cults. At the same time, proximity between cities does not always determine interactions, as in the case of the Samothracian maritime network, which, instead, preferred

27 Samothracian Networks Project, The Social Network, last updated 2016, <https://scholarblogs.emory.edu/samothraciannetworks/the-samothracian-social-network/> (last access: 22.11.2022); Connecting the Greeks Project Webpage, last updated 2022, <https://connectingthegreeks.com/> (last access: 22.11.2022).

28 ERC Mapping Ancient Polytheisms 741182 (DB MAP), Toulouse 2017–2023, <https://base-map-polytheisms.huma-num.fr/> (last access: 24.11.2022).

connections from farther afield.[29] Da Vela (2019, 509 f.) looked at the topographic vicinity (within a 5km radius) between settlements and cult sites, because it would have facilitated the flow of information (degree of connectivity) due to accessibility to the main surrounding communities. In 'Connecting the Greeks' the proximity of the cities where victors of games came from to the city where the festivals took place was examined. It seems to have played an important factor in the 4th cent. BC and less in the following centuries; a total of 60% of victors in the Amphiaraia-Romaia festival came from a town no more than 50km away, and in the 1st cent. BC this number declined to 40% and 39% of victors who originated from a city over 200km away (van Nijf/Williamson 2016, 55). Additionally, 'Connecting the Greeks' has looked at how a sanctuary and its cult had a favourable impact on the nearby city that regulated the festivals associated with the cult of the sanctuary. Because of its geographical proximity to the sanctuary, the city acquired political and economic power in the neighbourhood and the broader Greek territory in Greece and Asia Minor (van Nijf/Williamson 2016). The importance of proximity between sites can be seen indirectly in Rieger's work (2020) on the western slopes of Jebel el-Arab, where the sense of collective experience based on temples' style and motifs was shared between temples close to each other (e.g. Kanatha, Seleima, Mushennef, Rimet Hazem).

2.3. Road and Maritime Routes (Transportation Networks)[30]

Within spatial analysis looking at the movement of people in relation to the spread of religious ideas, a smaller number of projects sought to investigate how people carrying their religious traditions moved in the landscape by using maritime or terrestrial routes (transportation network).

As it is an ongoing project, it is not known yet if MAP will include maritime and road systems in their quantitative or qualitative analysis, although they are interested in the movement of gods through space (Lebreton personal communication). It does not seem that 'Connecting the Greeks' aims to consider, reconstruct or model routes that athletes or *theoroi* would have used to travel from one festival to another or from the city that they represented to the place where the festival would take place. Da Vela (2019, 509 f.) only considered the vicinity between settlements and cult sites, but it is not based on the distance between sites through ancient routes.

Malkin (2011, 153) stated that understanding the relationship between maritime routes and settlements is crucial when looking at the formation of Greek colonisation but there is no reference to how ancient routes would have facilitated the spread of religious ideas. Collar (2013, 117, 122), instead, suggested the central role of communication routes in understanding the spread of religious ideas, especially in the case of the cult of Dolichenus. In this case study, an epigraphic distribution map shows how the cult followed the Rhine and Danube valleys, and undertaking PPA has proposed long-distance overland or maritime links, whereas the spread of the cult was interrupted where viable routes would not be possible due to the type of terrain. However, she did not consider analytically how religious ideas spread or people associated with them did move from one node to another through specific roads or sea routes.

In contrast, GEHIR (Glomb et al. 2018; 2020) and ASCNET (Glomb 2021) have paid particular attention to the transportation network, which was one of their main tools to analyse the spread of the cult of Egyptian gods in the Aegean Sea and the west coast of Hellenistic Asia Minor, and the spread of the cult of Asclepius across the Roman Empire. Mazzilli (2018, 88–94) and RENE (Mazzilli 2022) considered the importance of Roman roads for the movement of soldiers and how roads would have facilitated the movement of worshippers going to a sanctuary. RENE (Mazzilli 2022) undertakes a more systematic analysis of the significance of the proximity of cult sites in relation to different benefactors, and gods. Crawford's analysis (2019; 2020) in Ostia consists of reconstructing

29 Samothracian Networks Project, The Social Network, last updated 2016, <https://scholarblogs.emory.edu/samothraciannetworks/the-samothracian-social-network/> (last access: 22.11.2022).

30 van Loon/de Haas's study (2019) on the cult place of Laghetto del Monsignore includes the analysis of the cult place in relation to the roads and pastoral routes.

ancient processional routes through GIS, urban network analysis, and agent-based modelling. 'Samothracian Networks' only hypothesised potential itineraries of city representative's travels, but there is no modelling of their reconstruction. It used the Argonautica epic to discuss the project and more generically maritime networks linked with Samothracian gods for pedagogical reasons (outreach activities in primary and secondary education) and gaming application.[31]

In Collar's discussion (2017) of the spread of the cult of Zeus Kasios, there is no attempt to reconstruct the maritime routes of ancient seafarers. The distribution of anchors in which their names were inscribed and the landscape itself (like sacred mountains associated with the deity) constituted traces of physical maritime routes for ancient seafarers under the divine protection of the god. Collar emphasised that this religious network and the landmarks of maritime routes were part of a perceptual mental web that carried and revealed 'an emotionally-charged series of narratives about seafaring and safe havens' (Collar 2017, 33).

2.4. Time (Temporal Factor)

Another important aspect in understanding religious networks is the temporal factor as the spread of a cult and cult sites changed over time depending on historical settings, changes, and the interplay of political powers and movement of people. However, not every research project on religious networks has been aimed at investigating the variation of religion over time. Crawford's research (2019; 2020) did not look at how processional routes might have changed over time based on her current publications. Rieger (2020) did not analytically examine the variation of motifs of temples, different group attendants, or the use of water distribution and its administration over time. Malkin (2011) and Eidinow (2011) did not discuss in detail the variation of Greek religious identities or polis religion over time. Malkin (2011) considered the temporal factor – including how major political changes and events shaped the process of (religious) identity formation in Greek colonisation – through a historical narrative rather than a more analytical and systematic approach. Although 'Samothracian Networks' considered inscriptions dated between the 2nd cent. BC and AD, it does not seem to discuss the evolution of networks over time, as far as can be seen from the project's website.[32] Blakely's forthcoming book, however, will reveal information about the temporal factor and the project's results.

'Connecting the Greeks' examined the development of the festival networks over time (like the origin of victors in the Amphiaraia-Romaia festival mentioned above) and how external political changes and events (like becoming an ally of Rome) could have had an effect on festival networks over time (van Nijf/Williamson 2019). MAP is also interested in exploring the divine onomastics in relation to social agents and (ritual) contexts across the Mediterranean over a long period (ca. 1000 BC–400 AD).[33] However, the forthcoming publications of both projects will reveal to what extent these projects will have a more discursive or more systematic approach, or a combination of two, depending on the data available.

In order to deal with the common issue of chronological uncertainty of archaeological and epigraphic datasets (see Bevan et al. 2013; Collar 2013, 172), scholars have categorised them in small time blocks of 50 or 100 years which are remodelled as a set of probabilities without considering the long-term span of some archaeological sites. This method has been sometimes called 'aoristic' analysis (Ratcliffe 2000; Johnson 2004; Bevan et al. 2013, 313). It has been applied to some studies on religious networks.

31 Samothracian Networks Project, Introduction, last updated 2016, <https://scholarblogs.emory.edu/samothracian-networks/> (last access: 22.11.2022).

32 Samothracian Networks Project, Introduction, last updated 2016, <https://scholarblogs.emory.edu/samothraciannetworks/> (last access: 22.11.2022); Samothracian Networks Project, The Social Network, last updated 2016, <https://scholarblogs.emory.edu/samothraciannetworks/the-samothracian-social-network/> (last access: 22.11.2022).

33 The ERC Advanced Grant MAP – Mapping Ancient Polytheisms. Cult Epithets as an Interface between Religious Systems and Human Agency. University of Toulouse – Jean Jaurès, 2017–2023, <https://map-polytheisms.huma-num.fr/> (last access: 24.11.2022).

Collar (2013) examined the spread of cults over time, providing snapshots of their distribution in phases. For instance, she looked at the cult of Jupiter Dolichenus roughly every 50 years in relation to the movement of soldiers, because this god was specifically associated with the Roman army. Similarly, she investigated the process of Hebraisation in four phases and the cult of Theos Hypsistos in three stages.

In three phases covering 100 years each, Da Vela (2019) explored the development of correlation, or lack thereof, between cult sites and elites in relation to their geographic position within the infrastructural system of settlements in northern Etruria.

Whereas the evolution of the spread of Egyptian cults was not considered in GEHIR (Glomb et al. 2018; 2020), ASCNET (Glomb 2021) tackles the issue of dating inscriptions dedicated to Asclepius by undertaking a simulation of the temporal distribution of the dedications to the god over centuries. This was additionally compared with the temporal curve resulting from the same simulation but based on inscriptions to other deities, such as Apollo and Jupiter, and the whole dataset from the Epigraphic Database Heidelberg. This comparison shows a similar curve and peak that can be interpreted more as a consequence of the evolving trend of commissioning inscriptions rather than the result of the spread of a specific cult.

Mazzilli (2018) and RENE (Mazzilli 2022) consider the spread and change of cult sites, gods, and religious architectural traditions in two broad phases, the Pre-Roman and the Roman period, given the impossibility of narrowing down this period into phases of 50 to 100 years due to the rarity of dating an inscription or a temple with a specific date.

3. Networks as Resources

Religion cannot be dissociated from culture, politics, and society nor be considered a distinctive category of its own; using Brent Nongbri's words, 'it [religion] was 'embedded' in the social structures of a given culture' (Nongbri 2008, 452; see also Nongbri 2013). In line with this thought, network studies on religion from the Pre-Roman to the Roman period consider religion dynamic and subject to social, spatial, and temporal factors. They explain how religion depended on interactions with and between social agents (from individuals, groups to political powers), who and whose interactions varied over time. Religion was also the result of connections between cults, religious ideas, cult places and the place/landscape (natural landscape, infrastructural system from settlements to transportation, such as terrestrial and maritime routes).[34] Natural agents have, in fact, an impact on religious networks, as shown by Anna-Katharina Rieger's work, for instance. She emphasised the key role of water, including and especially its administration, as a material resource that created networks between people and temples.

Nevertheless, religion was also the result of links between places, the landscape and human actors. Similarly, landscape in a broad sense, for instance, cannot be considered only as a material resource, but it should be regarded as a network of material and immaterial resources, such as social agents and religious practices. Hence, religion is the result of multi-levelled dynamic networks as immaterial resources. These networks, as a result, function as resources for religion: They are tools that enable religious identities and religion to be developed, to be maintained, and to be disseminated.

A network approach, which can be network thinking or network analysis, 'can offer an alternative, more fluid construction of ancient [...] religion', using Esther Eidinow's words (2011) from her work on ancient Greek religion. The network approach facilitates the grasping of a fluid model which considers such social complexity based on dynamic relations and social networks over time interconnected with spatial (including transportation) networks. The recent increase of using network analysis solely, or combined with network

34 Although they do not use network theory or analysis, van Loon and de Haas (2019), Papantoniou and Bourogiannis (2019) stress the importance of the location of the cult place in relation to its landscape in the development of cult places. For landscape they include natural landscape (rivers, coastal lines, elevation, and type of terrain) and infrastructural systems (route-ways, urban, and non-urban settlements).

thinking, can be seen in the search for a more analytical and systematic approach to unravel the complexity of religion as the result of multi-levelled networks. This does not undermine the validity of using the network as a metaphor or combining this with a more formal approach, as papers do in the section of the sacred landscape in this volume.

The outcome of the ongoing projects as well as future investigations on religious networks will offer a more detailed framework of the interlinking of religious, social, spatial, and transportation networks over time. It will also provide more information to assess the validity of studying these interconnected networks and of studying religion through a network approach. This review of the first ten years of exploration of religious networks has highlighted how religious networks and studying religion through the network as a resource is *in fieri* and still growing. It has offered a valid method to untangle the complexity of religion, which is also reinforced by two subsequent chapters in this volume which are dedicated to the study of the sacred landscape interlinked with other networks.

Francesca Mazzilli
University of Bergen
Department of Archaeology, History, Cultural Studies and Religion
Postboks 7805
5020 Bergen, Norway
Francesca.Mazzilli@uib.no

Royal Holloway, University of London,
Egham, Surrey TW20 0EX, United Kingdom
Francesca.Mazzilli@rhul.ac.uk

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Raffaella Da Vela

Networks of Cult Practices as Resources of Cohesion in Transhumant Societies of the Apennines (6th to 1st Centuries BC)

Keywords: infrastructures, connectivity, affiliation networks, Etruscans, Samnites, mobile pastoralism, ResourceComplexes

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Summary

The present contribution approaches religious networks as resources to create social cohesion in transhumant societies of Pre-Roman Italy. These networks are constituted by sacred groves, healing cults, open air sanctuaries, and household cults. The resulting religious landscape consists of small farms, huts, forests, lakes, rivers, and springs rather than of huge religious buildings.

The main research questions address the function of religious networks in communities organised in sparse settlements in the mountain regions (*vicatim*) as well as the sharing of cult practices, imagery, and myths as aggregative factors in transhumant societies along and across the Apennines. Through the comparison between geographic and culturally determined networks within the same chronology, it is possible to inquire the role of human ecology, landscape, and cultural preconditions in constructing and managing religious networks. In this framework, networks of cult practices became cohesive resources for the maintenance of a common identity and the guarantee of fair interactions within the communities of mobile pastoralists of the Apennine region.

Transhumance is a form of mobile pastoralism and husbandry, based on the seasonal mobility of livestock and shepherds (Costello/Svensson 2018, 3). Recently included in the immaterial cultural heritage of humanity by UNESCO, transhumance is not only an organised form of pastoralism and targeted mobility, but also represents a complex of tangible and intangible resources that can be understood as a form of human-environmental interaction. This interaction affects the whole life of the communities involved, playing a proactive role in local socio-cultural dynamics, and in supra-regional transcultural connectivity. This contribution considers the cult practices of local communities in the Apennine region as a significant aspect of transhumant societies of Iron Age Italy. In particular, the aim of the study is to analyse how networks of shared

cult practices were resources of cohesion in open-access resource landscapes, and how they played an aggregative role in contact zones. Specific research questions address the social function of religious networks in communities organised into sparse settlements in the mountain regions, as well as the political function of shared cult practices, imagery, and myths in regions connected by droveways. The cult practices have been analysed in two regions of ancient Italy where transhumance is archaeologically and ethnographically attested: Etruria in the north and Hirpinia in the south. The database relies on topographic data (positions of local communities, cult places, and droveways) as well as archaeological records (votive materials, offerings, and rituals).

These two case studies have been selected from regions with different cultural references and different socio-political organisations in order to detect recurrent patterns of interactions in the Apennines. The construction and implementation of networks of cult practices and norms has been approached as a resource in the management of these interactions within local communities, as well as a possible means to maintain and construct transversal identities in neighbouring regions with different systems of values and different languages.[1] The focus of the present paper on transhumance has been chosen to provide a specific, novel point of view on the societies of Iron Age Italy and is in no way intended to be exhaustive or exclusive. Looking at transhumance as a complex of resources and social interactions is therefore not meant to undermine the importance of other forms of economic activities such as farming, forestry, and mineral exploitation. These activities are rather considered as integrated along with transhumance in the macro socio-economic system of the Iron Age Apennines (Scopacasa 2015, 110).

1. On Transhumace in Iron Age Italy

1.1. Archaeological, Epigraphic, and Literary Sources of Transhumance in Iron Age Italy

Transhumance is not exclusively determined by climatic and geographical conditions (Marcone 2016, 203; Romito 1995, 18): these are, rather, preliminary to the social strategies and the cultural choices that result in the seasonal mobility of shepherds and flocks. Climate and geographical location are certainly preconditions for the development of forms of transhumance, which can then evolve differently depending on specific historical and cultural contexts. In the regions of the Italian peninsula crossed by the Apennines, these preconditions are fulfilled: cold and snowy winters up to 600m above sea level as well as dry and hot summers in the fluvial and coastal plains mean that sedentary pastoral husbandry is hardly practicable without a modern industrial infrastructural system. In the mountains, the abundance of springs and deposits of fresh water in the form of small lakes and creeks, wide and copious grasslands, as well as routes suitable for the passage of livestock, all create ideal locations for summer grazing. Green fluvial plains at sea level along the main rivers and their tributaries are, by contrast, appropriate for winter grazing. Certain mineral and geological factors come into play here, such as salt mines (*salines*) on both sides of the Apennines along the Adriatic and Tyrrhenian coast, as well as sulphurous fumaroles. These facilitate animal husbandry, as small amounts of salt and sulphur are necessary for the health of the animals, and both minerals are also used in the transformation and conservation of products such as meat and wool. These preconditions make transhumance more than merely possible as a mode of pastoral husbandry in the Apennine regions; they make it a desirable option. The generalised opportunity of a seasonal pastoral rotation or displacement does not imply homogeneity or uniformity in the solutions chosen for the management of livestock: this could take the form of a short seasonal migration of up to 70km between the mountains and the surrounding fluvial plains (vertical transhumance) or a longer seasonal migration of up to 300km from the Apennines to the coastal plains

1 The conceptualisation of resources adopted in the paper is a relational one. Resources are intended as material and immaterial means, used or considered potentially adequate by a society to alter social relationships, e.g. to improve or maintain status, quality of life, knowledge or power (Hardenberg et al. 2017, 14).

(horizontal transhumance). Both forms are historically known in Italy, the occurrence of both being mostly dependent upon local environmental systems, infrastructure, and different socio-political organisations. In ancient times, both horizontal and vertical transhumance are attested from the 2nd cent. BC in literary and epigraphic sources. These sources provide an overview of the main transhumance routes, their political management, and the social and cultural implications of this mobility and the encounters it produced.[2]

In the 're rustica', Varro clearly refers to long-distance (horizontal) transhumance across Italy (Varro, re rustica 2, 1, 1–6; 2, 2, 9; 3, 17, 9). This is also confirmed by some epigraphic documents, such as the later Saepinum inscription (CIL IX, 2438), which reports part of the correspondence between the Roman Imperial administration and local entrepreneurs involved in transhumance, discussing the usage rights for pastures and the safety of the flocks (Corbier 1983; 1991, 169–175). The practice of a horizontal transhumance does not exclude the possibility of local, short distance, vertical transhumance, and given an appropriate morphology of the internal regions, both can be present at the same time (Pasquinucci 2004, 168 f.; Gabba/Pasquinucci 1979, 114).

1.2. The Contribution of Zooarchaeological Analysis to the Debate

Alongside the literary and epigraphic sources, and especially when dealing with earlier periods without the availability of written sources, research on transhumance in ancient Italy relies on data from archaeometric analysis and from the material assemblages it reveals. Several archaeological and zooarchaeological indications seem to point to a long continuity of transhumance as a pastoral, but also economic and cultural practice in ancient Italy (Migliavacca et al. 2015, 598 f.).

The most reliable data on transhumance during the Iron Age comes from zooarchaeological and pedological analyses (Trentacoste 2020), which are still exceptional techniques in this kind of research, and are also less practicable when working with materials from older excavations, which frequently omitted the collecting of animal bones or other samples relevant to this topic. Archaeological proxies when seeking evidence of transhumance comprise objects linked with animal husbandry and the transformation of animal products, such as meat, milk, leather, and wool (in the very frequent case that the livestock were ovicaprine). Therefore, these findings cannot be linked *per se* to transhumance, since they could also refer to sedentary animal husbandry. In order to render such data useful and reliable for studies on ancient transhumance, the objects need to be considered in terms of their geographical distribution, their relation to other infrastructures, and their local contexts (settlements, production places, necropoleis, and sacred places). Moreover, their specific archaeological contexts, their ritualised use in cult practices or in burials, and eventually their iconographic representations can all furnish indications on the socio-cultural value of these objects and the status of the related activities in local communities. Some ethno-archaeological studies have pointed out how further proxies can be taken into account when considering social responses in comparable human-environmental interactions (Heitz 2015; Migliavacca et al. 2015, 601–605; Mientjes 2012; Santillo Frizell 2004).

New data collections and the combination of different sources and methodologies allow us to trace a continuous practice of transhumance in several mountainous regions of ancient Italy as well as in the surrounding plains, since at least the Middle Bronze Age and through the entire Iron Age (Aromatario 1992, 47; Gangemi 1985/1986, 118), right up to the first mentions of transhumance in the written sources. Although the social practice and organisation of transhumance are culturally and historically situated, and can lead to different kinds of social and economic organisation, this form of management of natural and climatic resources presents a general continuity in Iron Age Italy.

2 The historical research on these sources has been developed since 1979 by Carlo Emilio Gabba and Marinella Pasquinucci (1979), followed by Mireille Corbier (1983). These works were at the basis of further discussions (van Wonterghem 1998; 1999; Grassl 1999; Santillo Frizell 2004) and have been recently updated with the new results of archaeological research by their authors (Pasquinucci 2004; 2016; Corbier 2016).

On these premises, it is possible to consider transhumance as an activity which affected the life of a consistent part of the population of the Apennine regions during the Iron Age.

2. Transhumant Communities of the Iron Age Apennines, Between Conflicts and Cohesion

The seasonal mobility of shepherds and livestock in their locality and in the adjacent regions led to several instances of contact and interaction. The forms of these interactions were strongly affected by the political and social structure of local communities. From about the 2nd cent. BC, the Roman administration started a process of appropriation and control over transhumance, regulating the use and taxation of the droveways (*calles*) and pastures (*ager compascuus*) (Gallo 2015, 77 f.; Pasquinucci 2016, 197; Laffi 1998), and managing conflicts between shepherds and farmers. Before this time, the political organisation and administration of transhumance were decentralised and fragmented in the Apennine regions. In the Etruscan area of interest, across the northern Apennines, the political system was based on multiple city-states, which also directly controlled some of the surrounding areas. The peripheral areas, including most of the Apennines and the coast of the Tyrrhenian sea, were rather vast territories of cultural and economic influence (Nijboer 2015, 905; Becker 2015, 1132). In the southern Apennines, the political organisation seems to have been even more fragmented during the Iron Age, as indicated by the lack of cities in the hinterlands. Here, the management of the territory relied on sparse settlements and farmers organised in a dense network of transhumance, communication, and trade routes as well as relationships based on clan and family structures, kinship, and alliances (Pellegrino et al. 2017, 212–214; Bailo Modesti 1996, 44). This form of settlement organisation, defined as *vicatim* by Titus Livius (9, 13, 7),[3] was also known in the neighbouring regions of ancient Italy (Strabo 5,4,12: *komedon zoein* on the Opician settlement patterns; see also Rainini 2000, 238).

In both territorial administrative systems, the Etruscan and the Hirpinian one, the patterns of transhumance led to summer mobility throughout the underpopulated mountainous areas, which were difficult for any local powers to control and probably considered no man's (grass)lands, which could be used as open-access pastures. In winter, indeed, the same transhumance patterns brought the livestock back to the fertile fluvial plains, which were simultaneously the best locations for agricultural exploitation: resources and space on the plains were not unlimited. In this second case, therefore, negotiations and agreements must have been necessary to guarantee the usage rights of pastures and to avoid conflicts between shepherds and farmers (Blau 2019, 260). The right to use the droveways could be a further political issue (Gabba/Pasquinucci 1979, 140–142). Given the political organisation of local communities described above, the conflict potential presented by transhumant practices was probably as high in the early Iron Age as it was in the Imperial Roman period, for which literary and epigraphic sources are available. Presuming these potential conflicts were not always avoided, as is indeed suggested by the weapon assemblages and exhibition of military prestige in wealthy graves, negotiations and transactions still would have been the preferred option for resolving any disagreements. The exchange of technical knowledge as well as cooperation processes therefore would have been necessary for the maintenance of flocks and pastures. Furthermore, the integration of animal products and by-products in the supply chain would have required some agreement on the value of the materials being exchanged. Open-access resource regimes and pre-monetary economies did not in any case exclude the possibility of long-distance or horizontal transhumance, and transhumance crossing different cultural regions (Pasquinucci 2004). The material culture of the contact zones throughout the Apennines and in the neighbouring foothills clearly indicates that the exchange of products along the droveways was frequent and varied. This exchange was not limited to animal

3 The adverb *vicatim* expresses a perspective of the Augustan period and was probably used as a contrastive term to differentiate between the Roman colonial system based on cities and territories as well as the local pre-existing settlement patterns and political organisation based on the negotiation between local families (for the historical frame of this source: Gallo 2015, 71; Gabba/Pasquinucci 1979, 23 f.).

products, but included luxury goods, such as personal ornaments and decorated pottery, which seems to indicate the involvement of a social elite. The agreements reached between elite parties could be configured as chief exchanges (Naso 2012, 79), and probably also involved kinship politics, as the intra- and interregional mobility of women and intermarriage of elite women might indicate (Pellegrino et al. 2017, 212–214; Kruta Poppi 2015, 24).

These observations lead to the central question of the present paper, namely: Which intangible resources can be activated in transhumant societies to improve transactions, facilitate negotiation, and avoid conflicts? In the two following case studies, religious networks have been taken into consideration as possible socio-cultural resources for the creation of cohesion and collaborative strategies within and between transhumant communities. These particular networks are not defined as religious networks, but rather as 'networks of cult practices', since they were not necessarily ruled by religious institutions, but built up through knowledge transfer, exchange of experiences, and friendship. The choice of the cult practices examined here in order to inquire into the cohesive strategies of transhumant societies has been motivated by the highly frequent traces left by such practices in the archaeological record, especially in the mountainous regions.

3. Networks of Cult Practices

3.1. Networks of Cult Practices in the Northern Apennines: The Etruscan Network

The first case study is set in the northern Apennines, between the foothills north of the river Arno and the Po Valley, between the 7th and the 5th cent. BC. Here, literary sources (Titus Livius 5, 33, 9–10; Plinius, Naturalis historia 3, 20, 15) describe an Etruscan colonisation of the region, a colonisation conducted by single cities or single elite families within them. The literary sources support this in that they present the elaboration of different layers of memories and ideologies in form of foundation myths and heroes (Harari 2010, 51 f.; Sassatelli 2001, 169). If the presence of Etruscans from the south is epigraphically attested (Amann 2008, 261 with further literature; Sassatelli 1990, 54), and supported by further data, then this mobility should be thought of as a complex, fragmented, and uncoordinated action taking place over 300 years and contributing to the creation of a more massive frontier zone rather than a proper colonisation (Zamboni 2012, 26 f.; 2018, 238 f.). A Bronze Age horizontal transhumance across the northern Apennines, between the highlands and the hinterland of the coast in Maremma and in Romagna, has been suggested on the basis of specific findings and the distribution of settlements (Pizziolo et al. 2016, 3; the result of zooarchaeological analysis are forthcoming: Sabatini 2020, 193), and a similar transhumance has also been suggested for the Iron Age (Nijboer 2015, 797; Chellini 2013, 135; Fedeli 2012, 161 note 40; Pasquinucci 2004, 168–170; Santillo Frizell 2004). Further sources are available for the more recent epochs, especially for the Late Roman and medieval periods (Vanni 2019, 97), and the geographical preconditions suggest a possible continuity of this practice over a large span of time.

Some classes of the materials found, such as bronze figurines and miniature pottery, are clearly identifiable as cult objects and votives, and these attest to religious practices conducted in private, domestic contexts, as well as in communitarian cult places located near settlements or isolated in the mountains. The geographical distribution of bronze figurines and miniature pottery (*fig. 1*) reveals a higher concentration and wider variability of finds in the sacred groves and caves in the Apennines, such as the Grotta del Re Tiberio in the valley of the Senio river (Bertani 1997). The number of votives found in the sacred groves, lakes, and caves in the Apennines frequently reaches into the hundreds, and defines these places as religious hubs. In contrast, the attestation of such hubs down on the plains is sparse, with lower numbers of objects found at each site. Sometimes only a single object can testify to religious practices in a household, or along a given route from the mountain towards the plains. Mapping the presence of bones of sacrificed bovine and ovicaprine animals in most of the abovementioned places, as well as the attestation of Hercles' cult in the form of bronze figurines and the dedication of loom weights, it is possible to

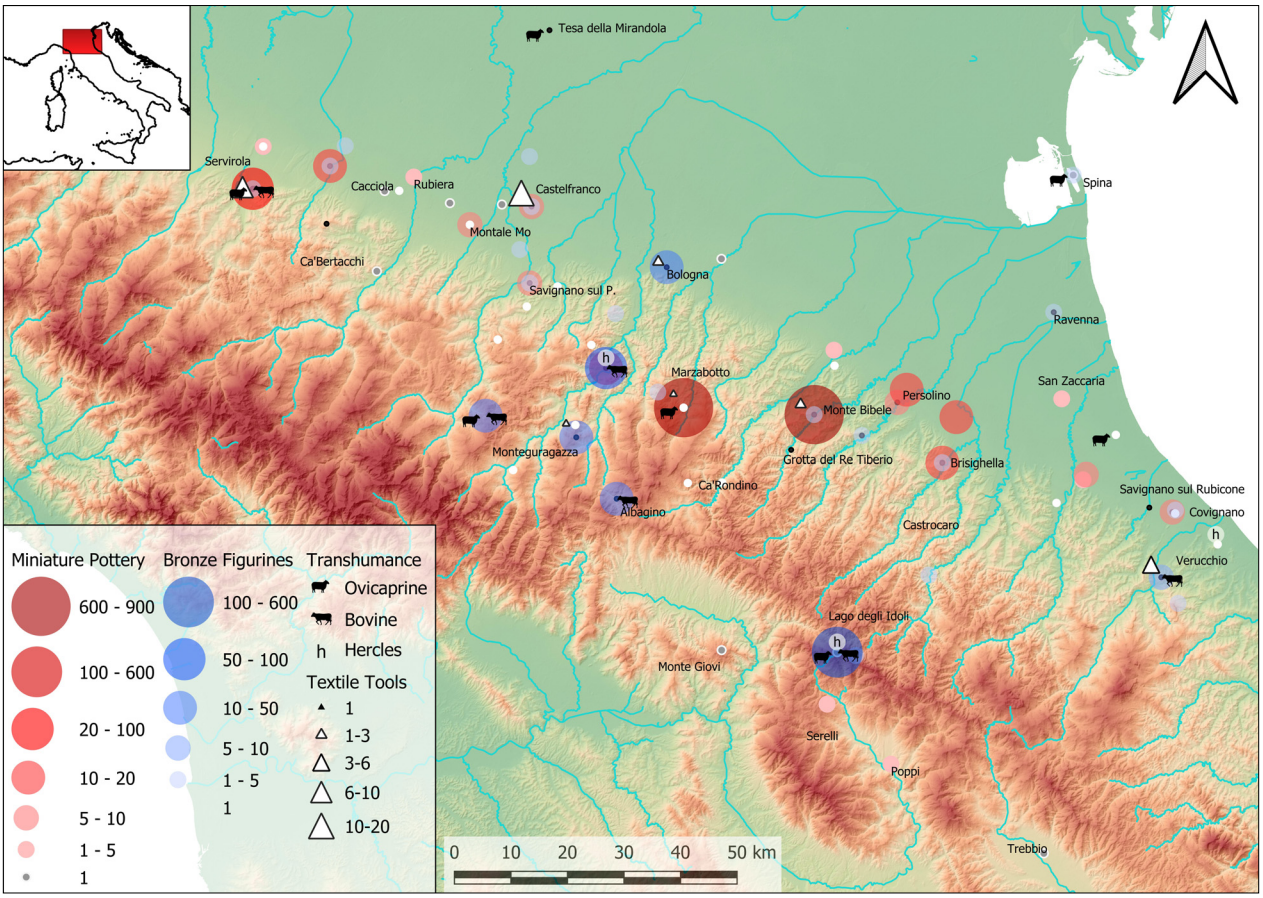

Fig. 1. Distribution and typology of the cult places in the northern Etruscan Apennines (by R. Da Vela with QGIS 3.8; DEM Copernicus EU-DEM v1.1; vectorial data: points R. Da Vela; rivers: Copernicus EU; symbols: <https://svg-clipart.com/animal/AgtemjU-sheep-silhouette-clipart>, Abu Badali common licence use; locator's vectorial data: @EuroGeographics).

notice a remarkable coincidence of these elements and their recurrence in many of the sanctuaries both in the Apennine mountains and along the rivers and creeks, which mark the main routes between the Apennines, the plains, and the salt mines on the Adriatic coast.

Only archaeometric analysis on both the animal bones, and the contents of miniature pottery from the cave of Re Tiberio could provide proof of the mobile pastoralism in this region. For this reason, the distribution of votives and cult practices linked to pastoralism along these routes can only be considered as circumstantial evidence of the relationship between transhumance and shared cults. It is therefore the actual spreading of such cult practices and the mobility of objects that shows the Apennines' central role in the communication and transmission of practices and religious knowledge between the core of the Etruscan lands and the Po Valley. The use of miniature pottery in small settlements both south and north of the Apennines seems to be linked to single households and families or just in few cases to collective cult practices (e.g. Monte Bibele: Vitali et al. 1997, 135–140; S. Polo d'Enza, Servirola: Miari 2000, 86–106; in general, on the contexts southern of the Apennines: Piccioni 2020) and does not correspond to a real religious normativism. It might be useful to clarify whether the bronze figurines were generically adopted into these cults, or if they rather reflect the spread of the official Etruscan religion.

Some of the examples are generic anthropomorphic or zoomorphic figurines, whereas others are linked to the iconographies of deities and worshippers disseminated by the urban workshops of Marzabotto and Faesulae (Desantis/Malnati 2012; De Vincenzo 2015, 73). The main difference

with miniature pottery is the possibility of tracing many types of the figurines back to precise iconographies, which at least demonstrates a shared imagery in terms of the visualisation of deities and worshippers. The reproduction of formal aspects and the adoption of similar attributes (e.g. a *patera* for libation, or the gesture of prayer) could represent a shared interpretation, or just a formal imitation of an image. Although it is possible that images and codifications circulated separately, largely dependent upon the reference systems used by local communities, the distribution of votives indicates a strong connection between the regional routes across the Apennines, routes along the creek valleys, and the geographical locations of sanctuaries and votive finds. In the case of miniature pottery, a specific type of vase with an oblong basin, flat bottom, and a pair of atrophic holed handles, one on each side, presents strong correspondences with miniature votives from coastal contexts that are directly linked with the healing cult of Italic deities existing near the salt mines (Rimini, Covignano, and Cupra Marittima). Some of these deities, such as Cupra, were worshipped in other communities practicing transhumance in the Apennines (Ferrando 2017, 11 note 27). The presence of this type of miniature vase in both the mountain cave sanctuaries and the households of the foothill settlements could be the missing link between a diffusion of religious practices and transhumance.

Once the semiotic ties between cult objects on the plains, in the mountains, and on the coast, and the possible dependence of these connections upon transhumance have been established, the intriguing question is which models of distribution are suitable to explain the huge amount of miniature pottery found in some cult hubs in the Apennines, for example in the Grotta del Re Tiberio, with more than 800 miniature vases currently reported (Bertani 1997, 81; Miari et al. 2013). Production of this pottery near the sanctuary can be excluded, because the mountain soil is not suitable for mass production of pottery: this would be more likely down in the alluvial plains, which are rich in lime and clay. The hypothesis of production taking place on the plains is also supported by some findings of miniature pottery in dismantled kilns. These kilns are distributed north of the Apennines, in San Zaccaria-Maiano and Savignano sul Rubicone and by Cesena in the plain of the river Savio (Miari et al. 2008, 32) and south of the Apennines in the upper Tiber Valley near San Sepolcro at Trebbio (Da Vela 2022). This makes it probable that the worshippers brought their own pottery for dedication at the sanctuaries in the mountains, a suggestion also supported by the comparison with the deposits of bronze figurines at Lago degli Idoli (Warden 2018, 23), a lake near the source of the Arno river. In this case we could consider the mobility of worshippers as a form of targeted religious mobility similar to pilgrimage practices, which were probably linked to the seasonal rhythms of transhumance, since the sacred groves and caves could not have been reached during the winter. Moreover, it is currently impossible to know whether the cult practice involved was the dedication of an empty vase, the performance of a liturgic act, or the dedication of a specific content inside the vase, as some remains of ochre within some of the miniature vases found in the Grotta del Re Tiberio suggest (Rondelli 2007, 103).

The practice of dedication implies a shared idea across the Apennines that bestowed value on selected shapes of miniature pottery or their contents in the context of cult practices. This idea would have required the transmission of knowledge and technical skills in the production of the pottery shapes, as well as an agreement as to which vases and contents could or needed to be dedicated. Some ethnological comparisons, suggesting that the vases, filled with some contents linked to the healing properties of the sacred waters in the caves could have been taken away, are more problematic (Calapà 2019, 126 f.; De Vincenzo 2015, 75; S. Ippolito at Corfinio: Dionisio 2013), because they do not explain why the pottery was in fact found in the cave, if the pilgrims were supposed to take the vases away with the contents inside. The remaining possibility is that pilgrims brought a quantity of miniature vases that exceeded their needs with them, and then left some of the vases as a votive gift, as well as for use by other pilgrims, who could then take away one of the vases left there by others in a sort of mutual exchange. This model could explain some particular domestic assemblages presenting miniature

pottery with similar shapes and different composition of the clay and firing techniques, as in the assemblage of Serelli (Incammisa 2013).

The first case study indicated as the networks of religious practices along the transhumance and communication routes and the presence of shared cult places on the Apennine were means to define common identities and value systems between communities living north and south of the Apennine. The mobility of humans and animals across the Apennine gave an impulse for the creation and reinforcement of the network ties within a long lasting network structure linked to the morphology of the territory and to the availability of water and food reserves.

3.2. Networks of Cult Practices in the Southern Apennines: The Hirpinian Network

The second case study is set in the southern Apennines, in the inland cultural area known as southern Samnium, which the Latin sources link with the Samnite Hirpini peoples (Poccetti 2017). Southern Samnium lays between coastal Campania to the west, Apulia to the east, Lucania to the south, and central and northern Samnium to the north. According to the sources, central Samnium was populated by Samnite tribes of the Caudini and Pentri (Scopacasa 2015, 20–24). Chronologically, this case study partly overlaps with the previous one, covering the period between the 6th and the 3rd cent. BC. The geographical aspects of this region meant that pastoral transhumance was the best solution for animal husbandry, and some archaeological studies on the Bronze Age in the region have pointed out that transhumance was already practiced at this time (Talamo 1996, 12; Gangemi 1985/1986, 117 f.). Moreover, studies of transhumant activities during the Iron Age in the neighbouring regions suggest the passage of droveways through Hirpinia itself (Heitz 2015; Roubis et al. 2015). These routes can be reconstructed on the basis of settlement continuity and the limits posed by the morphology of the territory, and as such appear concurrent with the droveways attested from the 2nd cent. BC, and during the Imperial Roman period. During this time, certain production hubs (Di Giuseppe 2014) and markets of agro-silvo-pastoral products (Di Giovanni 2015, 18–20; 1996, 253) constitute strong archaeological indicators of a centralised infrastructure for transhumant practices. The routes of Imperial Roman transhumance, which remained in consistent use until the 19th cent. AD, run across Hirpinia, particularly in the north. Here the droveway known as the Tratturo Regio Pescasseroli-Candela connected the Apennines with the Tavoliere delle Puglie, the grassland-plateau in the hinterland of the Apulian Adriatic coast. A further main droveway was probably reconstructed to form the *via Appia* (Ceraudo 2015; Grassi 2013). These main drove roads had minor branches, probably used for vertical transhumance, connecting the fertile plains of the Ofanto and Ufita valley (Romito 1995). The settlement patterns of these regions seem to be strongly affected by the infrastructure of transhumance, especially during the early Iron Age within the so-called Oliveto-Cairano culture and in the Samnitic period (Da Vela 2020).

The topographic distribution and the typology of cult places in the region reinforce the idea that cult practices and transhumance were structurally connected in Hirpinia (*fig. 2*). Since urban settlements are unknown in that region until the mid of the 4th cent. BC, the oldest cult places were exclusively rural. The centre of the Hirpinian religious identity, the Mephitis open air sanctuary in the Ampsanctus Valley (Santillo Frizell 2004, 80; de Cazanove 2003; Rainini 2003; 1996), was located close to a sulphurous fumarole in a small, deep valley, originating in a boiling muddy lake, where a female deity with chthonic and fertility aspects was worshipped (*fig. 3*). The earliest votives and statues, in the form of wooden *xoana*, could be dated to the Archaic period (Franciosi 2017). With the growing urbanisation that developed particularly after the establishment of a Roman colony in the Samnitic city of Maleuentum in 268 BC, the sacred landscape showed significant changes. The first urban cult places make their appearance in form of small urban shrines (Avellino, Civita: Chiosi 2013, 37 f.) or urban temples (Benevento, Rocca dei Rettori: Giampaola 2000, 36 and Piazza Orsini: Tomay 2015, 271–273, 279 f.). Some rural cult places were established in the mountains, like the one at Aiello del Sabato, Cresta del Telegrafo (Colucci Pescatori 2013), and finally other structures were built or

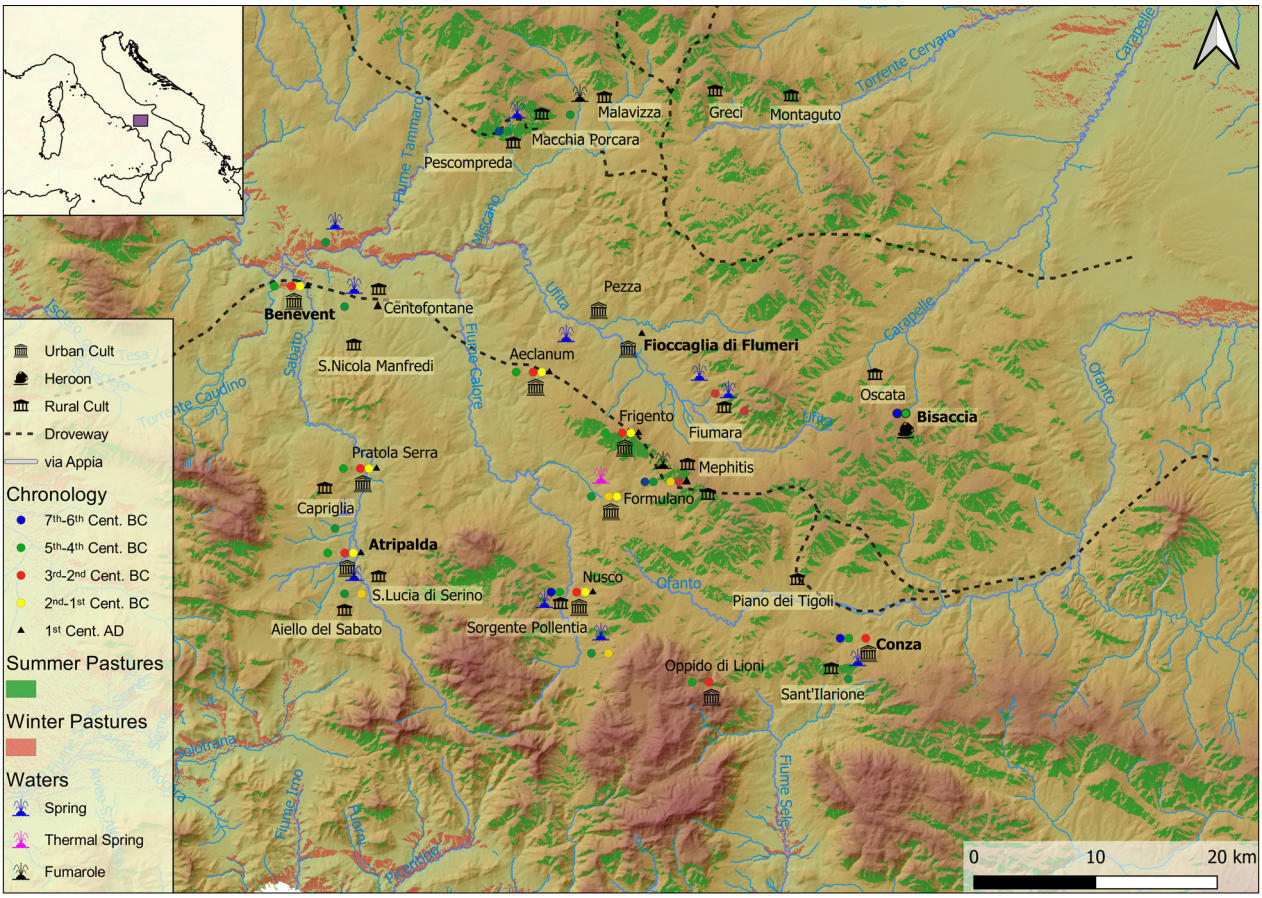

Fig. 2. Distribution and typology of the cult places in Hirpinia (by R. Da Vela with QGIS 3.8; DEM Copernicus EU-DEM v1.1; vectorial data: points R. Da Vela; rivers: Copernicus EU; locator's vectorial data: @EuroGeographics).

Fig. 3. The sulphurous fumarole of Mephitis in the Ampsanctus Valley (photo by R. Da Vela, 2019).

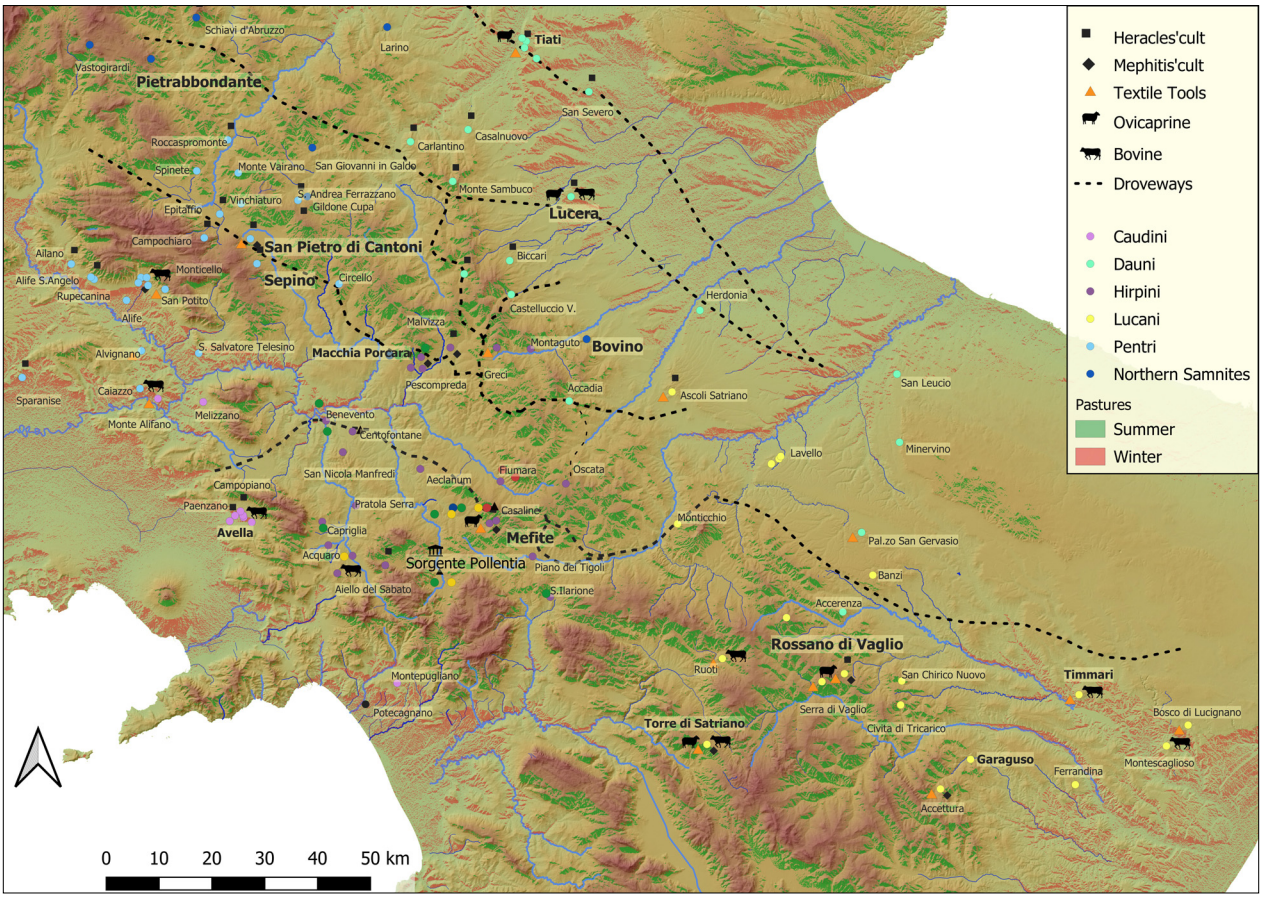

Fig. 4. The broader religious network of the Southern Apennines (by R. Da Vela with QGIS 3.8; DEM Copernicus EU-DEM v1.1; vectorial data: points R. Da Vela; rivers: Copernicus EU; symbols: <https://svg-clipart.com/animal/AgtemjU-sheep-silhouette-clipart>, Abu Badali common licence use).

used as suburban cult places, as at Macchia Porcara near Casalbore (Johannowsky 2001, 230–239), and the later Mephitis Sanctuary Ante Moenia at the Pass of Mirabella Aeclanum on the via Appia, near the city's livestock market (*forum pecuarium*: Di Giovanni 2015, 58). At a semantic level, all of these cults had common references to the basic religious values of the local communities: fertility, health, and the productivity of both humans and animals. Moreover, the cults of Heracles and of the mother goddess were associated in Hirpinia as well as in the neighbouring regions (Miele 2010; Poccetti/Nava 2001). Although the link between Heracles' cult and transhumance remains a point of discussion,[4] in the specific regional context of Hirpinia, all the Heracles figurines have been found in cult places along the droveways, and were mostly associated with healing cults established near springs and other water sources.

An analysis extended to the neighbouring regions involved in the same system of transhumance invites to consider the Hirpinian local cult places as part of a broader religious network, strongly connected with the Apulian cult places of Heracles at Tiati (Antonacci Sanpaolo 2000), as well as with the one of Mephitis at Rossano di Vaglio, where the epithet Aravina is the same used for Mephitis in Valle d'Ansanto (Battiloro 2018, 137 f.) and with the network of Heracles sanctuaries in north Samnium (Naso 2012, 79; van Wonterghem 1999) (*fig. 4*).

4 Stek 2009, 55–58 deconstructs the traditional view on the link between the cult of Heracles and transhumance, expressed e.g. in: Osanna/Sica 2005, 389 f.; van Wonterghem 1998; 1999; Gros 1995, 313–315; Aromatario 1992, 49. See also Krämer in this volume.

The distribution of votives as well as the presence of deities with a common field of interaction and sometimes, as in the case of Mephitis, with similar aspects and names indicates that societies practicing transhumance in the southern Apennines were integrated into a broader religious network. This network was partly institutionalised, but also arose as the result of the adoption, appropriation, or transmission of practices through the mobility of shepherds and flocks. The progressive standardisation of the votives and their spread during the Hellenistic period could correspond to the growth of transhumant activities in the 4th cent. BC, which ended in the commoditisation of those activities under the Roman administration (Gabba/Pasquinucci 1979, 48 f.). This growth made it necessary to identify institutions that could help the parties involved to avoid conflicts, and also guarantee the fairness of the negotiations involved. These negotiations could be linked to the mobility of shepherds, to the common use of resources such as pastures and water springs, and to the economic transactions made on the animal-produce markets. The capacity of religious institutions and common cults to assume this role in the absence of other political institutions is attested by the *cippus Abellanus*, an epigraphic document in the form of a limestone plate from the mid or late 2nd cent. BC. The document refers to the use of some plots of land between the cities of Abella and Nola, directly on the north-western boundary of the Hirpinian territory, in the Caudinian region (La Regina 1999, 11–15; La Regina 2000). The document, whose exact archaeological context is lost, contains the text of an agreement between two neighbouring cities, Abella and Nola, on the use of this land, probably pastures, under the management of a sanctuary of Heracles. The sanctuary was probably located in the territory between the two cities and chosen as guarantor of access and fair exploitation of the land in question. The function of extra-urban sanctuaries as religious and political hubs of transhumant societies is well known also in Etruria (Cherici 2012, 317–320), in Umbria (Amann 2021), and Greece from the Archaic to the Hellenistic period (McInerney 1999, 100–108). These sanctuaries were the stages for animal sacrifices and for common festivals. In that way the sanctuaries became on the one hand places of sacralisation of the shared resources (animals), but on the other hand also privileged spaces of the self-positioning of transhumant communities in the frame of regional and supra-regional acknowledgement. Moreover, these sanctuaries at the crossroads of transhumance routes were the places where treaties and interactions were ratified and conserved. This sacred guardianship of rights relating to transhumance can thus be considered a broader Mediterranean custom of adopting sanctuaries as institutions for the regimentation of mobile, seasonal pastoralism (Howe 2003; McInerney 1999, 102 f.).

The second case study permits a description of religious networks as a means of interculturel dialogues and guarantors of fair transaction in southern Italy, assuring the continuity of transhumant mobility and the transmission of traditional knowledge between mobile pastoralists of different geo-cultural areas.

4. An Empirical Approach to Miniature Pottery as a Semiotic Network

An empirical social network analysis has been conducted on both case studies, in order to describe the networks of cult practices and to detect new layers in the relationships between found objects as well as cult practices and places. Affiliation networks (Knappett 2011, 98–105) can be used to detect semiotic relationships between places and cult practices and to study communities of practice. These kinds of networks permit an analysis of the relationships between two groups of nodes of different nature, as people or places and objects. In our case studies the affiliation network of cult practices is based on a semiotic relation between cult places and cult objects. This relation, expressed in the network as an edge, is based on the assumption that local communities gave a particular meaning to the use of specific objects (first group of nodes) while worshipping at their cult places (second group of nodes). To make the comparison between the northern and southern Apennines easier, the

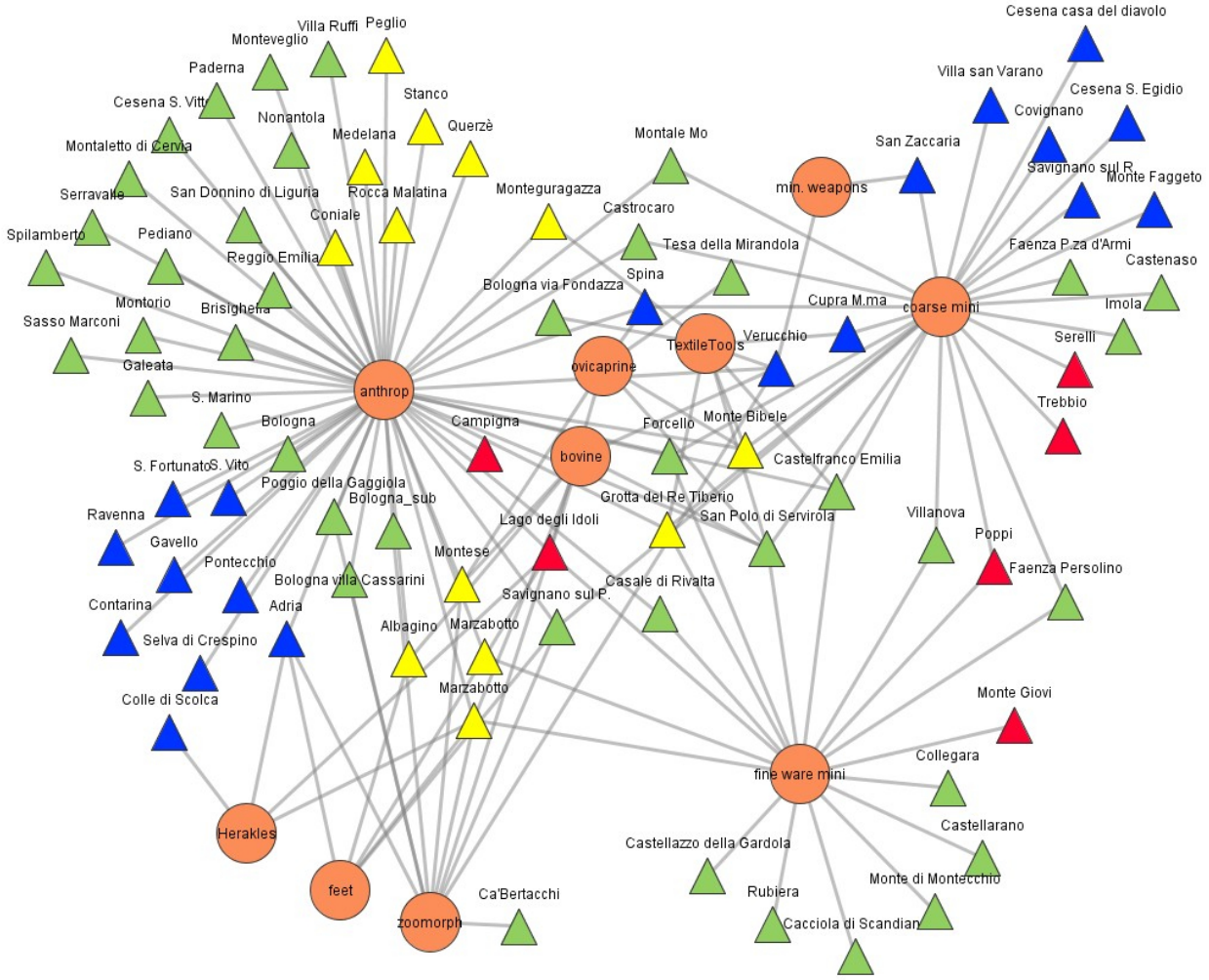

Fig. 5. Affiliation network of cult places and objects used in ritual practices in the northern Apennines. The different colours of the triangles correspond to different geographic positions within the region (by R. Da Vela with Visone 2.9.2. Software source: Brandes/Wagner 2004).

first group of nodes of the networks is in both cases the miniature pottery vases, and the second group represents the cult places in which these vases were used. The choice of miniature pottery as proxy for the analysis presents several advantages: the resistance and transportability of miniature pottery allowed their preservation in many sacred contexts of Iron Age Italy, especially in sacred groves and caves, but also in votive deposits within structured sanctuaries. This proxy is widespread in both regions in analysis, in association with archaeologically confirmed religious practices, including dedications, obliterations and disposal within sanctuaries. These characteristics made them especially suitable to study affiliation networks within the ancient sacred landscapes.

In the first case study the analysis has been conducted on the miniature pottery discussed, considering the typological details right down to the micro-scale. The miniature vases have been classified according to the typology proposed by Monica Miari (2000), including the new findings (*fig. 5*), which fit easily into her proposed categories. The comparison between urban, domestic, and communitarian cult places in the Apennines showed that the use of miniature pottery in cult practices corresponded to precise choices as to the shape and the production technique of these vases (*fig. 6*). This observation contributes to an explanation of the possible level of interaction between the networks of religious practices and the sanctuaries, which were geographical hubs

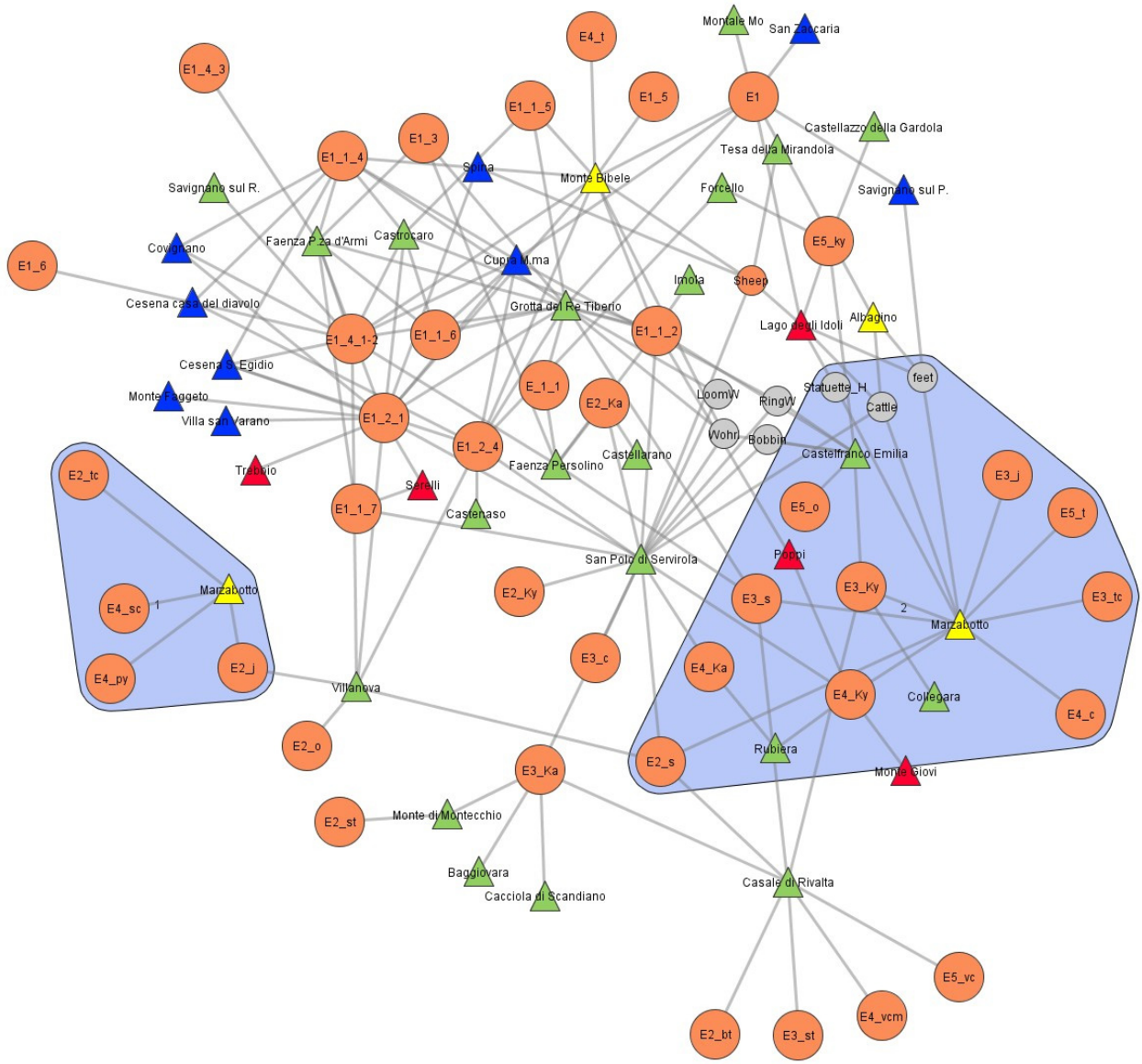

Fig. 6. Selection of typologies of miniature pottery for household cults (left) and for communitarian cults in Marzabotto (right) (by R. Da Vela with Visone 2.9.2. Software source: Brandes/Wagner 2004).

within the network of the transhumance routes. The detection of differences within the spectrum of miniature pottery and its usage in cult contexts opens up new lines of research based on micro-analysis of the formal values of these vases, and on their meaning, particularly in relationship to the sacralisation of resources connected to transhumant activities, such as salt or minerals. The distribution of specific pottery shapes from these hubs, in both the foothills and the plains, and in single households as well as the communitarian cult places of small settlements all indicates that cult objects linked to this mobility could assume a cohesive function between different geographical contexts and cultural areas, especially between the Etruscan heartlands, and the cultural regions north of the Apennines and on the Adriatic coast.

In the second case study, in Hirpinia, there is currently no typology for miniature pottery that is valid for the whole of the southern Apennines. The huge variety of miniature vessels therefore allows us to analyse the semiotic network of their shapes and cult contexts (*fig. 7*). This network shows that choices in the use of miniature

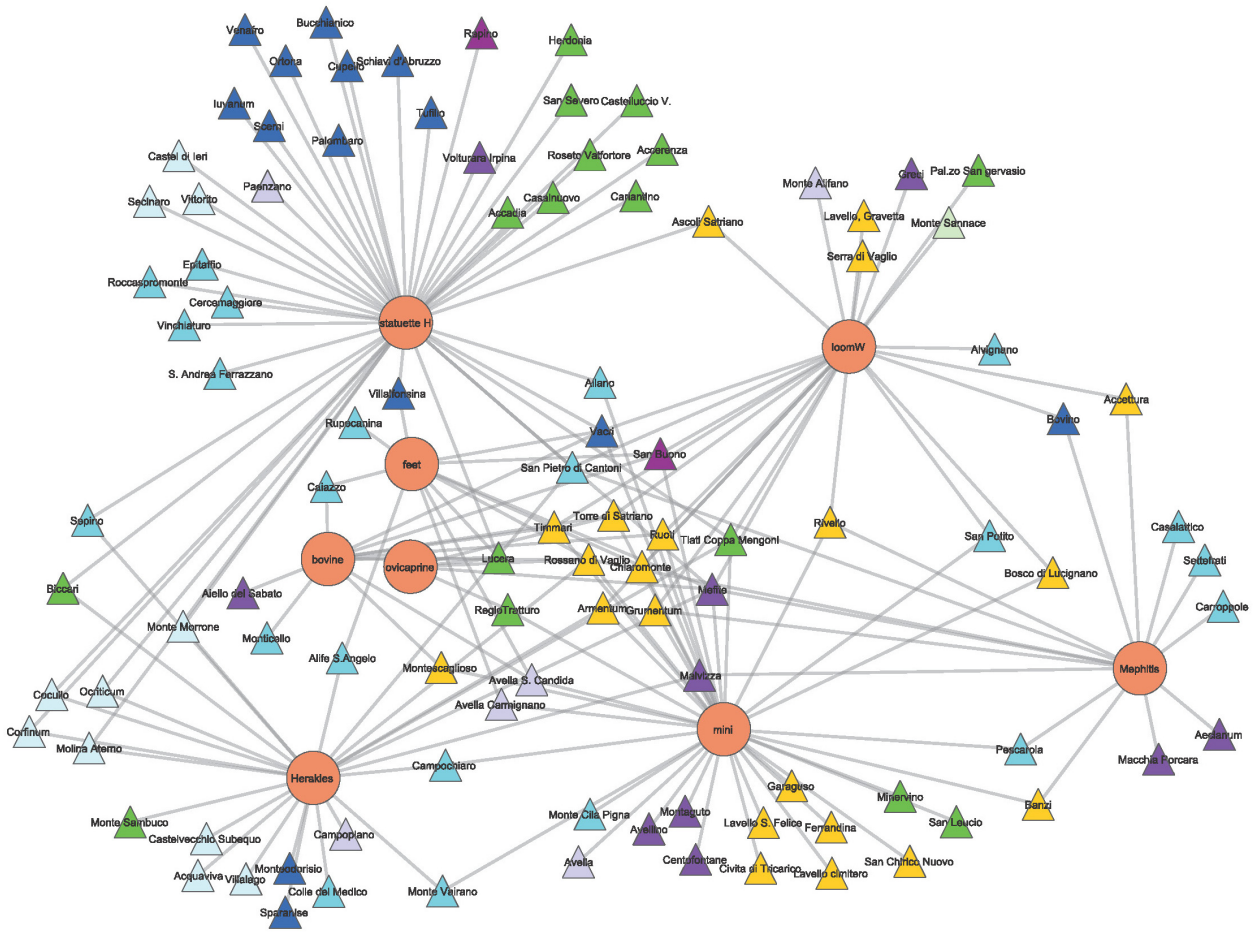

Fig. 7. Affiliation network of the shape of miniature pottery in the southern Apennines (by R. Da Vela with Visone 2.9.2. Software source: Brandes/Wagner 2004).

pottery shapes in sanctuaries were widely concurrent across the whole region, especially from the late Classical period. This homogeneity also corresponds to shared cults centred on the figures of Heracles and Mephitis, or deities with similar aspects and capacities. Among these cult places, it is the Lucanian sanctuaries, such as Torre di Satriano (Osanna/Sica 2005) and Timmari (Mandić 2011), which display a greater variety of forms and interact more strongly with the Greek colonies near the coast – the Lucanian cult places could thus be geographically considered as hubs of transhumance. An additional advantage of using empirical network analysis, in terms of observing the geographical distribution of pottery shapes, is its capacity to highlight connections and relational aspects in the choices of votives and deities made by local communities (*fig. 8*). Observation of the whole network reveals the visualisation of only a few specific geo-cultural clusters of cult practices, along with a high frequency of sharing and concurrence. This indicates the degree of cohesion constructed by transhumant societies through cult practice, even across the boundaries of different cultural traditions. The affiliative networks distinguish between geographical centrality, and centrality within the religious supra-regional network, since cult places possess a higher variability, being geographically more decentralised, but culturally more proximate to the Greek colonies, with a strong cultural and economic impact.

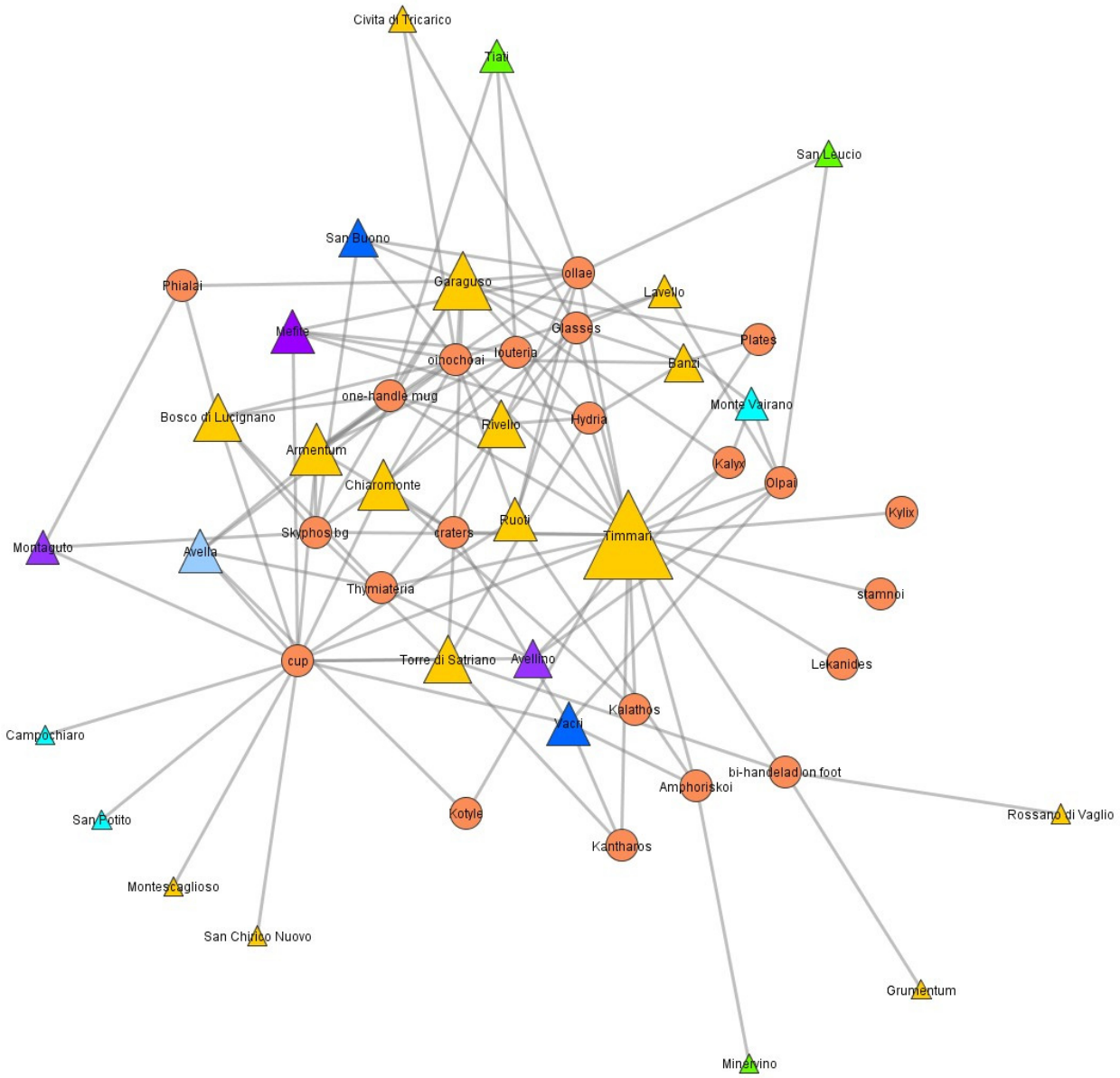

Fig. 8. Measurement of the betweenness centrality of cult places (by R. Da Vela with Visone 2.9.2. Software source: Brandes/Wagner 2004).

5. Networks of Cult Practices as Resources in Transhumant Communities

The comparison of the network of cult practices in these two different regional, historical, and political frameworks suggests some general patterns of interaction between religious practices and transhumant societies, which can be configured and understood as an integrated form of human-environmental agency. Networks of religious practices seem to have had a greater impact in the Apennines' regions, where the settlement patterns are sparse, and political and religious institutions seem to be lacking or at least less pervasive than they were in the more highly urbanised plains and coastal regions. This absence of institutional structures meant there was a need for social and cultural negotiation in the management of the resource landscapes. Networks of cult practices can be thus considered as cohesive resources for transhumant societies, from several different perspectives: (1) from a structural perspective, the

networks of religious practices were resources for the management of negotiations and transactions in transhumance; (2) from the perspective of interaction, they were resources to facilitate cultural translation and transcultural agreements between neighbouring communities; and (3) from a sociological perspective, these networks were resources for the formation of shared identities between communities involved in transhumance. These three aspects will be examined in turn:

(1) The analysis of the case studies pointed out the sacralisation of both the infrastructure and some resources of transhumance, such as water, mineral, animals, and animal products.[5] This sacralisation suggests that cult practices could be intentionally organised into a social network, in order to reach a common understanding of rules and norms governing practical matters related to transhumant activities. Especially in open-access resource societies, unregulated access to resources could cause conflicts, due to the lack of power and accepted norms in the management of those resources (Gonin et al. 2019). Networks of cult practices and religious networks provided a 'managerial' resource to guarantee fairness in the negotiations within such societies, or between groups with different political structures. These negotiations may have been related to the use of infrastructure such as pastures, water sources, and droveways, as well as to the economic transactions relating to products and by-products of pastoral husbandry. Therefore, these networks can build a common platform to manage conflicts between different actors involved in transhumance.

(2) Mobility, which is a defining aspect of transhumance, extends the cohesive potential of cult practice and religious networks across the comfort zones of politically or socially defined geo-cultural spaces. These networks allow the transmission of cult objects and practices over the conventional boundaries of local communities and thus create a transcultural dialogue platform between actors involved in transhumance in neighbouring regions (Heitz 2022). Religious knowledge transmitted and shared along the transhumance droveways played a very significant role in the maintenance of co-operative attitudes within those contact zones. The empirical application of networks invites us to rethink these contact zones as non-linear. The contact zones detected in the present paper are seasonal infrastructures that spread across the Apennine regions along the droveways, rather than stable, static geographical areas. The geographical positions of the sacred groves and worshipping places on these routes, as well as the cultural translation of the worshipped deities, show how these networks were important resources in guaranteeing peace and understanding between different cultural areas.

(3) As a consequence of the preceding observations, the case studies suggest that networks of cult practices were resources to create cross-cultural belonging and new layers of identities that were no longer linked solely to local communities, but rather to transhumant mobility. These new identities related to membership within a transhumant society, in which agreements on shared values and codes were negotiated over the traditional boundaries of city states, ethnic constructed identities or geographic and linguistic areas. These new identities were not exclusive, but rather inclusive. The networks, based on a relationship of fidelity-protection between humans and deities, built one of the nested identities acquired by actors involved in transhumance (for the topic of nested identities in Samnium: Scopacasa 2015, 297 f.). The shepherds and their families, belonging to a local community and rooted in their religious, cultural and technical traditions, acquired a further 'belonging' to a supra-regional community of transhumant people through their pastoral identities, and this greater community found a common base for interaction in their common religious references. The religious practices, conducted to obtain protection for the seasonal travellers and their flocks, as well as other advantages such as the health and productivity of their animals set common goals for this new community, contributed to the formation of these new identities across the Apennines.

5 The sacralisation of spaces and times of transhumance is accompanied by animal sacrifices and by the symbolic deposition of figurines of animals and loom weights and involved many different resources within the Resource-Complex of transhumance, transforming natural goods in resources as means to manipulate and create identities (in general on this topic: Schweizer 2021, 310 f.).

These transversal, nested identities are an expression of social segments not usually represented in the official written historical sources, and are not visible in the rhetoric of ethnic belonging present in the Roman sources, which report a later and external point of view, referring only to local elites interacting with Roman power structures.

Raffaella Da Vela
Eberhard Karls University of Tübingen
SFB1070 ResourceCultures
Gartenstraße 29
72127 Tübingen, Germany
raffaella.da-vela@uni-tuebingen.de

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Robinson Peter Krämer

Interregional and Cross-Cultural Networks as Economic Resources in Sanctuaries of Central Italy (7th to 5th Centuries BCE)

Keywords: political economy, Mediterranean long-distance trade, Etruscan and Italic elites, transhumance, Gravisca, Veii, Forum Boarium

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Abstract

During the Orientalising and Archaic periods, that is during the 7th to the 5th cent. BCE, sanctuaries in Central Italy could serve as important socio-political spaces for the developing Etruscan, Latial and Italic city-states and communities. Cult places provided visitors and worshippers with specific functions and activities, such as political meetings, public space for representation, fairs, festivals as well as markets and even institutions for long-distance trade. It is argued here that sanctuaries in Central Italy provided these services and functions with clear socio-economic strategies in order to create specific networks of participants and attendants. This article discusses three case studies and reconstructs their individual networks, each with different scales, functions and characteristics: (1) the Portonaccio Sanctuary of Veii served as a cross-cultural and political gathering place for social elite members of Etruria and Latium vetus, (2) Gravisca was a port of trade and connected to a vast Mediterranean network for long-distance trade, and (3) the Forum Boarium at Rome established a central nexus for the trade, distribution and control of the crucial commodities salt and cattle in all of Latium vetus from the coast to the Central Apennines. The different networks can be interpreted as key resources for each of the sanctuaries to gain supra-regional significance and influence in Central Italy.

1. Introduction

Sanctuaries in the ancient Mediterranean did not only serve religious purposes, but were often also used as places for fairs, markets and gatherings. One example for the Greek world is Olympia, where the archaeological findings of fountains, locally produced pottery and official, standardised bronze weights give not only evidence of the accommodation of visitors and participants in the sanctuary, but also of trade and markets during the Olympic Games and religious festivals. Merchants probably paid a fee to the priests for using the official weights and participating in the markets, similarly to other attested cases in Greek sanctuaries.[1]

1 Hitzl 1996, esp. 101–104; Gauer 2012. For economic activities in Etruscan sanctuaries, see Krämer 2022; in press.

For Central Italy, markets with merchants, farmers, artists and craftsmen, as well as ceremonial games, are mentioned by Dionysius of Halicarnassus and Livy at the *Lucus Feroniae* under Servius Tullius (672–640 BCE),[2] and at the *Fanum Voltumnae* in 403 BCE.[3] Theatre performances, *ludi sacri*, with fairs and markets have been reconstructed in Etruscan and Latin sanctuaries by various authors (Colonna 1993, 343–347; Camporeale 2010); additionally, Armando Cherici interpreted the *Fanum Voltumnae* as a possible regional market place for farmers and herdsmen at Volsinii (Cherici 2012).

These regular activities in sanctuaries of Central Italy on occasion of such markets, fairs, meetings, events and gatherings established networks of priests, worshippers, visitors and participants. Networks are understood here as a set of interactions between different actors with and within the framework of sanctuaries. The central hub of such a network was always the sanctuary as the defining social space or setting of interactions (among the different actors, but also with the sanctuary), but the duration (e.g. one-time event – regular festivals), scale (e.g. local – regional – Mediterranean), size, and characteristics (e.g. mainly economic, social or political gatherings) could vary vastly. Even the participants in this network could range from a few individuals to social groups and even entire communities.

In this article, it is argued that sanctuaries and the entities in control of cults were well aware of the networks of participants and that they intentionally shaped them through services and functions with clear socio-economic strategies in mind. This led to individual network structures and characteristics, which have rarely been studied, but can be interpreted as key socio-economic resources in the sacred landscape of Central Italy from the 7th to the 5th cent. BCE.

In order to reconstruct networks of sanctuaries, three well documented case studies from southern Etruria and Latium vetus have been selected (*fig. 1*), each involving different network structures, actors, and religious contexts: (1) the Portonaccio Sanctuary at Veii with a prestigious intercultural elite network; (2) the *emporion* Gravisca with a cross-cultural network for Mediterranean long-distance trade; and (3) the Forum Boarium in Rome with an interregional trade network built around the exchange of salt from the coast and cattle from the Apennines. The data sets for the reconstruction of the first two networks consist of inscriptions on dedicated vessels in the sanctuary, the reconstruction of the third network is based on a combination of literary and archaeological sources.

The three case studies are situated in the same regions and the sanctuaries were attended in the same time frame. Nevertheless, the networks are very different and allow the reconstruction of individual socio-economic strategies of each sanctuary when using their networks as resources to gain supra-regional significance and influence in Central Italy.

2. Case Study 1: The Portonaccio Sanctuary of Veii

The first case study, the Portonaccio Sanctuary, was located on top of a natural terrace on the west side of the city plateau of Veii. The suburban cult place was situated directly at the city gate (hence the name 'Portonaccio'), in one of the main streets of Veii. Ritual activities had begun by at least the first half of the 7th cent. BCE.[4]

In this first phase, the cult was performed in the open-air until ca. 540/530 BCE. Votive offerings (mostly bucchero pottery) were deposited next to a small shrine or *aedicula*, and at a later stage were placed in a large altar (maybe in the form of a foundational offering). Many vessels from this deposit contain formulaic inscriptions and provide information about the deities and the dedicants that will be discussed below.[5] The main god-

2 Dionysius of Halicarnassus, antiquitates Romanae 3, 32, 1–3; Livy 1, 30, 4–7.

3 Livy 5, 1, 1–7.

4 The Portonaccio Sanctuary of Veii is one of the best-known and most deeply studied Etruscan cult places (see Colonna 1985, 99–109 no. 5.1; 1987; Moretti Sgubini 2001, 37–88; Colonna 2002; 2008; Ambrosini 2009; Maras 2009a, 405–427; Baglione 2011; Carlucci 2011; Maras 2011; Michetti 2011; Potts 2015, 137 no. S10, 147 no. P16, 149 no. A2; Colonna 2019 with many further references).

5 For a selection of the inscriptions with further references see below Appendix I. All inscription numbers highlighted in bold in the text refer to the Appendix.

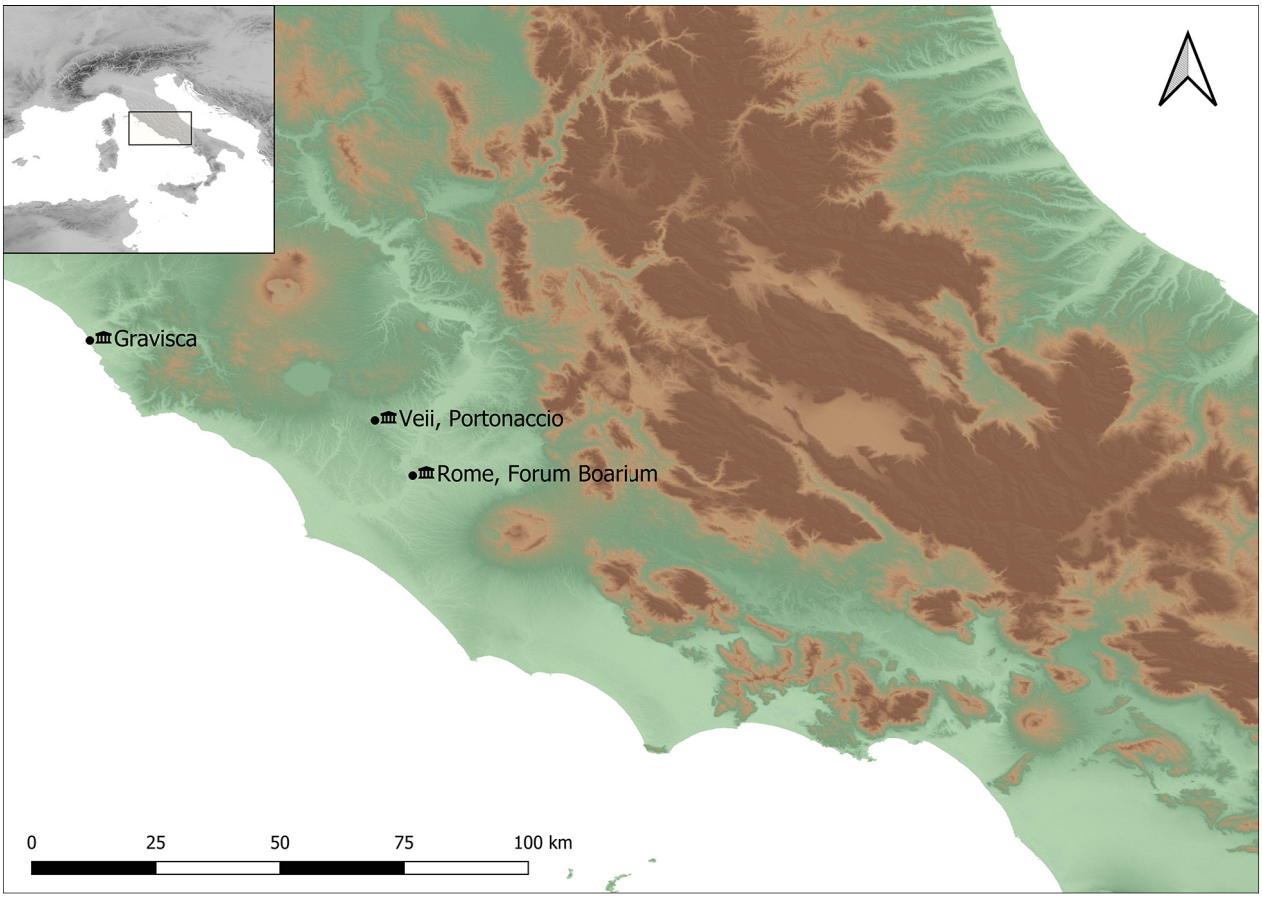

Fig. 1. Map of southern Etruria and Latium vetus with the three case-studies (by R. Da Vela with QGIS 3.16.1, <http://www.qgis.org>; SRTM Data: A. Jarvis, H. I. Reuter, A. Nelson, E. Guevara, 2008, Hole-filled seamless SRTM data V4, International Centre for Tropical Agriculture (CIAT), available on <http://srtm.csi.cgiar.org>).

dess of the sanctuary was Menerva, and the deities Aritimi/Artumes, Turan, Vena(i), Rath and Hercle were also venerated there. Two exceptional features of the cult at the Portonaccio Sanctuary from this phase are an oracle with a unique bucchero box for lots (an *arca* for *sortes*; inscription **I.12**), and the presence of a *scriptorium*, a writing school or a writing place with scribes, embedded into the cult place. A trapezoid building stood in the western part of the sanctuary, and has been interpreted as a banquet hall for visitors (Moretti Sgubini 2001, 38 f.; Colonna 2002; 2019, 118 f.).

In the sanctuary's second phase (ca. 540/530–510/500 BCE), it underwent a monumentalisation with the construction of a long terrace wall and a *sacellum* with the aforementioned altar for Menerva. In addition, an *oikos* and a cistern were built in the western part of the sanctuary (Moretti Sgubini 2001, 39 f.; Ambrosini 2009; Potts 2015, 149 no. A2; Colonna 2019, 119 f.).

During the third phase (ca. 510/500–450 BCE), the *oikos* was demolished and replaced with a large water basin and a monumental temple. The roof and pediment were decorated with architectural terracottas and life-size clay statues (Moretti Sgubini 2001, 57–64; Winter 2005; Colonna 2008; Carlucci 2011; Maras 2011; Michetti 2011). These radical building measures have been interpreted by Giovanni Colonna as an expression of a political shift at Veii from an aristocracy to a monarchy/*tyrannis* (Colonna 1985, 100 f.; Moretti Sgubini 2001, 40–43; Colonna 2019, 120–123).

Shortly after the middle of the 5th cent. BCE, the *sacellum* of Menerva was destroyed, buried, and replaced by a new entrance, while the altar area was renewed and monumentalised (Colonna 2002). This fourth phase of the sanctuary lasted until the Roman conquest of Veii in 396 BCE, and continued into the succeeding period of Roman dominion. The numerous dedications of statues,

figurines and votive heads in clay attest not only to ritual activities during the 5th–4th cent. BCE, but an uninterrupted continuity of cult practice after the Roman conquest of the city, lasting until the late 3rd/early 2nd cent. BCE (Moretti Sgubini 2001, 43 f.; Baglione 2008; Colonna 2019, 123 f.).

3. The Dedicants at the Portonaccio Sanctuary and Their Connections

The inscriptions on the votive offerings from the first phase in the Portonaccio Sanctuary allow us to reconstruct a vast interregional network of members of *gentes*/clans and of the social elites in the Etruscan city-states between the end of the 7th and the middle of the 6th cent. BCE. A selection of the inscriptions with further references can be found below in Appendix I.

At Portonaccio, votives usually describe the dedicating person to the reader in one formulaic sentence written in the first person (‘*mini muluvanice*…’ – ‘… dedicated me’ or similarly). During this period, the verb *mul-/muluvanice* describes the official act of a gift exchange (often between elite members) or of a dedication to a deity in a sacred context, as is the case here. The dedicating person is mentioned with his name and the name of his *gens*,[6] and sometimes the name of the receiving deity is also documented. The exceptionally rich collection of dedicants’ names allows the reconstruction of a vast and cross-cultural elite network centred on the Portonaccio Sanctuary, as demonstrated in the following discussion.

The names Velθur Tulumneś and Karcuna Tulumneś (**I.1**; **I.4**) testify to the presence of the aristocratic *gens Tulumne*, and according to Daniele Federico Maras the name is a typical ‘local’ name from Veii (Maras 2009a, 419). The *gens Tulumne* is also attested in two Latin votive inscriptions from a certain L. Tolonio(s) at the sanctuaries of Portonaccio and Campetti in Veii during the 4th–3rd cent. BCE. Dionysius of Halicarnassus (antiquitates Romanae 12, 5) and Livy (4, 17–19) mention Lars Tolumnius (in Etruscan he would be called **Larθ Tulumneś* or similar) as the king of Veii in 439–437 BCE. Therefore, both of the inscriptions at the Portonaccio Sanctuary provide evidence for the existence of an important, long-lasting *gens* of Veii that represented itself during the late 7th/early 6th cent. BCE at Portonaccio and according to literary sources even ruled Veii during the late 5th cent. BCE. If that was the case, it is remarkable that the family was able to represent itself in the city of Veii after the Roman conquest in 396 BCE (Morandi Tarabella 2004, 548–550 no. 569; Briquel 2009, 62 f.).

The name of the *gens Velkasna* (Laris Velkasnas; **I.12**) indicates a local clan from Veii (Maras 2009a, 419). However, the same *gens Velkasna* is also attested in an inscription from the end of the 6th cent. BCE, on a wall of the Cardarelli Tomb in the Monterozzi necropolis (loc. Calvario) in Tarquinia. It is therefore plausible that the *gens Velkasna* resided in Veii and attended the funeral of a member of a fellow *gens* in Tarquinia (Morandi 1999; Morandi Tarabella 2004, 188 no. 189; Briquel 2009, 49 f.).

Other *gentes* in inscriptions of the Portonaccio Sanctuary are similarly linked to city-states in southern Etruria. The *gens Teiθurna* is represented only once at Portonaccio ([Lari] s Teiθurn[as]; **I.18**), but appears on several objects of the 7th–6th cent. BCE that can be attributed to Caere (Colonna 1974; Morandi Tarabella 2004, 529 f. no. 546; Briquel 2009, 61 f.; ET Cr 2.73; 3.4–8). It is therefore highly probable that the *gens Teiθurna* was mainly active in Caere during the 7th–6th cent. BCE, while one member of this clan travelled to the Portonaccio Sanctuary and dedicated a vessel there.

The person Larice Vestricin[as] is attested twice at Portonaccio (**I.14**; **I.16**). This *gens* was present in the Monte Abatone Necropolis at Caere as well, where a person named Aranθ gifted an amphora to the deceased Ramuθasi Vestiricinai at the end of the 7th cent. BCE (Maras 2002, 270 f. no. 223; Morandi Tarabella 2004, 195 no. 198, 1; ET Cr 3.20). Therefore, Larice Vestricinas and his *gens* were probably from Caere (at least in the late 7th/first half of the 6th cent. BCE). The family name is connected to the Oscan name Vestirkíís (from the

6 In one case two persons dedicate a vessel (**I.1**), in another case an inscription contains probably a potter signature (**I.13**). If the generally accepted reading of inscription **I.6** is correct, there is only one case at Portonaccio with a woman dedicating an object. The less probable alternative in this case would be a man named Venalias Larinas.

Italic personal name **Vestrikos*), which might indicate a possible origin of the *gens Vestricina* in Campania or southern Samnium, and a subsequent migration to Caere in the 7th cent. BCE. However, this proposed origin is very uncertain and recently a connection in the opposite direction (from southern Etruria to the Oscan area) in a later period has also been discussed (on this subject Morandi Tarabella 2004, 195 f. no. 198; Briquel 2009, 51 f. with further references).

Two names may indicate a connection towards the city-state of Orvieto/Volsinii/Velzna. The *gens Amana* (**I.17**) is attested once at Portonaccio and also in the inscription of a chamber tomb for Larθ Amanas in the Crocifisso del Tufo Necropolis at Orvieto at the end of the 6th cent. BCE (Morandi Tarabella 2004, 57 no. 25; Briquel 2009, 47; ET Vs 1.92). The case of [Avi]le Zuqume (**I.15**) is more complicated: the name Zuqume may derive from **Zucu*/*Sucu*, and a variation of this (*Zuχu*) can be found at Orvieto in the chamber tomb of Larece Zuχus Mutus in the Cannicella Necropolis, dating from the end of the 6th cent. BCE. However, this connection is also very uncertain and must be treated as a proposal based on assumption (Morandi Tarabella 2004, 220 f. no. 228 f.; Briquel 2009, 55).

Two personal names show connections to the Etruscan city-state of Vulci and possibly to Rome. The dedication of Avile Vipiienas (**I.10**) might establish a plausible historicity to the tale of the brothers Avle and Caile Vibenna from Vulci, who were comrades (*sodales*) of Mastarna/Servius Tullius and helped him to become king of Rome in the early 6th cent. BCE. The tale is famously depicted in the wall paintings of the François Tomb at Vulci (ca. 330–320 BCE). Here it was used by the tomb owner Vel Saties and his *gens* to create and identify themselves with an epic past and glorious military victory of Etruscan heroes, such as Avle and Caile Vibenna, against Rome during the regal period. The images of the victorious past were in stark contrast to the historical reality of the late 4th cent. BCE with the increasing expansion of Rome (Holliday 2002, 63–74; Harari 2007; Rathje 2014; all with many references).

If one accepts the historicity of Avle Vibenna and identifies him as the Avile Vipiienas from the dedication at Portonaccio, then this person was from Vulci and played an important role in the regal period of Rome (Maras 2002, 262–264 no. 82; Morandi Tarabella 2004, 203 f. no. 210; Briquel 2009, 52; Maras 2009a, 417 no. Ve do.14).

The person Aville Acvilnaś (**I.5**) is known from his inscribed votive at Portonaccio and also from two bucchero oinochoai that he gifted in a funerary context at Ischia di Castro in the territory of Vulci (ET Vc 3.4–5). The name of the *gens Acvilna* is certainly connected to the Roman *gens Aquilia*, and one of its members, Caius Aquilius Tuscus, was consul of Rome in 487 BCE (Dionysius of Halicarnassus, antiquitates Romanae 8, 64–67; Livy 2, 40, 14). However, the direction of the transmission between the Latin *Aquilius* and the Etruscan *Acvilnaś* is unclear and under discussion (see Morandi Tarabella 2004, 33 no. 2; Briquel 2009, 46 f. with further references). According to Daniele Federico Maras (2009, 412 f. no. Ve do.7), the Etruscan *Acvilnaś* is a loan word from the Latin *Aquilius* and Aville Acvilnaś was a Roman aristocrat (probably Aulus Aquilius) who became an integrated member of the southern Etruscan elite, used the Etruscan language and participated in rituals at Portonaccio, as well as in gift exchanges with members of the social elite in Vulci. The case of Aville Acvilnaś certainly shows that he was somehow connected to Rome, Veii and Vulci in the first half of the 6th cent. BCE, which is noteworthy against the background of the aforementioned Avile Vipiienas/Avle Vibenna (**I.10**) and his connection to Servius Tullius/Mastarna.

Three inscriptions of the Portonaccio Sanctuary can be linked to the *ager Faliscus* and Latium vetus. Mamarce Apuniie (**I.3**) is not only known from his votive at Portonaccio: he also dedicated an inscribed bucchero amphora in a rich funerary context at Lavinium (probably a chamber tomb inside a monumental tumulus directly outside of the eastern city-gate) during the second quarter of the 6th cent. BCE (Guaitoli 1995, 557–562 with fig. 10, 14; Torelli 1996, 15; Morandi Tarabella 2004, 78 no. 49, 2; Briquel 2009, 48 f.; Maras 2009a, 410 no. Ve do.3).

The *gens Hvuluve* is represented twice at Portonaccio through the dedications of Θanirśiie Hvuluveś and [La]rice Hvuluves (**I.2**; **I.9**). A very similar name (maybe even the same *gens*) is attested in an inscription with the name Leθaie Vhulves on a bucchero vessel of the 1st half of

Name of *gens* or Person	No.	Connection	Type of Connection
gens Velkasna	**I.12**	Veii – Tarquinia	Personal mobility (gift exchange)
gens Teiθurna	**I.18**	Caere – Veii	Personal mobility (dedication)
gens Vestricina	**I.14; I.16**	(1) Caere – Veii (2) Campania, southern Samnium(?)	(1) Personal mobility (dedication) (2) Possible origin(?)
gens Amana	**I.17**	Volsinii – Veii	Personal mobility (dedication)
gens Zuqume	**I.15**	Volsinii – Veii	Possible connection to/origin in Volsinii(?)
Avile Vipiienas	**I.10**	Vulci – Veii – Rome	Personal mobility (dedication, warfare)
Aville Acvilnas	**I.5**	Rome – Veii – Vulci	Personal mobility (dedication, migration)
Mamarce Apuniie	**I.3**	Veii – Lavinium	Personal mobility (gift exchange)
gens Hvuluve	**I.2; I.9**	*ager Faliscus*, Latium vetus	Possible origin
gens Apaiae	**I.7**	southern Picenum; Apennine area	Possible origin

Table 1. Overview of individuals and *gentes* at Portonaccio and their connections (by R. Krämer).

the 6th cent. BCE at Mazzano Romano in the *ager Faliscus* (Naso 1994). The name Hvuluve/Vhulve is a loanword and originates either from the Latin (or Faliscan-Latin?) word *fulvus* ('blonde'), or the Latin personal name Fulvius ('the Blonde'). The *gens Hvuluve*/*Vhulve* is therefore originally from Latium vetus or the Faliscan area (Morandi Tarabella 2004, 198 f. no. 204; Briquel 2009, 56 f.; Maras 2009a, 415 f. no. Ve do.12).

Finally, according to Daniele Federico Maras (2002, 264 no. 118 with footnote 16; 2009a, 413 no. Ve do.8), the name of the *gens Apaiae* (Laris Apaiaeś; **I.7**) is probably of Italic origin and connected to the name Apaes in southern Picenum.

4. The Interregional Social Network at the Portonaccio Sanctuary of Veii

The actors of the Portonaccio Sanctuary were certainly members of rich and powerful clans/*gentes*, and belonged to different social elites with direct connections to the Etruscan city-states of Tarquinia, Caere, Volsinii, and Vulci, but also to Latium vetus and Rome (*table 1* and *fig. 2* give an overview of the above-mentioned connections).

In the 7th/early 6th cent. BCE, Etruscan literacy was limited to elite contexts and was particularly important in the mechanism of gift exchange between clans/*gentes* for the commemoration of friendships or alliances through *tesserae hospitales* (tokens of friendships – *hospitium*) and through gifts with formulaic inscriptions (especially including the verbal phrase *mini muluvanice* – … gave me as a gift).[7] In this sense, literacy became an important tool for the different Etruscan elites of the 7th/early 6th cent. BCE, as a means of communication, and a way to accumulate prestige and social capital, and enforce status differences as well as social stratification and segmentation.

Members of the Etruscan elite classes used the mechanisms and tools of literacy, especially *muluvanice*-inscriptions, in sanctuaries as well. Dedications thus became prestigious transactions between deities and the members of a strictly limited social circle, similar to the transaction of gift exchange (Krämer 2020, 122–124 with further references).

7 On early Etruscan literacy and its elite context see Sassatelli 2000; Maras 2012a; 2015a all with many references. On *tesserae hospitales* in Central Italy see Maggiani 2006; Colonna 2010, 287–289; Tuck/Wallace 2013, 16–20, 31–36 no. 3–8; Krämer 2016, 85 f. with fig. 8. On *muluvanice*-inscriptions and gift exchange between members of Etruscan and Latial elite families see: Cristofani 1975; Wallace 2008; Maras/Sciacca 2011; Tuck/Wallace 2013, 11–15; Amann 2015.

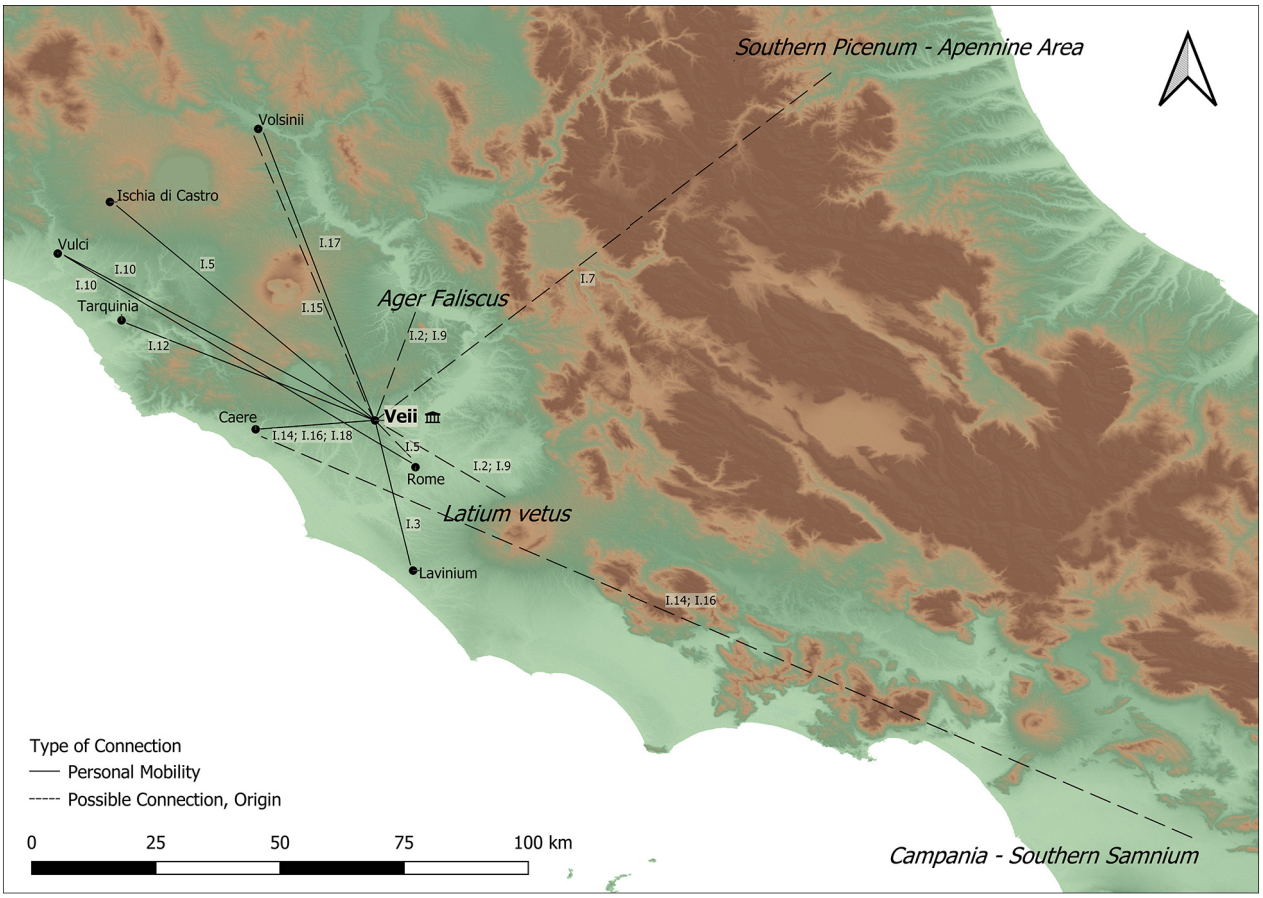

Fig. 2. Map of the Interregional Social Network at the Portonaccio Sanctuary of Veii (by R. Da Vela with QGIS 3.16.1, <http://www.qgis.org>; SRTM Data: A. Jarvis, H. I. Reuter, A. Nelson, E. Guevara, 2008, Hole-filled seamless SRTM data V4, International Centre for Tropical Agriculture (CIAT), available on <http://srtm.csi.cgiar.org>).

In what way did this elite social network with its interregional and cross-cultural connections serve as a resource for the Portonaccio Sanctuary of Veii? The sheer number of inscribed dedications at Portonaccio is certainly exceptional for an Etruscan sanctuary, and only matched by the inscriptions at Gravisca and Pyrgi, although these were mostly dedicated later and certainly not by members of Etruscan elite families. Only the 70 inscriptions (ca. 570–500 BCE) comprising dedications and the names of *gentes* in the recently excavated and published cult place Fondo Iozzino near Pompeii can be compared to the findings at the Portonaccio Sanctuary of Veii (Osanna 2016; Osanna/Pellegrino 2017; 2018).

In Etruria, the Portonaccio Sanctuary of Veii might therefore have established a unique role for itself as a supra-regionally and cross-culturally important and prestigious gathering place for Etruscan, Faliscan and Latial elites, who could represent themselves, create alliances and discuss sociopolitical issues in a separate, neutral and protected environment. One might think of the Portonaccio Sanctuary at Veii as an interregional religious centre, playing a similar role in terms of scale and sense as that of the Archaic Heraion at Samos in Greece, fulfilling the main function of a theatre and platform for public representation, communication and identity formation of social elites. Additionally, both sanctuaries, the Portonaccio of Veii and the Heraion at Samos, seem to have served also as 'international' meeting places for intercultural exchange, diplomatic contacts, social networking and political negotiations (for the sociopolitical role of the Archaic Heraion of Samos, see Mohr 2013, 21–39; Kyrieleis 2016; Ringheim 2019).

Moreover, the Portonaccio Sanctuary could channel, distribute, and control the key resource of literacy by establishing a *scriptorium*, a writing school or place. Daniele Federico Maras has shown

that *scriptoria* in Etruscan sanctuaries, especially the Portonaccio Sanctuary at Veii, were innovative and important nexuses for the development of early literacy that was certainly of high interest for elite *gentes* (Maras 2009b, 310–313; 2012b, esp. 332 f. with fig. 1; 2015a, 210–213).

In this sense, the Portonaccio Sanctuary provided members of elite families in Central Italy with the diacritical and prestigious tool of literacy, a platform for social representation and a meeting place for commemoration and communication with other elite members, thus gaining a unique and powerful position in the sacred landscape of Orientalising and Archaic Etruria.

5. Case Study 2: The *emporion* of Gravisca[8]

The second case study deals with the port and *emporion* Gravisca in the Etruscan city-state Tarquinia (Etruscan: *Tarchna*). The sanctuaries of Gravisca consist of two adjacent cult areas that were divided by the street leading from the port and salt works to the city of Tarquinia. Gravisca was first frequented by Greek sailors towards the end of the 7th/beginning of the 6th cent. BCE. Around 580 BCE, building activities began, and a first small *naiskos* was built for Aphrodite. Additionally, furnaces and evidence of metallurgical activities are already attested in the eastern area of the sanctuary during this phase (Torelli 2004, 120–122; Fiorini 2005, 181–185; Mercuri/Fiorini 2014, 31–33, 47–53). During the second building phase, around 550 BCE, the temple for Aphrodite was extended and a new cult building for Hera was constructed. At the same time, a new sanctuary for the Etruscan deities Śuri and Cavatha was built north of the previous cult area. These new building activities seem to have been connected with intensified long-distance trade and an increased number of Samian and eastern Greek visitors to the *emporion* and sanctuary.

6. The Dedicants at Gravisca and their Connections

Most inscriptions at Gravisca are written in Greek and mention Greek visitors, but there are some interesting Etruscan dedications as well.[9] The Etruscan offering inscriptions (for a selection, see **II.2–8**) are very short, written in a simple language and do not contain representative names of the prestigious *gentes* who visited Portonaccio, nor are they formulaic bearing the 'official' gifting expression *muluvanice*. Apparently, the social representation of an upper class did not play a significant role at Gravisca. In that case, what happened there in the 6th cent. BCE?

The Etruscan inscriptions of Gravisca represent the fundamental shift in Etruscan votive practice and literacy that took place in ca. 570–530/520 BCE. During this period, there was a gradual shift from long votive inscriptions bearing the names of exclusive *gentes* and describing the act of the dedication with the expression *muluvanice,* towards very short and simple consecrations,[10] or mentions of the dedicating worshipper.[11] This change in votive inscriptions represents a deep, fundamental shift from the diacritical cult practice of a limited prestigious social elite towards an open mass phenomenon accessible to large parts of society, taking place during the course of the 6th cent. BCE. Giovanni Colonna and Daniele Federico Maras have already observed this revolution in Etruscan religion and called it a shift between aristocratic and plebeian cult practices.[12]

8 For the findings and results of the excavation see the excellent and thorough publications of the series 'Gravisca. Scavi nel santuario greco': Valentini 1993; Boldrini 1994; Huber 1999; Johnston/Pandolfini 2000; Pianu 2000; Gori/Pierini 2001a; 2001b; Colivicchi 2004; Galli 2004; Iacobazzi 2004; Fiorini 2005; Fortunelli 2007; Bruni 2009. For a general overview of Gravisca see Fiorini/Torelli 2007; 2010; Fiorini/Fortunelli 2011; Mercuri/Fiorini 2014; Di Miceli/Fiorini 2019.

9 The inscriptions discussed here can be found in Appendix II, the inscription numbers refer to this Appendix.

10 E.g. *mi turuns* – I belong to Turan (**II.2**) or *vea* – to/for (the goddess) Vei (**II.5**).

11 E.g. *paiθe* – Paiθe (**II.5**), [---? *ar*]*nza turn*[*s* ---?] – [… Ar]nza ('little' Arnθ) [dedicated, gave it (or similar) to] Turan (**II.3**).

12 Colonna 1989/1990, 879: 'Non è certo casuale né artificiosa la contrapposizione tra Veio da un lato (e Vulci e Orvieto, donde vengono le uniche dediche lapidarie finora note), e Gravisca, S. Marinella e Pyrgi dall'altro, che è contrapposizione tra santuari urbani e santuari emporici, tra culto "aristocratico" e culto "plebeo", tra centro e periferia. Non v'è dubbio infatti che proprio nell'ambito emporico si sviluppino nuove forme di devozione, destinate rapidamente a grande fortuna, con riflessi sul regime delle offerte e del formulario votivo.' Maras 2009a, 31: 'Si assiste nel corso del periodo arcaico ad una evoluzione del sistema epigrafico votivo, a partire dal sistema aristocratico orientalizzante verso forme affini a quelle della Grecia classica, cui fa riscontro nel mondo etrusco una sensibile diminuzione dei testi funerari

A similar phenomenon can be found in the Greek *symposion* that was originally limited to the aristocracy and later became accessible to a large group of citizens.

Against this background, the short personal names of the dedicants at Gravisca – Arnza (little Arnθ; **II.3**), Ramθa Venatres (**II.4**), Paiθe (**II.5**), Tit[e] or Tit[a] (**II.6**) and [L]arza (little Larθ; **II.7**) – indicate that they were certainly not part of a prestigious social elite. Beyond that, the diminutive form with *-za* in Arnza and Larza could point to a particularly low social status, such as a poor person, slave, servant or freed slave (Latin *libertus*, Etruscan *lautni*).[13] In this sense, the abovementioned Etruscan dedications could have been made by servants or slaves who worked at Gravisca, or by recently freed slaves, or even by refugees who sought asylum in the sacred institution of the sanctuary (ἀσυλία; for the interpretation of the Etruscan dedicants, see Torelli 2004, 129 f.; Fiorini/Torelli 2010, 44 f. with footnotes 110–116; Mercuri/Fiorini 2014, 43–45; Krämer 2020, 124 with footnotes).

The Greek inscriptions paint a completely different picture of the Greek visitors at Gravisca during the 6th and 5th cent. BCE, and offer interesting insights about the places of origin of visiting merchants and the economic network across the Mediterranean during this period. Certainly the most famous attested dedicant at Gravisca is Sostratos, who offered a stone anchor to the Apollon of Aigina around 500 BCE (**II.1**). He has been often identified with Sostratos of Aigina, son of Laodamas, who is mentioned by Herodotus (4, 152, 3–4) as the wealthiest merchant of his time. Additionally, the name Sostratos is also attested on an Attic plate fragment of the late 6th cent. BCE from Pyrgi with the votive inscription [Σω]στρατος : ανε[θηκεν …] – [So]stratos ded[icated …] (Krämer 2016, 83 with footnote 47 and further references). It is probable that in all the three cases we are dealing with the same Sostratos from Aigina, while other cases discussed are less convincing (Johnston/Pandolfini 2000, 15 f.; Schweizer 2007, 307–311; Demetriou 2012, 64, 80 f.; Krämer 2016, 82–84).

Another dedicant has the common Greek name Euarchos (**II.15**), but according to Alan Johnston the script is almost certainly Aiginetan (Johnston/Pandolfini 2000, 19 no. 54; 25; Demetriou 2012, 80). Therefore, Euarchos was probably also from Aigina, like Sostratos.

Both the names Deliades (**II.9**) and Moschos (**II.12**) are common Greek names and give no indications about the specific regions or *poleis* that they may have departed from. Similarly unclear is the place of origin for Deiakos/Deialkos (**II.2**) and Eudemos (**II.18**). According to Norbert Ehrhardt (1985, 140), the name Eudemos was common in Ionia and Athens, while Daniele Federico Maras suggests that the name Deiakos/Deialkos was written in an Attic or Ionian alphabet. Therefore, both dedicants could be from Attica or the Ionian coast.

Themistagoras (**II.19**) has a clearer provenance, since this name is almost unknown in mainland Greece, but very common throughout the Ionian coast. Possible places of origin for Themistagoras could be Miletos, Ephesos, Phokaia or Lampsakos (Ehrhardt 1985, 140 no. 2).

The name Zoilos (**II.17**) is an interesting case, since dedications with this name not only appear in Gravisca, but also occur several times in Naukratis during the second quarter of the 6th cent. BCE, making it plausible that the same merchant visited and made offerings at both places. The name is fairly common in Samos, but often also appears in Naukratis on pottery from Chios in Ionian script. The merchant Zoilos was certainly from the Ionian coast, maybe from Chios or Samos, and probably visited both Gravisca and Naukratis (Johnston/Pandolfini 2000, 21 no. 83; 26; Demetriou 2012, 81; Krämer 2016, 84).

Two visitors at Gravisca were very likely from Samos. The name Hyblesios (**II.11**) is extremely rare and found on inscriptions from Samos, but appears also on one dedication to Hera at Naukratis around 550 BCE (Torelli 1982, 318–320; Ehrhardt 1985, 141; Demetriou 2012, 79 f.; Krämer 2016, 84). Probably a Samian merchant named Hyblesios travelled a similar route to Zoilos, visiting the *emporia* of both Naukratis and Gravisca, and dedicated vessels to Hera in both sanctuaries during the middle of the 6th cent. BCE. The name

di dono con l'arrivo dell'età recente'. See also Krämer 2020, 122–124 with fig. 8.6; Krämer 2022, 117–120, 132–140 with new data on this matter.

13 For the diminutive suffix *-za* in the Etruscan language, see Agostiniani 2003.

Individual Name	No.	Connection	Dating
Sostratos	**II.1**	Aigina – Pyrgi – Gravisca	ca. 500 BCE
Euarchos	**II.15**	Aigina – Gravisca	ca. 510–500 BCE
Deliades	**II.9**	Greece – Gravisca	ca. 550–530 BCE
Moschos	**II.12**	Greece – Gravisca	ca. 550–530 BCE
Deiakos/Deialkos	**II.2**	Attica or Ionian coast(?) – Gravisca	ca. 470–460 BCE
Eudemos	**II.18**	Attica or Ionian coast(?) – Gravisca	ca. 550–530 BCE
Themistagoras	**II.19**	Ionian coast – Gravisca	ca. 500–480 BCE
Zoilos	**II.17**	Ionian coast, maybe Chios or Samos(?) – Naukratis – Gravisca	ca. 550–530 BCE
Hyblesios	**II.11**	Samos – Naukratis – Gravisca	ca. 550 BCE
Erxenor	**II.16**	Samos – Gravisca	ca. 550–530 BCE
Lethaios	**II.14**	Caria or Ephesos – Mende – Gravisca	ca. 530–520 BCE
Paktyes	**II.10**	Caria, Miletos or Ephesos – Gravisca	ca. 550–530 BCE
Ombrikos	**II.13**	Umbria or Crete? – Gravisca	ca. 520–500 BCE

Table 2. Overview of Greek individuals at Gravisca and their connections (by R. Krämer).

Erxenor (**II.16**) is also relatively rare and found on Samos and Delos, but Samos is much more likely as the place of origin in this context (Johnston/Pandolfini 2000, 20 no. 75, 26; Demetriou 2012, 79).

Two visitors of Gravisca could be from the region of Miletos, Ephesos, or even from Caria. The name Lethaios (**II.14**) does not occur in mainland Greece, but a Carian river with this name runs near Ephesos. Lethaios could have been a Carian or a Greek merchant from the area of Ephesos. According to Alan Johnston, a contemporary Attic cup from Mende bears the same name in very similar script, meaning that the same person probably visited Mende and dedicated this vase (Torelli 1977, 408; Johnston/Pandolfini 2000, 18 no. 24, 25; Demetriou 2012, 81 f.). Paktyes (**II.10**) is a Carian name, but it is also found in Miletos and Ephesos. Herodotus (1, 153–161) mentions a treacherous treasurer of King Kroisos with this name, but we cannot possibly identify the dedicant at Gravisca with that person. The merchant Paktyes came either from Caria, Miletos or Ephesos to Gravisca (Ehrhardt 1985, 141 no. 3; Demetriou 2012, 82).

Finally, the name Ombrikos (**II.13**) is very difficult to interpret and could refer to someone from Umbria or might instead be related to the Cretan Ombrion and Ombrias (Torelli 1977, 408; Demetriou 2012, 82).

7. The Economic Network of Long-Distance Trade at Gravisca

It thus becomes clear that the Greek visitors to Gravisca came from specific regions and with clear intentions (see *table 2* and *fig. 3* for an overview of the visitors and their connections). The inscriptions of Sostratos and Euarchos from the end of the 6th cent. BCE can be traced back to Aigina, while many inscriptions (**II.11**; **II.16**; **II.17**; **II.19**) show links to the Ionian coast and especially to Samos, Ephesos and in some cases perhaps even Caria (**II.10**; **II.14**). Some of the Greek travellers, such as Sostratos, Zoilos, Hyblesios and Lethaios (**II.1**; **II.11**; **II.14**; **II.17**), can also be connected to other ports, *emporia* and sanctuaries, that is Pyrgi, Naukratis, and Mende. The data suggests that the Greek visitors were merchants (*naukleroi*) from the Ionian coast, many of whom became specialised in long-distance trade throughout the entire Mediterranean during the 6th cent. BCE.

The hypothesis that the sanctuary at Gravisca was established by an Ionian initiative, as proposed by Mario Torelli and Lucio Fiorini, is convincing and generally accepted among scholars, who exclusively debate the origin of the eastern Greek merchants involved in the foundation process: Phokaia, Miletos, Samos or a coalition of

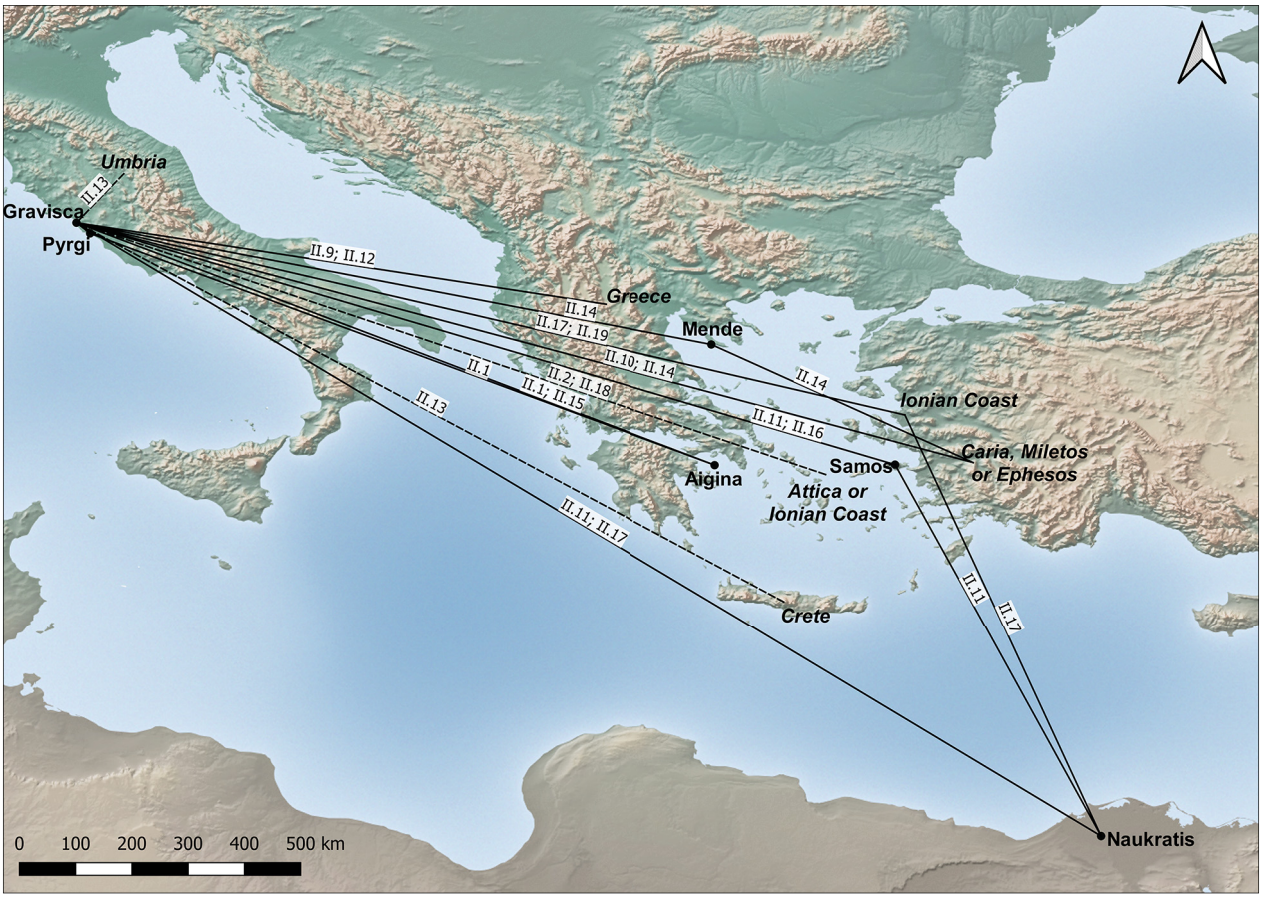

Fig. 3. Map of the economic network of long-distance trade at Gravisca (by R. Da Vela with QGIS 3.16.1, <http://www.qgis.org>; Made with Natural Earth. Free vector and raster map data, <http://www.naturalearthdata.com).

Ionian city-states in the sense of an Ionian league (Torelli 2004; Haack 2007; Demetriou 2012, 77–83; Mercuri/Fiorini 2014, 31–33; Krämer 2016, 78 f.; Di Miceli/Fiorini 2019, 55 f.). Herodotus' account and the archaeological data suggest that the *emporion* Naukratis was founded simultaneously on the initiative of the Ionian city-states at a similar date, although there is an intensive discussion about the details of the foundation (Krämer 2016, 77 f. with further references).

The author of this article has argued elsewhere that the establishment of both Naukratis and Gravisca were part of a larger strategy of eastern Greek merchants during the early 6th cent. BCE, a kind of 'Ionian masterplan' to create and control long-distance trade and the flow of resources on a large scale within the entire Mediterranean. This masterplan encompassed the founding and trade activities of the *emporia* Naukratis and Gravisca during the late 7th/early 6th cent. BCE, the foundation of the colony Massalia and the alliance with Nannos around 600 BCE, and the trade negotiations and alliances with Arganthonios at Tartessos and with Tarquinius Priscus at Rome during the early 6th cent. BCE, as well as the introduction of coinage at the same time (Krämer 2016).

The sanctuary of Gravisca and its Etruscan city-state of Tarquinia were part of a vast economic network throughout the entire Mediterranean during the 6th cent. BCE and were involved in the long-distance trade of resources (probably grain, metal or salt) with great profits for Tarquinia. According to Herodotus (4, 152), the access and establishment of the largest trade network of its time generated a great fortune for the Ionian *naukleroi* and for Sostratos, and it must have been profitable for Gravisca and Tarquinia as well.

8. Case Study 3: The Forum Boarium in Rome and its Interregional Trade Network

The last case study is the Forum Boarium (and the adjacent *portus Tiberinus*) in Rome (Coarelli 1988; 1995). The forum was situated on the riverbank of the Tiber and at the limit of the sacred border (*pomerium*) of Rome. Originally a swampy basin, the area had been transformed into the earliest Roman port and into a cattle market during the regal/Archaic period. While the forum was not itself a sanctuary, it was framed by two important cult places.

One sanctuary was dedicated to the goddesses Fortuna and Mater Matuta at Sant'Omobono, with monumental cult buildings and architectural terracottas existing from the 6th cent. BCE onwards (for the sanctuary, see most recently Damiani/Parisi Presicce 2019, 41–110; for the architectural terracottas of the Veii–Rome–Velletri decorative system and their interpretations, see Lulof 2000; Winter 2005; 2009, 311–393 ch. 5; Maras 2015b). The other cult belonged to Hercules and can be connected to the Ara Maxima of the Roman Republican period, although the actual date of establishment is uncertain (Coarelli 1988, 60–103; Torelli 2006).

What kind of networks found their nexus at the Forum Boarium in Rome? As mentioned above, according to literary sources Ionian merchants sailed the Tiber and made an alliance with the Roman king Tarquinius Priscus during the early 6th cent. BCE (Justin 43, 3, 4; see also Krämer 2016, 87 f. with footnotes 76–77 and further references). Indeed the Forum Boarium and the *portus Tiberinus* have often and rightfully been interpreted as an *emporion* for Mediterranean long-distance trade, especially with Greeks and Phoenicians, and Mario Torelli (2006, 574–583) has compared its role with those of the Etruscan sanctuary-ports at Gravisca and Pyrgi. An economic network similar to the one at Gravisca is possible, but cannot be evidenced via inscriptions or other sources.

Apart from that, the sanctuary of Sant' Omobono contained not only rich terracotta decorations with high symbolic value, but also an inscribed *tessera hospitalis* bearing the Etruscan name Araz Silqetenas Spurianas referring to the Etruscan *gens Spuri*(*a*)*na* from Tarquinia with possible links to Sulcis on Sardinia. Therefore, the sanctuary was part of a vast and prestigious intercultural elite network similar to that of the Portonaccio Sanctuary at Veii (Krämer 2016, 85 f. with footnote 65 and references). However, in this article a function fulfilled by this sanctuary is emphasised that is distinct from the previous case studies, with their aristocratic social networks and long-distance trade networks.

The name Forum Boarium ('cattle market') already points toward the trade of cattle along with wool, cheese, and milk as main activities on this site and, according to the literary tradition the cult and foundation of the Ara Maxima at the Forum Boarium was connected to Hercules, who slew Cacus and drove Geryon's cattle through Italy (Dionysius of Halicarnassus, antiquitates Romanae 1, 39–40; esp. 1, 40, 6).

Hercules was also an important god for the Sabellic people in the Central Apennines and strongly connected not only to transhumance and transportation routes, but also especially to cattle and salt, as evidenced by the sanctuary of Hercules Salarius in Alba Fucens.[14] In this sense, Hercules could have served as a protector of herdsmen and their cattle, and his popular cult in the Central Apennines and on the Forum Boarium seem to connect seasonal transhumance in the mountains and the trade of cattle, wool, cheese and milk in Rome.

Additionally, the Forum Boarium and the *portus Tiberinus* already served as a central hub for many streets and communication roads as early as the Archaic period, an important one of these being the *via salaria* ('salt road') that ran along the Tiber, Fidenae and Crustumerium into the Central Apennines and Sabine territory (Catani/Paci 1999). During the Archaic period, that is in the 7th–5th cent. BCE, cattle were probably bred by herdsmen under seasonal transhumance in the Latin and Sabine mountains, and then brought by the *via salaria* to the Forum Boarium, to be traded there along with cheese, wool and milk.

14 Van Wonterghem 1998; 1999; Torelli 2006, 579 f., but see also Bradley 2005, 134–140 and Stek 2009, 55–58 with a more cautious and critical point of view. For transhumance and religious networks in Hirpinia, see Da Vela in this volume.

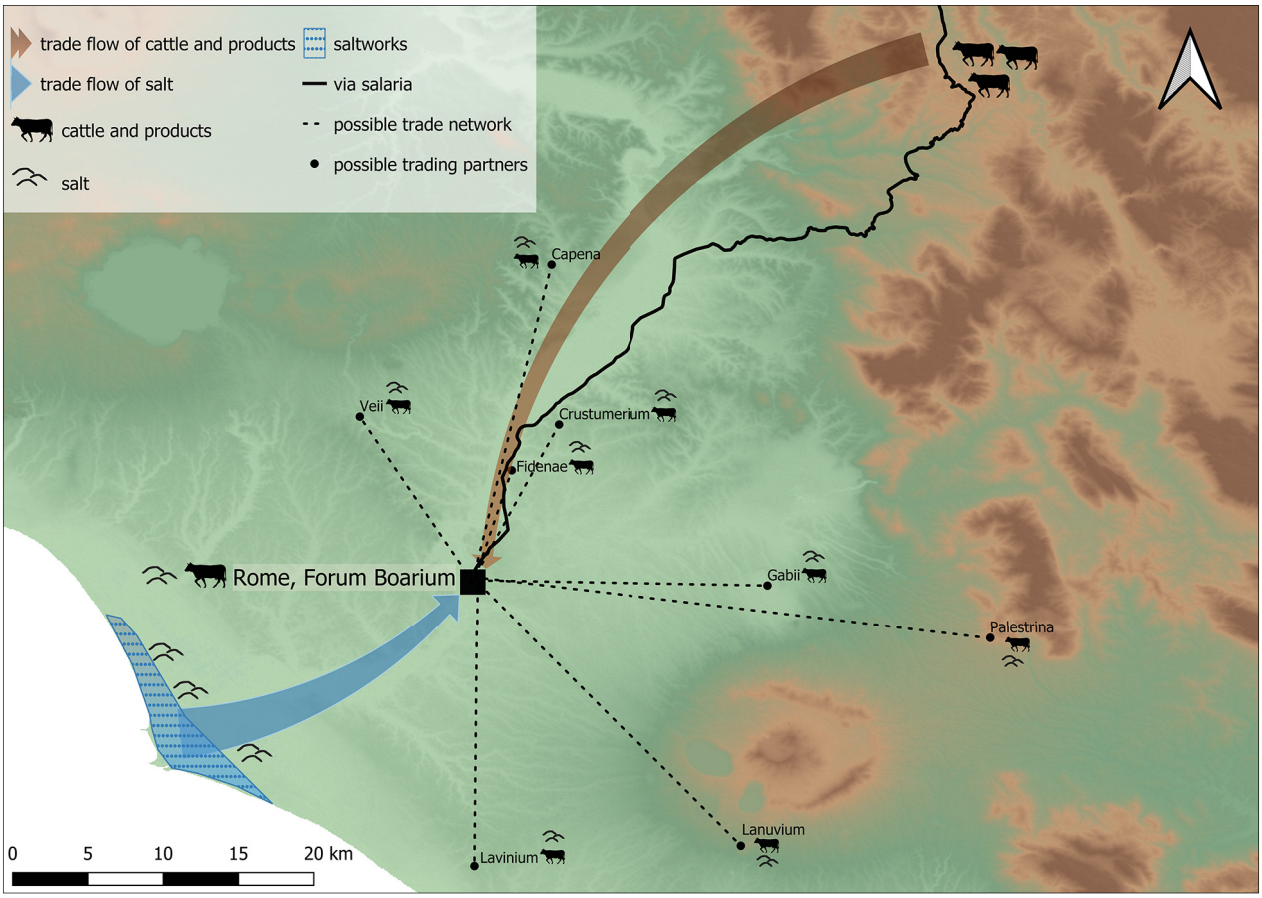

Fig. 4. Map of the interregional trade network of the Forum Boarium in Rome (by R. Da Vela with QGIS 3.16.1, <http://www.qgis.org>; SRTM Data: Jarvis A., H. I. Reuter, A. Nelson, E. Guevara, 2008, Hole-filled seamless SRTM data V4, International Centre for Tropical Agriculture (CIAT), available on <http://srtm.csi.cgiar.org>).

The name of the *via salaria*, the cult of 'Hercules Salarius' in Alba Fucens and Pliny the Elder (naturalis historia 31, 88–89) attest to the importance of salt for the cattle herdsmen, who needed it not only for the preservation of meat, but also as a nutritional supplement for their cattle, and transported it into the mountains along the *via salaria*. The salt was extracted from the saltworks at the mouth of the Tiber and on the Tyrrhenian coast,[15] then brought via the Tiber to the Forum Boarium and sold there to the herdsmen, as well as to the inhabitants of Rome and the surrounding Latin communities (Viglietti 2011, 231–233; Cifani 2021, 52 f.; Krämer in press).

The Forum Boarium served as an interregional market and a central nexus for the trade of the important commodities salt, meat, and livestock for the Latial coast, the Central Apennines, as well as for the Latin and Sabine communities in the Roman hinterland during the Archaic period (*fig. 4*). In this case the network was rather limited but dense, thus securing control over the trade of necessary goods in the entire region and gradually gaining monopoly over the salt trade in Central Italy (Cifani 2016, 166–169; 2021, 52 f. 223–226). One may even interpret the Forum Boarium in Rome in terms of what is referred to as a 'bottleneck' in political economy, meaning 'constriction points in commodity chains, which offer the opportunity to limit access by creating ownership over resources, technologies, or knowledge' (Earle et al. 2015, 639). Here, Rome was in control of regional resources that were naturally situated

15 According to the literary sources already in the regal period: Livy 1, 33, 9; Pliny the Elder, naturalis historia 31, 89; Plutarch, parallel lives. Romulus 25, 4.

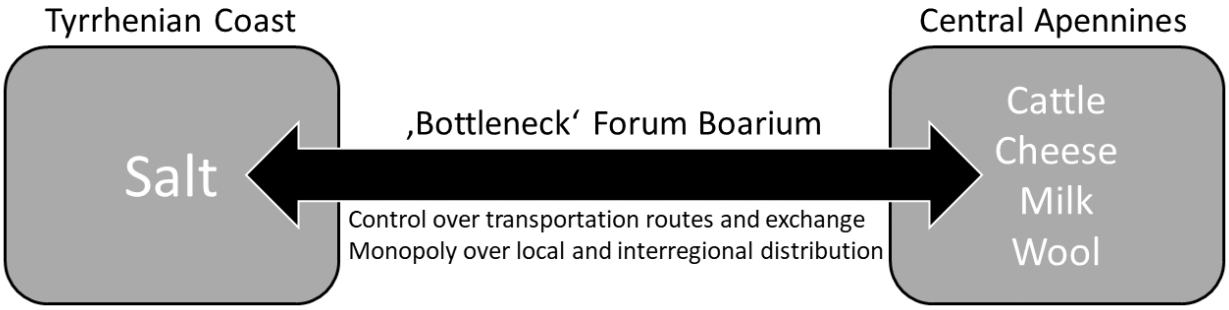

Fig. 5. Model of the 'bottleneck' created by the Forum Boarium in Rome for the distribution of regional resources in Latium vetus (by R. Krämer after Earle et al. 2015, 640 fig. 3).

in far-flung locations (the Tyrrhenian coast and the Central Apennines) and their transportation routes resulted in a 'bottleneck', granting Rome economic profits as well as socio-political power in the entire Latial-Sabine region (*fig. 5*).[16]

9. Networks as Economic Resources in Sanctuaries of Central Italy

The analysis of the three case-studies has shown that the Portonaccio Sanctuary at Veii, the *emporion* of Gravisca and the Forum Boarium at Rome all had very individual networks with different actors at their disposal. The Portonaccio Sanctuary was a cross-cultural gathering place for prosperous clans (*gentes*) of the social elites with political ambitions in different city-states across Etruria and Latium vetus, who established contacts, made alliances, and created social networks during the late 7th and early 6th cent. BCE. The *emporion* of Gravisca was part of a vast Mediterranean network for long-distance trade that was established by Ionian seafarers and merchants with direct and frequent connections to similar ports of trade, such as Naukratis and Pyrgi, and to other regions with lucrative resources, such as Massalia and Tartessos. The Forum Boarium at Rome was a regional, but powerful nexus for the transportation and trading of cattle and salt between the Central Apennines and the Latial coast, creating an important market and the control of important commodities in the Latin-Sabine region.

The above-mentioned examples were chosen for three reasons: They are well documented, two of the three case studies contain many inscriptions with information about the networks and their features, and they were cult places of supra-regional importance. But what do the case studies represent, were they the exception or the norm in regards to sanctuaries in Central Italy?

The three case studies were certainly exceptional in terms of significance or importance, and only a few other sanctuaries in Etruria stand comparison, such as Campo della Fiera near Orvieto/Volsinii (probably to identify with the *Fanum Voltumnae*, the federal sanctuary and meeting place of the Etruscan league attested in literary sources), Pyrgi, or the afore-mentioned cult place of Fondo Iozzino at Pompeii, at least in terms of its impressive collection of inscriptions. Above, the functions and significance of the Portonaccio Sanctuary at Veii have been compared to those of the Greek Heraion of Samos as well.

The Portonaccio Sanctuary, Gravisca, and the Forum Boarium are therefore not typical for the sacred landscapes or the whole of religious spaces in Central Italy from the 7th–5th cent. BCE, but they do show some significant characteristics within their specific networks.

All of the three sanctuaries analysed here operated with a high degree of specialisation regarding their functions and activities, the resulting individual networks can be interpreted as resources that translate directly into centrality, prestige, or socio-political and economic value for each of the

16 For the concept of 'bottlenecks' in political economics see Earle et al. 2015 with references.

sanctuaries and communities. The intercultural elite network of the Portonaccio Sanctuary at Veii lead to a unique role as an important socio-political meeting place throughout southern Etruria and Latium vetus. Gravisca, and therefore the city-state of Tarquinia, was connected to Mediterranean long-distance trade and its profits, while the Forum Boarium allowed Rome to control the flow and distribution of crucial commodities, such as salt and cattle, in the entire region of Latium vetus from the coast to the Apennines.

The perspectives of networks, and networks as resources, give us various insights into the role of the three sanctuaries. All of the three sanctuaries were significant socio-political and economic institutions. At the same time, they varied a lot in their functions and the actors of their networks (prosperous clans/*gentes* in Veii – Ionian *naukleroi* and seafarers in Gravisca – Latin and Sabine herdsmen, salt workers and communities in Rome), although the three sanctuaries were frequented in the same region and the same period. It is also argued that the sanctuaries themselves can be interpreted as *actors* with an *agency*, which intentionally designed their specific services and functions. Therefore, the networks were deliberately shaped and the result of particular socio-economic strategies and interests. In this sense, the individual networks were resources for each of the sanctuaries to gain a specific socio-economic profile and supra-regional importance.

Robinson Peter Krämer
University of Rostock
Heinrich-Schliemann-Institut für Altertumswissenschaften
Department of Classical Archaeology
Schwaansche Str. 3
18055 Rostock, Germany
robinson.kraemer@uni-rostock.de
kraemer.antiquity@gmail.com

Appendix

I. Selection of Vase Inscriptions from the Portonaccio Sanctuary at Veii with Personal Names

I.1. Bucchero oinochoe. End of 7th cent. BCE.
velθur tulumneś pesnu zinaie mene mul[*uvanice*] –
Velθur Tulumneś (and) Pesnu Zinaie dedicated me
Stefani et al. 1930, 310 no. 15, 311 fig. 16, 327 f. no. 15, Pl. 12c; Buonamici 1931, 547 no. 15; Buffa 1935, 244 no. 858; Vetter 1954/1955, 50 f. no. 2; Cristofani 1972, 93; De Simone 1975, 146 no. 33; Morandi 1989, 592–594 with fig. 6; Morandi Tarabella 2004, 548 no. 569, 1; Briquel 2009, 52–54, 62–65; Maras 2009a, 408 f. no. Ve do.1; Krämer 2022, 297 no. VP04; ET Ve 3.2.

I.2. Bucchero amphora. End of 7th – beginning of 6th cent. BCE.
mini θanirśiie turice hvuluveś – Θanirśiie Hvuluveś gave me
mi mla[*χ*] *mlakaś* – I am beautiful for someone/something beautiful
Stefani et al. 1930, 317 f. no. 39 with fig. 40, 332 no. 39, Pl. 12a; Buonamici 1931, 549 no. 39; Buffa 1935, 248 no. 881; Pallottino 1939, 474 no. 4; Morandi Tarabella 2004, 198 no. 204, 2; Briquel 2009, 56 f.; Maras 2009a, 409 f. no. Ve do.2; Krämer 2022, 297 no. VP05; ET Ve 3.30.

I.3. Bucchero oinochoe. Beginning of 6th cent. BCE.
mini muluvanice mamar:ce a:puniie venala –
Mamarce Apuniie dedicated me to (the goddess) Vena(i)
Stefani et al. 1930, 306 f. no. 1 with fig. 2, 324 f. no. 1, Pl. 11; Buonamici 1931, 545 no. 1; Buffa 1935, 242 no. 844; Buonamici 1942, 268–270 no. 1 with fig. 1; Colonna 1987, 427 f. with fig. 11; Amann 2000, 115 f.; Morandi Tarabella 2004, 78 no. 49, 2; Briquel 2009, 48 f.; Maras 2009a, 109, 410 no. Ve do.3; Krämer 2022, 297 no. VP06; ET Ve 3.5.

I.4. Bucchero oinochoe. First half of 6th cent. BCE.
mine mulvanice karcuna tulumneś – Karcuna Tulumneś dedicated me
Pallottino 1939, 457 f. no. 2; Vetter 1954/1955, 50 f. no. 2; Maras 2002, 267 no. 210, 268 fig. 29, Pl. 40, 77; Morandi Tarabella 2004, 548 f. no. 569, 2; Briquel 2009, 62–65; Maras 2009a, 411 f. no. Ve do.6; Krämer 2022, 297 no. VP09; ET Ve 3.6.

I.5. Bucchero oinochoe. Second quarter of 6th cent. BCE.
[*min*]*e muluvanice a:ville a:cvil:naś:* – Aville Acvilnaś dedicated me
Stefani et al. 1930, 310 no. 16, 311 fig. 17, 328 no. 16, Pl. 13g; Buonamici 1931, 547 no. 16; Buffa 1935, 244 no. 859; Buonamici 1942, 275 f. no. 16 with fig. 4; Morandi Tarabella 2004, 33 no. 2; Briquel 2009, 46 f.; Maras 2009a, 412 f. no. Ve do.7; Krämer 2022, 298 no. VP10; ET Ve 3.7.

I.6. Bucchero oinochoe. First half of 6th cent. BCE.
m[*i*]*ni mulvanice venalia : ś:larinaś : e:n mipi kapi m*[*i*(*r*)] *n*[*u*]*nai:* – Venalia Ślarinaś dedicated me. Do not take/touch me, I am sacred
Stefani et al. 1930, 307 no. 2 with fig. 3, 325 no. 2; Buonamici 1931, 545 f. no. 2; Buffa 1935, 243 no. 845; Pallottino 1939, 464 f. no. 12; Colonna 1987, 421 footnote 19; Amann 2000, 115 f.; Maras 2002, 267–270 no. 222 with fig. 30, 272 f., Pl. 78; Briquel 2009, 60 f.; Maras 2009a, 413 no. Ve do.8; Amann 2019, 42 f.; Krämer 2022, 298 no. VP11; ET Ve 3.13.

I.7. Bucchero kantharos. First half of 6th cent. BCE.
mini mulvanice laris : a::paia:e:ś: – Laris Apaiaeś dedicated me
Pallottino 1939, 459 f. no. 4; Buonamici 1942, 290 f. no. 51 with fig. 17; Vetter 1954/1955, 51 no. 4; Maras 2002, 264 no. 118, 265 fig. 27, Pl. 76; Morandi Tarabella 2004, 71 no. 38; Briquel 2009, 48; Maras 2009a, 414 no. Ve do.9; Krämer 2022, 298 no. VP12; ET Ve 3.8.

I.8. Bucchero chalice. First half of 6th cent. BCE.
mini mulvanice mamarce quθaniie[ś ?] – Mamarce Quθaniie[ś] dedicated me
Pallottino 1939, 458 f. no. 3; Vetter 1954/1955, 51 no. 3; Maras 2002, 263 fig. 26, 264 no. 85, Pl. 75; Morandi Tarabella 2004, 417 no. 456; Briquel 2009, 58 f.; Maras 2009a, 414 no. Ve do.10; Krämer 2022, 298 no. VP13; ET Ve 3.12.

I.9. Bucchero lid. Beginning of 6th cent. BCE.
min[*i mulu*]*vanice* [*la*]*rice hvuluves:* – [La]rice Hvuluves dedicated me
Pallottino 1939, 460 f. no. 5; Buonamici 1942, 291 f. no. 52 with fig. 18; Vetter 1954/1955, 52 no. 5; Morandi 1989, 590–592 with fig. 5; Maras 2002, 264 no. 163, 266 fig. 28, Pl. 76; Morandi Tarabella 2004, 198 no. 204, 1; Briquel 2009, 56 f.; Maras 2009a, 415 f. no. Ve do.12; Krämer 2022, 298 no. VP15; ET Ve 3.9.

I.10. Bucchero chalice (or bowl with handle). First half of 6th cent. BCE.
mine muluv[*an*]*ece a:vile vipiien:nas* – Avile Vipiienas dedicated me
Pallottino 1939, 455–457 no. 1; Buonamici 1942, 289 f. no. 48 with fig. 16; Vetter 1954/1955, 50 no. 1; Maras 2002, 262–264 no. 82 with fig. 26, Pl. 74; Morandi Tarabella 2004, 203 no. 210, 1; Briquel 2009, 52; Maras 2009a, 417 no. Ve do.14; Krämer 2022, 298 no. VP17; ET Ve 3.11.

I.11. Etrusco-Corinthian bowl. First half of 6th cent. BCE.
mini mulvanice velθur qurtiniie – Velθur Qurtiniie dedicated me
Pallottino 1939, 463 f. no. 10; Vetter 1954/1955, 53 no. 10; De Simone 1975, 147 no. 35; Maras 2002, 268 fig. 29, 271 no. 363, Pl. 79; Morandi Tarabella 2004, 417 no. 457; Briquel 2009, 59; Maras 2009a, 417 f. no. Ve do.15; Krämer 2022, 298 no. VP18; ET Ve 3.14.

I.12. Bucchero box for votives (*arca* for *sortes* of an oracle?). First half of 6th cent. BCE.
laris velkasna[*s* ---] *menervas* – Laris Velkasna[s dedicated me] to Menerva
Stefani et al. 1930, 312 no. 21, 313 fig. 22, 329 no. 21; Buonamici 1931, 547 no. 21; Buffa 1935, 245 no. 864; Colonna 1983; 1987, 423 with fig. 2; Morandi Tarabella 2004, 188 no. 189, 2; Briquel 2009, 49 f.; Maras 2009a, 419 no. Ve do.18; Krämer 2022, 299 no. VP20; ET Ve 3.10.

I.13. Etrusco-Corinthian phiale. Ca. 570–560 BCE.
[*m*]*ini nuluvanice lariś : leθaieś* – Lariś Leθaies dedicated me
*mi zinace vel*θ[*ur* -]*ncinie*[.]ś. – Velθur …ncinie.ś (Ancinie.s?) made me (Potter Signature)
Vetter 1954/1955, 55 f. no. 15; Cristofani 1972, 93; Morandi 1989, 581–585 with fig. 1–2; Briquel 2009, 57 f.; Maras 2002, 268 fig. 29, 271 no. 347, Pl. 44. 79; 2009a, 419 f. no. Ve do.19; Krämer 2022, 299 no. VP21.

I.14. Bucchero oinochoe. First half of 6th cent. BCE.
mine mulvanice larice ves.tricin[*as* ---?] – Larice Vestricin[as] dedicated me
Pallottino 1939, 461 f. no. 6–7; Buonamici 1942, 292 f. no. 54 with fig. 19; Vetter 1954/1955, 52 f. no. 6–7; De Simone 1975, 146 no. 34; Maras 2002, 269 fig. 30, 270 f. no. 223, Pl. 78; Morandi Tarabella 2004, 195 f. no. 198, 2; Briquel 2009, 51 f.; Maras 2009a, 424 f. no. Ve do.32; Krämer 2022, 300 no. VP34; ET Ve 3.15 = Ve 3.40.

I.15. Ionian cup. Last quarter of 6th cent. BCE.
[*mini avi*]*le zuqume turace me*[*ner*]*avas* – [Avi]le Zuqume dedicated [me] to Me[ner]ava (Menerva)
Stefani et al. 1930, 318 no. 41, 319 fig. 42, 332 f. no. 41, Pl. 14a; Buonamici 1931, 550 no. 41; Buffa 1935, 249 no. 883; Colonna 1987, 421–423 with fig. 1a–b; Morandi Tarabella 2004, 220 no. 228; Briquel 2009, 55; Maras 2009a, 426 no. Ve do.35; Krämer 2022, 300 no. VP37; ET Ve 3.29.

I.16. Bucchero vessel. First half of 6th cent. BCE.
[---? *l*]*arice vest*[*iricina*(*s*) --- ?] – [L]arice Vest(iricina) …
Stefani et al. 1930, 309 fig. 13, 310 no. 12; 327 no. 12; Buonamici 1931, 546 no. 12; Buffa 1935, 244 no. 855; Briquel 2009, 51 f.; Krämer 2022, 300 no. VP43; ET Ve 3.3.

I.17. Bucchero vessel fragment. First half of 6th cent. BCE.
[---]*amanas:*[---?] – from/of (the *gens*) Amana
Stefani et al. 1930, 314 fig. 27, 315 no. 26, 330 no. 26; Buonamici 1931, 548 no. 26; Buffa 1935, 246 no. 869; Morandi Tarabella 2004, 57 no. 25; Briquel 2009, 47; Krämer 2022, 300 f. no. VP44; ET Ve 3.4.

I.18. Bucchero vessel fragment. Beginning of 6th cent. BCE.
[---? *lari*]*s teiθurn*[*a*(*s*) ---?] – … [Lari]s Teiθurn[as] …
Stefani et al. 1930, 308 no. 6 with fig. 7, 326 no. 6; Buonamici 1931, 546 no. 6; Buffa 1935, 243 no. 849; De Simone 1975, 146 no. 32; Morandi Tarabella 2004, 530 no. 546, 3; Briquel 2009, 61 f.; Krämer 2022, 301 no. VP46; ET Ve 3.37.

II. Selection of Inscriptions from Gravisca with Personal Names

II.1. Stone anchor. Ca. 500 BCE.
Ἀπό|λον|ος Ἀι|γινά|τα ἐμ|ί. Σόστ|ρατος |ἐποίε|σε ho|[…] – I belong to the Apollon of Aigina, Sostratos made me, [son of Laodamas?]…
Johnston/Pandolfini 2000, 15 f. no. 1; Schweizer 2007, 307–311; Demetriou 2012, 64 f. with fig. 4, 80 f.; Mercuri/Fiorini 2014, 70–72 no. 8; Krämer 2016, 83 with footnote 46.

II.2. Attic red-figured skyphos. Ca. 470–460 BCE.
mi turuns – I belong to Turan
Δείακος / Δεί(α)λκος / Δεία(λ)κος – Deiakos or Deialkos depending on the reading
τε – trademark?
Torelli 1982, 312 no. 62; Pandolfini 1983, 265 no. 143; Valentini 1993, 271 no. 469; Johnston/Pandolfini 2000, 21 no. 92; 71 no. 380; Maras 2009a, 379 f. no. Ta co.13; Krämer 2022, 281 no. GR05; ET Ta 4.7.

II.3. Attic black-glazed skyphos. Second quarter of 5th cent. BCE.
[---? *ar*]*nza turn*[*s* ---?] – [… Ar]nza (‚little' Arnθ) [dedicated, gave it (or similar) to] Turan
Pandolfini 1983, 261 no. 117; Valentini 1993, 271 no. 466; Johnston/Pandolfini 2000, 71 no. 382; Torelli 2004, 130; Maras 2009a, 386 no. Ta do.2; Krämer 2022, 281 no. GR07; ET Ta 3.3.

II.4. Attic black-glazed kylix. Second half of 5th cent. BCE.
turns turce ramθa venatres – Ramθa Venatres gave (it) Turan
Torelli 1977, 422; Valentini 1993, 47 no. 94; 271 no. 468; Johnston/Pandolfini 2000, 71 no. 383; Maras 2009a, 386 f. no. Ta do.3; Krämer 2022, 281 no. GR08; ET Ta 3.4.

II.5. Attic red-figured kylix. Ca. 470–460 BCE.
vea – to/for (the goddess) Vei
*pai*θ*e* – Paiθe
Pandolfini 1983, 262 no. 125; Johnston/Pandolfini 2000, 71 no. 387; Torelli 2004, 130; Maras 2009a, 378 f. no. Ta co.12; Fiorini/Torelli 2010, 45 with footnote 111; Krämer 2022, 282 no. GR11; ET Ta 0.17.

II.6. Edge of an olla in impasto.
tit[---?] or [---?]*tit* – Tit[e] or Tit[a] (personal name)
Pandolfini 1983, 259 no. 104; Johnston/Pandolfini 2000, 72 no. 392; Torelli 2004, 130; Fiorini/Torelli 2010, 45 with footnote 113; Krämer 2022, 282 no. GR14; ET Ta 0.31.

II.7. Edge of an olla in impasto.
[---? *l*]*arza*[---] – [L]arza (little Larθ)…
Pandolfini 1983, 266 no. 155; Johnston/Pandolfini 2000, 72 no. 396; Torelli 2004, 130; Fiorini/Torelli 2010, 45 with footnote 115; Krämer 2022, 282 no. GR16; ET Ta 2.44.

II.8. Chalice with stripe decoration. Beginning of 5th cent. BCE.
mi velθurus ϕl(*avel*)*nas* – I belong to Velθur Φl(avel)nas (or Φlnas resp. Φ(e)lnas instead)
Pandolfini 1983, 266 no. 157; Johnston/Pandolfini 2000, 72 no. 397; Krämer 2022, 282 no. GR17; ET Ta 2.28.

II.9. Ionian cup. Ca. 550–530 BCE.
Δηλιάδης Ἥρηι – (From) Deliades to Hera
Torelli 1977, 407; 1982, 310 no. 21; Johnston/Pandolfini 2000, 17 no. 5; Demetriou 2012, 78; Mercuri/Fiorini 2014, 70 no. 5, 71 fig. 5; Krämer 2022, 283 no. GR43.

II.10. Attic lip cup. Ca. 550–530 BCE.
Ἥρηι ἀνέθηκε Πακτύης – Paktyes dedicated me to Hera
Torelli 1977, 407 f.; Torelli 1982, 310 no. 25; Ehrhardt 1985, 141 no. 3; Johnston/Pandolfini 2000, 17 no. 7; Demetriou 2012, 82; Krämer 2022, 283 no. GR45.

II.11. Attic band cup. Ca. 550 BCE.
Ὑβλήσιος Ἥρηι – Hyblesios to Hera
Torelli 1977, 407; 1982, 310 no. 24; 318–320; Boitani, in: Colonna 1985, 143 f. no. C1; Ehrhardt 1985, 141 with footnote 22; Johnston/Pandolfini 2000, 17 no. 9; Demetriou 2012, 79 f.; Krämer 2016, 84; 2022, 284 no. GR47.

II.12. Attic little-master cup. Ca. 550–530 BCE.
Μόσχος ἠ[– Moschos [to] H[era]
Torelli 1982a, 309 no. 3; Johnston/Pandolfini 2000, 18 no. 20; Demetriou 2012, 78; Krämer 2022, 284 no. GR58.

II.13. Attic black-figured cup. Ca. 520–500 BCE.
Ἥρηι Ὀμβρικός – (From) Ombrikos to Hera
Torelli 1977, 406 fig. 6, 407 f.; 1982, 310 no. 22; Johnston/Pandolfini 2000, 18 no. 22; Demetriou 2012, 82; Mercuri/Fiorini 2014, 70 no. 6, 71 fig. 6; Krämer 2022, 284 no. GR60.

II.14. Attic eye-cup. Ca. 530–520 BCE.
Ληθα(ι)ος Ἥρη(ι) – (From) Lethaios to Hera
Torelli 1977, 407 f.; 1982, 309 no. 10; Johnston/Pandolfini 2000, 18 no. 24; Demetriou 2012, 81 f.; Krämer 2022, 284 no. GR62.

II.15. Attic black-figured kantharos. Ca. 510–500 BCE.
Εὔαρχος μὰ[νέθηκε Ἀπόλλο]νι – Euarchos [dedicated] me to [Apollo]n
Torelli 1977, 405; 1982, 310 no. 39; Boitani, in: Colonna 1985, 143 f. no. C3; Johnston/Pandolfini 2000, 19 no. 54; Demetriou 2012, 80; Krämer 2022, 286 no. GR93.

II.16. Attic lip cup. Ca. 550–530 BCE.
Ἐρξήνω[– Erxeno[…]
Torelli 1982, 312 no. 58; Johnston/Pandolfini 2000, 20 no. 75; Demetriou 2012, 79; Krämer 2022, 287 no. GR112.

II.17. Attic little-master cup. Ca. 550–530 BCE.
Ζώιλ[– Zoil[…]
Torelli 1982, 312 no. 57; Johnston/Pandolfini 2000, 21 no. 83; Demetriou 2012, 81; Krämer 2016, 84; Krämer 2022, 287 no. GR120.

II.18. Attic black-figured kylix. Ca. 550–530 BCE.
Εὐδημο[– Eudemo[…]
Torelli 1977, 407 f.; 1982, 312 no. 64; Ehrhardt 1985, 140 no. 1; Johnston/Pandolfini 2000, 21 no. 87; Krämer 2022, 287 no. GR124.

II.19. Attic kylix. Ca. 500–480 BCE.
Θεμισταγόρας – Themistagoras (dedicated it/me)
Torelli 1977, 407; 1982, 312 no. 63; Ehrhardt 1985, 140 no. 2; Johnston/Pandolfini 2000, 21 no. 88; Demetriou 2012, 78; Krämer 2022, 287 f. no. GR125.

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RESSOURCENKULTUREN 22

NETWORKS AS RESOURCES FOR ANCIENT COMMUNITIES

When and how did networking become a resource for ancient communities? Were these networks perceived by ancient societies and actors as a means to perform and assert social, personal and group identities?

Covering various periods and geo-cultural areas from Iran to the western Mediterranean, with a strong focus on classical antiquity, the papers collected here approach the topic of network as resources in three different but interrelated thematic domains: the interaction between societies and the natural environment (socio-natural networks), the transmission of knowledge and habitus (networks of knowledge and power) and religious interactions (sacred landscape). The social values that communities attribute to the networks they are embedded in are opened up to new interpretative layers, dynamics and scales. Looking at networks as resources changes our perspective on both terms of the equation. On the one hand, ancient networks are reframed in their relational and social contexts and linked to their actors' intentions and perceptions. On the other hand, the properties of specific networks, such as fluidity, redundancy and the strength and fragility of relationships, shed new light on resources and resource-related socio-cultural dynamics.

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