

Invisible Circularity from the Roman Period to the Middle Ages

7–8 September 2022

Organisers:

Irene Bavuso (Aarhus University), **Guido Furlan** (Aarhus University),
Emanuele E. Intagliata (Università degli Studi di Milano) and
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Nora, Sardinia: archaic floor consisting of crushed ceramics, bones, shells, pebbles and sand
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Outline

Economic circularity is the ability of a society to reduce waste by recycling, reusing, and repairing raw material and finished products. The concept has received momentum in academia due to contemporary environmental concerns. Despite the recent surge of interest, economic circularity has not been fully addressed as a macrophenomenon by historical and archaeological studies. Some aspects of reuse have been studied as isolated phenomena but remain to be included in a wider theoretical framework such as that provided by the concept of circular economy. Research at UrbNet and the Circular Economy and Urban Sustainability in Antiquity Project is addressing this gap, trying to build a more complex understanding of ancient circularity as a driving force for the development of urban centres and networks.

The limitations of data and the relatively new formulation of targeted research questions means that several processes and agents involved in circular economies are still invisible to the eye of modern scholarship. Examples include forms of curation, maintenance and repair which must have had an influence on the economic systems but are rarely accounted for. The people behind these processes, for example collectors and scavengers, are also rarely investigated and poorly understood. Even better studied mechanisms, like reuse and recycling, are not explored to their full potential within the broader picture of ancient urban economies. Moreover, recycling is not necessarily limited to local communities, but may include processes such as the deconstruction of buildings or burials for materials to be passed on into trading systems. To make these circular processes visible, it is crucial to address them with an interdisciplinary perspective and a bottom-up approach.

This conference aims to investigate the invisible aspects of circularity in the archaeological record and in textual sources, to contribute to a more holistic picture of ancient economies. Although circularity is a global phenomenon, the main focus of this event will fall on urban societies from the Roman period to the Middle Ages in Europe, according to the framework of current research on circularity conducted at UrbNet. The proceedings of this conference will be proposed to Oxbow.

The main research questions we would like to address in this conference are:

- Can we look back at past published material culture to reassess their significance as items within a circular economy system?
- How can invisible processes or agents in a circular economy system be studied in more detail and more comprehensively?
- What can be said about the perception of circular economy in scholarship and what perception did past societies have of circular processes?
- How can archaeoscience and other new methodologies contribute to our understanding of invisible circularity in the past?



<https://urbnet.au.dk/news/events/2022/invisible-circularity>

Programme

DAY 1: Wednesday 7 September 2022	
9:00– 9:20	Introduction Rubina Raja, Irene Bavuso, Guido Furlan, Emanuele E. Intagliata and Julia Steding
Session 1: Materials <i>Moderator: Sine G. Saxkjær</i>	
9:20– 9:45	From Decoration to Magic: Examples of Glass Reuse from the Roman Period to the Early Middle Ages Cristina Boschetti
9:45– 10:00	Discussion
10:00– 10:25	Through Glass: Claimed and Invisible Evidences of Recycling and Reuse Practices Line Van Wersch and Alexis Wilkin
10:25– 10:40	Discussion
10:40– 11:00	Coffee break
11:00– 11:25	Re-Birth and Eternity: The Complex and Everlasting Lifecycle of Metals Thomas Birch
11:25– 11:40	Discussion
11:40– 12:05	Textile Recycling in the Roman Naval Contexts Margarita Gleba and Maria Stella Busana
12:05– 12:20	Discussion
12:20– 13:30	Lunch MOMU café

Session 2: Agents Moderator: Søren M. Sindbæk	
13:30–13:55	Alternative Economies in Palmyra: Perspectives from the Circular Economy and Urban Sustainability Project Rubina Raja
13:55–14:10	Discussion
14:10–14:35	Identifying Episodes of Recycling in the Archaeological Record Jonathan R. Wood
14:35–14:50	Discussion
14:50–15:10	Coffee break
15:10–15:35	People behind Processes: Notes on the Role of Junk Dealers in Past Urban Economies Guido Furlan
15:35–15:50	Discussion
15:50–16:15	Laws, Letters and Graves: Organisation of Scavenging in Ostrogothic Italy Irene Bavuso
16:15–16:30	Discussion
16:30–16:45	General discussion
18:30	Speakers' dinner Mefisto, Volden 28, 8000 Aarhus

DAY 2: Thursday 8 September 2022	
Session 3: Building Materials Moderator: Rubina Raja and Guido Furlan	
9:30– 9:55	Seeking the Invisible through Legacy Data: Notes on the Use of Archives for the Study of Circular Economy Emanuele E. Intagliata
9:55– 10:10	Discussion
10:10– 10:35	Mind the Gap: Researching Reuse Practices in Palmyra Julia Steding
10:35– 10:50	Discussion
10:50– 11:10	Coffee break
11:10– 11:35	Evolutionary Design Processes in Thermal Architecture of the Roman Empire Allyson McDavid
11:35– 11:50	Discussion
11:50– 13:10	Lunch MOMU café

13:10– 13:35	Reused Columns in an Ancient Circular Economy Jon M. Frey
13:35– 13:50	Discussion
13:50– 14:15	An Inconvenient Truth: Evaluating the Impact of Amphora Reuse Tom Brughmans
14:15– 14:30	Discussion
14:30– 15:00	Final discussion
15:00– 17:00	Visit to Moesgaard Museum Free access for speakers (state your name at the ticket counter)

Abstracts

From Decoration to Magic: Examples of Glass Reuse from the Roman Period to the Early Middle Ages

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During the last decade, several chemical studies have focused on the phenomenon of glass recycling in Roman and medieval Europe. It is now well known that from the late antiquity onwards the practice of glass recycling become gradually more intense. Some fresh glass continued to circulate in the Mediterranean region, but, especially in continental and northern Europe, recycled compositions become exclusive. It is less known that the collection of glass for remelting was flanked by the proper reuse of glass objects and fragments. The presentation will focus on this less explored, but equally important aspect of the ancient glass economy, presenting two case studies illustrating the reuse of glass during the early Roman period, and during the early Middle Ages.

The first case study will discuss the reuse of fragments of glass vessels in floor and wall mosaics. This practice is documented mainly in Greece and Italy, from the end of the second century BC to the third decade of the first century CE. The typological analysis of the fragments reused in the decorations will be discussed with the aim of reconstructing the dynamics governing the supply of glass fragments, during a time when glass vessels were relatively rare. The second case study will investigate the way of reusing glass fragments during the Early Middle Ages. The analysis of grave goods illustrates how glass fragments were transformed into body ornaments and amulets, charged by a supernatural value. At the same time, the multiple reasons behind the long-time circulation of glass beads will be explored, considering their social, economic and symbolic meaning.

Through Glass: Claimed and Invisible Evidences of Recycling and Reuse Practices

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Glass, both fragile and fusible, lends itself very well to recycling, which has been practiced since the very beginning of its existence (Freestone 2015). In written sources, through archaeological discoveries or archaeometrical analyses, numerous evidences testify to the melting of ancient objects as well as to the use and reuse of glass items, sometimes during very long periods. Though, in some regions and for specific times, the recycling of materials seems to have had a particular importance. Using archeological evidence, archaeometry as well as written sources, this paper will show how the study of glass can provide us with precious insights into the 'second life of things'. Indeed, at the end of antiquity, in Northwestern Europe, glass production only relied on secondary workshops that were supplied by Egyptian and Levantine primary production centres where sand and natron were fused (Schibille 2022). If it is now proven that these imports persisted after the fall of the western Roman Empire, in the north, their importance decreased (Shortland et al. 2006) to finally be replaced by potash glass, which appeared around the 9th century and which became dominant before the 12th century (Wedephol et al. 2011). In parallel with this technical change, the need for glass increased due to the revival of monumental architecture, and the artisans or their sponsors found solutions to acquire the needed materials.

Re-Birth and Eternity: The Complex and Everlasting Lifecycle of Metals

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Once an ore has been mined and the metal extracted, it's first use has been marked. Some metal objects, destined for the grave, deposition or lost along the way, remain simply that – a single and complete lifecycle. Most metals, however, due to their very nature, can be re-melted, mixed/alloyed and re-combined, marking a rebirth in an ever repeating and refreshing cycle of being re-used and repurposed. For some metals, like gold, this even gives them an 'eternal' quality. This continual refreshment and circularity are inherently outwardly invisible and immensely difficult to reconstruct. However, it is not impossible to decipher these biographic markers in the convoluted lifecycle of metal objects. Aspects of their composition, microstructure and isotopic signature may help us discern specific actions and stages along the way, by craftsmen, smiths and moneyers. Using a diverse chronological and geographical array of case-studies, this presentation will help uncover the invisible circularity and complex lifecycle of metals, evidencing their importance for re-use across economies from different societies.

Textile Recycling in the Roman Naval Contexts

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Textiles were and remain an indispensable part of human existence. Textile economy in the past had complex production and circulation networks. The evidence of textile reuse and recycling in Roman times is provided by both written and archaeological sources from across wide geographical areas. In this paper, we focus on the use of recycled textiles in naval construction such as caulking and insulation, focusing in particular on the archaeological finds from Italy and comparing them to similar materials excavated in other regions of the Roman Empire and beyond. We will explore the materials that were used (wool, linen); their possible origin contexts as reflected in the quality of the recycled textiles (e.g. extremely fine quality in the case of Nemi and much coarser in the case of Comacchio); and the possible chains of supply. While much scholarly work has been dedicated to the discussion of textile reuse and recycling within literary sources, the archaeological evidence is only beginning to be considered as direct proof of Roman circular economy.

Alternative Economies in Palmyra: Perspectives from the Circular Economy and Urban Sustainability Project

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In the second funding round of the Centre for Urban Network Evolutions (UrbNet), initiated in 2021, the issue of circular economies and urban sustainability has been high on the research agenda. However, even prior to that, the topic was central to research undertaken within the centre, namely in the Circular Economy and Urban Sustainability project, which takes its point of departure in the evidence from Palmyra collected since 2012 within the Palmyra Portrait Project. This paper addresses perspectives arising from research conducted within the Palmyra-related research projects at Aarhus University and UrbNet and will discuss a new thematic perspective, namely that of “alternative economies”. While much research has focused on Palmyra’s position in the world trade of the first three centuries CE, it is not until recently that research has tried to understand the city’s local and regional economic framework taking its point of departure in the evidence from the city and its immediate surroundings. It is clear that Palmyra’s overwhelming wealth in the Roman period was driven largely by its elite’s involvement in the long-distance trade, but there can also be no doubt that the city was, to a large extent, dependent on its own resources for everyday life aspects, and that economic patterns – although largely invisible in the evidence at first glance – were in place. So far these economic mechanisms have not been explored in any detail, mostly due to the scattered nature of the evidence. In this paper, I go back to the origin of the project’s ideas, recap its development and critically reassess what has been and might be done in future, addressing how the concept of alternative economies might, in fact, be even more useful than the term ‘circular economies’ when studying economic mechanisms in Palmyra and beyond in the Roman period.

Identifying Episodes of Recycling in the Archaeological Record

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Archaeological science has been more reticent than traditional archaeology in its approach to ancient recycling, predominantly because recognising that an ancient object might have been recycled can affect interpretations of compositional and isotopic analytical signatures and frustrate provenance investigations. However, any archaeological artefact made from recyclable material, such as glass or metal, may neither be the original object nor resemble it, with the consequence that a successful ancient recycling economy can become invisible when recycling is synonymous with re-melting rather than reuse. It is recognised here that there is no one-size-fits-all approach to investigate ancient recycling. There are methods, however, that align with the data available that may provide insight well beyond elemental composition, including the evolution of raw material availability and supply chains over time, the process of manufacture and how these might relate to external economic and political circumstances. It is therefore imperative that recycled material can be identified with some certainty in the archaeological record.

People behind Processes: Notes on the Role of Junk Dealers in Past Urban Economies

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Figures such as junk dealers and ragpickers were still popular in many twentieth-century European towns, and they are still present worldwide. They make their living collecting and reselling used, discarded objects, particularly metalware. This activity puts them rightfully within the frame of local circular economic circuits. Their impact in contemporary western economies, characterised by large, structured recycling mechanisms and facilities may be low, but their economic footprint may have been more substantial in the past. Still in the nineteenth century, ragpickers (straccivendoli, chiffonniers) played an important role in the paper industry.

The presence of collectors of reusable trash can be traced backwards in medieval Europe, in the Early Islamic World and, eventually, in classical antiquity; this attests to the existence of a well-rooted, long-lasting activity, playing – behind the scenes – a continuous role in urban communities.

In the Roman world, junk dealers and collectors of cullet and rags are attested by the written sources; archaeological proxies also suggest that their impact on the local economy was far from being negligible.

Laws, Letters and Graves: Organisation of Scavenging in Ostrogothic Italy

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The scavenging of cemeteries tends to be considered an act contrary to law and moral. Yet in the early medieval period, it was an extremely common practice, and in some cases it becomes a pious act, as attested, for example, in ecclesiastical and religious narratives where it is connected to the relocation of saints' bodies.

This paper looks at the scavenging of cemeteries, investigating early medieval reflections on this practice. For many areas of western Europe during the early post-Roman period, the written sources on this topic are scanty at best, but Ostrogothic Italy represents an important exception. Cassiodorus' *Variae* provide a vivid reflection on and a moral justification for the validity of this practice, although within certain fundamental limits. Moreover, this paper explores the different modalities in which scavenging was carried out. In general, archaeological finds and written sources from the early medieval period illuminate scavenging as an ad hoc activity; however, recent scholarship has shown that it could be part of an organised economic system. The Ostrogothic letters crucially reveal the co-existence of both a bottom-up scavenging, ad hoc or disorganised, and a top-down organisation which involved the court and its officials.

Seeking the Invisible through Legacy Data: Notes on the Use of Archives for the Study of Circular Economy

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In the past couple of decades, analytical techniques applied to archaeology have contributed extensively to reaching a more nuanced understanding of economic circularity in antiquity. By contrast, little effort has been put into reassessing data from old fieldwork in which circular economic processes were not the object of systematic studies and targeted research. Although a legacy-data approach is not always the answer to reaching a complete understanding of circular economic processes in past societies, it can nonetheless bring to the attention of the scholarly community previously unknown or largely ignored phenomena and, therefore, fill in important lacunae. Taking as case studies two archive collections (the Fonds d'Archives Paul Collart at the University of Lausanne and the Dörner Archive at the Forschungsstelle Asia Minor, University of Münster), this contribution will explore the extent to which it is possible to study circularity through legacy data. The case studies will include the reuse of building material in late antique/early Islamic Palmyra and the possible recycling of metal at Eski Käh̄ta in Commagene in the medieval period. In so doing, this paper will also discuss the problems associated with this type of approach and whether it is possible to overcome them.

Mind the Gap: Researching Reuse Practices in Palmyra

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The study of stone as building material and how it was reused is by no means new. Especially in the context of defensive structures (e.g. city walls) and religious buildings (e.g. churches), scholars have been interested in the practical, ideological and economic implications of reuse. Some sites have gained more attention than others when it comes to research on circular processes, and it is thus not surprising that we know most about the reuse of building materials in cities like Rome or Sagalassos.

In other regions, like the Near East, studies on reuse are being compounded by the lack of recorded evidence. In this paper, I will take Palmyra as the point of departure and explore the reuse of inscribed stone blocks. These stone elements are most suitable to explore their reuse because of the general interest in inscriptions and the more holistic documentation that comes with it. However, blocks without inscriptions have often not been thoroughly documented, and even those blocks including an inscription have often not been documented in a way that allows the reconstruction of their original and new context. This gap in the documentation leads to a biased view of the reuse practices, which needs to be acknowledged when trying to get a more holistic view of the economic practices. This paper thus has two aims:

1. demonstrating the potential in studying inscribed stone elements as a first step to explore reuse practices in the Near East;
2. discussing the problematic of the gap in documentation and evidence.

Evolutionary Design Processes in Thermal Architecture of the Roman Empire

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When circular processes are considered across the design, maintenance and adaptation of monumental architecture, they often inform sustainability in material and performative terms. Additionally, their identification renders the very practice of architecture – from conception, to execution to completion – more transparent. As such, an investigation of the social, political and economic mechanisms that underpin the building profession may yield evidence of cultural resiliency in as significant a measure as forensic analysis of material culture has done.

While the remarkable, 500-year lifespan of the Hadrianic Baths of Aphrodisias in Turkey certainly alludes to its architectural resilience, other, habitually obscure design processes were crucial to its endurance, ones which guaranteed institutional longevity in the bathing tradition. This paper will focus on collaborations within architectural practice that defined the Baths' trajectory: they variously address patronage and urban administration; incentives for renovation; design innovation and construction expertise; the monument's civic evolution; and a commitment to natural resource conservation that assured the Baths' viability through Late Antiquity. These affiliations and long-held traditions themselves required reinvention to endure, and their evolution informs us of patterns of architectural circularity that may apply to other Roman cities in their pursuit of immortality.

Reused Columns in an Ancient Circular Economy

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From the moment of its creation as a topic of academic discussion, the study of spoliation has commonly focused on the reuse of columns as especially significant bearers of meaning. As many scholars have noted, the compact cylindrical and easily identifiable form of these supporting elements make them both readily recyclable and a potentially powerful synecdoche for classical civilization. Thus, while the motivations may have been different in antiquity, the reuse of columns may serve as one of the earliest examples of an ancient circular economy to the point that it is often difficult to determine whether any one column in a post-classical context is in its secondary or even later phase of reuse. On the other hand, the cylindrical shape of columns leaves them unsuited to other uses, so that their 'misuse' as construction materials in Byzantine churches and fortifications may signal a different set of motivations altogether. When seen in the context of the ongoing discussion of circular economies, columns that have been prominently displayed in a way that breaks the cycle of reuse may well reflect a form of conspicuous consumption suggestive of a society far from a state of decline.

An Inconvenient Truth: Evaluating the Impact of Amphora Reuse

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Amphora reuse is an inconvenient truth: it certainly happened, and potentially on a huge scale. But the topic has received insufficient research attention in Roman studies, and its impact is rarely quantitatively addressed. But what was the effect of amphora reuse at different times and places in the past? What data and methods can Roman archaeologists use to evaluate this effect? How does the phenomenon affect our ability to interpret Roman amphora distributions as proxy evidence for the distribution of foodstuffs? In this presentation, I will summarise selected theories and evidence types used in the study of amphora reuse to identify the significant challenges involved in tackling this inconvenient truth. And I will demonstrate how a simulation methodology could be used to identify the differential effects on amphora distribution patterns of different probabilities of reuse at prime-use locales, and of reuse selection probabilities at port sites. This method is a proof-of-concept, and I will conclude with a description of the kind of future study that can instead implement the method in a highly specified and empirically informed way.

(This presentation is based on: Brughmans T, Pecci A. 2020. An inconvenient truth. Evaluating the impact of amphora reuse through computational simulation modelling. In: Duckworth C, Wilson A, editors. Recycling and reuse in the Roman economy Oxford studies on the Roman economy. Oxford: Oxford University Press; pp. 191–234.)

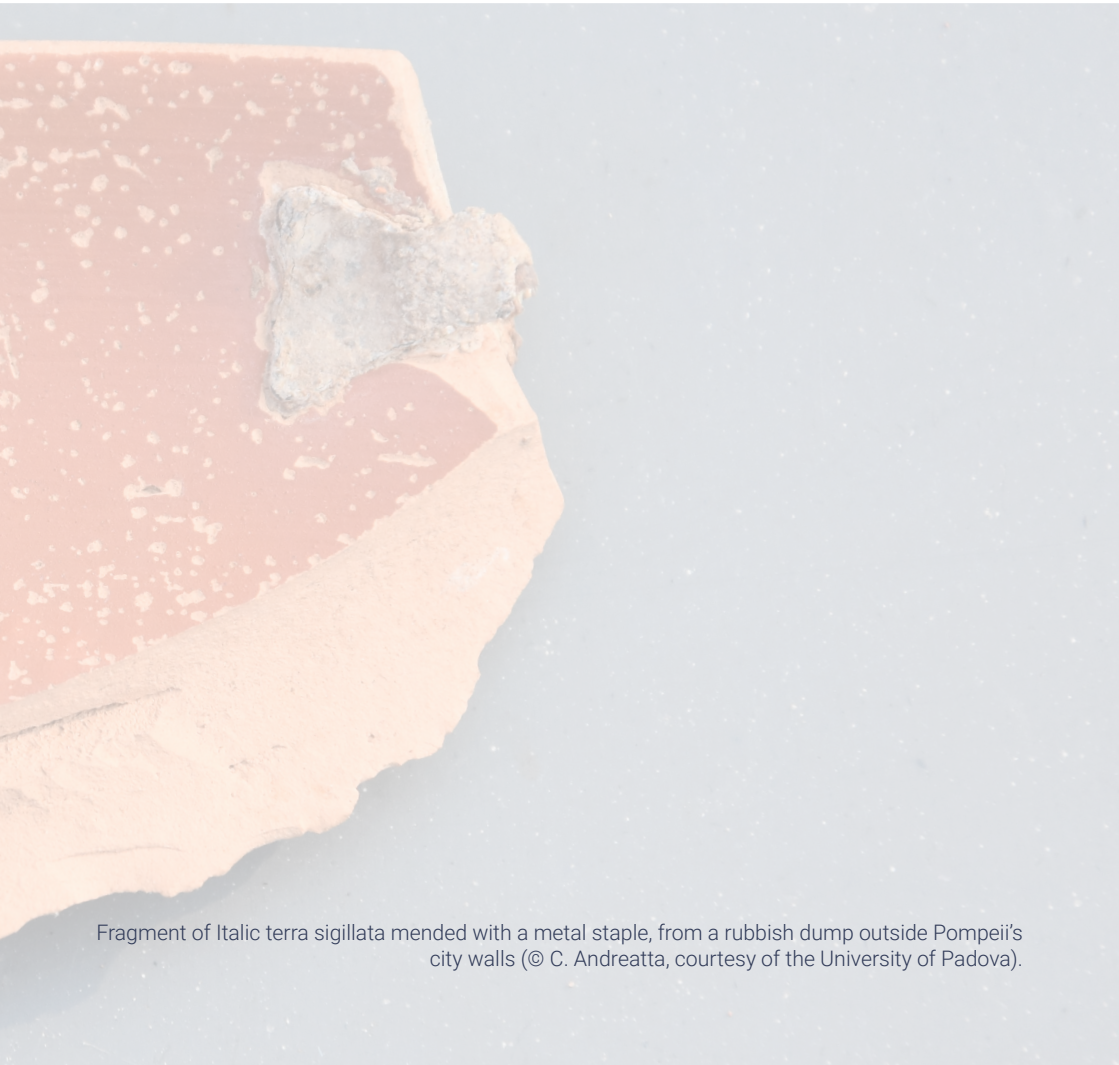
Notes



Notes



Notes



Fragment of Italic terra sigillata mended with a metal staple, from a rubbish dump outside Pompeii's city walls (© C. Andreatta, courtesy of the University of Padova).

Scan QR code to open map on your smartphone



Venues



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Book of Abstracts: *Invisible Circularity from the Roman Period to the Middle Ages*
7–8 September 2022

Organisers: Irene Bavuso (Aarhus University), Guido Furlan (Aarhus University), Emanuele E. Intagliata (Università degli Studi di Milano) and Julia Steding (Aarhus University)

Editors: Irene Bavuso (Aarhus University), Guido Furlan (Aarhus University), Emanuele E. Intagliata (Università degli Studi di Milano) and Julia Steding (Aarhus University)

Front cover: Detail of wall mosaic combining shells, lumps of Egyptian blue and a fragment of blue glass. Segni (Roma), nymphaeum, late 2nd century BC (© Boschetti, C. 2020. *Vetro e blu egizio nel ninfeo di Segni: aspetti decorativi, tipologici e tecnologici*, in F.M. Cifarelli (ed.), *Il ninfeo di Segni. Studi e ricerche*, Roma, pp. 55-67).

Back cover: Rubbish dump from Pompeii, covered by the pumices produced by the 79 CE eruption (© G. Furlan, courtesy of the University of Padova).