

Ceramics in Context Status Report 2015-2018

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View of the main street, Jerash, Jordan (Photo: Rubina Raja).

The Ceramics in Context Project is affiliated with Centre for Urban Network Evolutions (UrbNet), funded as a Centre of Excellence by the Danish National Research Foundation.



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Greetings from the director

Ceramics in Context – a collective research project funded by the Carlsberg Foundation

It is with great pleasure that I present the status report of the Ceramics in Context project. The project was initiated in 2015 and is based at Aarhus University, Denmark. The idea for the project developed out of the large-scale international research excavation project The Danish-German Jerash Northwest Quarter Project, which I direct together with my colleague Achim Lichtenberger from Westfälische Wilhelms-Universität Münster in Germany. Since 2011, we have been conducting fieldwork in the Decapolis city Gerasa, modern Jerash in northern Jordan. The city is characterized by the immense amounts of well-preserved ruins, which have been the subject of study for large numbers of scholars and travelers since the 19th century, when the city was rediscovered by Jasper Ulrich Seetzen, who reidentified the site as the ancient Gerasa, mentioned in numerous sources from the Antiquity.

The site is the second-most visited tourist site in Jordan and therefore, it is under pressure due to the many visitors and lack of appropriate development of the site for coping with large-scale tourism. Furthermore, the site is also under pressure from modern urban development in the region. Jordan in general, and not least northern Jordan, has undergone extensive urban development over the last centuries and this has increased the pressure on the archaeological sites, which are often located where modern cities have later developed – mostly due to topographic reasons. Therefore, there is a steadily increasing pressure on archaeologists working at such sites in order to document appropriately and to store and make documentation available to colleagues and a wider community as fast as possible.

Since 2011, many destructions of archaeological features at Jerash has taken place due to modern development. Most of these are undocumented. Unfortunately, even on-site illicit excavations take place, since the fencing around the site is not strong enough to keep out unwanted visitors. All these circumstances mean that archaeologists working at the site need to pay particular attention to meticulous documentation and storage of such documentation as well as the storage of the archaeological material itself.

One of the first challenges which any archaeologist is confronted with when working in Gerasa, is the number of finds, and not least the amounts of ceramic finds, which any trench at the site reveals. In Antiquity and the Early Islamic period, Gerasa was a regional pottery production center. Kilns are attested across the site. In the Hippodrome, in the southern part of the city, a series of pottery kilns and workshops that were excavated decades ago have yielded millions of sherds.

Since ceramics make up the basis for chronological typologies in classical archaeology and no firm typology existed for the locally produced ceramics from Gerasa, the idea with the Ceramics in Context project was to establish such a typology and refine earlier suggestions. Both these things would be based on the almost 1 million excavated sherds from all the trenches excavated by the Danish-German Jerash Northwest Quarter Project. While this is an active core element in the on-going work with the final publication, further perspectives have also come to light and been incorporated into the project. Within the framework of the project, we have conducted a full quantification, which means that all sherds have been documented. Such a full quantification practice opens up for completely new perspectives into the understanding of the amounts and

stability of the local production of ceramics over time. Furthermore, it gives insights into local production practice and, not least, preference, which allows a modeling of the local society's ways of thinking about and using resources optimally. This part of the project is undertaken in collaboration with colleagues based at Barcelona Supercomputing Centre and at Oxford University, and the on-going work is also featured in this report.

The geological and chemical fingerprinting of the ceramics from Gerasa also plays a central role within the Ceramics in Context project, and it takes center stage in a number of publications springing from case studies, which have been conducted within the project over the last years. Byzantine, Umayyad and Ayyubid-Mamluk ceramics have been studied and are currently under publication. Results have yielded new insights into local versus regional production and also into the patterns of producing pottery over several centuries.

Another part of the project has included hosting a series of workshops and conferences in order to bring together colleagues who have either worked in Gerasa or in the region. This has been done in order to gather as much expertise about the ceramics from the region as possible and to bring this expertise into written form. The internationally acclaimed double-blind, peer-reviewed series *Jerash Papers* (published by Brepols in Turnhout), which has been founded by myself and Achim Lichtenberger, is hosting a series of edited volumes stemming from these workshops. These publications will provide a solid basis for further discussions of the local ceramics and the imports, which are found in Gerasa.

The project is not yet at an end and I look forward to all the exciting results, which the numerous sub-projects promise to

yield. I would like to thank the Carlsberg Foundation for the generous funding of the project without which it would not have been possible to conduct the studies undertaken until now. Furthermore, a big thank you goes to all collaboration partners, some of which are featured in this report. It is wonderful to see how the Ceramics in Context project has blossomed and developed into an internationally acclaimed, best practice project on the archaeological sciences. This would not have been possible without the numerous dedicated students and staff in the project as well as the collaborations, which have developed over the years.

I hope you enjoy the report, the results and the exciting perspectives presented here.



Rubina Raja
Professor of Classical Archaeology
Centre director
Centre for Urban Network Evolutions
Aarhus University, Denmark



Project members



Rubina Raja, Professor and Director

Rubina Raja is professor of Classical Archaeology and center director of The Danish National Research Foundation's Centre of Excellence for Urban Network Evolutions (UrbNet). She is the director (together with Professor Achim Lichtenberger, Westfälische Wilhelms-Universität Münster) of the Danish-German Jerash Northwest Quarter Project. The Ceramics in Context project is embedded within the excavation project.



Achim Lichtenberger, Professor and Director

Achim Lichtenberger is professor of Classical Archaeology and director of the Archaeological Museum at Westfälische Wilhelms-Universität Münster. Since 2011 he has, together with Rubina Raja (Aarhus University), directed the Danish-German Jerash Northwest Quarter Project. The Ceramics in Context project is embedded within the excavation project.



Iza Romanowska, Barcelona Supercomputing Center (Barcelona, Spain)

Originally an archaeologist by training, Iza Romanowska graduated with a PhD in Complex Systems Simulation from the University of Southampton, United Kingdom. In 2017 she joined the Barcelona Supercomputing Center to work on data analysis and modelling for the Roman EPNet project investigating trade in foodstuffs in the Roman Empire.



Simon Carrignon, Barcelona Supercomputing Center (Barcelona, Spain)

Simon Carrignon has a transdisciplinary education which brings together cognitive science, evolutionary biology and computer science. Building upon this background, he models human interactions at the local level to understand global changes in the society. His work focuses on the impact of social interactions on economic trades throughout the human history.



Tom Brughmans, University of Oxford (Oxford, United Kingdom)

Tom Brughmans is an archaeologist specializing in the study of the Roman economy through ceramic data analysis, computational simulation modelling and network science. He is currently a postdoctoral researcher at the University of Oxford's School of Archaeology where he leads the Leverhulme-funded project MERCURY, affiliated with the Oxford Roman Economy Project.



Alex Peterson, PhD student

Alex Peterson's project aims to better understand the settlement history and ceramics of the Middle Islamic period in the Northwest Quarter of Jerash, Jordan. By taking a contextual approach, this project hopes to develop a more holistic synthesis of this less well understood period in history.



Line Egelund (2017-2018), Research assistant

Line holds an MA in Classical Archaeology from Aarhus University. Line has been a member of the excavations in Jerash since 2014 and has worked with Jerash material both in her MA thesis and as a student assistant. Line, who is now a PhD student in another project within the framework of UrbNet, acted as the database registration manager during her time as a research assistant.



Charlotte H. K. Christensen (2017, 2018), Intern

Charlotte holds an MA in Classical Archaeology from Aarhus University. In 2016 she was a part of the Danish-German Jerash Northwest Quarter Project field season. During her two periods of internship at UrbNet, she has been taking up various tasks, including work on database entries.

Student assistants



Erling Alexander Norton Thorsen (2017-), Student assistant

Alexander is an MA student in Classical Archaeology at Aarhus University. He holds a bachelor's degree in History and Archaeology from the University of Oslo. Alexander has been adding new entries to the database and has been correcting errors, if any, in already existing entries.



Fynn Riepe (2017-2018), Student assistant

Fynn is a BA student in History and Classical Archaeology at Westfälische Wilhelms-Universität Münster. He is an exchange student at Aarhus University and a student assistant at the Ceramics in Context project. He has been working on adding new entries into the database.



Maria Thiel Madsen (2017-), Student assistant

Maria is an MA student in Classical Archaeology at Aarhus University. She took up work at the Ceramics in Context project in 2017. Her work has been focused on entering the data from the total registration of the Danish-German Jerash Northwest Quarter Project 2012-2016 into the database.



Mette Normann Pedersen (2015-2018), Student assistant

Mette N. Pedersen recently finished her MA in Classical Archaeology at Aarhus University. She has worked within the framework of the Danish-German Jerash Northwest Quarter Project and in particular with data organization, drawing of ceramics and basic registration. Furthermore, she has worked on the glass from the excavation in her MA thesis and is now a research assistant at GeoScience, AGiR, at Aarhus University.

Former employees

David Stott (2014-2018), Database designer

Heike Möller (2015-2017), Assistant professor

Janek Sundahl (2015-2016), Student assistant

Line Egelund (2015-2017), Student assistant

Mie Egelund Lind (2017-2018), Research assistant

Steff Elgaard Wiklund (2017), Student assistant

Nicolai Broen Thorning (2017), Student assistant

Signe Bruun Kristensen (2015-2017), Student assistant, Ceramic registration and drawing



View of the main street towards the Artemision from the so-called Camp Hill, Jerash, Jordan (Photo: Rubina Raja).

The Danish–German Northwest Quarter Project: A brief overview of the 2011–2017 campaigns

Professor and Director Rubina Raja
Aarhus University, Denmark

In the year 2011, the joint archaeological project between Aarhus University and Ruhr University Bochum (later Westfälische Wilhelms-Universität Münster) under the direction of Prof. Dr. Rubina Raja and Prof. Dr. Achim Lichtenberger was begun. The project is funded by the Carlsberg Foundation, H.P. Hjerl Hansens Mindefondet for Dansk Palæstinaforskning, the German Research Foundation (DFG), The Danish National Research Foundation's Centre of Excellence for Urban Network Evolutions (UrbNet) and EliteForsk. The aim of the project is to examine the settlement history for the until now largely unexplored Northwest Quarter in the ancient city of Gerasa, modern-day Jerash, in Jordan.

2011 Campaign

With a three-week long survey campaign, the Danish-German Northwest Quarter project in Jerash was begun in September 2011. The aim of the 2011 campaign was to undertake a survey of the city's Northwest Quarter, which stretches from the Artemision in the southeast to the city wall in the northwest. The survey laid the ground for a long-term project in this area of the city. It consisted of the following elements:

1. An architectural field survey and documentation of all architectonic remains.
2. Geodetic measuring of the topography and the architectonic remains.
3. Geophysical prospection of the area through geomagnetic and georadar examination.

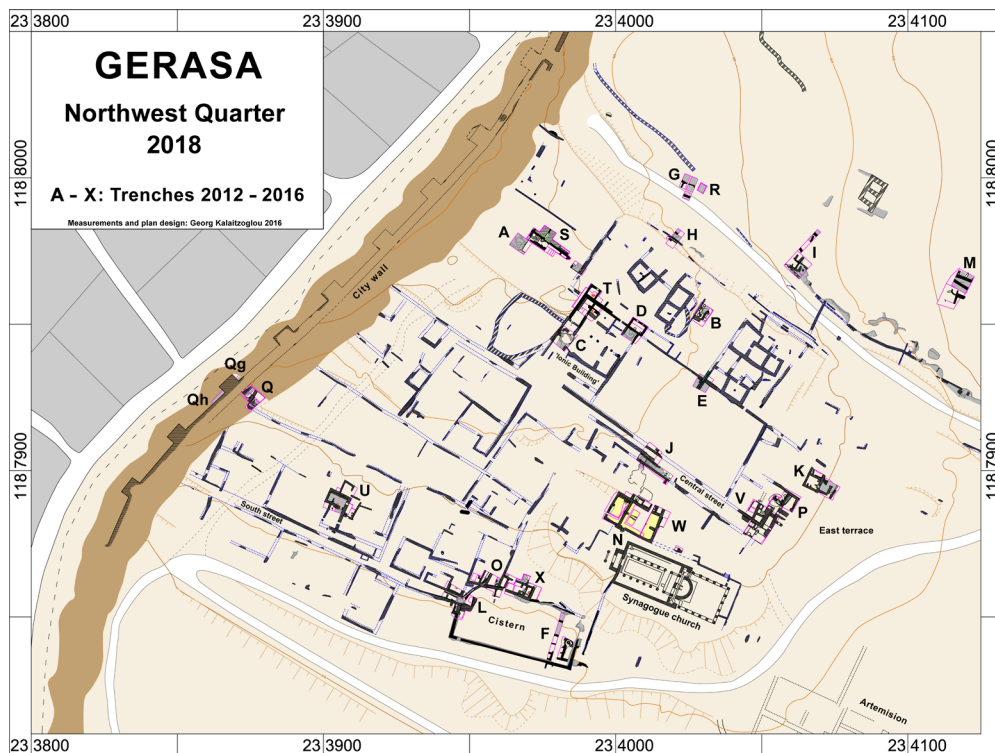
At the conclusion of the campaign, non-invasive prospection of the site provided much data useful for preparing the subsequent excavations that took place.

2012 Campaign

The three trenches excavated during the 2012 campaign yielded little evidence for occupation prior to the Late Roman/Byzantine period. Most of until now documented building activity took place between the Byzantine and Early Islamic periods with some reoccupations in the Middle Islamic period.

The earliest traces of human activities are the quarries in trenches A and C. They predate the later building activities and might be an indication of a sparsely settled area during the Roman period. However, the hill might have been occupied also in Roman and earlier periods as attested by sparse finds of pottery dating to the Hellenistic and Roman periods. Furthermore, the monumental altar-shaped architectural element, which was reused in an oil press, probably dates to an earlier period (Fig. 9). However, it remains unsure whether this block had its original place of origin in the vicinity or whether it had been moved there from somewhere else. At some point in the settlement history of the Northwest Quarter, a system of terraces was laid out in order to accommodate dense habitation, which covers all hill slopes. Even the oldest structures in the terraced area excavated so far follow the alignment of this system. As is evident by the overall mapping in general, and in trenches B and C in particular, some alterations of the inner arrangement took place over time.

Until the Middle Islamic period the excavated areas seem to have been more or less abandoned. From this period building activity began again and the large courtyard house over the cistern in trench C was constructed. Smaller, simple houses were also erected. Repairs and modifications of the buildings prove that the occupants, who had Mamluk-style pottery, lived in this area at least over a period of some generations.



Plan of the Northwest Quarter with trenches 2011–2016 (Photo: The Danish-German Jerash Northwest Quarter Project).

2013 Campaign

The results of the 2012 campaign, showing an intensification of the Late Byzantine and Islamic settlement in the Northwest Quarter of Jerash, was substantiated by the research undertaken in the 2013 campaign. The project was able to obtain a clearer vision of the small Mamluk settlement on top of the hill, and in 2013 we gained important information about the water supply of the ancient city. Concerning the topography of the Northwest Quarter, important new insights were gained: Firstly, insight into the course of the surprisingly steep valley on the northern side of the Northwest Quarter were gained and secondly, proof that there was no North Decumanus or later streets in trench G.

2014 Campaign

The results of the 2012 and 2013 campaigns, showing an intensification of the Byzantine and Islamic settlement in the Northwest Quarter of Jerash, was substantiated by the research undertaken in the 2014 campaign. The project gained a better understanding of the overall settlement on the hill, and in 2014 we again gained much important information about the water supply of the ancient city, but also about the Late Byzantine and Islamic period housing.

Concerning the topography of the Northwest Quarter, important new insights were gained: Firstly, deep structures for domestic and/or production usage cut into the bedrock in areas that seem to have been used as quarries in their earliest phases, were constructed after the quarry phases – a fact that yield interesting insights into the development of the Northwest Quarter. Such structures are previously unknown in this part of the city. Secondly, the fact that the eastern terrace seems to be covered by dense habitation, at least from the Byzantine period until the Abbasid period, is a new insight which will allow new perspectives on the overall urban development of Jerash in these periods. Thirdly, it is now beyond any doubt that the North Decumanus in the Roman period did not extend into the Northwest Quarter on the north side of the hill.

2015 Campaign

The results of the 2012–2014 campaigns, showing an intensification of the Byzantine and Islamic settlement in the Northwest Quarter of Jerash, were substantiated by the research undertaken in the 2015 campaign. In all trenches, the project found extensive Byzantine and Early Islamic occupation. Also, more Roman material was detected than in the previous years. This relates to the construction of the city walls (trench Q), but also to the first phase of use of the cave



Almost intact cooking pot from the excavation (Photo: The Danish-German Jerash Northwest Quarter Project).

complex as an oil press (trenches J and N) and to some, until now, not yet clearly specified activity in the area around the large cistern (trench O).

Some important further results need to be summarized: (1) We gained new data for the date of the construction of the city walls, which, at least in the excavated area, clearly dates to the Roman period. Further analysis of the finds will refine this date. (2) Again, we found impressive remains of Late Umayyad buildings on the eastern terrace, and (3) we found parts of a larger ecclesiastical complex which was related to the church south of it. It has mosaic inscriptions and nice geometrically decorated mosaic floors. This complex is of special importance because it is obviously one of the largest public buildings in the Northwest Quarter and furthermore, it presents important data for transformation processes in the aftermath of the Islamic conquest.

2016 Campaign

The results of the 2012–2014 campaigns, showing an intensification of the Byzantine and Islamic settlement in the Northwest Quarter of Jerash, were substantiated by the research undertaken in the 2015 campaign. In all trenches, we found extensive Byzantine and Early Islamic occupation, and this year even more Roman material was detected than in previous years. This relates to the construction of the large cistern in trench S as well as to the finding of a sediment basin

in trench X belonging to the large cistern on the southern slope of the hill.

Some important further results are summarized here: (1) We gained new data for the date of the cistern in the southern part of the Northwest Quarter, which underlines a clear Roman date. Further analysis of the finds may refine this date. (2) We found evidence for another Roman period cistern on the very top of the hill in trench S. This structure must be further investigated through the finds located within. (3) Impressive remains of Late Umayyad buildings on the eastern terrace were excavated, giving ample insight into the lavish buildings of the Umayyad culture and (4) furthermore, we further investigated the ecclesiastical complex which was related to the church south of it. It furthermore has geometrically decorated mosaic floors, which interestingly show that the mosaics completely followed the irregularities of the building's structure.

2017 Campaign

In 2017 a two-week study campaign was undertaken. During this campaign specialists and experts, who are working on different groups of material from the excavations as well as analysis programmes, took part. The intention of the campaign was to finish all further study of finds in order to prepare for the final publications of the project, which are currently in preparation.



View through the Tetrapylon (Photo: The Danish-German Jerash Northwest Quarter Project).

Forthcoming publications on the ceramic from Gerasa/Jerash in Jerash Papers

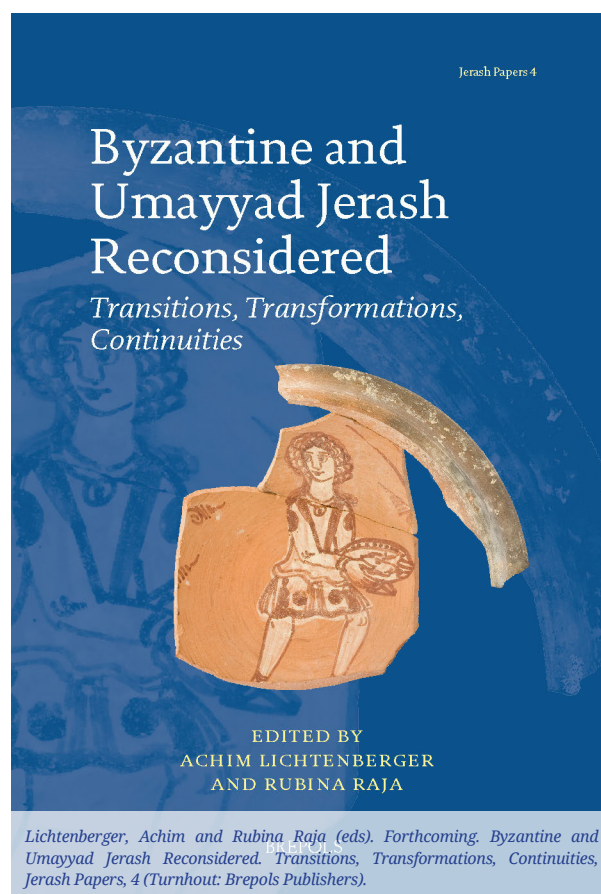
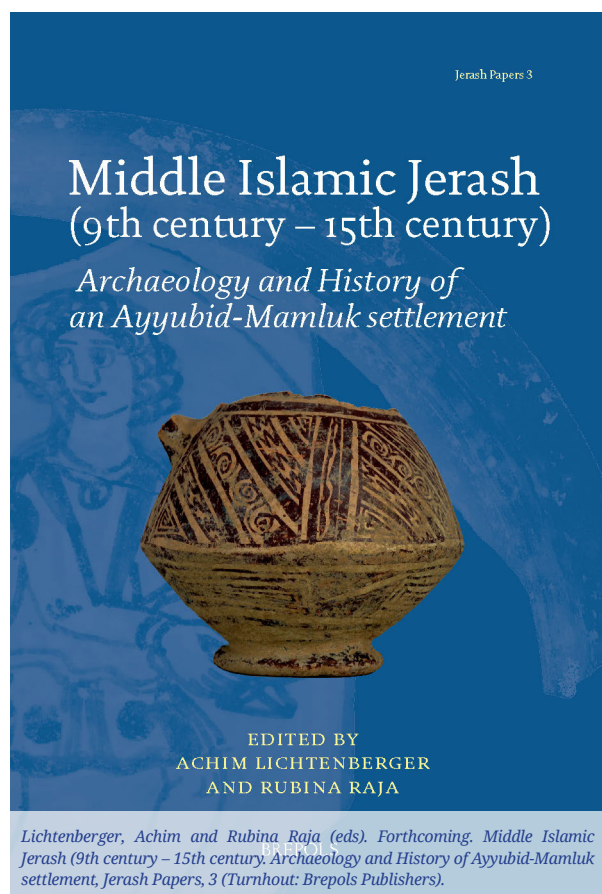
Professor and Director Rubina Raja
Aarhus University, Denmark

Within the framework of the Danish-German Jerash Northwest Quarter Project, the book series Jerash Papers (published by Brepols Turnhout) was founded by the two directors Professor Rubina Raja and Professor Achim Lichtenberger. This international, double-blind, peer-reviewed series is hosting several forthcoming volumes, which will provide a further basis for discussions regarding the local and imported ceramics from Jerash. This year, two volumes will be published – both originating from pottery specialist workshops held in 2016 at Aarhus University.

The two forthcoming volumes in Jerash Papers are:

Lichtenberger, Achim and Rubina Raja (eds). Forthcoming. Middle Islamic Jerash (9th century – 15th century. Archaeology and History of Ayyubid-Mamluk settlement, Jerash Papers, 3 (Turnhout: Brepols Publishers).

Lichtenberger, Achim and Rubina Raja (eds). Forthcoming. Byzantine and Umayyad Jerash Reconsidered. Transitions, Transformations, Continuities, Jerash Papers, 4 (Turnhout: Brepols Publishers).





Urban archaeology and the understanding of the past: Antiochia on the Chrysorrhoeas, also called Gerasa

Professor and Director Achim Lichtenberger
Westfälische Wilhelms-Universität Münster, Münster, Germany

Professor and Director Rubina Raja
Aarhus University, Denmark

Reprint from: Lichtenberger, A. & Raja, R. (2017). Urban archaeology and the understanding of the past: Antiochia on the Chrysorrhoeas, also called Gerasa, in: Lichtenberger, A. & Raja, R., *Gerasa/Jerash: from the Urban Periphery*, 9-20.

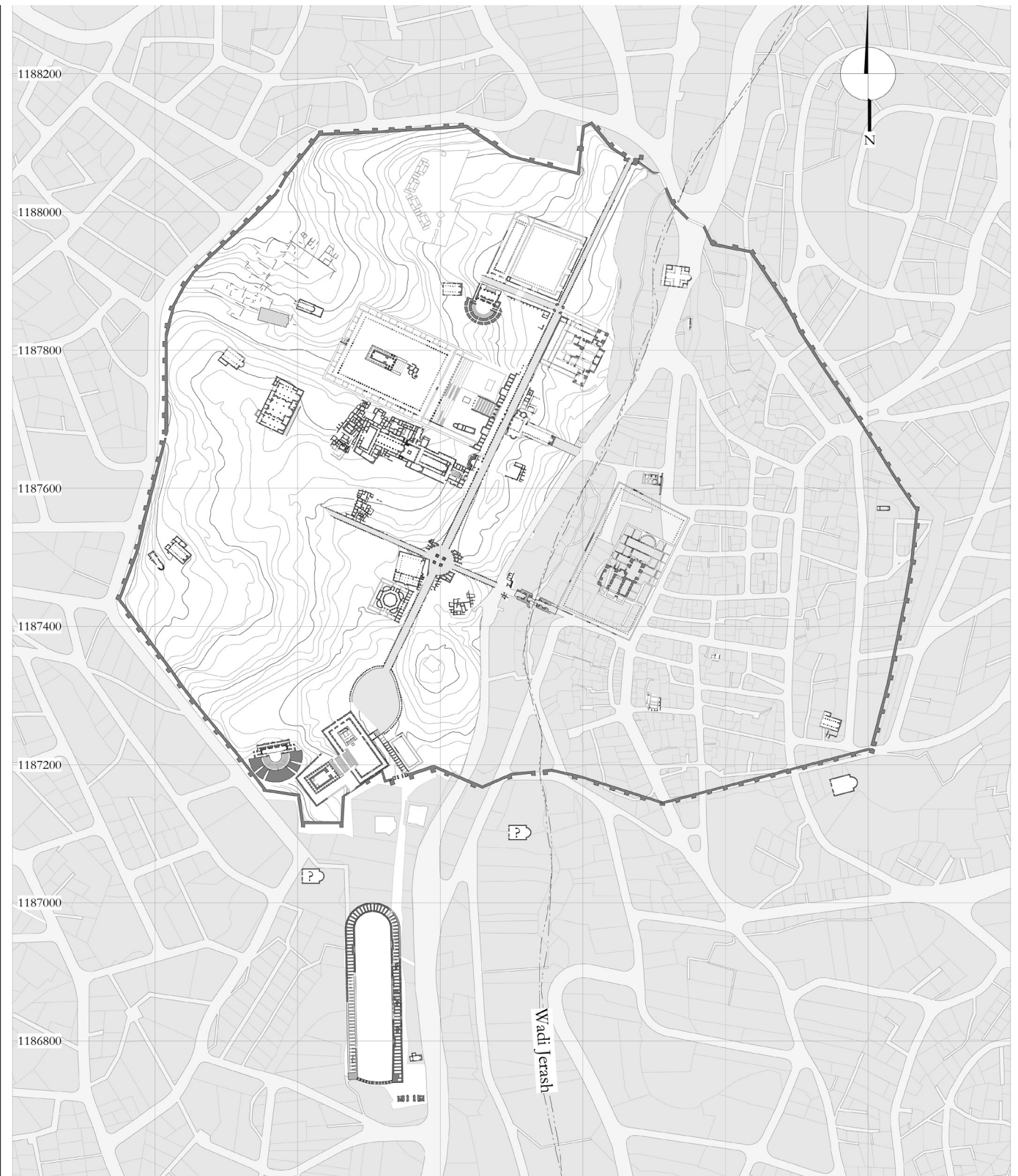
Gerasa, later known as Jerash, was a city in northern Jordan which flourished for several centuries (Figures 1). The city is known from ancient sources and is mentioned, among other ancient authors, by Pliny as being one of the Decapolis cities of the Roman period, all but one of which were located on the east side of the Jordan valley in southern Syria.

The city was rediscovered in the nineteenth century by a string of European travellers, the first of whom was the German traveller Ulrich Jasper Seetzen, who visited the site in 1806 and identified it as ancient Gerasa. Since then, the city has been the subject of numerous studies, and in the early twentieth century, the first archaeological explorations began. The large-scale American excavations headed by C. H. Kraeling in the 1920s and 1930s were the first to be undertaken with the aim of understanding the overall development of the site over time. Despite lacking any of the techniques or methods of modern archaeology, the scholars conducted an immense amount of work and published their findings in the celebrated 1938 synthesising work edited by Kraeling, *Gerasa: City of the Decapolis*. Scholars and visitors alike have been fascinated by the city ever since. Jerash remains the second most visited tourist location in Jordan, surpassed only by Petra.

Gerasa/Jerash flourished in the Roman, Late Roman, Byzantine and Early Islamic periods until it was struck by a devastating earthquake in 749 CE, which almost brought life in the city to a halt. We know from literary sources and from archaeological evidence that the city existed as early as the Hellenistic period, when, according to legend, it was founded as a settlement for veterans who had served in the army of Alexander the Great. This tradition seems to be an invention from the Roman period (Figure 2), since concrete evidence from the Hellenistic period dates only from Seleucid rule in the second century BCE. Until

now, little archaeological evidence from the Hellenistic period has come to light in Gerasa. The evidence that does testify to this period includes the magnificent Sanctuary of Zeus Olympios, located in the southern part of the city, as well as part of a settlement located opposite the sanctuary, which today houses a small museum. It may be that further Hellenistic evidence is still awaiting discovery.

Even earlier periods of settlement have been discovered here, in the region as well as in Gerasa. One of the most important Neolithic sites of the region, a so-called mega-site, is located right outside ancient Gerasa on the road leading south towards Amman, ancient Philadelphia. This site, Tell as-Sawan, which shows traces of settlement from as far back as 5000 BCE and holds rich evidence of human activity, has received renewed attention over the last decade and is currently being investigated by a team from the University of Jordan, Amman. The site is located on a promontory at a point where two wadis ran together. The site would have been easy to protect and fortify, and the location close to water was ideal for the settlers there. On the site, human skulls have been found buried under the floors of houses, divided from their bodies and with shells inserted in the empty eye sockets. Such a burial practice is known also at other Neolithic sites such as Ain Ghazal, near Amman. The investigations at Tell as-Sawan will bring new knowledge about settlement development and patterns in the region at this early period. Within the Roman-period walled city of Gerasa, prehistoric material has also come to light, if not to the same extent as at Tell as-Sawan. Nonetheless, this material shows that activity in the region was not confined to the promontory location.



جرش - Jerash - Gerasa

Plan général des vestiges archéologiques
au sein de la ville moderne
(Parcellaire 2008 d'après municipalité de Jerash)
Thomas LEPAON - 10/2010 - inédit

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Hellenistic and Roman Gerasa was situated in a dynamic region. The cities of the Decapolis were influenced by Hellenistic Greek and Roman cultures, and their urban layouts were often oriented towards the models following such traditions. But they were surrounded by traditional peoples such as Jewish population in Judaea in the west and the Arab Nabataeans in the south. Sometimes violent conflicts broke out, as in the First Jewish War, when war between these traditional societies and Rome also affected the Decapolis and Gerasa.



Figure 2: Bronze coin of Gerasa under Septimius Severus. Reverse: Alexander the Great as founder of Gerasa (Lichtenberger 2003, MZ 115).

Gerasa lay in northern Jordan, on the border of the Ajlun highlands to the west and the steppe desert to the east (Figure 3). To the north, the basalt formations leading into the Hauran begin; to the south, the desert road leads to Petra and Aqaba. Important north-south routes cross the region and connect with Egypt, the Red Sea and Mesopotamia, as well as the harbours of the Mediterranean. The Ajlun highlands are fertile even today and, in antiquity as today, these lands were cultivated. Furthermore, the Chrysorrhoas or Golden River ran through Gerasa, literally cutting the city into an eastern and a western half, which were connected in antiquity by bridges. The river had its origin some eight kilometres from the city, in Suf, from where it still flows today, but at a much slower pace than in antiquity. The fertile lands around the city were one of the reasons the city flourished. Gerasa was known for its linen production, with flax grown in the hinterland, and olives, vines

and other commodities were also cultivated. The epigraphic evidence from inscriptions tells us about landholdings owned by the elites in these regions, and the inscriptions underline that urban life went hand in hand with what took place outside the city walls. But despite surveys undertaken by an Australian team of researchers, the area around Jerash remains underexplored in terms of the exact nature of the use of the lands around the city. In recent years, the site and the region around it have undergone intense modern development. With every advancing year, more and more archaeological sites and monuments disappear as a result of the construction of new houses and roads.

The Roman to Early Islamic period: the city flourishes

Most of the evidence of urban life in Gerasa, or Jerash as it has been known since the Islamic period, stems from the period between Roman and Islamic times. The city became monumentalised in the first centuries CE when large structures were constructed along the main street, which ran through the city in a north-south direction and was more than a kilometre in length. This process started as early as the late first century BCE; during the reign of the emperors Trajan (98–117 CE) and Hadrian (117–138 CE), it intensified into a large-scale urban building programme. Along the colonnades, theatres, marketplaces, sanctuaries, and later churches and a mosque were constructed. Such monuments can be found in all the cities of these periods in the eastern Mediterranean, and they testify to civic pride (Figure 4). The sanctuaries too expanded, and the Artemision at Gerasa became one of the largest of the entire Roman world. It is in the area along and around the main street that most archaeological activity has been concentrated, and this remains the best-explored area of the city. Many publications have come out of the investigations of

these monuments, including the Jerash International Project, which was initiated in the 1980s with the support of UNESCO and ran for some years. This large-scale project brought to light important new evidence about the city's various monumental structures, including the theatres, the Sanctuary of Zeus, the Sanctuary of Artemis, several churches, and a macellum (marketplace) on the main street. Subsequent projects that contributed to our understanding of the site in Late Antiquity and the Islamic periods include the Copenhagen-based Jerash Islamic Project, which investigated the Early Umayyad mosque, situated on one of the intersections of the main street and built into an earlier Roman-period bathhouse. However, all these projects focused on the large monuments of the city and on spaces situated on or close to the main street. Not much is known about the area flanking the side streets of the city; even less is known of the areas situated far from the main street, such as the North-West Quarter.

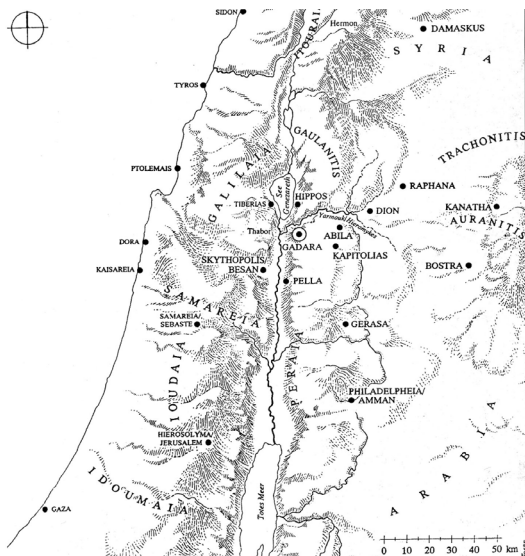


Figure 3: Map of the region (Hoffmann, A. and S. Kerner (ed.), *Gadara: Gerasa und die Dekapolis*, Mainz: Zabern, 2002, p. 3, Abb. 1).

In the Roman period, Gerasa was a medium-sized city covering an area of approximately 85 hectares. It was enclosed by high walls that were constructed at some point during the Roman period. The walls are more than four kilometres in length and are punctuated at strategic points by city gates, with bastions situated at regular intervals all around. The extreme topography of the site – with the intersecting river restricting crossing to manmade bridges in the absence of any natural crossings – has, since Schumacher's publication (1902) of a city profile, been rather neglected. But it is clear that the steep slope of the terrain, descending more than sixty metres to the river on both sides, meant that the topography of the site shaped the way in which the city could develop. While it was on the one hand a challenge, the topography also provided a magnificent landscape backdrop for various areas of the settlement.



Figure 4: Bronze coin of Gerasa under Marcus Aurelius. Reverse: Bust of Artemis as Tyche of Gerasa (Classical Numismatic Group, Electronic Auction 196, 1st October 2008, lot 162) [Diameter 15 mm].

In Late Antiquity, Gerasa/Jerash continued to prosper. The Late Antique period, in fact, seems to have been the most prosperous time for the settlement. Dense urban settlement is observed, and a rich pottery production existed. Many churches were erected in these centuries, and synagogues and later mosques were constructed in the city, attesting to the

diversity of the religious life of Late Antiquity. The flourishing of the city does not seem to have diminished after the plague pandemic of Justinian in the mid-sixth century CE or following the brief Persian occupation of 614 CE. Even the Islamic conquest, followed by the Arab invasion in 636 CE, did not change much in the city. Churches continued to be used, and although a large mosque was also erected in the city centre, this remained a heavily Byzantine city with the imprints of Christian culture. The destruction of the classical city came in the shape of an earthquake in the year 749 CE. This was one of the heaviest earthquakes in a region prone to quakes, and it devastated large parts of the southern Levant. Although a small-scale rebuilding seems to have taken place in the city centre, Jerash never recovered from this earthquake and was abandoned for what seem to have been some decades after the earthquake. In the Ayyubid and Mamluk periods, a resettlement of the site took place, but this was scattered in nature and had little to do with a true urban character. At the time of Seetzen's visit to the site in 1806, it was again lying abandoned. Only a Circassian resettlement at the end of the nineteenth century laid the foundation for the modern town of Jerash, which today occupies the eastern part of the ancient city – a fact that also hampers all archaeological investigation of this part of the ancient site.

The North-West Quarter and the Danish–German project

The North-West Quarter is the highest point within the walled city. It lies behind the massive Sanctuary of Artemis, which was laid out in the second century CE (Figure 5), and covers an area of approximately four hectares, forming a hill that slopes down from the west towards the east as well as from north to south, making it a prominent landscape feature within the urban setting. The topography of the North-West Quarter and

its unique location, as well as the fact that little archaeological work had been done in this area, laid the ground for the Danish–German Jerash Northwest Quarter Project, which began to explore the area in 2011. One complex, which had been investigated earlier in the 1920s, was the famous so-called Synagogue Church (Figure 6). This complex was a synagogue built into an earlier Roman-period house, later in the sixth century CE in turn converted into a church. Since the publication of this complex in the 1920s, only a few sondages or test excavations have been opened in the area, leaving us with next to no information about the overall settlement pattern on the hill. Among other things, the question of why and how the synagogue was converted to a church has puzzled scholars for decades.

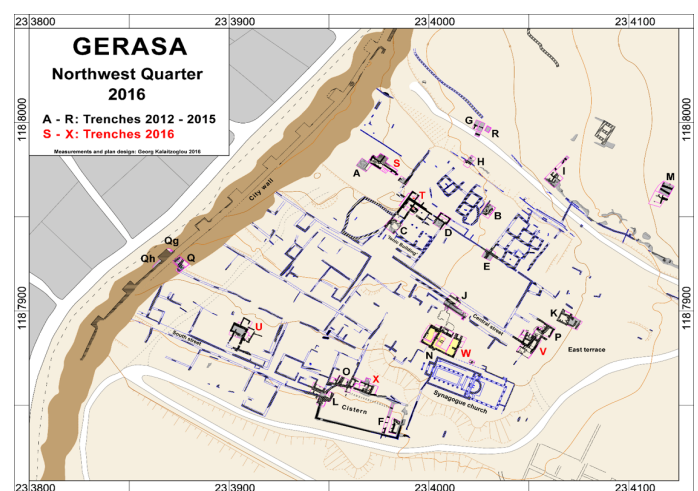


Figure 5: Plan of the North-West Quarter (Danish–German Jerash North-West Quarter Project).

Six archaeological campaigns have been undertaken by the Danish–German project, and the information gathered from these has been published in extensive preliminary reports in the Annual of the Department of Antiquities, Amman. Furthermore, a series of synthesising articles have been



Figure 6: Drone photograph of the Synagogue Church (Danish-German Jerash North-West Quarter Project).



Figure 7: Drone photograph of the Mamluk building (Danish-German Jerash North-West Quarter Project).

published regarding various aspects of the development of the North-West Quarter and how these contribute new information about the overall layout and use of space within the city over time. From the work undertaken so far, it is clear that the North-West Quarter was densely settled in the Late Roman, Byzantine and Early Islamic periods, and that the devastating earthquake of 749 CE brought life in this part of the city to a halt. It was not until the eleventh century that habitation was resumed on the hill in the form of several houses, one of which is quite monumental and lies at the very top of the North-West Quarter, indicating that it may have had an important strategic function (Figure 7).

Although the Roman period has yielded less material, it is now clear that monumental complexes were located on the top of the hill during this period, including a large cistern that served as substructure for a large building that seems to have been destroyed in the third century CE, together with the cistern. Furthermore, the largest cistern in the city is also located in the North-West Quarter, on the south side of the hill (Figure 8). This structure, measuring approximately forty by eighteen metres in its earliest phase, also dates to the Roman period, indicating that water management was undertaken during this period as early as the second century CE. Water pipes in situ have been excavated in several places, indicating that the water-management system was extensive from at least from the second century CE. Construction of the Roman-period monuments on the hill seems to have halted at some point in the third century CE, but as they were extensively reused, rebuilt and restructured over the following centuries, it remains difficult to give an overall impression of the North-West Quarter as it would have looked in the Roman period.

The Late Roman and Byzantine periods yield more information,

but often through phases which were also in use in the Early Islamic period. One of the most interesting complexes that have come to light is a large hall covered in mosaics, including inscriptions commissioned by the donors of the building, who were special forces of the Byzantine Emperor Justinian (527–565 CE), presumably stationed in the city to maintain law and order in the sixth century CE (Figure 9). This is of particular interest firstly because this special forces unit was unknown to us until now, and secondly because the close connection between the so-called Synagogue Church and the Mosaic Hall indicates that their presence may have had something to do with the conversion of the synagogue into a church. These new findings may thus alter our understanding of the history of Jerash in Late Antiquity by suggesting that the Roman military may have played a larger role in the region than previously assumed. However, remains from the Early Islamic period have also yielded information about, on the one hand, the continuity of traditions, techniques and cultural traits from the Roman and Byzantine periods, and on the other, the changes which the switch in rulership slowly brought with it, as seen in the coins found in the so-called House of the Scroll on the eastern terrace in the North-West Quarter. The eastern terrace has revealed a series of earthquake-destroyed houses which were devastated in CE 749 and have not been touched since then. This situation can be compared to that of sites such as Pompeii and Herculaneum, where frozen moments in time captured by a volcanic eruption or, in the case of Gerasa, an earthquake, are being excavated. These are situations that archaeologists do not often encounter.

The excavations in the North-West Quarter of Jerash are being undertaken using the latest innovative techniques. A non-invasive geodetic and geophysical prospection, as well as a survey of all the surface remains, preceded the actual

excavation in carefully selected areas. Because documentation and processing are crucial for every archaeological project, we conduct analogue and digital documentation as well as an extensive sampling programme for all kinds of materials. These samples are analysed for dating and composition and contribute to an improved understanding of the site and its material culture. In one case, computed tomography was applied to a silver scroll to digitally unfold and decipher the script on the fragile object without opening it (Figure 10).

Although the North-West Quarter in many ways seemed uninteresting from a traditional urban perspective when investigations were begun, the area turned out – not surprisingly – to be of profound interest for our overall understanding of the development of Gerasa/Jerash. Rather than approaching its work on the North-West Quarter as the settlement history of a peripheral quarter of Gerasa/Jerash, the Danish–German project sees its work as the basis for a case study that will yield important input into the formation of a structural understanding of the city as a whole, as well as that of a Middle Eastern city. In every excavated trench, rather than investigating the settlement history of a restricted area, we have approached the work with the big picture in mind. This means that important results, for example on the urban layout of Roman Gerasa or on the transition of Middle Eastern cities from the Byzantine to the Early Islamic period, can be scrutinised based on archaeological sondages in the North-West Quarter. The investigations have shown that when excavations are undertaken bearing specific research questions in mind, they yield a better basis for understanding the past. But they have also shown that archaeology, as so often, can surprise us, and that archaeologists must be prepared to work not only within their own chronological comfort zones, but also beyond what they are trained to do. Such a holistic and

multi-disciplinary approach – integrating approaches from the humanities and the natural sciences – brings fruitful results. Some of these we now present in this volume, which presents a variety of aspects researched over the last year within the framework of the Danish–German Jerash Northwest Quarter Project.

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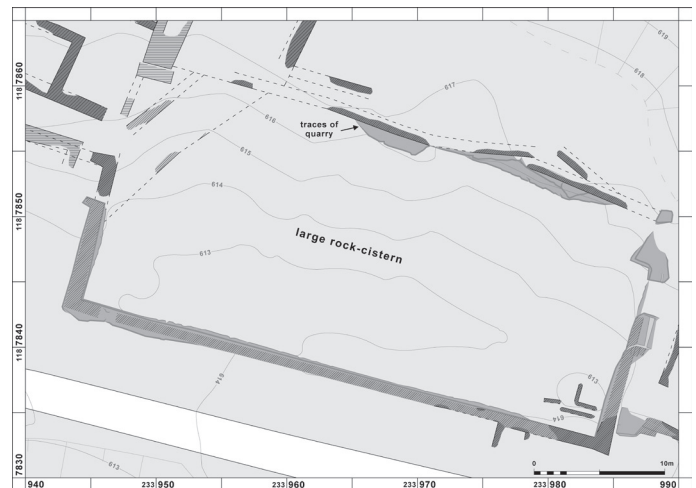


Figure 8: Plan of the large cistern (Danish–German Jerash North-West Quarter Project).

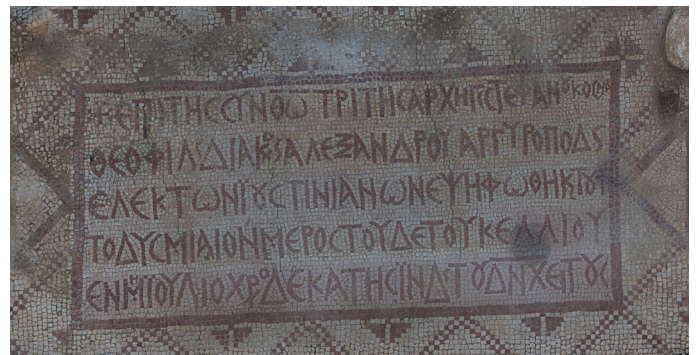


Figure 9: Mosaic inscription from the Mosaic Hall (Danish–German Jerash North-West Quarter Project).

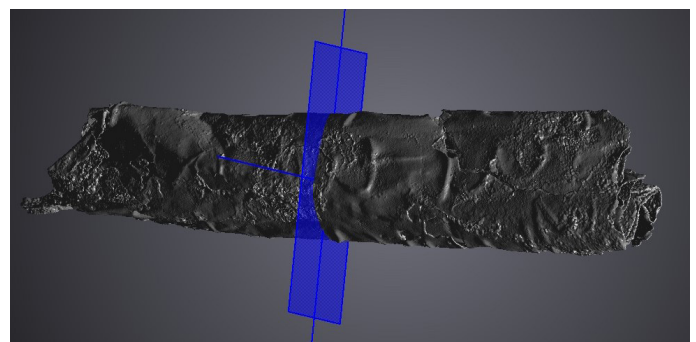


Figure 10: Digital imaging of unfolded part of the Jerash silver scroll (Danish–German Jerash North-West Quarter Project).

Ceramics in context: Interpreting life through pottery

Heike Möller
Formerly Aarhus University, Denmark

Reprint from: Lichtenberger, A. & Raja, R. (2017). Urban archaeology and the understanding of the past: Antiochia on the Chrysorrhoas, also called Gerasa, in: Lichtenberger, A. & Raja, R., *Gerasa/Jerash: from the Urban Periphery*, 59-66.

Jerash – ancient Gerasa – is famous for its large-scale pottery production, extending from Hellenistic/Roman to Umayyad times. The kiln sites were probably scattered all over the ancient town, as seen from the evidence of workshops found at the Hippodrome, next to the Temple of Zeus, along the Cardo, at the Artemis Temple, and at the North Theatre. Due to the large amount of locally produced pottery, which has been excavated in Jerash, we have to assume that what we have comprises only a small percentage of the total population of kiln sites.

The potters supplied their customers with all kinds of pots: containers such as storage jars and amphorae for transporting goods, but also cooking- and tableware such as the so-called Jerash Bowls. Vessels produced outside the town also made their way to Jerash. These were mainly used for food supply – transported in amphorae, but also included vessels for kitchen usage and tableware. Sometimes, these products were traded from far away, such as some amphorae carrying fish sauce (garum). The containers and their contents were made in Lusitania (Portugal) or Baetica (Spain). Some of the famous tableware, the so-called African Red Slip Ware, was produced in the region that today is Tunisia.

Pottery played an important role in daily life in Jerash. In the kitchen, it was used for food preparation; it was set at table as dining vessels; it was used in storerooms for food storage, at home, but also in certain agricultural contexts for oil production. Analysing pottery therefore extends far beyond dating particular types of evidence and creating typological sequences.

Beyond this traditional type of analysis, the functionality of economies (including networks of production and exchange), functions associated with particular sites, and diet and

standards of living can all be investigated through studying the pottery on site and viewing it within its broader archaeological contexts.

Research questions

Our research was intended to go beyond simple pottery studies that focus exclusively on the development or provenance of particular pottery forms over time. We wanted to push past these rather limited types of study and take a look behind the facts to view the changes in time from a different angle. What does pottery tell us in context, and what does it tell us about context?

The material studied at Jerash stems from the excavations in the city's North-West Quarter under the aegis of the Danish–German Jerash Northwest Quarter Project. More than 800,000 sherds were brought to light during five years of excavation. This is an enormous amount of material, and an excellent basis on which to tackle questions that go beyond basic work.

Nevertheless, as Jerash was one of the most important production centres of northern Jordan, questions concerning the local production are of crucial importance. Accordingly, characterising the composition of the clay that was used for the local pottery production was one of our main objectives. Several research publications on kiln sites in Jerash already exist, and based on various studies from numerous excavations in Jerash, we know that people in ancient times mass-produced pottery. Until now, however, the chemical fingerprint characterising local products remained unknown. Establishing this means that finds from Jerash can be identified elsewhere – beyond the city walls – and this gives an insight into the micro and macro networks of the site. What did people produce in such

We also have to ask the following questions: can we specify the production phases of particular pottery types by applying methods taken from the natural sciences to use several different dating methods? Do changes in style correspond

To characterise the fabrics of the local production, a series of sherds were sampled for further analyses. The sherds were selected primarily by their function and secondly by chronological frame so that we could consider both the time of production and the function of each vessel based on the composition of the fabric (Figure 2). Archaeometric analyses such as thin sections, cluster analyses and refiring experiments helped to establish the fingerprint of local ware. The information gained by these processes is important for the identification of Jerash productions on other sites, and it serves as a basis for further studies on regional networking and consumption patterns. To gain a better understanding of where imported finds were produced, non-local finds too were sampled and their petrology analysed (Figure 3).

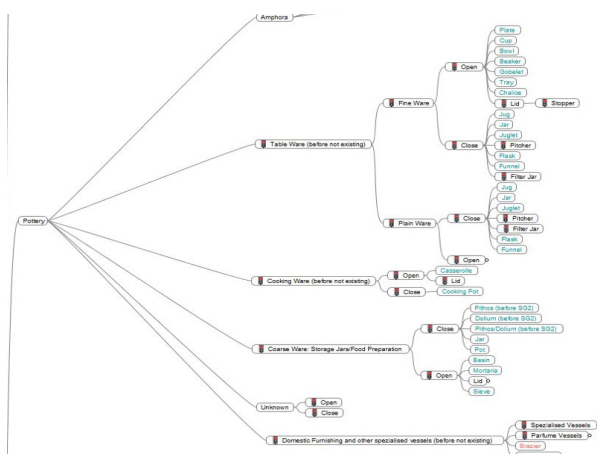


Figure 1: Mind map of pottery divided by functional groups (Heike Möller).

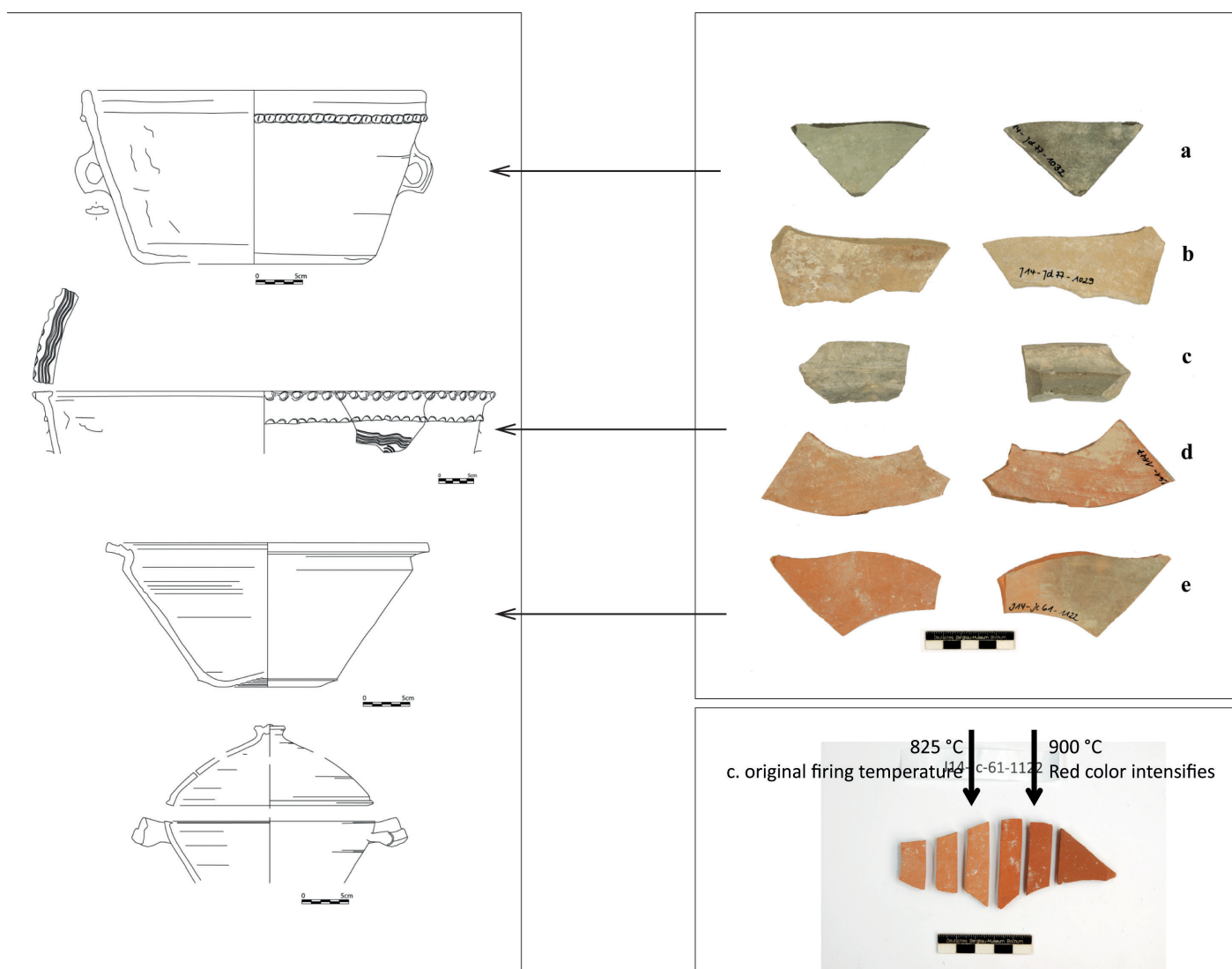


Figure 2: Selection of pottery sherds and refiring experiment (Stephen Merkel/Heike Möller).

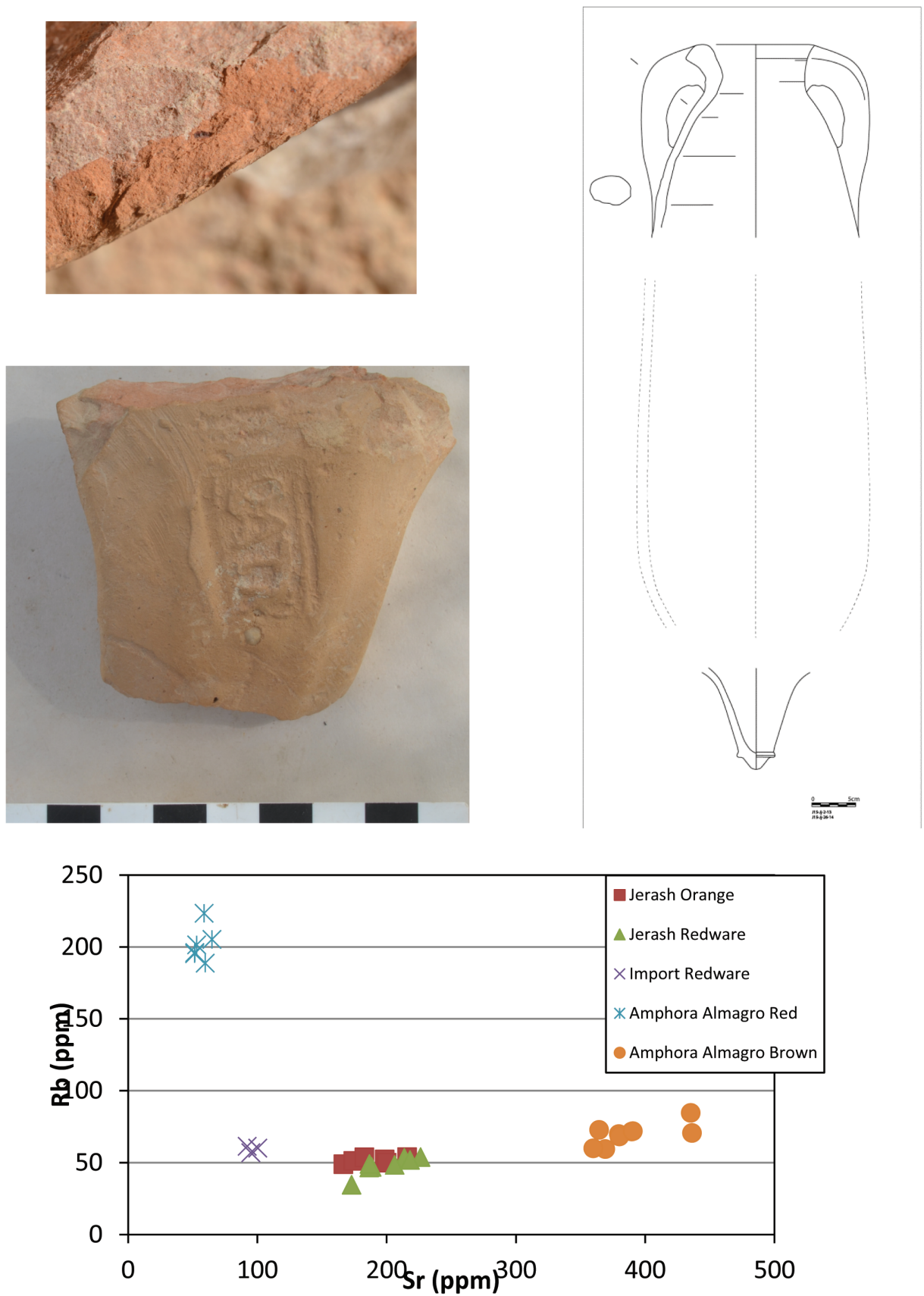


Figure 3: Almagro 50, produced in Baetica and Lusitania (?) (Stephen Merkel/Heike Möller).

Contexts

To reach an absolute dating for a context, we have to consider all datable finds. These might include coins, metal, glass, or other find categories that can be subjected to natural-science analyses such as radiocarbon dating. In order to date a context we have to go by the youngest find –the only find that can accurately date the context, as it is the last one produced. It is often very hard to determine which object is the latest object, as the context can consist of material made at different points in time. Great care is also needed to identify the youngest sherd, because some contexts can also be contaminated (for example, objects can be moved around at later points in time). The study of the context has to be comprehensive. This is one of the reasons why all the information has to be precisely documented: even the degree of fragmentation of a sherd can tell us a great deal about the history and development of a context.

Another issue in dating a context is the long lifespan of some vessel types. In general, the production of types was influenced by what we might call fashions, and this is probably the main explanation for the choice of delicate pottery as tableware. But most of the pottery was simply functional, and once a type was popular because it was practical, the production might continue without significant change for hundreds of years. Keeping such facts in mind, we have to constantly rethink typo-chronological approaches and be on the lookout for any changes in the details. But it is not just the slight variation in production that can indicate significant changes; the context itself may also help us to rethink established chronologies. Certain contexts excavated in the Northwest Quarter were chosen for more detailed analyses of specific pottery productions. Destruction layers, for example, mirror the inventory of a house or location

at the moment of destruction. The find assemblages from those contexts reflect the inventory of the site at the moment just before it was demolished; in other words, they tell us what material was in use at that same time. What kind of cookware was used with what type of tableware? What did the storage jars look like at that time? Knowledge of what materials were used at a specific point in time improves our understanding of the chronology of production phases (Figure 4).

New results

The archaeometric analyses that we ran allowed us to characterise the local fingerprint of pottery from Jerash, since almost all sherds showed the same geochemical compositions. It is now clear also that the differing coloration of some vessels was the result of different firing conditions, because the composition of the fabric is identical. This applies throughout all periods, from Roman to Early Islamic times. Because of the privileged natural conditions on site, it was possible to collect the clay that was used for pottery production almost everywhere in the vicinity of the city – and that, of course, is one explanation for why pottery was produced on such a large scale in Jerash.

From Roman times, the potters supplied the people living in the North-West Quarter with storage jars, cooking- and tableware produced in local kilns. Nevertheless, imports from both near and far also made their way to the North-West Quarter, as attested by imported Late Roman amphorae, probably carrying wine from Cilicia, or amphorae containing fish sauce (garum) made in what is now Spain or Portugal. Tableware from as far away as Tunisia reached the site, proving that the North-West Quarter was embedded in a broader trade network at least from Roman to Early Islamic times (Figure 5).

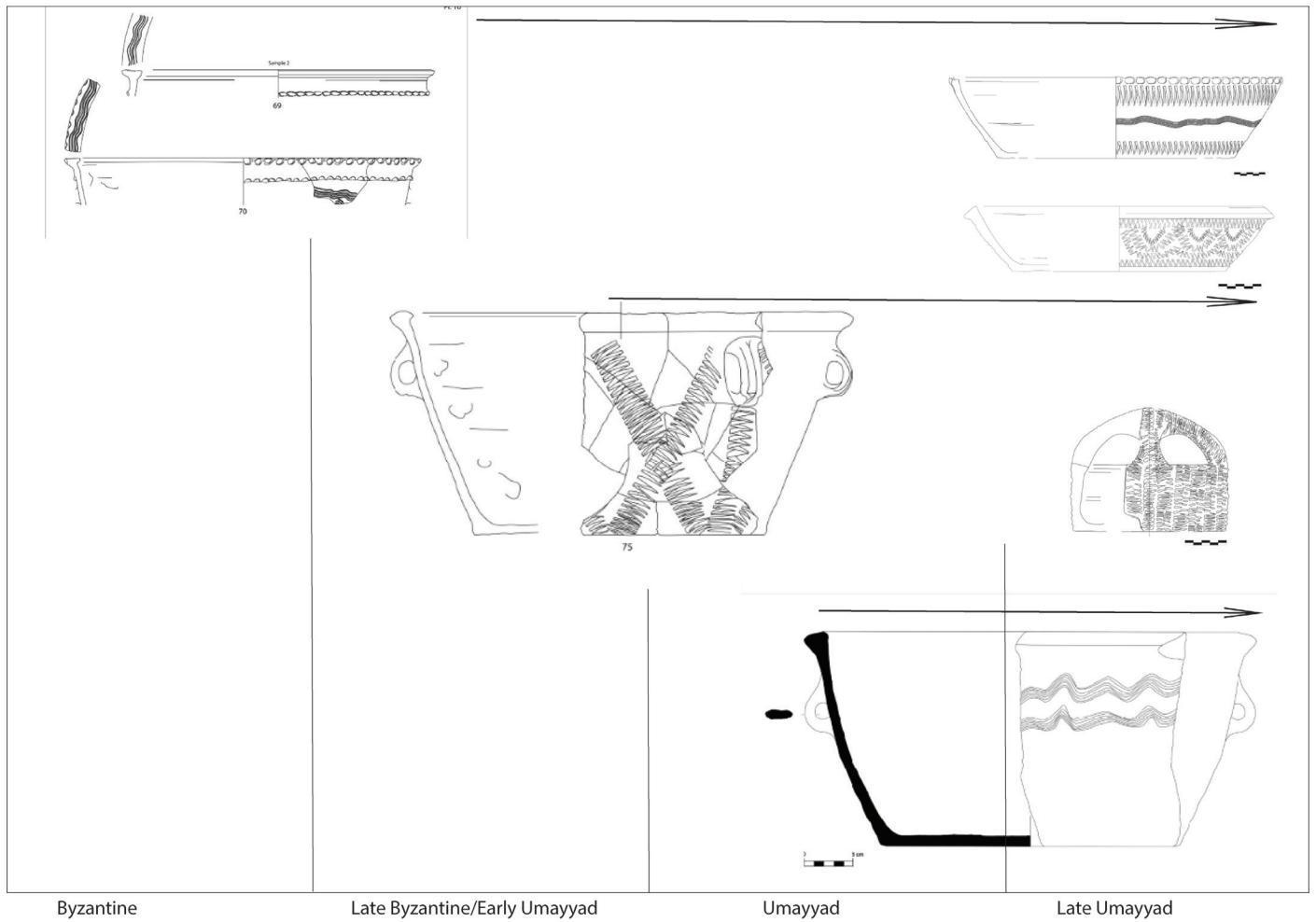


Figure 4: Production phases of Umayyad pottery (Heike Möller).

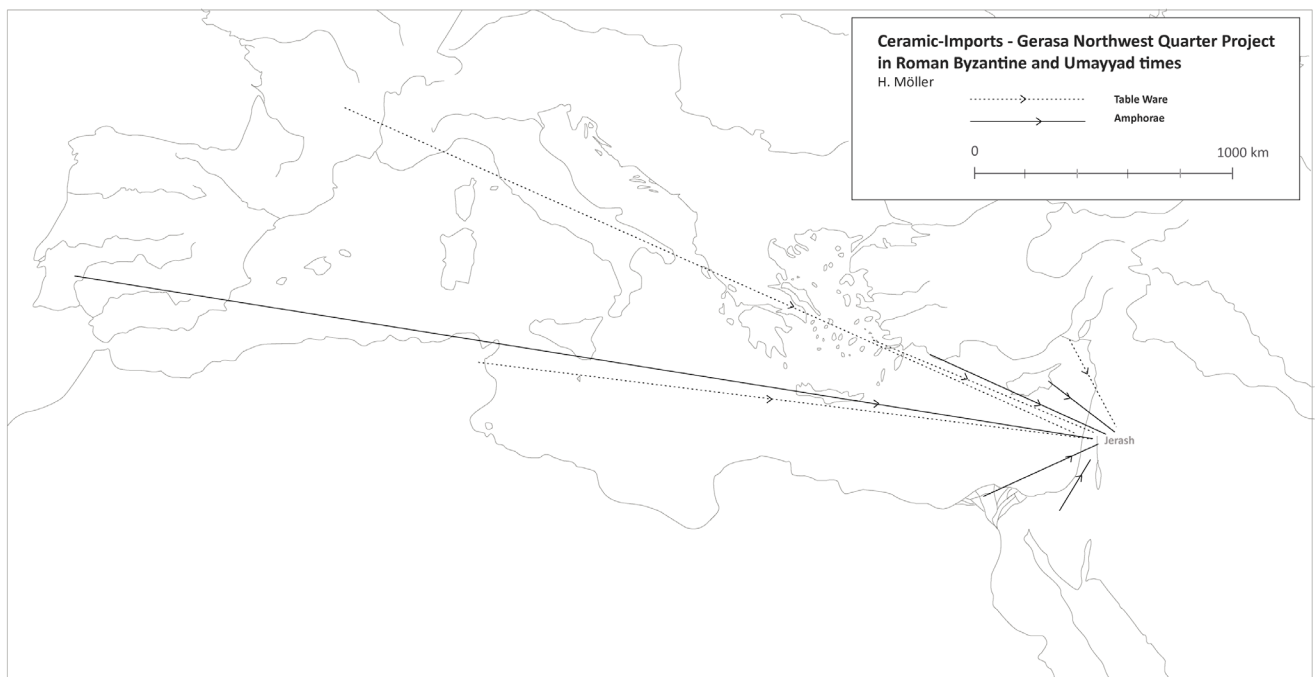


Figure 5: Map of pottery imports of Jerash in Roman to Early Islamic times (Heike Möller).

On site, the natural prerequisites seem to have been sufficient for subsistence, probably even for a surplus economy. Two excavated oil presses in the North-West Quarter are evidence of oil production and consumption, and traces of oil were also found in two of the locally produced amphora.

Undisturbed contexts such as the Umayyad destruction layers in Trenches K, P and V, which uncovered a residence-like edifice with adjacent buildings, give insight into the inventory of a building complex just before it was demolished by the earthquake of 749 CE. The pottery production that existed as early as the Late Byzantine and Early Umayyad period seems to continue until the middle of the eighth century, since late examples have been found in all the destruction layers. However, other vessels represent new inventions of the later Umayyad period, such as some of the cooking pans, stoves and storage jars. These point, at least to some extent, to a new tradition of cooking, and also vessel decoration, in the later years of the Umayyad period.

The absence of any Abbasid pottery in the North-West Quarter makes it clear that the site was abandoned after the earthquake. Settlement in the North-West Quarter before the Ayyubid–Mamluk period, when new buildings were constructed and the pottery characteristic of this period was used and discarded, cannot be documented.

As already pointed out, among the many finds documented by the Danish–German Jerash Northwest Quarter Project over the years, it is the pottery that played an important role in daily life in Jerash. It was used in very different contexts – in kitchens or as dining vessels, as storage jars but also as containers for food storage and transport. A closer look at the pottery in context, involving different materials and using

natural-science methods, does more than contribute to a better understanding of the chronological sequences of particular productions. It adds knowledge about the site's function and it tells us about the functionality of economies, such as networks of production and exchange, and also about diet and about standards of living – but only if we approach the pottery in a broader archaeological perspective than the simple study of form and formal development over time.

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Sorted ceramics in the total registration during The Danish-German Jerash Northwest Quarter Project's campaign in 2015 (Photo: Mie E. Lind).

Ceramics in Context: Common Wares and Cooking Vessels from Jerash

Signe Bruun Kristensen
MA student, Aarhus University, Denmark

The aim of my current work on the ceramic material from Jerash is to explore the questions of production patterns and the versatile function of the common ware group. This will be examined by viewing the unexpectedly versatile find contexts of the ware type, the immediate development in shape, and the regional counterparts.

Furthermore, I aim to investigate to which degree the substantial findings of common ware pottery from the campaigns can illustrate the production and function of Late Roman to Early Byzantine cooking ware. Cooking ware is often interpreted as being of mere practical usage – not serving more than a domestic purpose. Is this really the case? In Jerash, additional functions of these pots have been demonstrated, thus a more careful study on the subject will disclose the multifunctionality of the ware as well as underline its importance as archaeological material. Under the title: “Defining shape and function in Late Roman – Byzantine local produced cooking ware”, my aim is to create a chronology

and typology of the domestic ware. By defining the firing and production patterns, I furthermore hope to create a typology that can be applied to the common ware of the hinterland.

The research is made possible by analyzing ceramic material using methods like thin-section – a technique allowing for a stringent mapping of the clay matrix, with help from the Ceramic in Context project.

My aim is to contribute with a more legible depiction of the otherwise overlooked ceramic group, that is the common ware. Additionally, I intend to comprise a quantitative group of locally produced common ware, the focal point being cooking ware from the Late Roman to Early Byzantine period.

Furthermore, to explore questions such as: Did resource management or economical awareness dictate mending practices; and can cooking ware provide us with supplementary information other than “just” diet changes?



Cooking pots excavated from the Northwest Quarter of Jerash, Jordan (Photo: Signe Bruun Kristensen).



Staircase to the Sanctuary of Artemis seen from the main street in Jerash, Jordan (Photo: The Danish-German Jerash Northwest Quarter Project).

Cooking up culture: production traditions in Late Roman–Byzantine locally produced cooking ware

Signe Bruun Kristensen
MA student, Aarhus University, Denmark

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A cooking pot tells a tale – not just of the cook busy in the kitchen, or the skilled potter who threw it on the wheel, but of the culture in and by which it is shaped. Although ceramic cooking wares have been found in great number at classical excavations throughout the world, little attention has hitherto been paid this ceramic group – a group that in spite of its plain and simple exterior may prove to be of great importance to the archaeological material. If we look past the conventional perception of these wares, a narrative of stylistic, functional and socio-historical development unfolds. The vast assemblage of domestic pottery uncovered by the Danish–German Jerash Northwest Quarter Project is no exception. Numerous domestic areas have been uncovered in the first five years of excavations, which allow us to draw a more detailed picture of everyday domestic life and practices. The extensive ceramic material and well-established find contexts provide an excellent opportunity to present a cooking-ware typology and chronology for the Roman and Byzantine period in Jerash.

Research questions

Pottery plays an important role in any archaeological context, as it provides a marker for chronological and cultural change (McKern, 1939). One of the first steps towards understanding domestic pottery is establishing a typology that can provide a basis for dating and for classifying the stylistic development of the cooking vessels. Used correctly, a classification can be used as a means to define the intended as well as the actual function of the cooking vessel, taking into consideration that the intended and actual use do not necessarily intertwine (Skibo, 2013). Ultimately, such a classification can reveal which parts of the Roman and Arabic world ancient Jerash interacted with. To answer all this, we need to dive directly into the clay. The ceramic material from the excavations in Jerash raises

and answers questions. Does a cooking pot need to show signs of usage over fire to be a real cooking pot, or is function even important so long as it belonged in the kitchen? Did local potters rely on foreign techniques when manufacturing the pottery, or were they themselves the trendsetters for production? Did the consumers of ancient Jerash look for quality or quantity when shopping for a new pot? Can we trace Roman influences in the ceramic material, as seen in architecture and infrastructure? This short chapter endeavours to explain the processing of the pottery, and to present some of the new knowledge it provides – big or small.

Methods

The ceramic material is sorted and counted shortly after being uncovered in the field, categorised by fabric, shape, and firing technique. Diagnostic fragments such as rim, handle and base are kept for further study, a process that includes a thorough analysis of clay matrix, surface treatment, and orientation (Lichtenberger et al., 2012). Additionally, time is dedicated to the processes of drawing, conserving and reconstructing the pottery in order to come as close to the original appearance of the pot as possible.

The material has been carefully selected from the vast ceramic corpus as samples have been taken from trenches representative of the broad spectrum of shapes and fabrics. The group characterised as cooking ware is further subcategorised by presumed function: pot, pan, casserole and so forth (Figures 1–2). The process of grouping and naming vessels is performed with great caution, so as not to exclude vessels that will compromise the dataset; therefore, the term “cooking ware” often includes vessels not necessarily directly related to practices of cooking. Subsequently, a more thorough

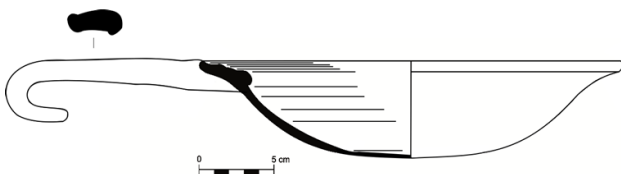


Figure 1: Reconstruction based on (J13-Ed-20-28). Byzantine casserole (fifth–sixth century CE). This type comes in two varieties: a pale red colour with a diameter of 22 cm and a larger model measuring up to 42cm, in a bright grey. The smaller model illustrated here is by far the most popular (Danish–German Northwest Quarter Project).

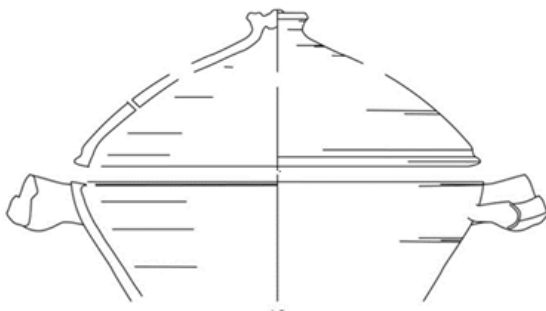


Figure 2: Lid (J15-Nb-57-227-28), casserole (J14-Je-77-1107), date Byzantine–Late Byzantine (fifth–sixth century CE). Casserole with lid, found in great numbers at the excavations in Jerash. Lid and bowl are produced as one item, cut in two just before going in the kiln, creating a lid that fits the casserole to perfection (Danish–German Northwest Quarter Project).

recording of firing methods, production techniques, and the tempering of the clay is conducted. The firing technique is established by studying the immediate colour of the pot, which reveals the temperature and oxidation in the kiln at the time of production. The tempering of the clay is defined by recording the mineral and organic inclusions of the clay, ultimately sorting the material into three groups: fine, medium, and coarse. This process enables us to speculate about the refinement of the clay and therefore the craftsmanship of the potter. This process is executed with the help of a 20x magnifying lens, before undergoing thin-section technology. The latter is a scientific procedure used to determine the components of the clay (such as quartz or lime) as well as defining the density. This method is important in the analysis of cooking ware, as some of these

components can make for a better heat transfer and decrease the risk of breakage (Reedy, 1994). Additionally, the clay matrix reveals the heat endurance of the pot and can thereby provide information about what was cooked in the vessels and how. The components of the clay can demonstrate whether the clay has been imported from foreign regions or has been collected from the local deposit. A local clay may indicate a larger production of pots, assuming the clay was easily accessible and therefore presumably cheaper to come by. In addition, imported clay shipped in from abroad, carrying exotic contents or decorations would have been of greater cost and prestige. As we still see today, the production of merchandise is unavoidably affected by external conditions. An imported clay or imitation of foreign shapes can thus give us an idea of the regions Jerash traded with, and how far their caravans and ships travelled; as a result, it can also give an indication of the local infrastructure and economy.

The stylistic and functional development of pottery provides an idea of the production patterns and the customers' increasing demand for the product. Furthermore, it paints a picture of the stylistic trends to which the area was subjected (Morrison, 2015). For example, the dimensions of the pot grow bigger from the Roman period to the Byzantine period, a stylistic development that may indicate a shift in consumer behaviour (Lund, 2006). The shaping of the pot and its surface treatment are correspondingly important for a well-functioning cooking pot. For example, the modelling of shoulder and base is not just a stylistic choice by the potter, but also a way of minimising the stress on the pot when exposed to strong fluctuations in heat. The ribbing on the body may look like a decorative choice, but it can also be a technique added to optimise the pot's heat conduction (Figure 3). These methods, actively applied by the potter, are reflected in the diameter of the mouth and body of

the pot, the size and placement of the handles, and the angle and curve of neck and lip. Aspects such as traces of fire, quality, and traces of contents and wear and tear are also taken into consideration.

Typology

Typology is a keyword in archaeology, whether working with architecture, jewellery or, in this case, pottery. A typology can be explained as a methodical study with the single goal of finding a solution to a specific question (Rice, 1987). It is the process of classifying a material into groups of types based on the physical characteristics of the artefacts – the only requirement being that the individual artefact has more in common with the artefacts in its assigned group than with the ones outside that group. Every artefact can be divided into elements which, as a whole, will make up that artefact. A cooking pot will often be categorised by rim, lip, neck, body, and base – all features that can be moulded in countless ways. Consequently, the elemental composition of a pot is theoretically unlimited. What is more, no manmade pots, whether turned on a wheel or moulded by hand, will turn out exactly the same, regardless of how skilled the potter is. So as not to end up with just one pot in each group, the groupings are made with room for variation.

A typology allows the material to be tested against local and regional parallels and/or counterparts with respect to one or more recognisable attributes, and it can lead to a better understanding of the material. Viewing a typology in close relation to the stratigraphic material helps us to reach a reliable dating of the material. One must however, be aware that a typology is not without its limitations. When a ceramic material is being characterised into narrowly defined groups of types, the extremities in the classification are bound to be

neglected and the typology will consequently fail to describe all the variabilities of the artistic tradition.

The cooking pots from the excavations in Jerash have been divided into eight main groups on the basis of rim, neck, body, handle, and base. Few of the vessels were found intact or with all five elements present; therefore the focus has been placed on rim, neck, shoulder, and handle, as they are the elements most often discovered in the field. Groups 1 and 5 are described here, clearly illustrating the different types found in the cooking pot category. Group 1 (Figure 4) is defined by a pointed lip folded outwards, a short curving neck, and rounded shoulders, and is found in great quantities at the site. Group 5 (Figure 5) carries a flattened, outwards-folded rim, a straight elongated neck, and sloping shoulders. This too was detected throughout the site, nevertheless in smaller numbers. Both groups are found in a variety of colours and sizes.

The groupings of the pots allow for further research, as demonstrated here. The development of the pot in regard to production technology, size, decoration, surface treatment, and quality is now compared to the find contexts and the regional counterparts. This approach is applied to all the shapes that cooking ware holds, ultimately drawing a picture not only of the cooking ware, but of the waste ceramic material detected in Jerash. The tendencies and developments of the pot find parallels in a large spectrum of archaeological findings. As we know today, trends can be detected in every single area and aspect of life; and accordingly this ceramic material is closely connected to popular tendencies in furnishing a house, practising a religious life, and also in economic ability and consumption in the area. Developing a cooking ware typology is, therefore, key to answering questions that go far beyond the results presented here.

New results

The cooking pot provides us with a broader knowledge of the ancient city of Jerash. But in addition to providing the basis for a reliable chronology, it also draws attention to the colourful life that was lived in ancient Jerash. The discussion of function and of the actual use of the vessels has proved to be very informative when studying cooking ware. The 2012 campaign unearthed three cooking pots that had been deposited intentionally. The pots had the characteristics of typical Late Roman cooking pots, but showed no signs of direct use over fire. Additionally, a tile fragment indicating a valuable content lidded the pots. Analyses of the content showed no signs of biological remains, which indicates that the final function of the pot was related neither to food preparation nor to serving as a burial urn (Lichtenberger et al., 2015). Although the final purpose of the cooking pots cannot be determined, they underline a larger scale of reuse and multiple functions being given to plain domestic wares. It is often believed that a regular cooking pot, casserole, or pan is an item used for preparing food directly in the oven or on the fire, whereas smaller bowls, jugs, and jars were used for storage, serving or presented directly on the table. But the excavations in question have shown that this seldom is the case. On the contrary, we see examples of smaller juglets and larger storage jars whose use over direct fire is indisputable, as the soot marks are strongly indicated. So we may conclude that the intended purpose of particular groups of cooking ware may not have been limited to one single function, but was multifunctional by intent (Skibo, 2013). We have also seen that these pots have longer lifespans than the presumed average of three years (Spataro, 2015). The life of the pot is prolonged by giving the broken vessel a new function in the household or production. The excavations reveal a great deal of reuse in the form of vessels that have

been mended with plaster or lead clasps. This is recorded both in times of prosperity and recession, indicating a profound respect for resources, regardless of their economic value. This corresponds with the well-conceived system of recycling for non-biodegradable products implanted in antiquity (De Sena, 2006). Furthermore, the many recorded examples of reuse, for example a cooking pot becoming a melting pot for glass or lead, suggest a high degree of manufacturing activity in ancient Jerash, as further underlined by the large number of kilns in the city. These findings suggest that Jerash was a production centre, able to produce goods for local demand.

In preparing the clay for production, Jerash does not follow the traditions of the regular Roman province. The clay matrix shows no signs of intentional improvements such as added quartz or lime to optimise the use of the pot over fire, a technique often applied elsewhere in the Roman world. The local potters have resorted to simpler measures when probing to improve their pots. The pots are prepared for the exposure to fire by perfecting the body shape. The soft curves of the shoulder and base minimise breakage, and the ribbing of the body and base helps to ease the heat conduction. It seems that this approach of optimising the function by rethinking shape rather than temper is practised to a degree not matched by regional counterparts. This indicates that Jerash was a trendsetter in regard to pottery production, and it underlines the city's production superiority in the region. The production of pottery seems to continue at the same pace from the Late Roman to the Umayyad period, but seems to reach its peak in refinement of execution and quantity during the Late Roman–Early Byzantine period.

As outlined above, the results of the excavation suggest a high degree of reuse of pottery and that the population had

a diverse approach to disposing of resources (Vaag, 2006). A worn or cracked cooking pot could be used as a storage jar in both kitchen and workshop, or as a melting pot in glass production. Furthermore, the rim of a pot could have a new life as a cooking stand or as the niche of a hearth – a creativity that is not repeated in the finer imported wares, where no traces of mending have been found at the site.

The use of cooking ware has also proved rewarding as a dating tool. Studying firing techniques, and thereby the colouring of vessels, has proved to be a good indication of the shift in date. When viewing the full repertoire of shapes in the category of cooking wares, a pattern emerges: the Late Roman material shows a pale orange colour, whereas the Byzantine period is dominated by a bright greyish colour, only to be surpassed by a deep red colour in Umayyad times. Our work with the cooking ware of ancient Jerash has shown just how much it can reveal about societies past and present if we make full use of the very diverse investigative tools now available to us to push beyond the boundaries of the basic typological, functional and contextual studies.

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Figure 3: Typical Roman–Late Roman (early third century CE) cooking pot (J15-Qa-24-1). Characterised by pale reddish colour, ledge at rim, shortened curving neck, carinated looped handles, globular ribbed body, rounded base. Shows signs of use over fire at body and rim (Danish–German Northwest Quarter Project).

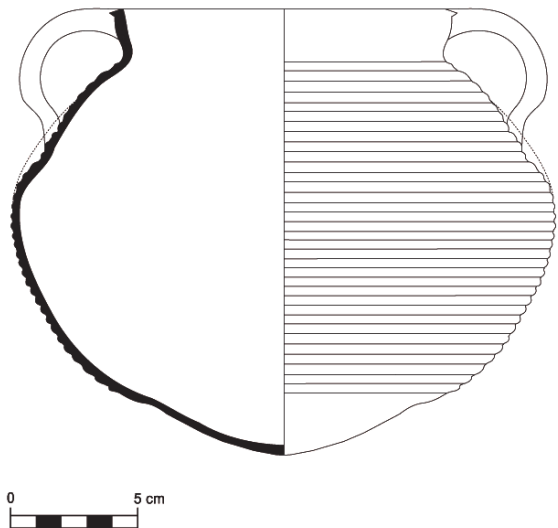


Figure 4: Group 1 in the cooking-pot typology (J12-Ab-17-1) Flattened rim, pointed lip folded outwards, curved shortened neck, rounded shoulders, carinated looped handles, deep ribbing at shoulder and body (Danish–German Northwest Quarter Project).



Figure 5: Group 5 in the cooking-pot typology (Bc-33-24-25). Broad rim folded outwards; straightened elongated neck; sloping shoulders; broad, carinated looped handles; no or very shallow ribs at body (Danish–German Northwest Quarter Project).

Medieval Ceramics from Jerash

Alex Peterson
PhD student, Aarhus University, Denmark

Over the past year, my PhD project, as part of the Ceramics in Context project, has made great strides in furthering research on Middle Islamic Ceramics by examining the ceramic material from a Middle Islamic hamlet in the Northwest Quarter of Jerash. Research on Islamic pottery in Jordan and the Levant is still at an early stage of development, and many studies publish ceramics without contextualizing them or interpreting them in meaningful ways. For this reason, I have made an effort to develop a more precise ceramic chronotypology for the Ayyubid–Mamluk period by focusing on an individual site such as Jerash. After constructing a chronotypology and examining the pottery at a local level, it can then be placed in its regional context in order to gain insight into the social history of a region, production and consumption, lines of trade, and cultural regionalism. Along with this, it is important to consider what the pottery was used for. Considering aspects of diet or food and eating trends is necessary to better understand and contextualize the pottery. By combining both the empirical analysis of ceramics and the deeper meanings of pottery use, their social and economic implications will be understood in a way that can take research on this topic much further.

At the conclusion of the 2016 excavation campaign, the project now has the potential to revolutionize our understanding of the settlement history of Jerash during the Middle Islamic period. Excavations in the substantial Middle Islamic residential complex in the Northwest Quarter have documented several chronological floor layers. Analyzing the material remains from these layers, and from the other trenches, has shed light on the chronology and function of the complex over a period of several generations. Imported pottery found at the site has also now been identified, originating from Palestine, Egypt, Syria, and beyond. As such, the Middle Islamic hamlet in Jerash is clearly not an isolated complex, but a nodal point in a larger network that connects the settlement to urban and rural landscapes regionally. Since little has been published on the pottery or settlement history from this region of Jordan during this period, the pottery assemblage from Jerash will be fruitful for further analysis of the ceramic material from other sites within northern Jordan. The final synthesis produced from this project will be important in creating a better understanding of a period of Jerash's settlement history, which, until now, has been largely unexplored and not well understood.



Handmade geometric painted jug excavated from the Northwest Quarter of Jerash (Photo: The Danish-German Northwest Quarter Project).



View of the Nymphaeum on the main street (Photo: Rubina Raja).

Medieval pottery from Jerash: the Middle Islamic settlement

Alex Peterson
PhD student, Aarhus University, Denmark

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Jerash was one of the cities of the Roman Decapolis and an important urban centre. The landscape of Jerash is still dominated by its Roman ruins, and the city was at its height in Late Antiquity and the Early Islamic period. This peak in urban life was seemingly halted abruptly with the devastating earthquake of 749 CE. Archaeological evidence for continuing occupation after the quake is much harder to detect, as only sporadic traces of continuing occupation into the Abbasid period or activity later in the Middle Islamic (Ayyubid–Mamluk, or twelfth to sixteenth century) have been documented within the city. Hitherto the only significant node of Mamluk settlement was documented around the vicinity of the Temple of Zeus in the southern part of the city (Tholbecq 1997–1998).

The excavations conducted since 2011 by the Danish–German Jerash Northwest Quarter Project, however, have begun to shed new light on the Middle Islamic period in Jerash. In fact, Middle Islamic occupation in Jerash is much better represented than previously thought, as recent discoveries have uncovered a large concentration both of Middle Islamic structures and of pottery. A residential complex was excavated, consisting of a large courtyard house (the Ionic Building) and two related building complexes with both isolated and joining rooms (Figure 1). This hamlet was situated alongside a terrace extending further east, with the larger courtyard house or Ionic Building located centrally on the summit of the hill.

Beyond the archaeological record, the only clues to the nature of Jerash during the Middle Islamic period came from brief literary sources dating to the twelfth-century Crusades period. Historical chronicles of the Crusades written by Fulcher of Chartres and William of Tyre both mention an Islamic fortification built there by the governor of Damascus in 1120 CE, and both state that it was besieged and subsequently razed

to the ground by a Crusader army. In these accounts, Jerash is described as a city lying in ruins; nothing is said to indicate the presence of any other settlement in the once-flourishing Decapolis city. It seems that no extensive settlement in Jerash existed in the early twelfth century. The archaeological record, however, clearly indicates the presence of a significant residential domestic complex in Jerash later in the Middle Islamic period, situated on the summit of the hill in the North-West Quarter. Based on the pottery finds, its origin probably dates to the late twelfth or early thirteenth centuries.

Archaeological and historical research in northern Jordan has shown that numerous new settlements were formed during the early Mamluk period. Rather than a decline in the scope of settlement, patterns of settlement were probably reoriented following environmental, agricultural, and political change. Agricultural investment by the Mamluk sultanate fostered a demographically and economically healthy agricultural export market in the hills and valleys of northern Jordan. New towns and hamlets were built, or sometimes moved from one side of a wadi to the other (Walker 2011, 218). In Jerash, the Middle Islamic settlement can be characterised as a reuse of urban space, as the builders erected their structures over the Byzantine and Early Islamic remains. Both the substantial amount of Middle Islamic pottery present in the North-West Quarter and the evidence of architectural expansion of the hamlet over several generations reflect patterns found at other sites within Jordan; however, the scale and character of the Middle Islamic activity in Jerash stands out in comparison to typical Middle Islamic rural sites in the region.

The buildings are large and well planned and the material remains reveal both international connections and higher socioeconomic conditions. This is significant, and Jerash now

represents an important new and previously unknown node of Middle Islamic activity in northern Jordan.

New approaches to Middle Islamic pottery

Following on from these new and exciting discoveries in the North-West Quarter, a new research initiative was launched to analyse the ceramic find material. Classically, studies on pottery have tended to focus on typologies and technology, resulting in the publication of large and bulky volumes of ceramic catalogues. Although this is useful, pottery cannot be properly understood without investigating what it was used for. Investigating pottery as objects with a utilitarian use in day-to-day life can teach us a great deal about past societies. Not only do we gain insight into trade and manufacturing, but also into diet, food and eating trends, and human activities. Throughout history, pottery vessels have been important everyday objects, and it is important to examine the deeper social and economic meanings of pottery use. Little has been published on the pottery of this period, and the ongoing analysis of pottery remains from the Jerash North-West Quarter will provide a solid base for further research on Middle Islamic pottery at other rural and urban sites in northern Jordan.

Researching the ceramics of the Middle Islamic period poses several challenges. Although the art, history, and architecture of the Middle Islamic period has been well studied, research on the pottery remains at a very early stage. An underlying issue that continues to be problematic is the lack of any definitive regional chronological and typological distinctions for Islamic ceramics. In the past, a bias in archaeological sampling and procedure existed, resulting in Islamic pottery often being neglected or misdated. Furthermore, many of the historically based period divisions (Umayyad, Abbasid, Ayyubid, or Mamluk) for Islamic pottery are inappropriate as changes in



Figure 1: Middle Islamic Hamlet from the northwest quarter of Jerash, consisting of the 'Ionic Building', complex A, and complex B (The Danish-German Northwest Quarter Project).



Figure 2: Closed HMGP Jug from Jerash, J14-Ic-29-1x (The Danish-German Northwest Quarter Project).

the pottery rarely fit within these political events. Ceramic studies are often purely typological in nature and treat ceramics as isolated objects. As a result, the social context of these objects is often lost within large volumes. As mentioned above, it is crucial to remember that ceramic objects played a part in everyday life. By understanding how pottery was used as an everyday utility item, aspects of social life can be better investigated.

One of the first signs dating the complex to the Middle Islamic period was its association with handmade geometrically painted pottery, a pottery type that became increasingly popular in the twelfth century and has been found widely distributed throughout Jordan and the Levant. Both handmade geometric painted wares and undecorated handmade wares are typically associated with the Ayyubid–Mamluk period, originating as early as the late eleventh century and remaining in use until at least the fifteenth century. In a few instances, this type of pottery production has been found into the early twentieth century (Walker 2014, 194). In the North-West Quarter, handmade geometric painted vessels primarily consist of common table wares, including closed jugs (Figure 2), open bowls (Figure 3), and dishes (Figure 4). Wheel-made jugs, amphorae, glazed vessels, and sugar pots were also produced during this period. In the North-West Quarter, glazed bowls with one or two colours have been documented, but wheel-made pottery has been difficult to distinguish due to poor preservation. The absence of sugar pots at the site means that the hamlet was probably not connected with the lucrative sugar industry of the time. Examining this pottery will enable us to better understand the settlement history of Jerash in the Middle Islamic period; conversely, the pottery itself can be better understood through empirical and contextual analysis of the finds from the North-West Quarter. This will lead both to

a more developed ceramic typology for Jerash and its regional context, and an improved understanding of what daily life might have looked like in a Middle Islamic hamlet.



Figure 3: Open HMGP bowl from Jerash, J16-Tc-60-18 (The Danish-German Northwest Quarter Project).

Daily life, social networks, human activities

Analysed in relation to the architecture of the hamlet and their specific context, ceramic finds can assist in clarifying the chronology and relationship between the structures on the site.

Within the larger courtyard house, there are at least two floor layers, with signs of repairs over time. Along with this, architectural analysis determined that the entire complex went through three phases of development and that this was probably undertaken by a larger community over several generations. Close examination of the pottery finds documented with the floor layers can shed light on the chronological development of these three phases.

Glazed pottery is much rarer on the site than the typical handmade geometrically painted pottery ware, but can be more precisely dated. Within an older floor level, a sherd from a slip-painted glazed vessel (Figure 5) dating to the twelfth or thirteenth century was found. Likewise, a green glazed bowl (Figure 6), popular during the fourteenth and fifteenth centuries, was discovered embedded in the youngest floor of the courtyard house. If the Crusades-period chronicle was accurate in its description of Jerash's abandonment, it would place the construction of the North-West Quarter hamlet in the late thirteenth century, but historical narratives are rarely reliable and it may have been built earlier in the late Ayyubid period in the twelfth century.

Based on the green glazed bowl embedded in the younger floor, it could be argued that the hamlet was inhabited, or remained viable, until at least the fourteenth or fifteenth century. This is interesting, as it would attest to a large community residing on the hilltop over several generations within an area that scholars have long considered abandoned. After the house's construction, it is clear that additions were built onto it over time, and floors renovated and repaired by the individuals who lived there. The presence of glazed wares also reflects the elite status of the individuals living in the larger courtyard house. Glazed wares were much rarer and more expensive, and owning such a vessel would be a symbol demonstrating an individual's wealth. Our research on the pottery continues, and we hope it will reveal further aspects of the socioeconomic conditions of these communities over a long period of use.

Though the excavations in the building complexes east of the courtyard house produced fewer datable glazed sherds, the architecture and pottery finds across all three complexes demonstrate that these buildings are contemporary. The larger

courtyard house was joined to the Middle Islamic buildings further east along the terrace by a long east-west wall. Sherds from a handmade painted vessel documented in the courtyard house also joined with a sherd found on the floor of the complex to the east (Figure 7). The courtyard house is thus shown to be architecturally linked to the Middle Islamic structures to the east not only through the shared east-west running wall, but also through the pottery. Thus the Middle Islamic activity across the hilltop can be related chronologically. The courtyard house is therefore just one part of a larger Middle Islamic domestic complex, which was planned and realised.

Clues to the functions and aspects of daily life can also be gleaned from ceramic evidence. For instance, when the handmade geometrically painted pottery was examined, many of the forms of tableware had larger diameters than similar forms of earlier periods. This could be a pointer to meals being shared in large communal gatherings, as opposed to individual families. Excavations in the courtyard house have produced fantastic assemblages that when put in context with other finds clarify its role in relation to the other two. Most of the glazed pottery originates from trenches sited in the courtyard house that also yielded luxurious objects such as metal utensils, jewellery, pierced pearl beads, amber beads, and multicoloured painted wall plaster. Its rooms are very ornate in comparison with the other buildings. Corroded coins and a small metal weight that could have been for weighing coinage may point to some kind of exchange taking place. In sum, the courtyard house or the Ionic Building has a much more representative appearance. Its ornate and representative character stands out compared with the other buildings, revealing its function as the possible social and economic centre of the Middle Islamic hamlet in the North-West Quarter. Its representative nature may point to this building having a role in liaison between the residents of

the North-West Quarter and the local Mamluk administrators.

The glazed pottery finds have shed additional light on the hamlet's role as a nodal point within a larger social network. While a large proportion of the handmade geometrically painted pottery wares and green glazed wares were made locally or perhaps regionally, other finds point to wider ties beyond the hamlet's immediate hinterland. Several slip-painted glazed sherds of a style produced in Palestine were found, and a faience pendant from Egypt was documented. These ties portray some of the geographical ties linking the community to a larger and interconnected world. Even more interesting are finds of blue glazed sherds (Figure 8), which indicate the hamlet had links to possibly Egypt, Syria, or Iran. Blue glazed vessels were of a type commonly produced to imitate Chinese pottery. All this means that we cannot view the rural hamlet in Jerash as isolated: it too had connections both to the wider region and out to the world through social networks and trade. Indeed, the hamlet is a nodal point within a much larger social and economic network linking the medieval Islamic world.

In conclusion, it is now clear that a substantial building complex existed in the North-West Quarter of Jerash in the Middle Islamic period. As the literary sources offer little guidance here, it is the material remains that we must work with to gain a deeper understanding of the scope, function, and character of the Middle Islamic hamlet. Our initial assessment of pottery from the selected contexts has begun to shed light on the chronology and function of the complex.

By approaching With a contextual approach to the ceramic repertoire, both the settlement history and the urban lifestyle of this newly discovered Middle Islamic settlement can be better understood. Even more importantly, since little has been

published on Middle Islamic pottery in this region, the pottery assemblage from Jerash will be fruitful for further analysis of pottery at other sites in northern Jordan.

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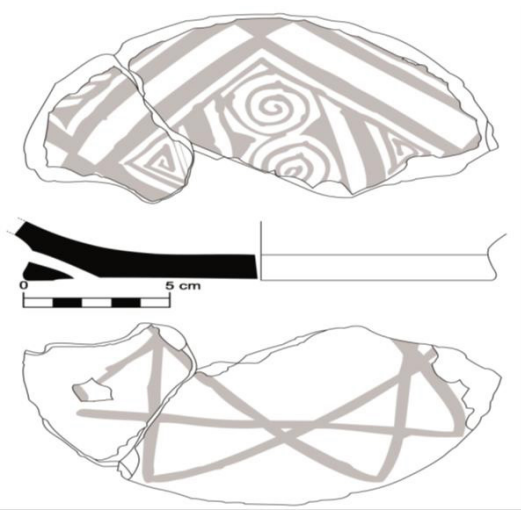


Figure 4 Open HMGP plate from Jerash, J13-D-9-2 + J13-E-17-1 (The Danish-German Northwest Quarter Project).

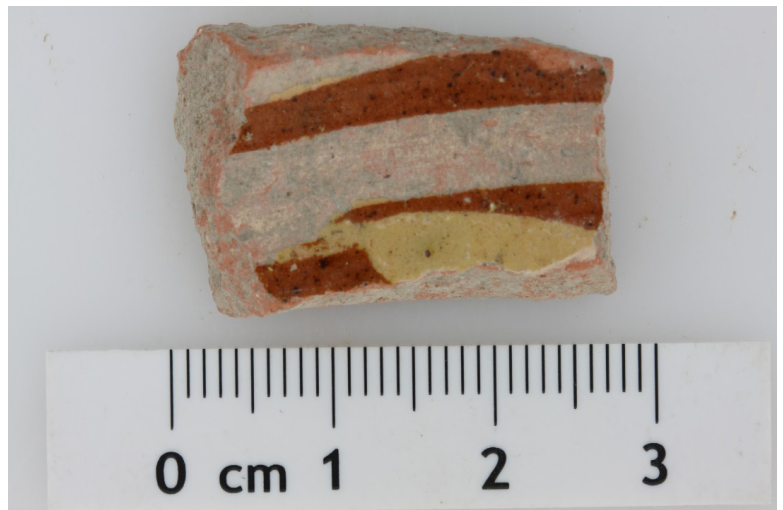


Figure 5: Slip painted glazed sherd similar to a type excavated with the older floor level, 12-13th century (The Danish-German Northwest Quarter Project).



Figure 6: Green glazed bowl popular during the 14th and 15th century (The Danish-German Northwest Quarter Project).



Figure 7: Photograph of the interior surface of the two joining sherds found linking the courtyard house to the complex B to the east (see Figure 2) (The Danish-German Northwest Quarter Project).



Figure 8: Blue glazed sherd from the northwest quarter of Jerash (The Danish-German Northwest Quarter Project).

Ceramics in Context: Petrography of Roman and Early Islamic Pottery

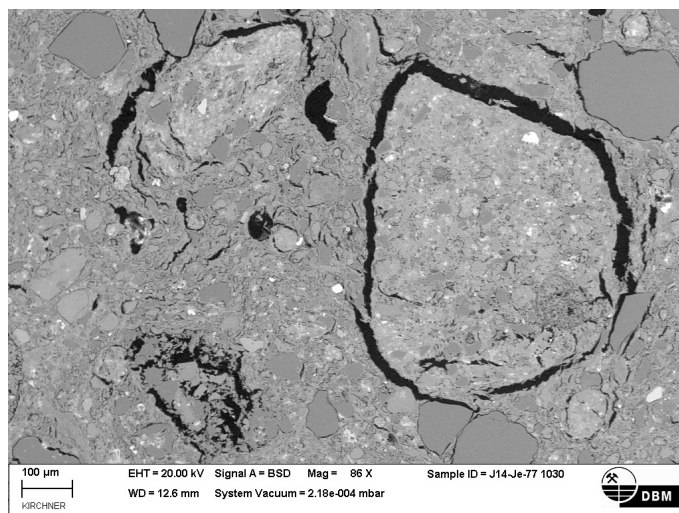
Dr. Stephen Merkel
Deutsches Bergbau-Museum Bochum, Bochum, Germany

In the fall of 2015, I began working with the Ceramics in Context project with an exploratory study of 18 Roman–Umayyad sherds found at Jerash. These sherds were investigated by thin-section petrography, X-ray diffraction (XRD) and inductively coupled plasma mass spectrometry (ICP-MS) in Bochum in order to begin to answer questions of production technology provenance: local production versus importation of pottery vessels. An experimental re-firing was also carried out using 5 sherds of most likely local production. These studies are currently awaiting publication and form the basis for further analyses on pottery from Jerash undertaken in 2016 and 2017. Over this timespan, approximately 200 sherds of pottery potentially produced at Jerash as well as obvious imports were analyzed by portable X-ray fluorescence (pXRF) on cut surfaces and fresh breaks – firstly, to test to which extent the results could be compared to the ICP-MS results and secondly, to explore the variation and potential patterns in composition in order to inform further sampling of the material. The results of the pXRF study gave mixed results; though there are numerous benefits for using this technique such as speed of analysis, there are several disadvantages as well regarding the reliability of the data and its low resolution. In the end, groups could be formed based on major and minor elements like iron and calcium and, to a certain extent, trace elements as well – such as strontium, rubidium and zircon. The groups developed by this method together with visual observations were used as the basis for the selection of 15 sherds and 10 tiles to be analyzed by thin-section petrography and ICP-MS, which is currently underway and will be prepared for the final report.

Additionally, samples of 5 of the 9 (minimum) amphorae of the Amalgro 50 type, likely produced on the Iberian Peninsula, were analyzed by thin-section petrography and ICP-MS, and the results are currently in preparation.

At two workshops in Denmark organized as part of the Ceramics in Context project, results of the studies at various stages were presented:

- Conspicuous productions – Gerasa's pottery finds from Byzantine to Umayyad times in Context.
- Regional Networks! Technological Transfers? Production and Consumption Patterns in Roman Pottery of the Decapolis.



Scanning electron backscatter image of grey ware basin (J14-Je-77-1030) showing ceramic matrix and argillaceous rock fragments commonly found in locally produced ceramics from Jerash, Jordan (Image: Stephen Merkel and The Danish-German Jerash Northwest Quarter Project).



View from the Northwest Quarter towards the Tetrapylon on the ancient main street of Jerash with the modern city in the background (Photo: Rubina Raja).

Tiles and Building Ceramics from the Northwest Quarter of Jerash

Philip Ebeling
MA Student, Westfälische Wilhelms-Universität Münster, Münster, Germany

Roof tiles (tegulae) and building ceramics are rarely investigated during excavation projects, however, some publications do work with building ceramics more responsibly. While most of the latter ones approach this topic from a perspective of typology, others work statistically. If available, one can also work epigraphically or historically (e.g. movements of Roman military units). Rare publications even consider the absence of roof tiles in certain contexts and deliver interpretations towards this lack being an evidence in itself.

Although the excavations in the Northwest Quarter of Jerash never yielded evidence for a tiled roof, brick wall, or such constructions made of building ceramics, many objects of this material are frequently present in almost all of the contexts. As such, a study of these artefacts needs a different approach and aim.

All objects classified as “building ceramic” have been found in a state of reuse (but perhaps one tubulus-like object used as an out- or inlet of some sort – maybe a simple smoke hole/chimney). The majority of all these objects appear in connection with walls. Certainly not all of them were used simply as convenient material for wall fills. Many of the tegulae, usually found in connection with walls, showed a deliberate and distinctive reworking, like the smoothening of edges and breaks.

The documentation of building ceramics included a visual examination of fabric and production marks. A collection of 111 different fabrics of building ceramics seemed to be too

rich in variation in comparison to the pottery on site. For this reason, we conducted petrographic analysis on a collection of objects (tegulae, ibrices, tubuli, pila-units and lateres) from stratigraphically secure contexts. This study was conducted in cooperation with Dr. Stephen Merkel of the Deutsches Bergbau-Museum (German Mining Museum) in Bochum and funded by the Deutscher Palästina Verein (German Palestine Foundation).

The study outlined above aims to gain further insight into production methods and habits of reuse. As such, this approach may answer the most important questions raised by the excavated contexts. All results will be published in the final publication series.

Fragment of a roof tile with traces of paint on the surface (Photo: The Danish-German Northwest Quarter Project).





Columns along the main street in Jordan, Jerash (Photo: The Danish-German Jerash Northwest Quarter Project).

A technological study of the medieval glazed wares from Jerash

Dr. Carmen Ting

Marie Skłodowska-Curie Research Fellow, Archaeological Research Unit, University of Cyprus, Cyprus

This study aims at characterizing the technical practices used to make the glazed wares, recovered from the Northwest Quarter of Jerash, with particular emphasis on their glazing tradition. Glazing tradition, here, refers to the glaze production technology, which comprises the following aspects: (1) the composition and type of the glaze, (2) the substances (e.g. colorants and opacifying agents) that were added to alter the qualities and properties of the glaze, (3) the composition and type of the ceramic body, the glaze adhered to, (4) the method of glaze application, and (5) the sources of raw materials used. Such emphasis on the glazing tradition is based on the argument that glaze production represented technological innovation – a process that is believed to have begun in the 9th century CE and stimulated by the interactions among different cultures representing the East and West – in the Mediterranean world during the medieval period. Thus, the study of the glazing tradition will enable us to understand the socio-political contexts that would have provided the impetus for technological innovation, as well as to delineate the dynamics of cultural interactions.

With this in mind, the study sets forth to test three hypotheses, which are elaborated below:

- Hypothesis 1: The glazed wares from Jerash reflect the occurrence of an exchange of goods. This would be evident in their glazing traditions being identical with the better-known examples of glazing traditions in the region and/or beyond.
- Hypothesis 2: The glazed wares from Jerash represent the transmission of technological knowledge. In this case, the glazed wares were produced using locally available raw materials, but the techniques involved in preparing the glazed wares, particularly the type of glaze and ceramic body, and the method of glaze application, followed other well-established traditions.

- Hypothesis 3: The glazed wares from Jerash were a continuation of local tradition or a manifestation of technological innovation. Either way, this would be demonstrated in their glazing traditions being drastically different from other known examples in the region.

- The testing of these hypotheses requires a fine-grained examination of different aspects of glazing tradition as mentioned above. Thus, thin-section petrography and scanning electron microscopy energy dispersive spectrometry (SEM-EDS) are the two principal analytical methods used in this study with their application being described as follows:

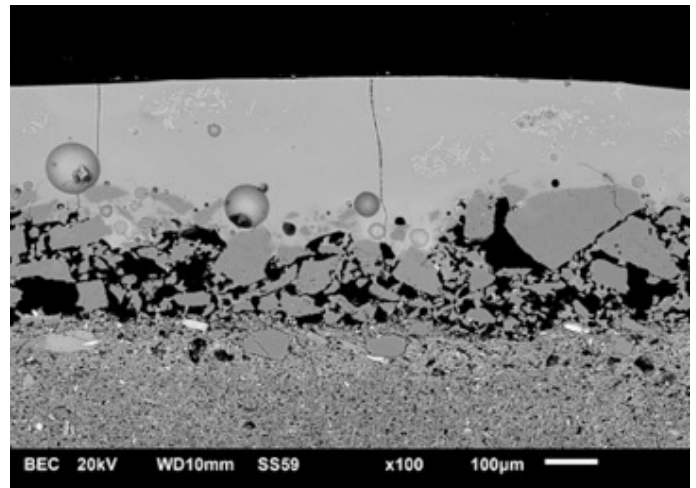
- Thin-section petrography is used to characterize the mineralogical composition and thus the type of the ceramic body (e.g. calcareous, non-calcareous, stonepaste, etc.). By comparing the data of this study with the previous archaeometric analysis of ceramics from Jerash as well as the better known glazed ware examples in the region it will allow the determination of whether the glazed wares were made locally or imported.

- SEM-EDS is particularly useful in this study because it allows the characterization of the elemental composition and thus the type of glaze (e.g. high-lead, lead alkali, etc.). By focusing on a specific area of the sample at high magnification, it also allows the determination of the glaze application method, such as the order of slipping, carving, and glazing, and the occurrence of biscuit firing of the ceramic body before glaze application.

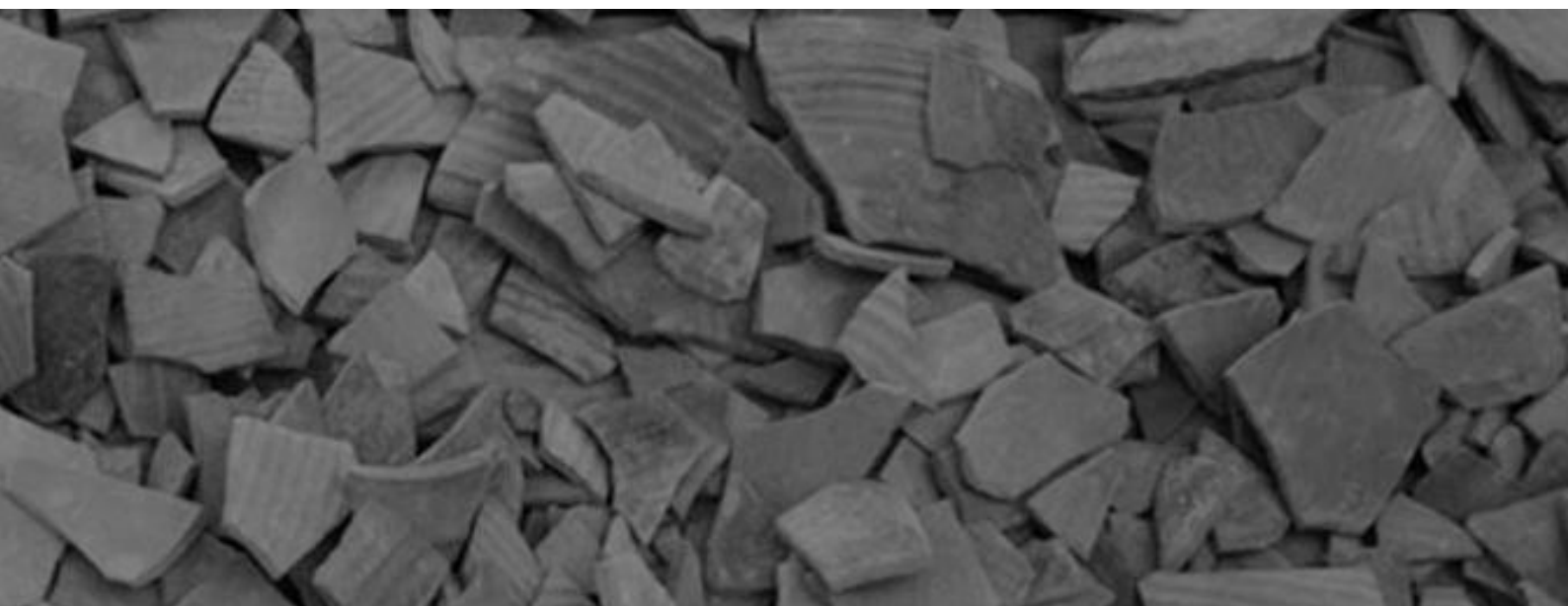
The significance of this study is twofold. First, by delineating the movement of goods and/or the transmission of technological knowledge as expressed in the glazing tradition, this study will be incorporated into a broader study of medieval ceramics and settlement patterns of the Northwest Quarter of Jerash, which together will serve to highlight the role played by this community in the regional, or perhaps international, exchange network. Second, the results of this study will contribute to

challenging the polarized dichotomy that characterizes the extant understanding of the glazed wares' production in the eastern Mediterranean during the medieval period. The production of the "elite" glazed wares is often regarded as the "first quality" and innovative, marking a stark contrast to the production of other types of glazed wares, which is assumed to be static in terms of manufacturing technologies and craft organization through time.

Thus, it is hoped that this study will shed light onto the "local" traditions of glaze production technology and their implications to the broader technological developments in the region.



Backscattered electron (BSE) image showing the presence of glaze with a layer of silica-laden slip on top of the ceramic body (Image: Carmen Ting and The Danish-German Jerash Northwest Quarter Project).



Ceramic pieces from Jerash, Jordan (Photo: Rubina Raja).

Lipid Analysis: Preliminary Results on Selected Middle Islamic Pottery

Professor Silvia Polla
Freie Universität Berlin, Berlin, Germany

Presented below is the summary of some of the preliminary results of the lipid analysis conducted on selected Middle Islamic pottery sherds:

Extraction-derivatization and GC/MS

The powdered samples were extracted using the methodology which follows the one described by Pecci et al., including the derivatization with BSTFA before analysis by GC-MS. To analyze the oil derivatives, the respective amount of powdered sample was extracted twice using 50 ml CHCl₃/MeOH for 15 min, assisted by ultrasonification. The extract was separated from the solid using a centrifuge (10 min). The supernatants' solvent was removed using a gentle stream of nitrogen. Then, alkaline hydrolysis was carried out by addition of 2 mL NaOH (2M in MeOH) for 1 h at 70°C. After cooling the reaction mixture to room temperature, the sample was acidified by addition of 15 droplets of concentrated HCl in water, the pH was tested to be 1. The acidified solution was extracted twice using 3 mL CHCl₃ each. After removal of the solvent using a gentle flow of nitrogen, the extract was transferred into the sample vial using two times 50 uL CHCl₃. Again, the solvent was removed. Derivatization was carried out using 25 uL BSTFA for 1 h at 70°C. After addition of 50 uL n-hexane and 25 uL internal standard solution (1.3 mg/mL dotriacontane in hexane), the sample was submitted to GC-MS analysis.

The GC-MS method described in literature was customized for an Agilent 5977E MSD single-quadrupole mass spectrometer with a 7820A GC system equipped with a SiO₂ DB-5MS GC column (30m x 0.25mm, Agilent Technologies), including a temperature program similar to the one described in literature (1 min at 50°C, then a ramp of 5°C/min, 10 min at 300°C) utilizing added dotriacontane to mark the end of the chromatogram and

as internal standard. All found compounds were compared to the retention times and mass spectra of standards produced from pure compounds derivatized using BSTFA.

Samples and Results

Mamluk Cooking Vessel (sample 406, J14-Id-32-3)

The presence of ricinoleic acid together with its oxidation by-product azelaic acid is a strong indicator for castor oil and/or linseed oil or more generally of flax (*Linaceae* plants family). Arachidic acid is also an important component of linseed oil. The presence of hexanedioic acid and nonanoic acid as oxidation by-product of the oleic acid and marker for fatty acids, can suggest that linseed oil has been processed in the vessel.

Lactic acid together with benzoic and, in particular, fumaric acid can be interpreted in this context as a marker for fermentation processes related to fruits/fruit juices, i.e. of a process of breaking down sugar. Although benzoic acid can also suggest wax as source of compound and in order to interpret it as a certain indicator of such, we would expect to find it coupled with vanillin, which is absent here. Nevertheless, the formation of benzoic and cinnamic derivatives as degradation of flavonoids that are naturally present in beeswax has already been discussed in literature. In this case, we cannot exclude beeswax and/or honey as a source of the detected compounds.

Even though the combination of palmitic, myristic and stearic acid together with lauric, decanoic acid, hexanoic and heptadecanoic acid can also suggest a possible animal source for these lipids, we can probably with reason in this case exclude animal fat as a source of the detected compounds

because of the lack of cholesterol, a good indicator of ruminant animal fats. On this basis, we hypothesize a mixed use of the cooking vessel connected to principally plant oils (castor, linseed) and vegetable products (Linaceae; fruits).

Hand Made Geometrically-Painted Ware (sample 435, J13-D-9-9 (FIOA 29/07-13))

The combination of lactic, benzoic and fumaric acid suggests fruits/conserved fruits as a probable source of the detected compounds. Hexanoic, nonanoic, indicating a plant origin of compounds, and the saturated (lauric, myristic, palmitic, stearic) and unsaturated fatty acids – oleic acid, the additionally found azelaic acid might be an oxidation/fermentation product of oleic acid, in relation to the absence of cholesterol, indicates that plant oils or vegetable products were stored in the vessel.

Especially the presence of ricinoleic acid furthermore suggests the use of ricinus/castor oil and/or linseed oil/flax.

Painted Jug (sample 361, J14-Ic-29-1x)

Ricinoleic acid has been detected also in the painted jug, together with other saturated and unsaturated fatty acids (lauric, myristic, palmitic, stearic, oleic and azelaic acids), plausibly indicating a plant origin of the compounds (castor/linseed oil). Similarly, as in the other samples, we could detect other oxidation by-products of the oleic acid like hexanedioic acid and nonanoic acid. Lactic acid as indicator of fermentation processes has also been detected. Hexanoic, heptadecanoic and decanoic acids in absence of cholesterol cannot be related with certainty to animal fats, as they can have also a plant origin.



Base fragment from a Middle Islamic closed vessel (J13-D-9-9) which was sampled for residue and lipid analysis (Photo: Silvia Polla and The Danish-German Jerash Northwest Quarter Project).

Artificial economies: Computational simulation of product preference theories for explaining Jerash ceramic assemblages

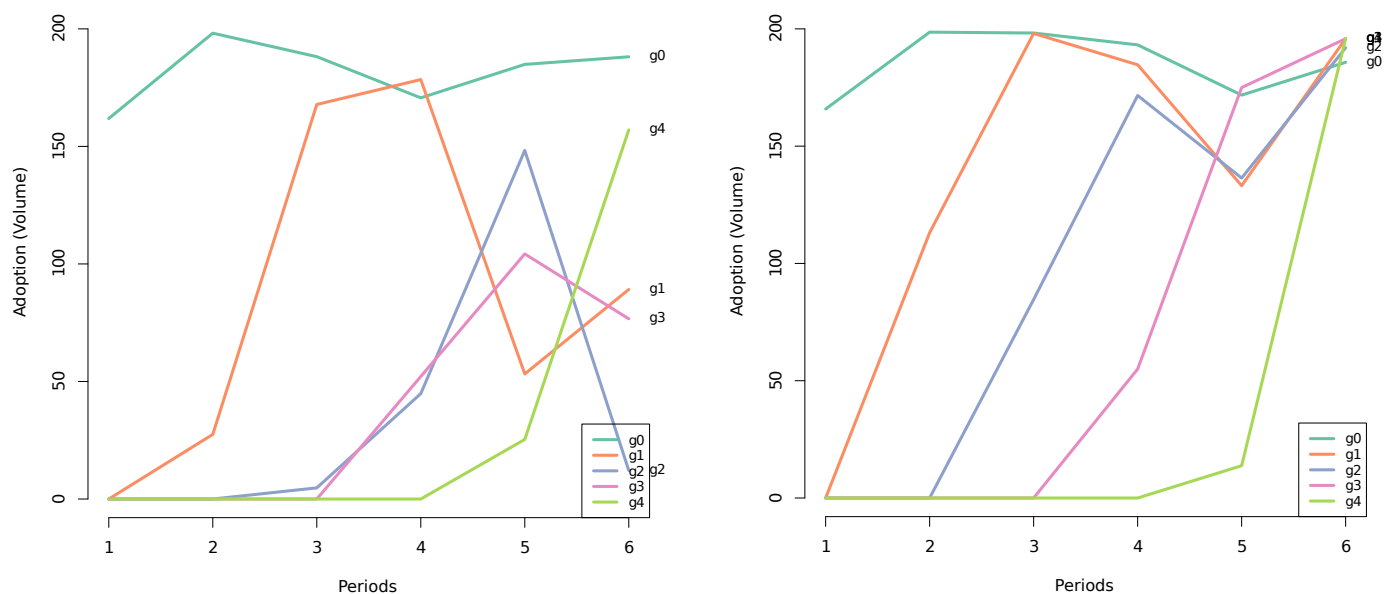
Dr. Tom Brughmans
University of Oxford, Oxford, UK

PhD Student Simon Carrignon
Barcelona Supercomputing Centre, Barcelona, Spain

Professor and Director Achim Lichtenberger
Westfälische Wilhelms-Universität Münster, Münster, Germany

Professor and Director Rubina Raja
Aarhus University, Denmark

Dr. Iza Romanowska
Barcelona Supercomputing Centre, Barcelona, Spain



Example of the kinds of simulation output that can be expected of this project (results drawn from a related research project since the current project's experiments are in a preliminary phase). The graphs show the differences in the adoption of five different products depending on experiments, where agents either do not learn from each other's buying strategies (left) or where they do learn from each other (right). Differences in the introduction time of products and whether consumers' buying behaviour is affected by their peers can lead to strong differences in their consumptions (Figure: Simon Carrignon).

What explains the strong reliance of the Jerash urban community on locally produced craft products for centuries? This reliance is evidenced in a diversity of material data types (ceramics, glass, stone), but the excavated ceramics offer the most robust evidence. Fully quantified contexts from the Northwest Quarter in Jerash, totaling close to 1 million sherds, reveal the dominance (over 99%) of locally produced tableware, coarse ware, cooking ware and amphorae; imported ceramics from the region or other parts of the Roman, Byzantine and Umayyad empires are extremely rare (typically less than 0.02%). The locally produced ceramics cover all functional categories required for daily use but are extremely limited in their typological diversity. This pattern is evidenced for at least the 2nd century CE until the mid-8th century CE, when the town was hit by an earthquake, leading to a temporary break

in occupation of the excavated area. The exceptional nature of this phenomenon becomes clear in light of comparisons with other urban centers in the region with comparable geographical settings and economic situations but significantly more diverse ceramic assemblages consisting of a combination of local products with regional and overseas imports (e.g. Pella and Scythopolis). The archaeological evidence of Jerash points towards a degree of self-sufficiency in craft products, which sets it apart from comparable towns in the region: why?

A number of theories can be proposed to explain this phenomenon, relating to geographical setting, economic situation, the dynamics of craft production and the preference for locally produced craft products. This research project focuses on testing theories of local product preference through

a combination of approaches. Data analysis of a full collection and quantification of ceramics excavated in the Northwest Quarter of Jerash (the first project in the region attempting such an ambitious data recording strategy), combined with C14 dating of selected contexts and chemical analyses of pottery fabrics, enables us to reveal a robust data pattern reflecting the results of the urban consumption of craft products for a period of seven centuries. Computational modelling supported by supercomputing resources enables us to formally express a range of behavioral economics theories of individual consumer preference that could explain this phenomenon

as a series of agent-based models. Results of simulation experiments, using these models, will be compared with the complete collection of excavated ceramics, and interpretation will be informed by our knowledge of other craft industries. This multi-disciplinary approach will provide unique insights into the economy of a mid-sized urban settlement in the Roman, Byzantine and Umayyad empires. It further offers the prospect of contributing to the social sciences in general by gaining insights into the century-long implications of human decision-making influenced by preference mechanisms.



View of the so-called Oval Piazza (Photo: Rubina Raja).

Conferences and workshops

Mamluk Pottery: Material Culture and History in the Middle Islamic Period

13th of June 2016

Aarhus University (Aarhus, Denmark)

Organizers: Professor Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Professor Rubina Raja (Aarhus University, Aarhus, Denmark)

- Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Rubina Raja (Aarhus University, Aarhus, Denmark), "Introduction".
- Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Rubina Raja (Aarhus University, Aarhus, Denmark), "Middle Islamic Jerash: New Evidence and Perspectives".
- Jacques Seigne (Institut Français du Proche-Orient, Paris, France) and Laurent Tholbecq (Université Libre de Bruxelles, Brussel, Belgium), "The medieval installations from the Zeus temple area (Jerash, Jordan)".
- Georg Kalaitzoglou (Westfälische Wilhelms-Universität Münster, Münster, Germany), "A Middle Islamic hamlet in Jerash: Its architectural development".
- Alex Peterson (Aarhus University, Aarhus, Denmark), "Middle Islamic ceramics in context from the NW quarter of Jerash".

- Heike Möller (Aarhus University, Aarhus, Denmark), "Interpreting Middle Islamic finds "out of context": The Northwest quarter evidence".

- Basem al-Mahamid (Department of Antiquities of Jordan) and Hanadi al-Taher (Department of Antiquities of Jordan), "The Mamluk/Ottoman sherds of Umm Zuwaytinah in the light of structural analysis".

Conspicuous productions: Gerasa's pottery finds from Byzantine to Umayyad times in Context

12th October 2016

Aarhus University (Aarhus, Denmark)

Organizers: Professor Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany), Assistant Professor Heike Möller (Aarhus University, Aarhus, Denmark), and Professor Rubina Raja (Aarhus University, Aarhus, Denmark)

- Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany), Heike Möller (Aarhus University, Aarhus, Denmark) and Rubina Raja (Aarhus University, Aarhus, Denmark), "Welcome and Introduction".
- Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Rubina Raja (Aarhus University, Aarhus, Denmark), "Byzantine and Umayyad Gerasa. Results and findings from the Danish-German Jerash Northwest Quarter project".

- Daniela Baldoni (Italian Archaeological Mission at Jerash), “Archaeological evidence for craft activities in the area of the Sanctuary of Artemis in Gerasa between the Byzantine and Umayyad ages”.
 - Anne-Michèle Rasson-Seigne (Université François-Rabelais Tours, Paris, France) and Jacques Seigne (Université François-Rabelais Tours, Paris, France), “Evolution between VI and VIII century of some ceramic types of Gerasa from six sealed contexts”.
 - Raffaella Pappalardo (Università di Napoli Federico II, Naples, Italy), “The Late Antique Jerash Project: Preliminary Results of the pottery data”.
 - Gry Barfod (Aarhus University, Aarhus, Denmark), “Pigments – More than meets the eye”.
 - Stephen Merkel (Deutsches Bergbaumuseum Bochum, Bochum, Germany) and Michael Prange (Deutsches Bergbaumuseum Bochum, Bochum, Germany), “Material Science Approaches to the Study of Pottery from Jerash”.
 - Alexandra Uscatescu (Universidad Complutense Madrid, Madrid, Spain), “Gerasa’s Fine Ware in the Age of Transition: A cultural overview”.
 - Dorothea Csitneki (Ruhr-Universität Bochum, Bochum, Germany), “Jerash Bowls, a new approach”.
 - Georg Kalitzoglou (Westfälische Wilhelms-Universität Münster, Münster, Germany), “The many faces of continuity: The transition from Byzantine to Umayyad in the Northwest-Quarter of Jerash”.
 - Signe Bruun Kristensen (Aarhus University, Aarhus, Denmark), “Re-defining shape and function. Production traditions of Late Roman-Umayyad locally produced cooking ware”.
 - Heike Möller (Aarhus University, Aarhus, Denmark), “Continuity versus Discontinuity: New results on Umayyad finds of a Residence-like Edifice on the Eastern Terrace”.
- Regional Networks! Technological Transfers? Production and Consumption Patterns in Roman Pottery of the Decapolis***
- 1st March 2017**
- The Royal Danish Academy of Sciences and Letters, Copenhagen, Denmark**
- Organizers: Professor Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany), Assistant Professor Heike Möller, and Professor Rubina Raja**
- Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany), Heike Möller (Aarhus University, Aarhus, Denmark) and Rubina Raja (Aarhus University, Aarhus, Denmark), “Welcome and Introduction”.
 - Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Rubina Raja (Aarhus University, Aarhus, Denmark), “New Research in the Northwest Quarter of Jerash and its Impact on Roman Gerasa”.

- Lisa Berger (Universität zu Köln, Cologne, Germany) and Bernd Liesen (Archäologischer Park Xanten, Xanten, Germany), “Roman pottery from sanctuaries in Umm Qes/Gadara (Jordan) and its hinterland”.
- Elizabeth Osinga (University of Southampton, Southampton, England), “Ceramic trends at Umm el-Jimal: Quantification, provenance and typo-chronology (Nabataean/Roman to Early Byzantine period)”.
- Malogorzata Daszkiewicz (Freie Universität Berlin, Berlin, Germany), “Ceramics found in Gadara – Provenance studies using combined laboratory analyses”.
- Gerwulf Schneider (Freie Universität Berlin, Berlin, Germany), “Late Hellenistic to Late Roman Fine Wares in the eastern Mediterranean”.
- Stephen Merkel (Bergbaumuseum Bochum, Bochum, Germany) and Michael Prange (Bergbaumuseum Bochum, Bochum, Germany), “Material Science Approaches to the Study of Pottery from Jerash”.
- Anne-Michèle Rasson-Seigne (Université Francois-Rabelais Tours, Pairs, France) and Jacques Seigne (Université Francois-Rabelais Tours, Pairs, France), “Local ceramic productions at Jerash during the Early Roman Period (1st BC-1st - AD): Influences and diffusion”.
- Georg Kalitzoglou (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Heike Möller (Aarhus University, Aarhus, Denmark), “Roman Gerasa – New Results from the Danish-German Jerash Northwest Quarter Project – Contexts and Finds”.

The Archaeology and History of Jerash: 110 Years of Excavations

2nd – 3rd March 2017

The Royal Danish Academy of Sciences and Letters, Copenhagen, Denmark

Organisers: Professor Rubina Raja (Aarhus University, Aarhus, Denmark) and Professor Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany)

- Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Rubina Raja (Aarhus University, Aarhus, Denmark), “Introduction”.
- Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Rubina Raja (Aarhus University, Aarhus, Denmark), “Archaeological Research in Jerash and the Danish-German Northwest Quarter Project 2011-2016”.
- Don Boyer (The University of Western Australia, Perth, Australia), “The role of landscapes in the occupational history of Gerasa and its hinterland”.
- Genevieve A. Holdridge (Aarhus University, Aarhus, Denmark), Kristine Thomsen (Aarhus University, Aarhus, Denmark), Søren M. Kristiansen (Aarhus University, Aarhus, Denmark) and Ian A. Simpson (University of Stirling, Stirling, Scotland), “Soils, sediments and environmental history: Introducing geosciences to archaeology at Jerash”.
- Louise Blanke (University of Copenhagen, Copenhagen, Denmark), “Suburban life in southwest Jarash from the Roman to the Abbasid period”.
- Alan Walmsley (University of Copenhagen, Copenhagen, Denmark), “Urbanism at Islamic Jarash: New readings from archaeology and history”.
- Georg Kalitzoglou (Westfälische Wilhelms-Universität Münster, Münster, Germany), “The Northwest Quarter of Jerash: Outlines of a settlement history”.

- Massimo Brizzi (Independent researcher), “The Artemis Temple in Jerash: Overreaching or resistance?”.
- Thomas Lepaon (Mission Archéologique Française de Jerash, Tours Area, France), “The ‘great eastern baths’ of Jerash/Gerasa: Balance of knowledge and ongoing research”.
- Daniela Baldoni (Italian Archaeological Mission at Jerash), “A Byzantine thermopolium on the main colonnaded street in Gerasa”.
- Ali Al Khayyat (Department of Antiquities of Jerash, Jerash, Jordan), “The challenges facing Jerash archaeological site development”.
- Roberto Parapetti (Centro Ricerche Archeologiche e Scavi di Torino, Torino, Italy), “Recent Italian restoration work and excavatopn in the Sanctuary of Artemis”.
- Jacques Seigne (Université Francois-Rabelais Tours, Pairs, France), “Why did Hadrian spend the winter of 129/130 in Gerasa?”.
- Pierre-Louis Gatier (Université Lyon, Lyon, France), “Romans in Gerasa: A Greek inscription from the hippodrome excavations”.
- Maysoon al Nahar (University of Jordan, Amman, Jordan), “Tell Abu Suwwan, Jerash, Jordan: Neolithic skulls and rituals”.
- Heike Möller (Aarhus University, Aarhus, Denmark), “High pottery quantity: Some remarks on ceramics in context from the Danish-German Jerash Northwest Quarter Project”.
- Ingrid Schulze (Universidad Complutense de Madrid, Madrid, Spain) and Wolfgang Schulze (Ludwig-Maximilians-Universität München, Munich, Germany), “Working with coins in Jerash: Problems, solutions and preliminary results”.

- Gry Barfod (Aarhus University, Aarhus, Denmark), “Forensic investigations of then Jerash glass”.

Specialist Workshop: Danish-German Northwest Quarter Project

11th October 2017

Aarhus University (Aarhus, Denmark)

Organisers: Professor Rubina Raja (Aarhus University, Aarhus, Denmark) and Professor Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany)

- Rubina Raja (Aarhus University, Aarhus, Denmark) and Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany), “Introduction and Presentation”.
- Jesper Olsen (Aarhus University, Aarhus, Denmark) and Bente Philippsen (Aarhus University, Aarhus, Denmark), “AMS Dating and Baysian statistics”.
- Søren M. Kristiansen (Aarhus University, Aarhus, Denmark) and David Stott (Aarhus University, Aarhus, Denmark), “LiDar”.
- Gry H. Barfod (Aarhus University, Aarhus, Denmark), “Glass”.
- Christoph Eger (Georg-August-Universität Göttingen, Göttingen, Germany), “Metal”.
- Thomas Birch (Aarhus University, Aarhus, Denmark) and Vana Orfanou (Aarhus University, Aarhus, Denmark), “Metal analysis”.
- Signe Krag (Aarhus University, Aarhus, Denmark), “Jewellery and textile production”.

- Kristine Thomsen (Aarhus University, Aarhus, Denmark), “Plaster and mortar and wall-paintings”.
- Alex Peterson (Aarhus University, Aarhus, Denmark), “Medieval pottery”.
- Sara Ringsborg (Aarhus University, Aarhus, Denmark), “Stone objects”.
- Philip Ebeling (Westfälische Wilhelms-Universität Münster, Münster, Germany), “Tiles”.
- Marie Louise S. Jørskov (University of Copenhagen, Copenhagen, Denmark), “Human bones”.
- Tom Brughmans (University of Oxford, Oxford, England), Simon Carrignon (Barcelona Supercomputing Centre, Barcelona, Spain) and Iza Romanowska (Barcelona Supercomputing Centre, Barcelona, Spain), “Computational simulation modelling of pottery trade”.
- Margit Petersen (Viborg Museum, Viborg, Denmark), “Conservation”.
- Alexandra Uscatescu (Universidad Complutense Madrid, Madrid, Spain), “Late Antique Imports at Gerasa: A reappraisal of the macellum case”.
- Anne-Michèle Rasson-Seigne (Université François-Rabelais Tours, Paris, France) and Jacques Seigne (Université François-Rabelais Tours, Paris, France), “Imported pottery to Jerash during Roman time (1st AD-3rd AD)”.
- Agnes Vokaer (Université Libre de Bruxelles, Brussel, Belgium), “African Red Slip Ware and imported amphorae in Syria from the Roman to the Early Islamic period”.
- Yvonne Gerber (Universität Basel, Basel, Switzerland), “Imported Pottery in the ‘Hinterland’ of the ‘Nabataean’ Kingdom”.

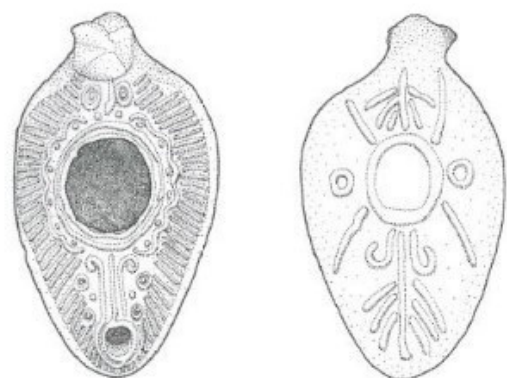
Cilician Wine, African Plates, Italian Cooking – Imported Pottery in the Decapolis in Roman to Early Islamic Times

12th October 2017

Aarhus University (Aarhus, Denmark)

Organisers: Professor Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany) and Professor Rubina Raja (Aarhus University, Aarhus, Denmark)

- Rubina Raja (Aarhus University, Aarhus, Denmark) and Achim Lichtenberger (Westfälische Wilhelms-Universität Münster, Münster, Germany), “Ceramics from the Northwest Quarter in Jerash: Narratives and numbers”.



Dotted drawing of a locally produced, so-called Jerash lamp from the excavations in Jerash, Jordan (Figure: The Danish-German Jerash Northwest Quarter Project).



Tetrapylon on the ancient main street of Jerash, Jordan (Photo: The Danish-German Jerash Northwest Quarter Project).

Presentations

2015

Rubina Raja, "Neue Forschung in Gerasa", Rotary Club Meeting, Rotary Club Erfurt-Gloriosa (Erfurt, Germany), 3rd of February 2015.

Rubina Raja, "High Definition Archaeology: The example of Gerasa in the Decapolis", Geoscience seminar, University of Stirling (Stirling, United Kingdom), 3rd of March 2015.

Rubina Raja, "Changing the urban picture through High Definition Archaeology: Urban development in Jerash (Jordan) from the Roman to the Mamluk Period", Cornell University (Ithaca, USA), 17th of April 2015.

Rubina Raja, "Redefining the urban picture: Gerasa in Jordan seen through the lens of High Definition Archaeology", Joukowsky Institute for Archaeology and the Ancient World (Providence, USA), 21st of April 2015.

Rubina Raja, "A silver scroll from Jerash", Department of Antiquities (Amman, Jordan), 30th of August 2015.

Rubina Raja, "Unraveling urbanism through a "High Definition Archaeology" approach. A 3D historiography of concepts of the ancient city", Max Planck Society Distinguished Lecture, Max Planck Institutes (Berlin, Germany), 22nd of October 2015.

Rubina Raja, "Turning urbanism upside down: The Danish-German Northwest Quarter Project, Jordan", UrbNet open house, Aarhus University (Aarhus, Denmark), 18th of November 2015.

Rubina Raja, "New archaeological research in Gerasa. The Danish-German Northwest Quarter Project", University of Vienna (Vienna, Austria), 4th of December 2015.

2016

Rubina Raja, "Network urbanism and high-definition archaeology: Examples from the field", Biocomplexity seminar, University of Copenhagen (Copenhagen, Denmark), 12th of January 2016.

Rubina Raja, "Tracking urban networks through high-definition archaeology: The case of Jerash in the Decapolis", Stockholm University (Stockholm, Sweden), 15th of January 2016.

Achim Lichtenberger and Rubina Raja, "Biographies of cities and rivers. The case of the golden river at Gerasa in the Decapolis", conference: Biographies of Place, Aarhus University (Aarhus, Denmark), 19th of January 2016.

Rubina Raja, "Networks, nodes and high definition archaeology: The case of Gerasa in the Decapolis", Uppsala University (Stockholm, Sweden), 15th of February 2016.

Rubina Raja, "Christen, Juden und Soldaten im Gerasa des 6. Jh.s.", Kommission für Alte Geschichte und Epigraphik (Munich, Germany), 22nd of February 2016.

Rubina Raja, "New archaeological research in Jerash. The Danish-German Northwest Quarter Project", American Centre for Oriental Research (Amman, Jordan), 9th of March 2016.

Signe B. Kristensen and Heike Möller, “Ceramics in Context - Pottery Production, Consumption and Trade Networks in one of the Decapolis Cities during the Roman and Byzantine Periods”, conference: Keramik Plus, University of Copenhagen (Copenhagen, Denmark), 11th of March 2016.

Heike Möller, “Simitthus/Chimtou: Some insights into local/regional produced pottery in Roman times”, conference: 12th Roman Archaeology Conference, Sapienza Università di Roma (Rome, Italy), 16th-19th of March 2016.

Rubina Raja, “The gardeners of the upper valley: The importance of water to urban (religious) life in Gerasa”, workshop: Water and Religious Life in the Roman and Late Antique Near East, Durham University (Durham, United Kingdom), 22nd of March 2016.

Kristine Thomsen, “Understanding complex urban space and development through geochemistry: The case of Jerash in Jordan”, Aarhus University (Aarhus, Denmark), 11th of April 2016.

Achim Lichtenberger and Rubina Raja, “New Evidence for Byzantine and Islamic Jerash in the Light of Research of the Danish-German Jerash Northwest Quarter Project”, conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 22nd of May 2016.

Alex Peterson, “Ayyubid-Mamluk Evidence from the Danish-German Northwest Quarter Project”, conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 22nd of May 2016.

Cathrin Pogoda, “Necropoleis and Tombs of Jerash”, conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 22nd of May 2016.

Dorothea Csitneki, “Jerash Bowls, Chronology, Typology and Iconography”, conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 22nd of May 2016.

Georg Kalaitzoglou, “The Northwest Quarter of Gerasa: A New Established Urban Quarter”, conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 22nd of May 2016.

Heike Möller and Annette H. Sørensen, “Roman and Early Byzantine Ceramic Finds – New Results on Micro- and Macro Regional Patterns in Jerash’s Northwest Quarter”, conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 23rd of May 2016.

Signe B. Kristensen, “Production Patterns of Late Roman-Byzantine locally produced Reddish Ware”, conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 23rd of May 2016.

Ditte Maria D. Hiort, “The Power of an Archaeology of Alters – Quantity, Locality, Visibility and Expressivity”, conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 23rd of May 2016.

Achim Lichtenberger and Rubina Raja, "New Evidence for Byzantine and Islamic Jerash in the Light of Research of the Danish-German Jerash Northwest Quarter Project", conference: International Conference on the History and Archaeology of Jordan, Princess Sumaya University for Technology (Amman, Jordan), 24th of May 2016.

Achim Lichtenberger and Rubina Raja, "Introduction", conference: Mamluk Pottery: Material Culture and History in the Middle Islamic Period, Aarhus University (Aarhus, Denmark), 13th of June 2016.

Achim Lichtenberger and Rubina Raja, "Middle Islamic Jerash: New evidence and perspectives", conference: Mamluk Pottery: Material Culture and History in the Middle Islamic Period, Aarhus University (Aarhus, Denmark), 13th of June 2016.

Alex Peterson, "Middle Islamic ceramics in context from the NW quarter of Jerash", conference: Mamluk Pottery: Material Culture and History in the Middle Islamic Period, Aarhus University (Aarhus, Denmark), 13th of June 2016.

Basem al-Mahamid and Hanadi al-Taher, "The Mamluk/Ottoman sherds of Umm Zuwaytinah in the light of structural analysis", conference: Mamluk Pottery: Material Culture and History in the Middle Islamic Period, Aarhus University (Aarhus, Denmark), 13th of June 2016.

Georg Kalaitzoglou, "A Middle Islamic hamlet in Jerash: Its architectural development", conference: Mamluk Pottery: Material Culture and History in the Middle Islamic Period, Aarhus University (Aarhus, Denmark), 13th of June 2016.

Heike Möller, "Interpreting Middle Islamic finds "out of context": The Northwest quarter evidence", conference: Mamluk Pottery: Material Culture and History in the Middle Islamic Period, Aarhus University (Aarhus, Denmark), 13th of June 2016.

Jacques Seigne and Laurent Tholbecq, "The medieval installations from the Zeus Temple area (Jerash, Jordan)", conference: Mamluk Pottery: Material Culture and History in the Middle Islamic Period, Aarhus University (Aarhus, Denmark), 13th of June 2016.

Heike Möller, "Gerasa (Jordan) - Pottery Production and Trade Networks of the Decapolis Cities during the Roman and Early Byzantine Periods", congress: Rei Cretariae Romanae Fautores, University of Lisbon (Lisbon, Portugal), 28th of September 2016.

Achim Lichtenberger, Heike Möller and Rubina Raja, "Welcome and Introduction", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Achim Lichtenberger and Rubina Raja, "Byzantine and Umayyad Gerasa. Results and findings from the Danish-German Jerash Northwest Quarter Project", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Alexandra Uscatescu, "Gerasa's Fine Ware in the Age of Transition: A cultural overview", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Dorothea Csitneki, "Jerash Bowls, a new approach", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Georg Kalaitzoglou, "The many faces of continuity: The transition from Byzantine to Umayyad in the Northwest-Quarter of Jerash", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Gry H. Barfod, "Pigments - More than meets the eye", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Heike Möller, "Continuity versus Discontinuity: New Results on Umayyad finds of a Residence-like Edifice on the Eastern Terrace", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Jacques Seigne and Anne-Michèle Rasson-Seigne, "Evolution between VI and VIII century of some ceramic types of Gerasa from six sealed contexts", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Raffaela Pappalardo, "The Late Antique Jerash Project: Preliminary Results of the pottery data", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Signe B. Kristensen, "Re-defining shape and function. Production traditions of Late Roman-Umayyad locally produced cooking ware", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Stephen Merkel and Michael Prange, "Material Science Approaches to the Study of Pottery from Jerash", conference: Conspicuous Productions: Gerasa's Pottery Finds from Byzantine to Umayyad Times in Context, Aarhus University (Aarhus, Denmark), 12th of October 2016.

Rubina Raja, "Urban Development in Gerasa from the Roman to the early Islamic period: New results from the Danish-German Northwest Quarter Project", UCLA (Los Angeles, USA), 21st of October 2017.

Rubina Raja, "New research on the urban Development of Gerasa - Antiocheia-on-the-Chrysorrhoas", Berkeley University (Berkeley, USA), 25th of October 2016.

Alex Peterson, "Middle Islamic Ceramics from the Northwest Quarter Project", conference: Society of Medieval Archaeology Student Colloquium, Free University of Brussels (Brussels, Belgium), 3rd of November 2016.

Alex Peterson, "Ceramics in Context: Pottery of a Middle Islamic hamlet in the Northwest Quarter of Jerash", UrbNet Centre Day, Aarhus University (Aarhus, Denmark), 21st of November 2016.

Genevieve A. Holdridge, "Urban geoarchaeology of Jerash", UrbNet Centre Day, Aarhus University (Aarhus, Denmark), 21st of November 2016.

Heike Möller, "Ceramics in Context 2.0: Reviews and new perspectives", UrbNet Centre Day, Aarhus University (Aarhus, Denmark), 21st of November 2016.

Kristine Thomsen, "Gerasa: Mortars matter!", UrbNet Centre Day, Aarhus University (Aarhus, Denmark), 21st of November 2016.

Kristine Thomsen, "Gerasa: Mortar", seminar: ToRS-Saxo 4th Annual Seminar, University of Copenhagen (Copenhagen, Denmark), 2nd of December 2016.

Kristine Thomsen, "Urbanism in Gerasa, Jordan, through the lens of geochemistry", seminar: CAH: Classical Antiquity and its Heritage, Aarhus University (Aarhus, Denmark), 7th of December 2016.

2017

Rubina Raja, “New archaeological research in ancient Gerasa (Jerash): The Danish-German Northwest Quarter Project”, conference: 118th Annual Meeting of the Archaeological Institute of America, University of Toronto (Toronto, Canada), 5th–8th of January 2017.

Heike Möller, “Gerasa (Jordan): Pottery Production and Trade Networks in Roman to Early Islamic Times”, conference: Network Evolutions, Aarhus University (Aarhus, Denmark), 18th–20th of January 2017.

Rubina Raja, “Network Evolutions”, conference: Network Evolutions, Aarhus University (Aarhus, Denmark), 18th–20th of January 2017.

Rubina Raja, “Antiocheia-on-the-Chrysorrhoas-formerly-called-Gerasa - new archaeological research”, University of Oxford (Oxford, United Kingdom), 20th of January 2017.

Elizabeth Osinga, “Ceramic trends at Umm el-Jimal: qualification, provenance and typo-chronology (Nabataean/Roman to Early Byzantine period)”, conference: Regional Networks: Technological Transfers? Production and Consumption Patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Heike Möller, Rubina Raja and Achim Lichtenberger, “Welcome and Introduction”, conference: Regional Networks: Technological Transfers? Production and consumption patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Georg Kalaitzoglou and Heike Möller, “Roman Gerasa - New Results from the Danish-German Jerash Northwest Quarter Project - Contexts and Finds”, conference: Regional Networks: Technological Transfers? Production and consumption patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Gerwulf Schneider, “Late Hellenistic to Late Roman Fine Wares in the eastern Mediterranean”, conference: Regional Networks: Technological Transfers? Production and Consumption Patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Jacques Seigne and Anne-Michèle Rasson-Seigne, “Local ceramic productions at Jerash during the Early Roman Period (1st BC-1st AD): influences and diffusion”, conference: Regional Networks: Technological Transfers? Production and Consumption Patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Lisa Berger and Bernd Liesen, “Roman pottery from sanctuaries in Umm Qes/Gadara (Jordan) and its hinterland”, conference: Regional Networks: Technological Transfers? Production and Consumption Patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Malgorzata Daszkiewicz, “Ceramics found in Gadara – provenance studies using combined laboratory analyses”, conference: Regional Networks: Technological Transfers? Production and Consumption Patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Rubina Raja and Achim Lichtenberger “Regional Networks. Technological Transfers? Production and consumption patterns in Roman Pottery of the Decapolis”, conference: Regional Networks. Technological Transfers? Production and consumption patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Rubina Raja and Achim Lichtenberger “New Research in the Northwest Quarter of Jerash and its Impact on Roman Gerasa”, conference: Regional Networks. Technological Transfers? Production and consumption patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Stephen Merkel and Michael Prange, “Material Science Approaches to the Study of Pottery from Jerash”, conference: Regional Networks: Technological Transfers? Production and Consumption Patterns in Roman Pottery of the Decapolis, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 1st of March 2017.

Achim Lichtenberger and Rubina Raja, “The Archaeology and History of Jerash. 110 Years of Excavations”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Achim Lichtenberger and Rubina Raja, “Archaeological research in Jerash and the Danish-German Northwest Quarter Project 2011–2016”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Alan Walmsley, “Urbanism at Islamic Jarash: New readings from archaeology and history”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Daniela Baldoni, “A Byzantine thermopolium on the main colonnaded street in Gerasa”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Don Boyer, “The role of landscape in the occupational history of Gerasa and its hinterland”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Genevieve A. Holdridge, Kristine Thomsen, Søren M. Kristiansen and Ian A. Simpson, “Soils, sediments and environmental history: Introducing geosciences to archaeology at Jerash”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Georg Kalaitzoglou, “The Northwest Quarter of Jerash: Outlines of a settlement history”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Louise Blanke, “Suburban life in the southwest Jarash from the Roman to the Abbasid period”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Massimo Brizzi, “The Artemis Temple in Jarash: Overreaching or resistance?”, conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Thomas Lepaon, "The 'great eastern baths' of Jerash/Gerasa: Balance of knowledge and ongoing research", conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 2nd of March 2017.

Ali Al Khayyat, "The challenges facing Jerash archaeological site development", conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 3rd of March 2017.

Gry H. Barfod, "Forensic investigations of the Jerash glass", conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 3rd of March 2017.

Heike Möller, "High pottery quantity: Some remarks on ceramics in context from the Danish-German Jerash Northwest Quarter Project", conference: The Archaeology and History of Jerash, The Royal Danish Academy of Sciences and Letters (Copenhagen, Denmark), 3rd of March 2017.

Ingrid Schulze and Wolfgang Schulze, "Working with coins in Jerash: Problems, solutions and preliminary results", conference The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 3rd of March 2017.

Jacques Seigne, "Why did Hadrian spend the winter of 129/130 in Gerasa?", conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 3rd of March 2017.

Maysoon Al Nahar, "Tell Abu Suwwan, Jerash, Jordan: Neolithic skulls and rituals", conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 3rd of March 2017.

Pierre-Louis Gatier, "Romans in Gerasa: A Greek inscription from the hippodrome excavations", conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 3rd of March 2017.

Roberto Parapetti, "Recent Italian restoration work and excavation in the Sanctuary of Artemis", conference: The Archaeology and History of Jerash. 110 Years of Excavations, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 3rd of March 2017.

Kristine Thomsen, "Urban life in Jerash: Development of mortar and plaster from a diachronic perspective", 2nd Follow Up Meeting with the Danish National Research Foundation, Aarhus University (Aarhus, Denmark), 2nd of May 2017.

Rubina Raja and Achim Lichtenberger, "Roman period portrait habit in the funerary sculpture of northern Jordan: Local and foreign influences and their implications", conference: Funerary Portraiture in Greater Roman Syria, The Royal Academy of Sciences and Letters (Copenhagen, Denmark), 16th of June 2017.

Rubina Raja, "On urban network evolutions: The case of the Decapolis city Gerasa in Jordan", lecture series: Urban Network Evolutions, The Danish Institute in Athens (Athens, Greece), 12th of September 2017.

Rubina Raja, "Urban networks in the Roman Near East: Lines of enquiry", lecture series: The Dynamics of Urban Networks in the Near East, 1st century CE-8th century CE, Aarhus University (Aarhus, Denmark), 2nd of October 2017.

Alex Peterson, "Medieval pottery", workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Christoph Eger, “Metal”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Gry H. Barfod, “Glass”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Jesper Olsen and Bente Philippsen, “AMS Dating and Bayesian statistics”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Kristine Thomsen, “Plaster and mortar and wall-paintings”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Marie Louise S. Jørskov, “Human bones”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Margit Petersen, “Conservation”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Philip Ebeling, “Tiles”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Rubina Raja and Achim Lichtenberger, “Outline” workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Rubina Raja and Achim Lichtenberger, “The Danish-German Northwest Quarter Project”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Sara Ringsborg, “Stone objects”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Signe Krag, “Jewellery and textile production”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Søren M. Kristiansen and David Stott, “LiDar”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Tom Brughmans, Simon Carrignon and Iza Romanowska, “Computational simulation modelling of pottery trade”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Thomas Birch and Vana Orfanou, “Metal analysis”, workshop: Specialist workshop for the Danish-German Jerash Northwest Quarter Project, Aarhus University (Aarhus, Denmark), 11th of October 2017.

Agnes Vokaer, “African Red Slip Ware and imported amphorae in Syria from the Roman to the Early Islamic period”, workshop: Cilician Wine, African Plates, Italian Cooking – Imported Pottery in the Decapolis in Roman to Early Islamic Times, Aarhus University (Aarhus, Denmark), 12th of October 2017.

Alexandra Uscatescu, “Late Antique Imports at Gerasa: A reappraisal of the macellum case”, workshop: Cilician Wine, African Plates, Italian Cooking – Imported Pottery in the Decapolis in Roman to Early Islamic Times, Aarhus University (Aarhus, Denmark), 12th of October 2017.

Jacques Seigne and Anne-Michèle Rasson-Seigne, “Imported pottery to Jerash during Roman time (1st AD-3rd AD)”, workshop: Cilician Wine, African Plates, Italian Cooking – Imported Pottery in the Decapolis in Roman to Early Islamic Times, Aarhus University (Aarhus, Denmark), 12th of October 2017.

Rubina Raja and Achim Lichtenberger, “Introduction”, workshop: Cilician Wine, African Plates, Italian Cooking – Imported Pottery in the Decapolis in Roman to Early Islamic Times, Aarhus University (Aarhus, Denmark), 12th of October 2017.

Rubina Raja and Achim Lichtenberger, “Ceramics from the Northwest Quarter in Jerash: Narratives and numbers”, workshop: Cilician Wine, African Plates, Italian Cooking – Imported Pottery in the Decapolis in Roman to Early Islamic Times, Aarhus University (Aarhus, Denmark), 12th of October 2017.

Yvonne Gerber, “Imported Pottery in the ‘Hinterland’ of the ‘Nabataean’ Kingdom”, workshop: Cilician Wine, African Plates, Italian Cooking – Imported Pottery in the Decapolis in Roman to Early Islamic Times, Aarhus University (Aarhus, Denmark), 12th of October 2017.

Rubina Raja, “Gerasa in the Decapolis: Local, regional and imperial networks”, lecture series: The Dynamics of Urban Networks in the Near East, 1st century CE-8th century CE, Aarhus University (Aarhus, Denmark), 23rd of October 2017.

Rubina Raja, “Urban religion in Late Antique Antiochia-on-the-Chrysorrhoas-formerly-called-Gerasa”, conference: Urban Religion in Late Antiquity, Augustinerkloster (Erfurt, Germany), 8th of November 2017.

Rubina Raja, “Towards new lines of enquiry in urban archaeology: urban networks and dynamics”, University of Lund (Lund, Sweden), 13th of November 2017.

Rubina Raja, “High-definition narratives in grand-narrative regions: The case of the Decapolis city Gerasa”, conference: High Definition Narratives, Aarhus University (Aarhus, Denmark), 15th of November 2017.

Kristine Thomsen, “More than meets the eye: New strategies for analyzing mortar and plaster”, conference: High-Definition Narratives, Aarhus University (Aarhus, Denmark), 16th of November 2017.

Rubina Raja, “High-definition narratives in grand-narrative regions: The case of the Decapolis city Gerasa”, Aarhus University (Aarhus, Denmark), 16th of November 2017.

Rubina Raja, “The stuff of people: How and why things move around”, lecture series: The Dynamics of Urban Networks in the Near East, 1st century CE-8th century CE, Aarhus University (Aarhus, Denmark), 20th of November 2017.

Rubina Raja, “Urban matters: From the detail to the map that matters”, lecture series: The Dynamics of Urban Networks in the Near East, 1st century CE-8th century CE, Aarhus University (Aarhus, Denmark), 20th of November 2017.

Kristine Thomsen, “Urban life in Jerash: Development of mortar and plaster from a diachronic perspective”, PhD/Postdoc course: Kolloquium, PhD/Post-Doc, der Klassischen Archäologie im Wintersemester 2017/2018, Christian-Albrechts-Universität zu Kiel (Kiel, Germany), 14th of December 2017.

2018

Alex Peterson, “Ceramics in Context: Middle Islamic Pottery from the Northwest Quarter of Jerash”, PhD Pre-defence, Aarhus University (Aarhus, Denmark), 21st of February 2018.

Rubina Raja, “Investigating urban networks in the Roman Near East: lines of enquiry”, conference: Archéologie et histoire de l’Orient hellénistique et romain. Régions non-méditerranéennes: Éthiopie, Arabie, Mésopotamie, Iran, Université Paris (Paris, France), 27th of March 2018.

Rubina Raja, “1) Gerasa in the Decapolis: local, regional and imperial networks, 2) From the detail to the map that matters. The conundrum of the urban matters”, conference: Archéologie et histoire de l’Orient hellénistique et romain. Régions non-méditerranéennes: Éthiopie, Arabie, Mésopotamie, Iran, Université Paris (Paris, France), 10th of April 2018.

Vana Orfanou, Thomas Birch, Rubina Raja and Achim Lichtenberger, “Copper-based recycling management and technological choices at Roman and early Islamic Jerash, Jordan”, conference: XXth International Congress on Ancient Bronzes, Universität Tübingen (Tübingen, Germany), 17th–21st of April 2018.

Kristine Thomsen, “Why Mortar Matters: New Results”, Aarhus University (Aarhus, Denmark), 24th of April 2018.

Kristine Thomsen, “Understanding Complex Urban Space and Development through Geochemistry: The Case of Jerash in Jordan”, PhD Pre-defence, Aarhus University (Aarhus, Denmark), 2nd of May 2018.

Vana Orfanou, Thomas Birch, Rubina Raja, Achim Lichtenberger, Gry Barfod and Charles Leshner, “Metallurgy at the frontier: Roman and early Islamic copper-based technology at Jerash, Jordan”, conference: 42nd International Symposium on Archaeometry, Autonomous University of Yucatan (Merida, Mexico), 20th–26th of May 2018.

Achim Lichtenberger and Rubina Raja, “Gerasa: The City and the wadi”, conference: 19th international congress of classical archaeology, University of Bonn (Bonn, Germany), 23rd of May 2018.



The Artemis Temple in Jerash, Jordan (Photo: The Danish-German Jerash Northwest Quarter Project).

Publications of the Danish–German Northwest Quarter Project and Ceramics in Context (2015–)

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Photograph with view of the so-called Oval Piazza. Taken between 1898-1946 by the American Colony (Jerusalem) (Photo: G. Eric and Edith Matson Photograph Collection, Library of Congress, Prints & Photographs Division, LC-DIG-matpc-05953)

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View from Camp Hill towards the Tetrapylon (Photo: The Danish-German Jerash Northwest Quarter Project).

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TV

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Line Egelund, Mie Egelund Lind and Rubina Raja, "Krig og kulturarv", *Weekendavisen Ideer*, 15th of September 2017.

Exhibitions

Jerash et dansk-tysk udgravningsprojekt i Jordan

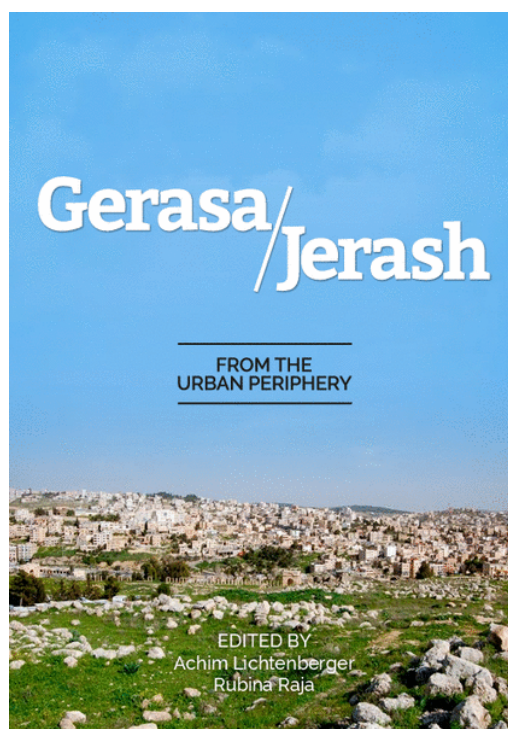
24th of February–25th of June 2017

Museum of Ancient Art, Aarhus University, Denmark

Complementary publications

Lichtenberger, Achim and Rubina Raja (eds). 2017. *Gerasa/Jerash: From the Urban Periphery* (Aarhus: AUTRYK).

Lichtenberger, Achim and Rubina Raja (eds). 2017. *Gerasa/Jerash: Fra Den Urbane Periferi* (Aarhus: AUTRYK).



Cover of the complementary publication, *Gerasa/Jerash: From The Urban Periphery*, ed. by Achim Lichtenberger and Rubina Raja.



Photos from the opening of the exhibition "Jerash et dansk-tysk udgravningsprojekt i Jordan" in the Museum of Ancient Art, Aarhus University, 24th of February 2017 (Photos: Ole Hejlskov).

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Collaborators

Institutions

- Aarhus University Archaeological IT (Aarhus, Denmark)
- Aarhus AMS Centre (Aarhus University, Denmark)
- Danish Technological Institute (Taastrup, Denmark)
- Department of Antiquities (Amman, Jordan)
- Department of Antiquities (Jerash, Jordan)
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- UrbNet – Centre for Urban Network Evolutions (Aarhus, Denmark)

Museums

- Moesgaard Museum's Department of Archaeological Science and Conservation (Aarhus, Denmark)
- Viborg Museum (Viborg, Denmark)

People

- Professor Dr. Achim Lichtenberger, Westfälische Wilhelms-Universität Münster (Münster, Germany)
- Dr. Alf Lindroos, Åbo Akademi University (Turku, Finland)
- Post doc Dr. Carmen Ting, University of Cyprus (Nicosia, Cyprus)
- PD Christoph Eger, Georg-August-Universität Göttingen (Göttingen, Germany)
- Post doc Dr. Iza Romanowska, Barcelona Supercomputing Centre (Barcelona, Spain)
- Professor Dr. Michael Prange, Bergbaumuseum Bochum (Bochum, Germany)
- Assistant professor Pernille Bangsgaard, Natural History Museum of Denmark (Copenhagen, Denmark)
- MA student Philip Ebeling, Westfälische Wilhelms-Universität Münster (Münster, Germany)
- MA student Signe B. Kristensen, Aarhus University (Aarhus, Denmark)
- Junior professor Silvia Polla, Freie Universität Berlin (Berlin, Germany)
- PhD student Simon Carrignon, Barcelona Supercomputing Centre (Barcelona, Spain)
- Dr. Stephen Merkel, Bergbaumuseum Bochum (Bochum, Germany)
- Post doc Dr. Tom Brughmans, University of Oxford (Oxford, England)

Projects

- LCP - The Levantine Ceramics Project

Webites

Ceramics in Context

<http://projects.au.dk/ceramics-in-context>

Danish-German Jerash Northwest Quarter Project

<http://projects.au.dk/Internationaljerashexcavation/>

Centre for Urban Network Evolutions

<http://urbnet.au.dk/>



Ceramic pieces from Jerash, Jordan (Photo: Rubina Raja).

The Danish–German Jerash Northwest Quarter Project, team members 2011–2017

Directors

Achim Lichtenberger (2011-2017)
Rubina Raja (2011-2017)

Team members

Gry Barfod (2017)
Michael Benecke (2012-2013)
Anders Meander Bjerregaard (2013-2014)
Christin Braeck (2016)
Malene Byø (2015-2016)
Charlotte Helene Kjær Christensen (2016)
Dorothea Csitneki (2012-2013)
Robert Dylka (2017)
Philip Ebeling (2013-2017)
Christoph Eger (2016)
Julian Einschenk (2015)
Alessandra Esposito (2015)
Holger Fleischer (2016)
Till Flüchter (2014)
Eike Granser (2012-2013)
Luisa Goldammer-Brill (2015)
Pawel Grüner (2014)
Christoffer Pelle Hagelquist (2012)
Mette Marie Hald (2017)
Niels Benjamin Hansen (2014-2015)
Max Herbst (2016)
Ditte Maria Damsgaard Hiort (2011-2012, 2014)
Gitte Lambertsen Hjortlund (2016)
Genevieve Anna Holdrige (2016)
Charlotte Bach Hove (2014-2015)
Anne Ditte Høj (2013-2014)
Pernille Bangsgaard Jensen (2014-2015, 2017)
Peter Fink Jensen (2014)
Peter Mose Jensen (2015)
Jesper Vestergaard Jensen (2016)
Nicole Jezewicz (2015)
Marion Jobczyk (2016)
Georg Kalaitzoglou (2011-2016)
Tim Kinnaird (2017)
Hans Peter Klossek (2013-2016)
Rudolf Kniess (2011)
Signe Krag (2012-2013, 2016)
Kevin Kremser (2015)
Patrick Kreuz (2017)
Signe Børsen Koch (2012)
Signe Bruun Kristensen (2012-2014, 2016)
Søren Munch Kristiansen (2016)
Nadia Schmidt Larsen (2013-2014)
Charles Leshner (2017)
Mie Egelund Lind (2015-2017)
Alf Hilding Lindroos (2013-2014)
Kevin Luijter (2015-2016)
Peter Hambro Mikkelsen (2015)
Heike Möller (2015-2016)
Line Egelund Nielsen (2014-2017)
Anders Olesen (2013)
Mette Normann Pedersen (2015-2017)
Margit Petersen (2014-2017)
Alex Hunter Peterson (2015-2016)
Sören Pfeiffer (2015)
Nicole Pieper (2015-2016)
Dana Pilz (2011)
Jens Christian Pinborg (2011-2014)
Cathrin Pogoda (2012-2013)
Julie Thomsen Raunstrup (2016)
Alexander Reso (2016)

Anne Riedel (2012-2013)
Stefan Riedel (2011-2013)
Sara Ringsborg (2014-2015)
Ulrike Rübesam (2014-2015)
Ingrid Wolfgang Schulze (2015)
Wolfgang Schulze (2015)
Michael Schwab (2016)
Holger Schwarzer (2013, 2015-2016)
Ian Simpson (2015-2017)

Karen Elizabeth Spencer (2015)
Helle Strehle (2012-2013)
Janek Sundahl (2014-2015)
Annette Højen Sørensen (2011-2015)
Kristine Thomsen (2016)
Nicolai Broen Thorning (2015)
Steff Elgaard Wiklund (2016)
William Thomas Wootton (2016)



Team photos from 2011 (top left), 2012 (bottom left), 2013 (top right) and 2014 (bottom right) (Photo: The Danish-German Jerash Northwest Quarter Project).



Team photos from 2015 (top) 2016 (center) and summer study campaign 2017 (bottom) (Photo: The Danish-German Jerash Northwest Quarter Project).



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Cover: Joining hand-made geometric painted ware sherds from Jerash, Jordan (Photo: The Danish-German Jerash Northwest Quarter Project)

Back cover: The North Theater in Jerash, Jordan (Photo: The Danish-German Jerash Northwest Quarter Project)

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