

Big Data on the Roman Table

AHRC Research Network

WORKSHOP 1 ABSTRACTS

Introduction to Big Data on the Roman Table and its themes

Pim Allison (University of Leicester)

In the way of a general introduction to this workshop and its aims I will, very briefly, discuss each of the workshop themes in relation to my own research projects that have involved legacy data from Pompeii and from early imperial military sites in Germany. I will introduce the collating and analytical processes I have used for these datasets, to date. I will highlight problems faced, and possible ways forward, when re-collating material (legacy data) that has already been collated with different research agenda, in different parts of the Roman world. I will also present some of the preliminary quantitative and spatial analyses carried out on these data. As a comparable, and analogical, study I will also showcase the analyses I have carried out tablewares and teaware sets from the 19th and early 20th-century Australian site of Kinchega to show how detailed analyses of fabric, decoration profiles, and assemblages can lead to greater understandings of changing social practices around eating and drinking in this frontier, colonial context.

Multi-functionality in Roman ceramics

L.M. Banducci (Carleton University, Ottawa)

This paper seeks to address some fundamental questions about the function and use of Roman domestic ceramics: How do we define and identify function? How do we identify multi-functionality? Are some ceramic wares better suited to being multi-functional? What are the implications for our understanding of Roman foodways when we label certain vessels “cooking wares” and others “table wares”? Beginning with a brief review of anthropological approaches to object function, I interrogate one particular Roman ware – internal red slip pottery or Pompeian red ware. Although we can examine specific criteria like clay composition and morphology in order to narrow down the intended or ideal function of a ceramic type, the consideration of use wear, find context, and the holistic study of complete finds assemblages can complicate this picture. The cultural context of the Roman world, expanding as it does throughout the Mediterranean and beyond, is also an important factor in our assessment of object function. Is the function of an object more flexible the further that object gets from its place of origin, or less? Internal red-slip pottery has the potential to provide direct answers to such questions since it was widely-distributed in the Roman world. It is particularly identifiable owing to what scholars have termed its red “non-stick” internal surface; yet little information about its use has been demonstrated empirically. The intention of this study is to engage with statistically significant datasets. Thus, this project employs my systematic morphological study, ceramic petrology, and use wear analysis of hundreds of examples of this ware from sites in Italy and incorporates published data about internal red slip from throughout the Mediterranean.

Domestic production and consumption patterns in the Roman rural settlements of the Madrilian region (Central Spain)

Jesús Bermejo-Tirado (York University. Toronto)

My project lies in the analysis of 16 small rural sites (farms, villages and so-called *villae*) excavated in the center of the Iberian Peninsula in the course of emergency interventions performed in the Madrilian region as an aftermath of the Spanish constructive boom between the late 90's and the first years of XXI century. The study of all these rural contexts allows me to have access to a huge quantity of different data both from administrative archaeological reports (often called "gray literature") and from the individualized analysis of archaeological artifacts curated in the Museo Arqueológico Regional de Madrid (Alcalá de Henares, Spain).

This paper is focused on the discussion of the documental routines for the record of this information and the methodological tools applied to obtain inferences about the production and consumption patterns of these communities during the period of the Roman domination of the region. The use of some methodological procedures, as the functional (vs. chronological) analysis of material culture, or the implementation of the operative chain concept as a framework for the study of domestic production will be addressed. In doing this, I want to show how the selection of some methodological trends is involved *de facto* in the design of variables and database formats used to obtain our inferences.

Why quantifying pottery and recording the evidence of pottery use matter

Edward Biddulph (Oxford Archaeology)

Pottery data offer huge potential to reveal patterns in Roman dining practices. For example, evidence of use, notably burning, residues and use-wear, can indicate how pottery was used, while inter-site assemblage comparison and variation in typological traits can point to the extent and diversity of practices, and allow us to assess the influence of different cultural environments. We potentially have a wide tool-kit with which to analyse the pottery, from basic descriptive statistics to multivariate analysis, from simple observations to scientific analyses. To extract reliable information from the pottery, we require robust data, but too often the published data are not adequate. Any trawl through pottery reports quickly reveals that pottery data are inconsistently presented and quantified and subject as much to personal preference and prejudice as it is to ceramic necessity. And researchers are likely to struggle to find data on use-wear, burning and so on. In this paper, I will make a plea for consistent quantification, demonstrate the value of recording and analysing data relating to the use of dining wares, and discuss how such data may be captured systematically and usefully disseminated.

Brief flirtations in time: studying rich but short-lived military interludes

David Breeze (formerly Historic Scotland) and Rebecca Jones (Historic Scotland)

The Antonine Wall in Scotland, Rome's north-west frontier, was built in the 140s AD and occupied for a generation, making it a microcosm of a Roman frontier when they were at

their zenith in the mid 2nd century. Antiquaries and archaeologists have been studying the frontier for well over a century, leading to the collation of a rich body of data.

This data was digitised and mapped in detail as part of the nomination of the Wall as a World Heritage Site (inscribed in 2008) and GIS layers have been created mapping all interventions together with the details of what was found (where possible). Missing from this dataset was the excavated material-cultural assemblages, now predominantly housed in three museums. Yet this artefact record has the potential to enable contemporary inter and intra-site analyses, looking at social-spatial behaviour, status and use. Our case study will be the fort at Bearsden, where nearly 1/3 of fort and annexe was excavated from 1973-84 and publication is imminent.

Big Data on the Roman Table Workshop Presentation 26th and 27th September 2015

Eating In and Eating Out in Roman Leicester

Nick Cooper and Liz Johnson (University of Leicester Archaeological Services)

This presentation aims to pull out the important threads of evidence for pottery vessel occurrence in Roman Leicester (*Ratae Corieltaavorum*), drawn primarily from the quantitative analysis of assemblages from large-scale excavations undertaken beneath the Highcross, Leicester shopping centre 2003-6, and previously at Causeway Lane (1991) and The Shires (1988), alongside the small, unique assemblage from Castle Street identified as a delicatessen. Analysis has allowed us to chart changes in vessel types occurring in Leicester across the Roman period, alongside which we can also look at vessel glass, other utensils and plant and animal remains. Against this background pattern, ‘snapshot’ assemblages occasionally occur that relate to specific buildings and give us valuable insights into evolving dining practice. Two present possible evidence for ‘eating out’ during the 2nd century; firstly from the fill of a timber-lined cellar on Little Lane producing tablewares, amphorae, and flagons alongside animal bones and oysters. The second is the fill of a cess pit from the Castle Street ‘delicatessen’ containing amphorae, flagons, tableware bowls and dishes but no cups, alongside exotic plant foods, fish and smoked shoulders of beef. The third is from a kitchen drain and two cess pit at the 3rd century courtyard house on Vine Street, representing ‘eating in’, and contained a wide range of animal and plant foods alongside cooking pots, bowls and wide dishes in black-burnished ware alongside large colour-coated beakers.

Studying function of Roman Pottery. Some remarks

Xavier Deru, (University of Lille)

Assigning function to pottery types is not an easy task. Archaeologists have long debated the difference between primary function – the function for which the vessel was originally made, and the ‘real’ function of the vessel – how it was used in everyday life; many contradictions exist. A practical solution for our purposes is to assign an *a priori* function in the first instance and then to test this in different assemblages and contexts. Form, technique, and wear marks are the main criteria to determine this. Giving examples, I will explain how we can arrange pottery in general functional classes (food consumption, lighting etc), food classes (drinking, eating, cooking etc) and specific classes (beaker, flagon, cup etc). The second part of the paper will examine more complex issues relating to pottery in assemblages – how function may change in time and space, how pottery is selected for the same function,

and whether vessels in other materials such as bronze and glass were able to directly compete with pottery.

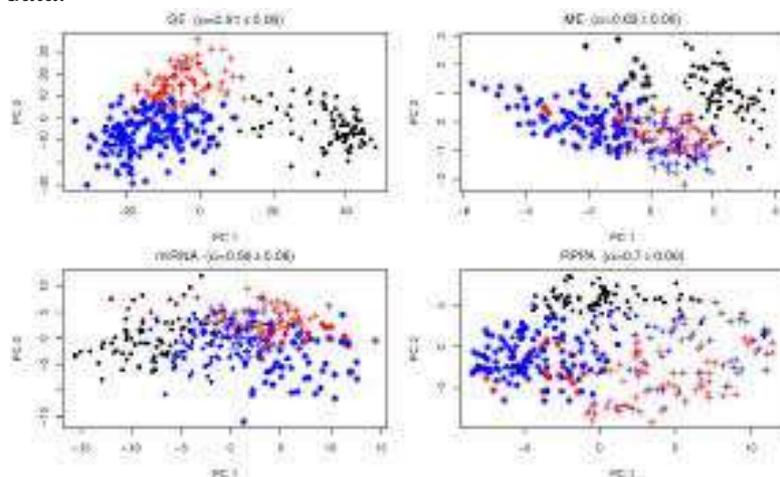
Comparison of pottery usage on 5 sites
Jeremy Levesley (University of Leicester)

In this talk we will explore the hypothesis that the sort of pottery found on a site depends on the classification of the room in which it was found. We will look at classifications Barracks, Administrative, Streets, Officers, Fortifications for buildings, and Chalice, Cup, Bowl, Platter, Plate, Glass, Pot for pottery. This will be done across 5 sites hopefully. If successful this will give provide a correlation which is significant.

One might hope to be able to make a good guess about what the building usage was from the distribution of pottery. Of course, this is not so useful, but provides an indication of the possibilities of finding correlations in data.

A key emerging theme will be that to perform this sort of analysis the collection of data must be as uniform as it can be. Thus a reward to the archaeologist of using a standard ontology will be much greater predictive power in the data collected.

The main purpose of this presentation is to explore how data analytics can be used to interpret data from a Roman site. Once we have a description of pottery which allows us to more reliably categorise the amount of each sort of pottery at a site, we have the opportunity to classify sites in this manner. The final summary of the multilevel statistics for a site is some sort of signature. Having determined a signature for an individual site we can compare these across multiple sites in order perhaps to create clusterings of similar sites (in the sense of how we generated the signature in the first place). This might be useful for higher level analysis of Roman pottery usage and what one might conclude about the sociological make-up of the sites from such data.



Investigating Changing Consumption Patterns through Ceramic Data: The Perspective from Roman Mediterranean France.
Benjamin P. Luley (University of Pennsylvania)

This paper focuses on Roman Mediterranean France during the first century C.E., and the use of ceramic data to compare consumption practices between native sites, where the majority of

the population was Gallic, and more urban sites in the province which were marked by a greater degree of Roman influence or the presence of a sizable Roman population. Specifically, the paper first explores the question of typologies for similar ceramic vessel forms in different ceramic wares related to cooking and dining, as currently outlined in the DICOCER (*Dictionnaire des céramiques antiques en Méditerranée Nord-Occidentale*) ceramic manual typically used by archaeologists for the region. In regard to these communal ceramic wares, it is argued that the variability in naming similar forms from different wares, and in particular a reliance on Latin terms (e.g. patina, caccabus) for certain ceramic wares, can in fact influence the way archaeologists interpret consumption patterns after the Roman conquest, underscoring the need for a more consistent typology across different ceramic wares. The paper then discusses the use of the computer program SYSLAT, used extensively

Dinner with the neighbours? Issues with characterising, comparing and synthesising site assemblages from Roman London

Michael Marshall and Fiona Seeley (Museum of London Archaeology)

Roman London has seen some of the most intensive excavation in the Roman Empire. Huge quantities of pottery, glass, small finds and environmental evidence have been recovered with much of the material being well stratified and centrally curated in the London Archaeological Archive and Research Centre. All this ought to make Londinium an ideal place for studying Roman foodways but much still needs to be done. We begin with a case study of the recent analysis of the finds from Bloomberg London and highlight some of the challenges and opportunities that developer funded archaeology creates for understanding eating and drinking in Roman London. We go on to consider structural problems in London archaeology including: variable approaches to quantification, analysis, publication and curation of data; the availability and value of expertise and the lack of recent synthesis.

Before it gets on the table

Allard Mees (Römisch-Germanisches Zentralmuseum at Mainz)

Whatever ceramic vessels were put on the table was dependent on the market mechanisms which determined the flow of goods. Any choice on the local market was heavily influenced by whether a certain type of vessels was either generally available or perhaps a more exotic phenomenon within the regional available spectre, compared with the overall distribution of the goods involved. Any social analysis must take these supply determining supra-regional market mechanisms into account before coming to conclusions.

The new research database on Roman terra sigillata from the Northwestern Roman empire comprises more than 200'000 name stamped vessels from 3700 different sites

(<http://www.rgzm.de/samian>). This vast material may function as a starting point for in depth data analysis of regional and supraregional market mechanisms.

Starting from existing distributions, statistical analysis will be presented on discrete differences between geographical differences in distribution of potters and forms and methods for determining chronological differences in production centre output.

Table ware suites and shifting analytical scales: from micro to macro

Martin Pitts (Exeter University)

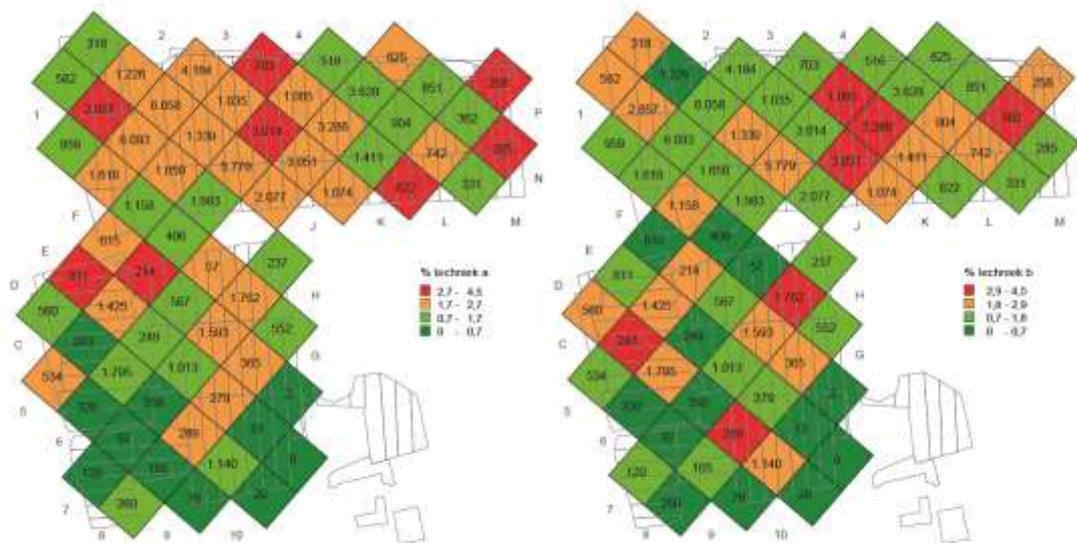
This paper explores the possibility for identifying shared (if not identically replicated) consumption practices based upon the recurrent contextual association of fine ware ceramics, from local to inter-provincial scales of analysis. A particular aim is to be able to connect analyses of social practice at a (typically) small number of well-published sites and cemeteries in which contextual studies of depositional associations are possible, with broader-brush data from larger regions. Case-studies and data are drawn largely from first century AD NW Europe. The implications for visualising such patterns will also be considered, using a combination of Correspondence Analysis (CA) and more basic descriptive tools.

Quantitative and spatial analysis of tableware from the canabae legionis at Nijmegen(NL)
Rien Polak and Ryan Niemeijer (Radboud University of Nijmegen)

In 1987-1997 an area of c. 3.5 ha situated in the *canabae legionis* to the west of the *castra* of Legio X Gemina at Nijmegen was excavated. The excavations produced over 500,000 objects, almost 90% of which consist of pottery sherds. Only recently a start has been made with the more or less detailed publication of the major finds groups, with a focus on chronology and distribution.

In order to master the quantities involved, several methods for analysis have been developed. One method is primarily aimed at **distribution analysis**. Since the finds are unevenly distributed over the excavated area, working with absolute numbers of finds makes no sense. By quantifying the finds in a grid of squares of 25x25 m projected over the excavation the (relative) distribution of any category of finds can be visualised (fig. 1). For our paper we intend to apply this approach to tableware, to study its distribution in various ways.

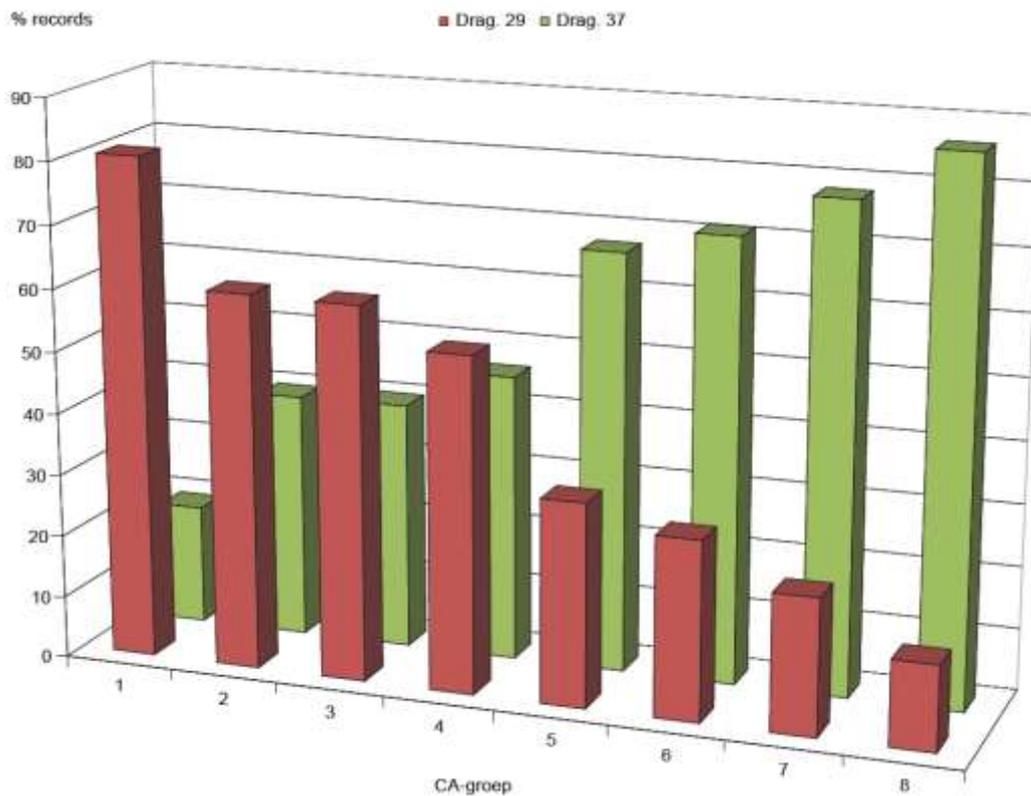
Fig. 1 Comparison of the distribution of two fabrics of colour-coated ware (rim sherds only), expressed as percentages of all pottery. The numbers printed in the squares represent the numbers of rim sherds of all pottery.



A second method is primarily aimed at **chronological analysis**. A correspondence analysis (CA) has been made of the pottery. We think that the resulting order is basically chronological. We used it to divide the excavated features in eight groups representing a

chronological time series (fig. 2). For our paper we intend to apply this approach to tableware, to study its chronological 'behaviour' in various ways.

Fig. 2 Distribution of the decorated terra sigillata bowls Drag. 29 and 37 over the eight distinguished CA-groups.



Besides these spatial and chronological aspects we will look at the **context** of the tableware, but in a very coarse way. Since there is only a very general interpretation of the excavated features, it is not possible to perform a detailed context analysis. But an overview of the quantities of tableware per broad context group (pits, ditches etc.) may shed some light on deposition patterns.

A first volume presenting a.o. the applied methods (ch. 2) and colour-coated ware (published in Dutch) may be downloaded here:

https://www.academia.edu/8790140/Opgravingen_op_het_terrein_van_het_voormalige_Cani_siuscollege_in_Nijmegen_1987-1997_Vondsten_uit_castra_en_canabae_I

Eating and drinking on the boundaries of Italia

Stephanie Ratto and Alessandro Quercia (Soprintendenza per I Beni Archeologici del Piemonte)

The Soprintendenza Archeologia of Piedmont is in charge of investigating and analyzing numerous contexts of Roman age (towns, rural settlements, tombs) which yielded big pottery assemblages related to food consumption. Some of them have been subject of studies aimed to the identification of the main vessels and their functions in eating and drinking practices.

For the first 'Big data' workshop, we will focus mainly on a big ceramic dump next to the Roman circuit walls of Augusta Taurinorum (current Torino), which was investigated between 1990 and 2001. This context consisted of a series of succeeding levels dated between the end

of the 1st and the end of the 3rd centuries AD, which contain a huge quantity of amphorae, finewares and coarsewares (more than 800 boxes).

The analysis of this ceramic assemblage provides important knowledge on the pottery trade, as well as on the food habits of the people who lived in Augusta Taurinorum throughout the centuries. Also, this context can give helpful information for distinguishing the dumps located outside the city wall, primarily related to workshops, and the domestic refuses identified into the town.

A database was build for containing the ceramic finds, which were distinguished for classes, shapes and morphological types. Unlike finewares and transport amphorae, the coarse wares did not have a previous repertoire as a reference. Then, a classification based on the distinction of forms and types and on the identification of the main functions of the vessels was set up for the coarsewares.

Roman Libarna Project – legacy data and new excavations

Alessandro Quercia (Soprintendenza per I Beni Archeologici del Piemonte), Pim Allison (University of Leicester and Katie Huntley (Boise University)

A number of houses in two *insulae* in the Roman city of Libarna, in eastern Piedmont in northern Italy, were excavated in the 1960s and 1970s. Artefacts from these excavations has been partially recorded. Although most of the non-diagnostic finds, such as the body walls, were discarded during the excavations, selected artefacts and the limited available information on their location has been collated into a database, in order to provide a preliminary contextual analysis of the finds.

A collaborative project between the *Soprintendenza Archaeologia del Piemonte*, the University of Leicester, the University of Boise, Idaho, and the Technical University of Texas is in the process of being set up. One of its aims is to take a more specifically consumption-oriented approach to the domestic spaces in this north Italian town to investigate household practices in this region, through excavations of further domestic spaces and detailed artefact analyses. The project therefore will aim to incorporate legacy data with newly excavated foodways material culture.

Developing a method for a spatial correspondence analysis

Martin Sterry (Univ. of Leicester)

Multivariate analyses, in particular correspondence analysis, (CA) have become a standard exploratory tool for analysing and interpreting variance in archaeological assemblages. Notable examples include those involving artefacts (e.g. Cool and Baxter 1999; Pitts 2010), archaeobotanical assemblages (van der Veen 2007) and faunal assemblages (Manning et al. 2013). Although it has been noted that CA ‘might be of considerable relevance to spatial analysis’ (Wheatley and Gillings 2002: 146), as yet there has been no truly successful integration. This makes it difficult to isolate spatial influences on assemblage composition from the CA scatterplots (except through pre-determined regionalisations) even though these may be of equal or greater importance to other determinants such as, cultural, socio-economic and temporal aspects.

This paper will present a novel method for visualising CA in ArcGIS by transforming the resultant scatter graphs of the CA into colour maps within which the similarity and difference between assemblages directly corresponds to the similarity and difference of the colours used to display them. Utilising datasets of faunal assemblages from Late Iron Age to Late Roman central England and ceramic assemblages from field surveys the paper will demonstrate how the method is applied and how it can be used to draw out spatial and temporal trends. Further, the paper will explore the potential of this analysis for using the data to define past zones and areas (and how they change over time).

Digging in the Pompeian storerooms: foodways and consumption patterns through legacy data

Luana Tonioli (Soprintendenza archeologica di Pompei)

One of the main goals of the Great Pompeii Project is addressed to the reorganization and the scientific study of the findings in the Pompeian storerooms, putting in context different forms of legacy data and adopting a multi-disciplinary approach.

The paper discusses the methodologies used to collect and format these data, often variable in quality, and to compare them with recently excavated contexts in the city. In detail two main case-studies are analyzed, the unpublished excavations from Villa dei Misteri and Casa del Frutteto (I, 9, 5). First these data are analyzed from a spatial-patterning point of view, to investigate the function and the activities that took place in the domestic spaces, although these artefacts were selected during the excavations and non-diagnostic finds were discarded. Then the pottery data are implemented with other artefact categories, through statistical methodologies, in order to obtain a comprehensive reconstruction of the consumption patterns and diet habits, moving towards a more food-centered archaeology:

On ontological data representation

Emilio Tuosto et al. (University of Leicester)

Ontologies generalise classical "table views" of data by explicitly representing classes (of individuals), the semantic relations among such classes, and some useful meta-relations. As highlighted in the context of Tracing Network project

(<http://www.cs.le.ac.uk/TracingNetworks>), ontologies can - more suitably than traditional data management systems - help with

- i) integrating data sets of different kinds
- ii) querying data in more flexible ways, and
- iii) extending and adapting data sets by adding new fields or relations.

Such features are paramount to represent, elaborate, and query data about types and shapes of vessels, geographic and spatial information, and statistical data. Several open problems are still to be solved. Although it is relatively easy to model and populate ontologies, typical users may struggle to fully exploit the expressive power of query languages as they tend to be rather complex. For this we propose to develop a graphical query language. Such graphical language will provide the basis for enabling lay users to execute sophisticated queries without requiring knowledge about the mathematical concepts behind the underlying ontologies.

Late Hellenistic to Early Imperial tableware in Roman Asia Minor – a perspective on the diachronic patterns and morphological developments.

Rinse Willet (Leiden University)

Although the study of tablewares has a long history in the Roman East, research has been hindered by the relatively few and recent interdisciplinary research projects that study and publish their tableware in depth. But in the last decades, advanced provenancing techniques, combined with efforts to study tableware en masse have been employed, resulting in a better understanding of this archaeological phenomenon. Distribution patterns for the major wares found in the East (Eastern Sigillata A, B, C, D; Italian Terra Sigillata; African Red Slip Ware, Late Roman C and D) are successfully mapped by Philip Bes by compiling published data into a single database of the ICRATES (Inventory of Crafts and Trade in the Roman East) project. Yet many questions remain on the relationship between production and consumption of these wares and on the role more local products played on the ancient table, both of which are not helped by the relative paucity of well-studied closed archaeological contexts.

This paper wishes to address some of these issues, by studying the tableware data for Asia Minor. For this, as a first step the data from Sagalassos is discussed. At Sagalassos, a city located in Pisidia, in the South-West of Asia Minor, substantial production facilities for tableware (Sagalassos Red Slip Ware or SRSW) are archaeologically attested and the excavations, ongoing for nearly three decades, has yielded a vast amount of these vessels. Possibly this production was set up to supply the newly founded colonies of Pisidia in the late first century BC, although of interest is that the morphology does not necessarily correspond to trends observed in the wares with a larger distribution in the Mediterranean. Yet these data represent a production-site and for only few other sites SRSW has been published. Therefore the next logical step is to compare Sagalassos with consumption patterns of tableware at cities of Asia Minor (Ephesos, Assos, Tarsos, Anemorion and Perge) as recorded in the ICRATES database. These represent sites both in proximity of and at some distance to producers of tableware, and represents a good testbed for the consumption of tableware, both in quantity as in quality (i.e. what shapes were being consumed). As a chronological framework, the Hellenistic to Roman Imperial periods are used.

To visualize the data for Sagalassos (50,000+ vessels) and ICRATES (c. 4800 vessels for Hell.-Imperial Asia Minor) is studied using linear, Gaussian and gamma data distribution methods, whereby not only the quantitative developments are observed, but also the sequences of vessel types and ‘fashions’ are taken into account. The findings of these must be set against a background of the changes in Asia Minor, which on the one hand becomes part of the Roman Empire with turmoil, Roman intrusion, and an increase in urbanization, while at the same time the ‘Greek’ culture seems to continue in this region as well.