

Pottery and Paradigms

Leicester's strength in interdisciplinary work has brought researchers from three departments together to work on a project that straddles time and space and bridges the ancient and modern.

'Tracing Networks: Craft Traditions in the Ancient Mediterranean and Beyond' is the innocuous-sounding name of a multi-million pound five year project at the University of Leicester. The title gives little clue to the complexity and potential impact of the scheme which has an astounding concept: using computers to increase our understanding of history and then using that understanding of history to increase our knowledge of computers.

This research, funded by a £1.73m award from the Leverhulme Trust, has brought together academics from three departments – Archaeology and Ancient History; Computer Science and Museum Studies.

The whole process starts with the study – or studies, for there are a number of specialist sub-projects – of thousands of artefacts produced in and around the Mediterranean between circa 1500BC and 200BC (roughly, the late Bronze Age to the Classical period). The researchers will look at not only the size,

shape and design of the items but also how they have been made and what they have been made from.

Petrographical, chemical and other types of analysis of pottery fragments, for example, can reveal where the clay originated – which can be a long way from where the items were found, thus providing evidence for the existence of trading networks.

"Archaeological material is scarce and often in a very fragile state," points out Dr Ann Brysbaert of the School of Museum Studies. "Analytical instrument technologies improve all the time so we always look into employing non-destructive techniques where possible. This ensures that future work – with new research questions and newly developed methods – can still carry out groundbreaking research."

From this detailed examination of artefacts in museum collections and archaeological sites, a picture can be built up of the 'networks' which



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Spindle whorl, 9th-7th c. BCE, from the Incononata site, Metaponto, Basilicata, Italy. This example is indigenous Italic, but the geometric decoration may have been inspired by contemporary Greek pottery.



Wooden trough for salt production, Romania.

Phoenician and indigenous Sardinian (Nuragic) pottery from central Sardinia.



Punic-style stamp in the shape of a footprint on a Greek loom weight from Metaponto, Basilicata, Italy dating to the 4th-3rd c. BCE.



Blue faience bead, 6th c. BCE, found at the site of San Salvatore, Comune di Bova, Calabria, Italy. Faience, made of crushed quartz or sand and often coloured blue with copper based pigments, was originally an Egyptian technique, which spread to the Aegean world and beyond.



Egyptian blue pigment, coloured by copper ores.

enabled the relevant technical and artistic knowledge to spread across (what was then, effectively) the known world. These are not simply trade networks: knowledge can be spread through families and communities, by contact between different cultural groups or through the conquest of one group by another. Why people choose to adopt (or not adopt) innovative ideas and new technologies is not straightforward. Consequently, the scale and complexity of this process makes the use of advanced computing facilities essential.

“We’re looking at movement, but not just of trade or objects,” explains Professor Lin Foxhall of the School of Archaeology and Ancient History. “We’re focussing more specifically on the movement of knowledge: how it spreads geographically and how it can jump from one craft to another. Studying knowledge allows us to trace things that we can’t otherwise study. For example, cooking technology follows the spread of food. We can also look at coins, not as objects in their own right or even as a monetary system, but as a technology.”

By creating an ‘ontology’ – a formal representation of concepts and the relationships between them – the Tracing Networks project promises to deliver results much more complex and unexpected than could ever be achieved through a simple catalogue or database of the items.

“With a database, you can only retrieve information directly from the stored data – provided that you know the right questions to ask,” explains Professor José Fiadeiro from the Department of Computer Science. “By building an ontology, the project will be able to classify and organise the data collected by the archaeologists in a clever way, which will bring out relationships that we could not otherwise find, and put forward new theories.”

Although it is early days, outputs from Tracing Networks are likely to include

books, papers, conferences and a permanent website which will make the data collected and the links identified available to future researchers around the world. Furthermore, as well as inspiring new computing paradigms and enhancing our knowledge of ancient history, the project also has the potential to feed directly back into the museums which house the original artefacts.

“Museums displaying archaeological collections often arrange objects into typological and chronological sequences, or combine the two,” observes Dr Brysbaert. “However, these arrangements do not really include people in the story, if there is in fact a storyline at all. By looking into the technological aspects of objects and studying crafts from a human and social perspective as well, these items can be seen in relation to people: those who made them and those who used them.”

One aspect that marks Tracing Networks as innovative – and makes the expected outcomes transcend our understanding of the past – is that the team plan to take the information generated by analysing these ancient knowledge networks and apply it to 21st century computer networks.

Computer scientists are always interested in new ways of working – new ‘paradigms’ – and these historical networks of knowledge dissemination offer exciting new models for the way software applications organise themselves in ‘global computers’ (wide area networks).

Tracing Networks is a unique project which could potentially have a lasting impact in the fields of computer science, museum studies, archaeology and ancient history. Others involved are Professor Colin Haselgrove and Dr Ian Whitbread from the School of Archaeology and Ancient History and Dr Effie Law, Dr Monika Solanki and Dr Emilio Tuosto from the Department of Computer Science, together with colleagues from the Universities of Exeter and Glasgow.

Ultimately, the project’s strength lies in bringing together three University departments, their staff and their students, in a new and exciting way. Tracing Networks promises to enhance our understanding of the past, the present and the future, applying a historical understanding to cutting-edge technology and vice versa. ■

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