

Understanding Societal Transformation Through Ceramic Production and Use in Pisidia and Isauria

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Abstract This paper seeks to contribute to debates about Byzantine societal change between the 7th and 9th centuries AD. It considers the production of Late Roman D Ware at dispersed sites in Pisidia in Asia Minor and the production of painted jars found with globular amphorae in a rural settlement at Kilise Tepe in Isauria. These artefacts help us to examine both continuity of late Roman ceramic traditions and the emergence of new families of vessels in the 7th century. The paper considers the active role of material culture in understanding ideas shared by people across wide areas, including political and traditional chronological boundaries.

Keywords Byzantine. Ceramic. Production. Red slip. Water jar. Globular amphora. Head loading.

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1 Introduction

Changes in late Roman ceramics during the seventh century signal the transformation of long-held ideas and the emergence of new kinds of material culture, economy and settlement during the second half of the first millennium AD (Wickham 2005, 693-824; Haldon 2016, 289-90; Brubaker, Haldon 2011, 1; Decker 2016).

While archaeological surveys which use ceramics as a proxy for the identification of settlements have reported an apparent drop in the period from the seventh to ninth centuries AD, the interpretation of the significance of the changing ceramic record in the Byzantine period is complicated by methodologies that are grounded in traditional classical archaeological approaches and assumptions that have prioritised particular elements of material culture (Jackson 2020). Ceramic repertoires after the mid-seventh century have become the focus of research that has increasingly revealed evidence of networks of trade both at a local level and across wide areas in the Mediterranean and beyond (Hayes 1992; Vroom 2017; Vionis 2020). What is emerging from synthetic analyses of ceramic assemblages from the period between the seventh and ninth centuries is a series of families of types in classes with shared attributes that Vionis has recently argued represent a shared *koine* (Vionis 2020). Unique characteristics of complex material assemblages from each locale reveal the extent to which potters and communities engaged at a local level in material ideas shared more widely.

This paper will consider case studies for pottery production at a key period of transition during the seventh and later centuries from southern Anatolia. As I hope to show, the ceramics from both case studies contribute datasets that help us to develop new narratives for understanding economic exchange and people's lives in the seventh century and beyond.

The first case study represents an example of the continuity of the late Roman table-ware tradition at a series of relatively small, nucleated workshop sites discovered in the southern foothills of the Pisidian Taurus in Asia Minor but thought until 2007 to be produced in Cyprus. These workshops were part of a very extensive network of production sites in a region dominated by cities in Late Antiquity whose duration of the production, trade and consumption helps us to see the continuity of late Roman traditions into a period during which new forms of pottery emerge in the Eastern Mediterranean trade.

The second case study concerns ceramics produced a rural settlement in Isauria, Kilise Tepe, located in a wide agricultural basin about 45 kilometres north west of Silifke (Seleukeia) in the Göksu pass. The wares made at Kilise Tepe include closed vessels decorated with painted motifs that are apparently unique in the Göksu Valley. Their decoration is characteristic of vessels found across the Eastern

Mediterranean and their morphological characteristics recall other closed forms including globular amphorae found at the site and beyond. Production and use at Kilise Tepe ceases suddenly when the site is abandoned but the painted vessel tradition and amphora types found in the assemblage at Kilise Tepe continue to be made and used elsewhere into subsequent centuries.

Both case studies remind us of the importance of writing material narratives at a local level. The unique characteristics of these assemblages caution against a uniform narrative, but they also help us to see ways in which these vessels form part of shared ideas across time and space.

In the Roman period, Pisidia, Pamphylia and neighbouring Lycia were among the most urbanised regions of Asia Minor (Willett 2020). Detailed understanding of the structural archaeology of the later phases within the cities is often lacking from the period after the seventh century. While there is evidence for continued occupation in places, evidence also points to the construction of walls and fortifications that suggest shifts in the type of urban investment (Heltenkemper, Hild 2004). Selected sites serve as examples. In the Pisidian Taurus, at Sagalassos some of the few stratified contexts dating between the late Roman and middle Byzantine material provide insight into dramatic shifts in ceramics alongside changes in the urban character (Vionis, Poblome, Waelkens 2009a, 193-7; 2009b). In Lycia, a fortified kastro at Arif contrasts with the earlier city at nearby Arycanda and indicates a new kind of settlement in the seventh century (Harrison 2001). While at Limyra on the Lycian coast, Joanita Vroom has presented ceramics, textual and other archaeological evidence for continued occupation in the city beyond the seventh century (Vroom 2007).

2 Late Roman D Ware from Pisidia

2.1 Background to Case Study 1. The Discovery of Late Roman D Ware Production in Asia Minor

Late Roman D ware has long been discovered at consumer sites across the Eastern Mediterranean and beyond since it was first described by Waagé (1948) following excavations at Antioch. Between 2007 and 2011, the first evidence for its production was found at seven ceramic sites surveyed around the modern town of Gebiz in southern Turkey in the foothills of ancient Pisidia close to the Pamphylian Plain (Jackson et al. 2012, 92-3, figs. 1-2). The intensive survey of seven relatively small sites took place in the Küçük Aksu valley as part of the Pisidia Survey Project but it seems likely that the clay beds would have extended beyond the area studied and there-

fore their exploitation for ceramic production may have continued beyond the locality sampled.

Evidence for the production of all forms of this ware, was found within a small part of a tributary of the Aksu river which runs through the southern Taurus across the Pamphylian Plain to the Mediterranean near the ancient city of Perge. From there, these vessels would have followed trade networks connecting coastal cities and beyond, linking Asia Minor, Cyprus, Egypt and Eastern Mediterranean regions especially (Meyza 2007, maps 1-16).

The discovery of workshops making Late Roman D Ware (LRDW) in southern Turkey (Jackson et al. 2012) was particularly significant because for decades it had been thought to have been produced in Cyprus where no kiln sites have been found to date. In 1972, in *Late Roman Pottery*, John Hayes had proposed that this group of table ware be named 'Cypriot Red Slip' and that it was most probably produced in Cyprus because at that time the concentration of finds of the ware seemed to be commonest on the island (Hayes 1972, 371). Hayes later acknowledged a Pamphylian origin might be possible as suggested by Nalan Firat from evidence at Perge (Firat 2000, 37; Hayes 2001, 277).

2.2 The Significance of Late Roman D Ware

LRDW production sites in Asia Minor demonstrated new evidence for connections between Asia Minor and the Eastern Mediterranean, since ceramics follow trade routes with other goods which may not survive well in the archaeological record. The durability of ceramics enables them to serve to some extent as proxy evidence for trade routes (Greene 2005).

A further issue relates to Pamela Armstrong's argument that LRDW production finished a century after the terminal date proposed by Hayes up to the end of the seventh century (Armstrong 2006; 2009; Hayes 1972, 382; Catling 1972; Catling, Dikigoropoulos 1970). Based on excavated archaeological deposits from Cyprus at the Kormakiti Panagia, the Kornos Cave, Dhiorios cooking pot factory and the Salamis Bench Deposit, Armstrong showed that LRDW Form 9 Types B and C can be identified in deposits which may be interpreted to belong to AD 750 and perhaps as late as AD 800.

When we consider Armstrong's interpretation for a later chronology alongside the discovery of the new production sites in Asia Minor, we can see the significance not only for understanding the pattern of settlement in the countryside (Armstrong 2006; 2009), but also the implications for wider trading patterns and excavated contexts across the Eastern Mediterranean (Armstrong 2009, 171).

While LRDW was indeed conspicuous by its absence in an assemblage of Umayyad-period material from Beirut published by Paul

Reynolds (Reynolds 2003a, 544; 2003b), Uscatescu notes that Late Roman D Ware “was imported regularly beyond the Islamic conquest (end of the seventh century), especially to coastal sites and Galilee. LRD is present but less important at the Transjordan region” (Uscatescu 2003, 551). This is significant since the amphora types in the Umayyad deposit seem to suggest connections with Byzantine types and the Aegean.

Pushing the terminal date of LRDW lengthens the production and consumption of these ‘Roman’ table wares and shows that they overlapped with newer forms of ceramics. Material culture here connects people across time and large areas of space including what became international boundaries. This new chronology makes less pronounced a perceived rupture in society in the mid-seventh century in those areas where this material is identified.

2.3 Quantitative Analysis of Material from the Production Sites

Three seasons of intensive survey by the author and a team from Newcastle University as part of the Pisidia Survey Project in 2009, 2010 and 2011 demonstrated conclusively the presence of production of all forms of this ware published to date (Jackson et al. 2012). The piles of wasters from the sites around Gebiz reveal the enormous quantities produced [fig. 1]. Methods used included: the identification of kilns through the geomagnetic surveys; the identification of the fired walls of kilns on the surface of sites with other evidence for production; distorted (overfired) ‘wasters’ of all the main forms of Late Roman D published by Hayes and moulds for making flasks, as well as tools for stamping pottery of the kind used for decorating LRDW. The production sites are relatively small, dispersed workshops. Their concentration suggests numerous relatively independent workshops conforming to a shared repertoire.

It was recently suggested that the large quantities of misfired sherds and the comparatively thick walls of the sherds found at the LRDW production sites provide evidence of a lack of skills in pottery firing among workers and technical problems with firing (Decker 2016, 49). But wasters are a typical phenomenon of ceramic production in all periods. A better interpretation of the substantial quantities of ceramics recovered from the production sites in Pisidia would be that they are a reflection of the substantial scale of this extra-urban industry in late Antiquity. Its mottled colours, stamped decoration and rouletting suggest skeuomorphic links to metalwork production.

The quantitative analysis of the forms produced and recovered through systematic collection on the surface at each site helps to inform us of the duration production took place at individual work-



Figure 1 Section from LRDW Production site at POI216, Akçapınar Köyü, Camii Yıkığı, near Gebiz (photo: M. Jackson)

shop sites. Significant numbers of Form 9B sherds recovered demonstrate relatively late production at sites surveyed. They constituted just under a third of the assemblage recovered from the site at POI261 Kadırgürü Mevkiisi – 1,021 rim sherds of a total of 3,498, 40,615 g of a total 134,616 g, 28.84% of the total Estimated Vessel Equivalent (EVE) [table 1]. At site POI199 Kömbeci Mevkii, Form 9B was the second-most common found (after Form 2), 111 out of 759 sherds, 16.77% total EVE, 15.51% total weight and 14.62% total number of sherds; at POI216 Akçapınar Köyü, Camii Yıkığı, Form 9B was the third-most common rim form (after forms 2 and 7), of 838 sherds analysed, Form 9B was represented by 12.38% total EVE, 6.95% total weight and 11.58% total number rim sherds.

Table 1 LRDW Production site POI261 Kadırgürü Mevkiisi, artefact quantification and dating (M. Jackson; dating after Hayes 1972, 1980; Meyza 2007; Armstrong 2009)

Form number	EVE	No. of rim sherds	Rim weight (g)	% total EVE	% total rim weight	% total no. of rim sherds
Hayes Form 98 (Jackson et al. 2012, fig. 16)	6,614	1,021	40,615	28.84	30.19	29.19
Meyza Form 6 (Jackson et al. 2012, fig. 18.1-3)	3,184	474	5,415	13.88	4.03	13.55
Hayes Form 8 (Jackson et al. 2012, figs 13-14)	3,216	440	14,567	14.02	10.83	12.58
Hayes Form 2 (Jackson et al. 2012, figs 10-11)	2,497	385	6,991	10.89	5.20	11.01
Hayes Form 10 (Jackson et al. 2012, fig. 17.4)	1,683	291	20,743	7.34	15.42	8.32
Meyza Form K5.2 (Jackson et al. 2012, fig. 15)	1,764	276	12,860	7.69	9.56	7.89
Hayes Form 7 (Jackson et al. 2012, fig. J 2)	1,253	193	17,663	5.46	13.13	5.52
Quantified rim forms with less than 5% representation	2,722	418	15,662	11.88	11.64	11.94
Totals	22,933	3,498	134,516	100	100	100

Form	l.4 th	e.5 th	m.5 th	l.5 th	e.6 th	m.6 th	l.6 th	e.7 th	m.7 th	l.7 th	+8 th
Hayes Form 98											
Meyza Form 6											
Hayes Form 8											
Hayes Form 2											
Hayes Form 10											
MeyzaForm KS.2											

One of the difficulties we faced when trying to date products collected from the surface of these sites was that without excavation we needed to rely on existing chronologies. Some of the results from the survey, however, revealed problems with existing dates and serve as a useful caveat to remind us that existing chronologies are not to be accepted without question. Perhaps a most clear example is a waster made from two sherds of different forms fused together in a single kiln firing – a Form 1 and a Form 8 (Jackson et al. 2012, 109). These two types were previously thought to belong to very different periods: Form 1 is traditionally considered to be from the late fourth to late fifth century, whereas Form 8 is considered to be mainly late sixth or early seventh (Hayes 1980, lxii). If they had been found in excavated contexts at consumer sites, they would likely have been used to help date the assemblages in which they were found. The fact that their fusing together in a kiln demonstrates that they were clearly made at exactly the same time raises questions about the existing chronologies. Given that Forms 1 and 8 come from apparently well understood and accepted periods, we might rightly question ceramic chronologies for the much less well understood period after the seventh century!

2.4 LRDW Form 9 and ‘Well Form’ in the Eastern Mediterranean

Armstrong’s reinterpretation of the date of Form 9 from the traditional end point in the mid-seventh century (Armstrong 2009) to as late as the early ninth century (AD 800), if we can accept it, has enormous implications for the historical narrative. The argument is significant because it reduces considerably the gap in the number of settlements identified between AD 650-800. The resulting graphs based on material recovered on the Balboura Survey show settlement into the eighth century, while on other surveys where such material has not been identified, there appears to be little or no evidence for that period (Roberts et al. 2018, 310, fig. 2). This apparent gap emphasises an important point about the extent to which ceramics represent an appropriate proxy for settlement. It leads us to question assumptions based on changes in material culture, an over/under representation by presence or absence of visible or identifiable ceramics and whether there may be misunderstanding of ceramic chronologies for the period between the seventh and ninth centuries (Pettegrew 2007; Sanders 2000; Jackson 2020).

The location of the kiln sites in southern Anatolia was made, completely independently, at almost the same time as Armstrong published her argument about the chronology of Form 9. Together these discoveries make a compelling case for us to re-evaluate our models and understanding.

While the discovery of sites in Pisidia does not prove that sherds in LRD Ware forms were not also produced in Cyprus or elsewhere, it does demonstrate for the first time that they *were* produced in Asia Minor and as we have seen the implications of this discovery are multiple.

Production of table wares is usually linked closely to the wider economy. The distribution of LRDW reveals trade links from the Pisidian Taurus to Cyprus and the Eastern Mediterranean during the Early Byzantine period, and importantly, afterwards (Meyza 2007, maps 13-16). It can be of no surprise that the location of the kiln sites, close to rivers, provided not only sources of water for pottery making but also a route and means of transportation to the coast. Firat has reported various forms at Perge including ‘Anemurium Well Form’ dated after AD 630 by Caroline Williams at Anemurium (Williams 1977) and found also at Limyra (Vroom 2007, 272-3). It is highly likely that the pottery was following similar routes as other products and industries, and so Well Form and Form 9 provide important proxy evidence to change our understanding of the wider economy and networks of trade in other goods.

Indeed, the pattern of Form 9 at sites right around the Eastern Mediterranean is of considerable significance because from the mid-

seventh century many of the Eastern provinces became part of the new Islamic caliphates. Uscatescu had already reported LRDW in early Islamic contexts (Uscatescu 2003, 551) and while they were not found at Beirut (Reynolds 2003a, 544), the assemblages Armstrong used for the redating of Form 9 apparently post-date the invasion of Cyprus following the expansion of the Islamic world. In this context, the production of Late Roman D ware in Pisidia and its discovery on Cyprus and around the Eastern Mediterranean in areas that have become part of the Islamic Empire helps to transform our ideas about trade and exchange in the period after the seventh century by highlighting the communication not only of trade, but of ongoing cultural ideas relating to dining and decoration of vessels between these regions.

3 Painted Ware and Globular Amphorae from Isauria

3.1 Background to Case Study 2. Excavations in Isauria

In the second case study I would like to focus on other important traditions which emerge as significant in the period from the seventh century. These include painted wares and globular amphorae which are two of the families of vessels that become more popular in subsequent centuries across the Mediterranean (Vionis 2020; Vroom 2017).

In Turkey, Kilise Tepe represents one of very few intentional excavations of a Byzantine rural settlement (Izdebski 2017). Excavations at Kilise Tepe revealed very well-preserved evidence for domestic contexts that offers fresh insights into many aspects of rural life and economy at this important period of wider transition of society. These contexts provide a detailed record of the ceramic traditions at the site including locally produced wares. Kilise Tepe, therefore, represents a key case study to complement urban excavations such as Anemurium (Eski Anamur), Elaiussa Sebaste (Ayaş) and those at the ecclesiastical complex at Alahan.

Evidence from Elaiussa Sebaste and Anemurium has suggested that thriving late Roman settlements were largely abandoned by the eighth century AD (Equini-Schneider 2008; Russell 2021, xi). Inland in Isauria, the evidence from the rock-cut church Al Oda with its aniconic decoration may suggest occupation into the period after the seventh century AD (Gough 1957).

As noted above, ceramics are not used consistently through time and overreliance on easily recognisable imported amphorae and fine wares for recognising settlement density is a notoriously problematic issue (Pettegrew 2007; Sanders 2000; Jackson 2020). Locally produced coarse wares however represent the majority of material recovered from most sites, especially inland at rural settlements such

as Kilise Tepe where out of tens of thousands of early Byzantine sherds only a handful were red slipped wares. Ceramics remain one of several essential tools for understanding many aspects of society but to use them primarily as proxies for chronology is to neglect the insight they offer into their roles in the lives of people in the past.

3.2 Excavations at Kilise Tepe

The assemblages from Kilise Tepe, in the Göksu Valley of southern Turkey reveal rare, excavated evidence for domestic contexts in Asia Minor (Jackson 2015). Assemblages from this site afford fresh insight into artefacts produced by the inhabitants for use there. The aim of this case study is to consider how people made and used material culture as part of the rhythms of their daily lives. I hope these analyses will take us beyond arguments about settlement duration to offer insight into ways in which artefacts played roles in lives of people during a period of societal change.

The ceramics abandoned on the floors of houses from the final early Byzantine phase at Kilise Tepe enable us to develop an appreciation of the purpose of local production within the village economy on which many of the larger settlements relied. We can see the nature of trade from the coast directed inland as well as pottery made and used within the settlement itself. Among the most striking aspects of the assemblage of finds at Kilise Tepe are the decorated, locally made water jars found together with globular amphorae at a key moment of transition during the seventh century (Jackson, Postgate 2007, front cover; Jackson 2015). These locally made products belong to families of wares which seem to take on significance across the empire and beyond. The connections that emerge from the contextual relationships of artefacts at Kilise Tepe facilitate an approach which considers their morphology and use.

The mound at Kilise Tepe measures 150 metres by 100 metres with 13 metres of accumulated deposits dating from the early Bronze Age to the twelfth century AD. Kilise Tepe is located in a fertile, well-watered natural basin in the Taurus mountains of southern Anatolia; it sits on a conglomerate terrace some 30 metres above the flood plain of the River Göksu and commands a striking view over the landscape in all directions. The site lies at a spring, close to a bridge over the river and a junction of roads running towards the Mediterranean coast at Silifke (ancient Seleuceia), Aydıncık and Anemurium and inland towards the central Anatolian plateau. Nine seasons of excavation (1994-98, 2007-11) have been conducted at Kilise Tepe to investigate all phases of the site (Postgate, Thomas 2007; Bouthillier et al. 2014; Jackson 2015).

In the early Byzantine period, from the late fifth to the seventh century AD, the well-preserved remains of stone and mud-brick hous-

es provide evidence for a settlement located around a basilica church. Excavation of these houses has revealed that in their final phase they were abandoned. The objects lying on the floors of these buildings provide a remarkably rare, excavated example of domestic material culture at a key moment in the history of southern Asia Minor. Painted wares produced at Kilise Tepe and globular amphorae including those not produced at the site recall those found across the early medieval Mediterranean. The pottery has many affinities with new traditions of ceramics found in the eighth century, but the latest radiocarbon samples suggest that the abandonment probably took place during the seventh century AD.

Study of the assemblage as a whole helps to provide insight into practices at Kilise Tepe and serves as a useful case study in its own right. Changes in pottery production go hand-in-hand with other changes in the wider economy and society in the seventh century. In this case study I would like to consider how ergonomics might be one of a complex set of interconnected drivers that played a role in the adoption of globular forms and the economy. While we cannot transpose the situation at Kilise Tepe onto other regions, the evidence from the site provides a rare level of detail which may offer useful analogy for society elsewhere.

The remarkable assemblage at Kilise Tepe was excavated on floors in a series of domestic spaces (Jackson 2015). The room fill in area O15a, serves as an example of contexts featuring both globular amphorae and water jars typical of this phase across the site [fig. 2]. The assemblage in O15a included locally-made vessels: a jug with a flat base (O15/022) and two water jars with concave bases and side handles (O15/021 and O15/132). These were found with two large, decorated storage vessels or *pithoi* (O15/106 and O15/108), and a decorated globular amphora with a concave base (O15/150). The local jars were made from clay extracted in the immediate vicinity of Kilise Tepe (Jackson 2015, 372; Jackson 2008). Non-local or imported vessels included another globular vessel with a rounded base (O15/107), and a Late Roman Amphora 1 (O15/118) [fig. 3].

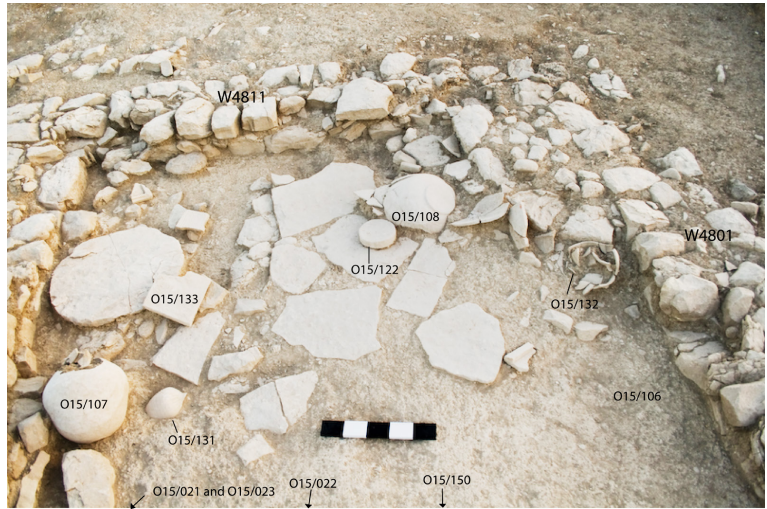


Figure 2
Objects on the floor in area
O15a, Kilise Tepe
(excavation: K. Green; photo:
B. Miller)

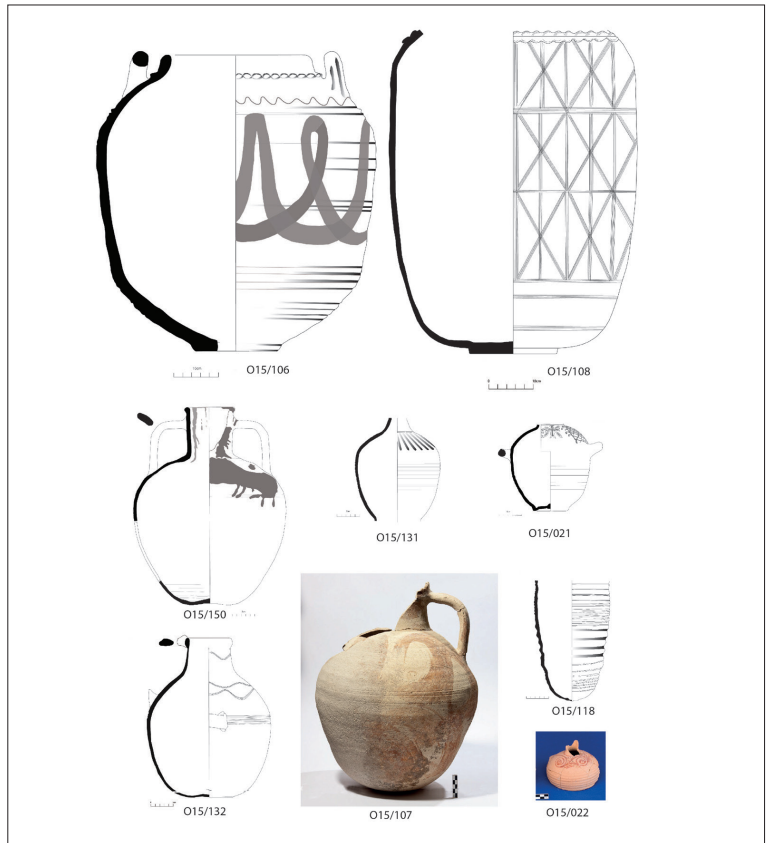


Figure 3
Assemblage of pottery from
the floor of room in O15a,
Kilise Tepe (drawings: M.
Jackson; photos: B. Miller)

3.3 Water Jars at Kilise Tepe

The water jars such as O15/021 [fig. 4]; O15/132; and others found elsewhere at Kilise Tepe, for example, N11/076 decorated with painted fish, have three handles: a large vertical strap handle attached on one side from the rim to the shoulder and two looped handles placed opposite each other on the shoulders to the left and right of the vertical handle. The central and lower body of the vessels is often ribbed, while the shoulder is smooth but usually painted with ornate motifs in dark red-brown or purple paint: fish, crosses, birds, foliage, grapes, stars and other symbols. The porous fabric would have facilitated latent heat of evaporation to keep contents cool.

The vertical handles of these jars each have a convenient knob close to the rim that facilitated pouring, but for these large jars to be poured when full, another hand would have been required to support the lower belly. These vessels were designed in part as jugs.

The rounded horizontal handles, located on the shoulders of the vessels, would have been no use for pouring. They work with the concave bases of these vessels [fig. 3]. The base is shaped not just for resting on a surface but also for comfort so that the jar may be balanced on the head; the horizontal side-handles facilitate both a vertical lift and are located at just the right position for steadying with a raised hand when balanced on the head as with water jars found throughout the world since early antiquity. Experimentation of several vessel bases from Kilise Tepe confirmed that they fit well to the shape of one's head.

Vessels with a wide girth, low centre of gravity and gently rounded, saggy, or concave base are not easy to hold and when full, if carried in front of the body, or balanced on the hip or shoulder, these globular shapes would put considerable strain on any person's back. But as with objects found all over the world made in a variety of materials from baskets to metals, they are ideally suited for balancing upon the head. A slightly rounded base can be used with a circular cushion placed on the head beneath a vessel. A modern example is the Daranu, a doughnut-shaped circular object, one of three types made from rope and aricanut leaves in Sri Lanka (personal communication with Dulma Karunarathna, University of Peradeniya).

At Kilise Tepe, these decorated water jars were not simply artefacts for use in the house. As part of the daily routine, such jars would have spent much of their time travelling backwards and forwards to collect water from the spring on the north side of the mound. Regular journeys rarely more than a 200 metres, linked to performance of tasks, would have served to join these decorated objects to the people who carried them, to structure time and to afford human interactions with all the threats as well as opportunities venturing into public would bring. Supporting a heavy load on the head would



Figure 5 Kilise Tepe, Decorated water jar O15/021 (photo: B. Miller)

have been conspicuous and would also have changed the shape of the body: impacted posture and gait in the short term and the physique through long-term trauma.

In Africa, Bonifay questioned whether his Amphora Type 7 with its small size, umbilical base and loop handles on the sides was in fact a water jar (Bonifay 2004, 91-2, fig. 48, jug no. 66; Riley 1981, 108, fig. 8, 111); he suggested a link between the globular amphora and existing Punic-Roman water jug traditions (Bonifay 2007, 143). While we cannot be certain that globular forms were all carried on heads, they would afford such a practice; we can verify this since contemporary communities all over the world continue to collect their water and carry other loads in this way today.

Regular transportation of water in jars at Kilise Tepe reveals embodied knowledge for carrying heavy loads in ceramic vessels. Through discovery of the globular amphora in the seventh-century assemblages at Kilise Tepe, we gain insight into the way large loads could be carried. For those already familiar with the practice, the globular amphora shape may have afforded certain advantages over the existing late Roman amphora forms such as the Late Roman Amphora 1. The form of amphorae is often studied typologically but the

ergonomic role of amphorae is central to their role as objects for transporting goods.

Two examples of globular amphorae from the same room serve as examples: O15/107 and O15/150. The best-preserved globular amphora from Kilise Tepe O15/107 [fig. 3] appears to have been imported to the settlement because the fabric is not local; O15/150 by contrast is made from local clay. Both O15/107 and O15/150 have relatively vertical necks and a wide rounded shape, with two vertical handles attached to the neck and shoulder. The base of O15/107 is only very slightly concave, O15/150 more so, as is typical for the form across the Mediterranean. A further vessel O15/132 seems to have the water-jar form with a single vertical handle as well as two horizontal handles and a concave base but its decoration is more similar to the amphorae than the water jars at Kilise Tepe.

3.4 Carrying Loads. The Globular Amphora

In the Roman period, examples of globular-shaped amphorae existed (Opait 2014), but in general most Roman amphorae were more elongated. This is well illustrated by the composite diagrams which map variously Roman and Late Antique amphorae (Bevan 2014, 394, fig. 4; Reynolds 2005, 586, map 2; Bonifay 2004, 88). When full, vessels with pointed lower bodies, slender toes or projecting bosses could be moved with one hand on a handle and the other grasping the toe or lower body; these shapes could be held against the stomach and chest (McCormick 2012, 63), or perhaps over the shoulder (see e.g. terracotta AD 300, Trustees of the British Museum Registration no. 1903,1117.1).

The increasing dominance of the globular amphorae is one of the most intriguing developments in material culture that occurred across the Mediterranean during the period from the sixth to eighth centuries AD in Byzantine and Islamic societies and beyond (Arthur 1993, 237; Saguì, Ricci, Romei 1997, 36, figs. 2, 4-5; Bonifay 2004, 88). By AD 700 many of the late Roman ceramic types are thought to have come to an end, signalling dramatic changes in the interregional exchange network (Wickham 2005, 717; Vroom 2017, 183, fig. 13.4). Though examples had existed in earlier times, from the Near East to the western Mediterranean, globular forms came to supplant many of the more elongated amphora types that for centuries had been typical in the classical world (Riley 1981, 117; Reynolds 2005; Bonifay 2007, 149; Williams 2014). Indeed, the globular amphora is well known in Italy, North Africa, the Aegean, and the Eastern Mediterranean (Muri- aldo 1993-94, 232, figs. 6.2-4; Bonifay 2004, 88, fig. 46, 151-3; Poulou-Papadimitriou 2017; Wickham 2005, 787). Scholars have questioned why these new amphora shapes appeared in the ceramic repertoire

and came to replace amphora traditions that had existed in the classical world for centuries (Bevan 2014, 397). They indicate something of the interconnectivity of these regions and the success of this new family of amphora types. Many different and interrelating factors will have combined to influence the rise of the globular amphora family.

There is significance in the fact that the globular form is *not morphologically the same* as other forms. The globular amphora is characterised not only by its shape but also by its somewhat standardised (smaller) size “evening out around 30 litres” (Arthur 2007, 174). The interpretation of these ‘diminutive’ vessels is often linked to narratives of degeneration at the end of the Roman period:

Smaller amphorae, may reflect a decline in carrying capacities because of a decline in the quantities of surplus products to be shipped, but they may also have been adopted following technological difficulties in manufacturing large vessels on the wheel, or in firing them. (Arthur 2007, 175)

There is a danger of explaining the diminishing size in the pre-existing narrative of economic decline of the period for which the vessels are then used as supporting evidence. Sagui by contrast notes that the *Castrum Perti* globular type is very big relative to the very small *spatheion* whose size might reflect valuable contents (Sagui, Ricci, Romei 1997, 36).

The globular shape is ergonomically more similar to the globular LRA 5 or LRA 6 with their low centres of gravity. For centuries from the Roman period on into the Islamic period the bag-shaped amphora with loop handles on a narrow shoulder near the rim and a wide lower body with a rounded base continued changing remarkably little, well adapted to the roles it served (Uscatescu 2003, 547-9; Bonifay 2007, 145).

3.5 Transforming Bodies

Ergonomically practical in many ways, head loading is a logical response to the problem of needing to carry heavy loads. In the absence of wheeled vehicles head loading can be remarkably efficient. Studies of people in East Africa note that while a person can carry up to 20% of their own body weight relatively easily, women of the Luo tribe sometimes carry the equivalent of 70% of their body mass on their heads (Maloiy et al. 1986). In South Africa, containers used for head loading ranged from 16 to 78% of the carrier’s body weight, with the mean average container weighing 41% (Geere, Hunter, Jagals 2010, 7). These figures seem to align reasonably well with the variety of globular-amphora forms and Arthur’s estimation of the average contents of the globular amphora being about 30 litres (Arthur

2007, 174). If a person weighed perhaps 60-70 kilograms then a reduction in size from Roman-period amphorae to c. 30 litres of liquid would represent a considerable load to carry analogous to the burdens of many today. As social and economic contexts change, we may see the increasing adoption of this form as part of that wider societal change which involved elements of innovation.

3.6 A Shift to New Kinds of Economy Based on Different Actors

While there is a general view that the breakdown of international trade led to localised production and exchange (Haldon 2016, 289), it is clear that globular amphorae are traded across the Mediterranean and Aegean (Vionis 2020). Their places of production and their distribution are evidence that they were carried by ships. The implications of the adoption of a version of existing forms of amphora across the breadth of the Mediterranean reflect not only shifts away from the dominant forms of long-established and varied Classical ceramic traditions. They also signal a shift to new kinds of economy based on different actors at all levels, new methods of transportation and dramatically new ways of working.

4 Conclusions

In these two case studies we have snapshots from the seventh century of the overlap between long held late Roman and newer early medieval ceramic traditions and the variation, continuities and changes in society. The discovery of kiln sites producing all the forms of Late Roman D Ware reveals proxy evidence for the role of Pisidia in trade networks across the Eastern Mediterranean. The colour, surface treatment, stamped decoration and form of these dishes testify to continuity in long-held dining practices and shared ideas about material culture. But inland, at Kilise Tepe in Isauria, only a handful of red slip ware sherds were excavated from the same period as the LRDW was produced in Pisidia. This reminds us of the importance of considering whole local assemblages in rural contexts and both the potential and the dangers of focusing on key types.

At a time when red-slip wares and their metal counterparts may have dwindled somewhat, but show more continuity in late Roman traditions than was once recognised, the important globular form, increasingly adopted across the Mediterranean, reflects innovation. The form, function, and decoration of decorated water jars from Kilise Tepe help us to understand the significance of ornately decorated objects in rural contexts rarely studied. These jars offer in-

sight into the rhythms of daily life including the structuring of time through gendered tasks and considerable labour. It seems likely that the embodied knowledge for carrying the water jars would have extended to head loading of other vessels at Kilise Tepe including globular amphorae. It is tempting to see new ways of carrying loads as embodied knowledge which emerges alongside ideas and economies in a period of societal change.

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