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Ceramics, clays and classification in Cyrenaica

By Keith Swift*

Abstract
This paper provides an interpretative framework and classification for the macro- and microscopic identification and provenancing of ancient Greek and Roman ceramic fabrics from Cyrenaica and the wider North African littoral based on ceramic petrology and the kinds of clay sources available for ancient pottery production.

إطار تفسيري، وتصنيف للتعرف الكلي والمجهري ومنشاء التركيب الخزفي الإغريقي والروماني القديم من سيرينايكا (إقليم برقة) والنطاق الأوسع لساحل شمال أفريقيا، مستنداً على علم الصخور للسيراميك وأنواع مصادر الصلصال المتوفرة لإنتاج الفخار القديم.

Petrological approaches provide a geological and geomorphological framework for the identification, characterisation and classification of fabrics based on the kinds of locally available clay sources selected, exploited and manipulated for ceramic production. Because of broad similarities in geology, study of fabrics from Cyrenaica is more widely applicable to the North African littoral extending from west of the Nile Delta east to the Straits of Gibraltar.

The primary archaeological aim of ceramic petrology is to identify meaningful macro- and microscopically observable features which can be identified and quantified in assemblages from excavations and surveys of archaeological landscapes. Applying these methods, study of the substantial excavated assemblages from ancient Greek Euesperides provided new evidence for nature, scale and scope of economic and cultural interactions between western Cyrenaica and other regions of the Mediterranean world based on the ceramic evidence (Swift 2005). In this way, pottery types not amenable to stylistic provenancing, including coarse pottery in particular, can contribute direct evidence of social, economic and cultural interactions as seen through the lens of material culture.

The catalyst for wider study of Cyrenaican and North African fabrics was the excavation at Euesperides, carried out by the Society for Libyan Studies (Wilson et al. 2001; 2002; 2003; 2004; 2005), and studies of its Archaic to early Hellenistic ceramic assemblages. Comparatives from the excavations of Roman-period Berenice in the museum storerooms in Benghazi were also an essential point of reference, allowing for diachronic study using well-published material and important typologies of Roman pottery in Cyrenaica and the wider Mediterranean world (Riley 1979; Kenrick 1985). Descriptions and discussions of coarse pottery fabrics by John Riley were especially invaluable at the outset of the Euesperides study. Riley's observations proved to be both macroscopically and microscopically applicable to those from Euesperides and continued to be borne out in petrographic analyses of the coarse pottery from Euesperides carried out at the Research Laboratory for Archaeology and the History of Art in Oxford (Swift 2005).

Petrological approaches developed in the course of that study provided compositional comparanda for geographically wider observations on North African ceramic fabrics. Extensive first-hand observations of ceramic fabrics were made from surface scatters from sites across Cyrenaica including Tocra, Ptolemaïs, Maaten el-Agla, Apollonia, Cyrene and Balagrae. Wider observations of North African fabrics were also made in Tripolitania at Lepcis Magna and Sabratha, the latter providing direct connections to the characterisations of local pottery fabrics by John Dore (Dore and Keay 1989). Later, in-field observations and petrological characterisations of ceramic fabrics were undertaken for sites in and around Alexandria and the western Nile Delta, under the aegis of the Alexandria and Thonis/Herakleion Project of the Institut Européen d'Archéologie Sous-Marine and the Oxford Centre for Maritime Archaeology.

Classification of North African fabrics by clay source

The kinds of clays and other sediments locally available in Cyrenaica provide a framework for broad but fundamental classification of North African fabrics in general. This was initially based on clay sources in their environs of ancient Greek Euesperides, for production of late Archaic to early Hellenistic pottery (c. 530–250 BC; Swift 2005), and its successor Berenice for production of late Republican and Roman pottery (with contexts from the late second century BC onwards; Lloyd 1977; Riley 1979). Characterisation of the petrological groups is based on consistent features seen across a corpus of thousands of pieces from the Society for Libyan Studies'

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excavation at Euesperides (Swift 2005; Swift in Wilson et al. 2003; 2004; 2005), combined with first-hand observations at other sites in Cyrenaica and Tripolitania.

Most Cyrenaican fabrics fit squarely within the classificatory scheme presented here (Table 1), but there are always outliers and atypical pieces to be found, probably the result of very localised variations in sediments, experimentation with textures and non-plastic inclusions by ancient potters, or the occasional import produced in superficially similar fabrics.

North African *terra rossa* fabrics

Like much of the North African littoral, Cyrenaica is covered extensively by *terra rossa* soils. Pedogenic, these thin soils are formed *in situ* above the limestone bedrock. Well drained, the lower levels accumulate iron oxides from the organic surface layers, resulting in the characteristic reddish colour which gives them their name.

North African *terra rossa* soils are rich in quartz grains, aeolian material transported by desert winds (*ghibli*) from the arid regions to the south. The quartz is often well rounded and highly spherical as a result of having been saltated along on the desert surface. Petrographically, the microstructure of these fabrics contains abundant grains of quartz fine enough to be considered as part of the matrix, giving these fabrics their hardness and finely granular texture (Figure 1). They frequently contain calcareous precipitates and limestone fragments from the chemical weathering of the limestone. These often degrade during firing leaving rounded voids, often with whitish carbonate halos (Figure 2).

First-hand testing demonstrated that the clay component in Cyrenaican *terra rossa* soils separates easily from the larger silt-size fractions when elutriated. In soil samples, the clay component usually makes up around one quarter to one third of the volume. The granulometry of the levigated clays compares well to that of *terra rossa* fabrics, containing abundant fine quartz grains as well as fine carbonate precipitates in dried clay samples extracted from the soils. This dry clay powder would have been well suited as a coarsening material added to other kinds of clay (see 'Admixture of clays and sediments' below). Since the clays must be extracted from the *terra rossa* soils, their production would have involved the widespread and intensive use of elutriation, although naturally refined clays may have been sought out very locally, such as in gullies or field run-offs.

These fabrics are ubiquitous in Cyrenaica and were the most common fabrics in the coarse pottery assemblages from Euesperides, accounting for about half of all local wares with examples encompassing the entire range of major shapes in coarse pottery (Swift 2005).

Punic *terra rossa* fabrics

Punic North African coarse ware imports to Euesperides were identified via similarities with the fabrics of Punic transport amphoras and with fabrics ubiquitous in surface scatters at Sabratha and Lepcis Magna. The Punic coarse pottery excavated at Euesperides provides direct evidence for trading networks extending across the Gulf of Syrte and more intense material-cultural interactions between Punic North Africa and Greek Cyrenaica than had hitherto been recognised (Swift 2005). Although produced from similar sediments, Punic fabrics show subtle yet consistent differences in texture, hardness and granulometry which permit identification and differentiation from *terra rossa* fabrics from western Cyrenaica. Further, although Punic coarse pottery shapes of the fourth and third centuries BC followed basic Greek types, they show clear technological differences from the local wares produced at Euesperides. They are consistently much harder, suggesting some variation in pyrotechnologies between Punic North Africa and Greek Cyrenaica. There are also differences in forming techniques, including tooling, trimming and surface wiping, which suggests distinct ceramic production traditions. Interpreted technologically, such apparently minor differences in vessel micromorphologies in fact provide a crucial means of regional differentiation, particularly where fabrics are granulometrically similar.

Cyrenaican and Punic coarse wares suggest the differentiation of regional productions in quartz-limestone fabrics produced from *terra rossa* soils. A perennial problem in the study of archaeological pottery from North Africa, comparisons of Greek and Punic pottery from Euesperides show that apparently homogenous fabrics can be differentiated through a combination of petrological and technological studies. Such an approach also holds promise for the further differentiation of *terra rossa* fabrics within Cyrenaica and across the North African littoral. But the study of coarse pottery from Euesperides also suggests that this is only really feasible for substantial assemblages, since it relies on the recognition of consistent differences across large numbers of typologically similar pieces in the relatively restricted and standardised Greek repertoire of common shapes.

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Table 1 - Clay types, their fabrics, sources and attested locations

Clay/Fabric type	Typical characteristics of fabrics	Clay sources and locations
Terra rossa	Finely granular fabrics firing to red, abundant extremely fine quartz inclusions give a distinctive texture, often with rounded voids from carbonate precipitates in the source sediments and occasionally fragments of weathered limestone	From *terra rossa* sediments formed *in situ* on the limestone bedrock across the North African littoral, rich in iron oxides which give the fabrics their deep reddish colour. Clay fraction easily levigated out of surface soils, clay-rich deposits are found in gullies and run-offs
Marl clay	Extremely fine texture, calcareous, typically firing yellowish to light greenish grey. Inclusions of marine microfossils, varying by geological unit, are abundant in examples from Euesperides and Berenice, and frequent in examples from Cyrene, Balagrae and Apollonia	In lithostratigraphic units in the limestone geology, particularly on the Jebel Akhdar, examples of outcropping below Cyrene and in the area of Balagrae, and on the coast at Maaten el-Agla and Apollonia. Also found at Ptolemaïs. At Euesperides and Berenice, coming from a vein of marl clay appearing on the surface to the east of the urban centres
***Sebkha* (lagoonal)**	Friable, powdery, porous fabrics usually firing to orange, often with white surfaces from high salt content in the clay source. Diagnostic inclusions are shell fragments from quiet-water species, and at Euesperides inclusions of rounded calcareous sand from weathering of calcarenite bedrock	Lagoonal environments on the Cyrenaican coast, including at Euesperides and Berenice, and in the vicinity of Alexandria
Admixed	Continuum of textures and firing colours from mixtures of, primarily, *terra rossa* and marl clays in varying proportions, mixture of inclusions usually indicating the proportions of each clay used in the mixture. Poor mixing can result in clay concentrations of *terra rossa* sediment in marl clays and calcareous clay aggregates in *terra rossa* fabrics	Anthropogenic, often the addition of *terra rossa* sediments to marl clays. Natural mixture may occur at the interfaces of outcrops of marl clays where these meet surface sediments, or in run-off of *terra rossa* soils into lagoonal environments. Examples of admixed marl and *terra rossa* clays identified at Cyrene. Admixture in lagoonal environments identified at Euesperides and Alexandria. Admixed fabrics are associated with Cyrenaican transport amphoras and black-gloss fine wares, seem likely to be anthropogenic but possibly from careful selection of naturally mixed sediments

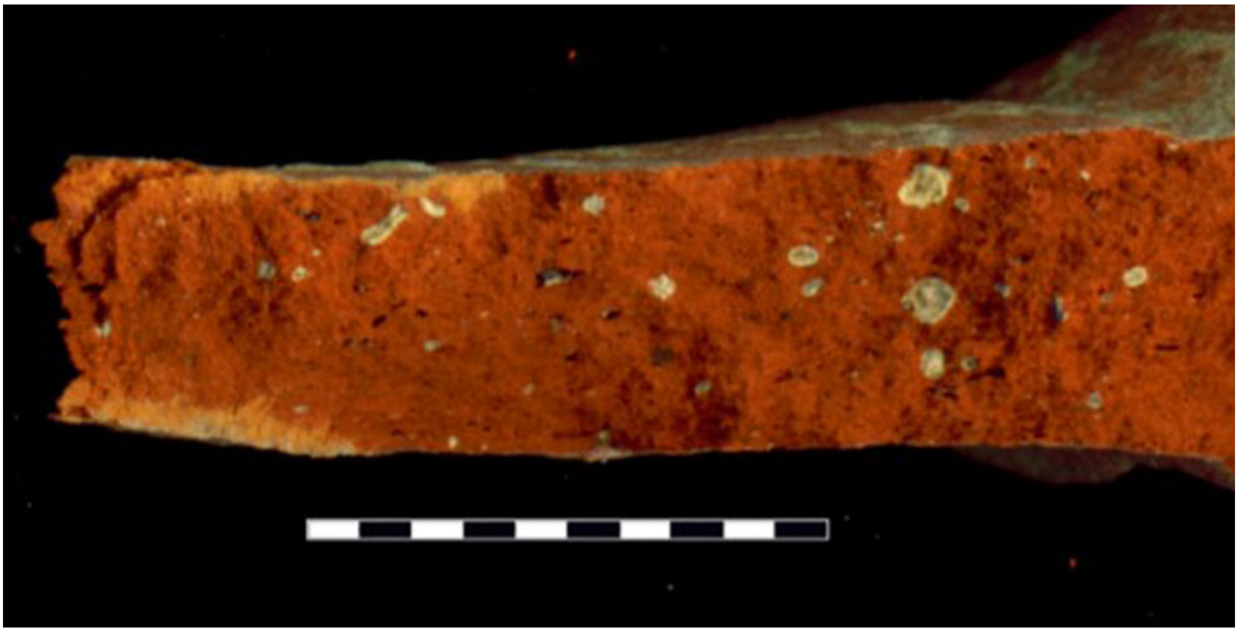

Figure 1. Example of a terra rossa *fabric from Euesperides showing a finely granular consistency and typical carbonate inclusions. Scale 10 mm. (Photo: K. Swift)*

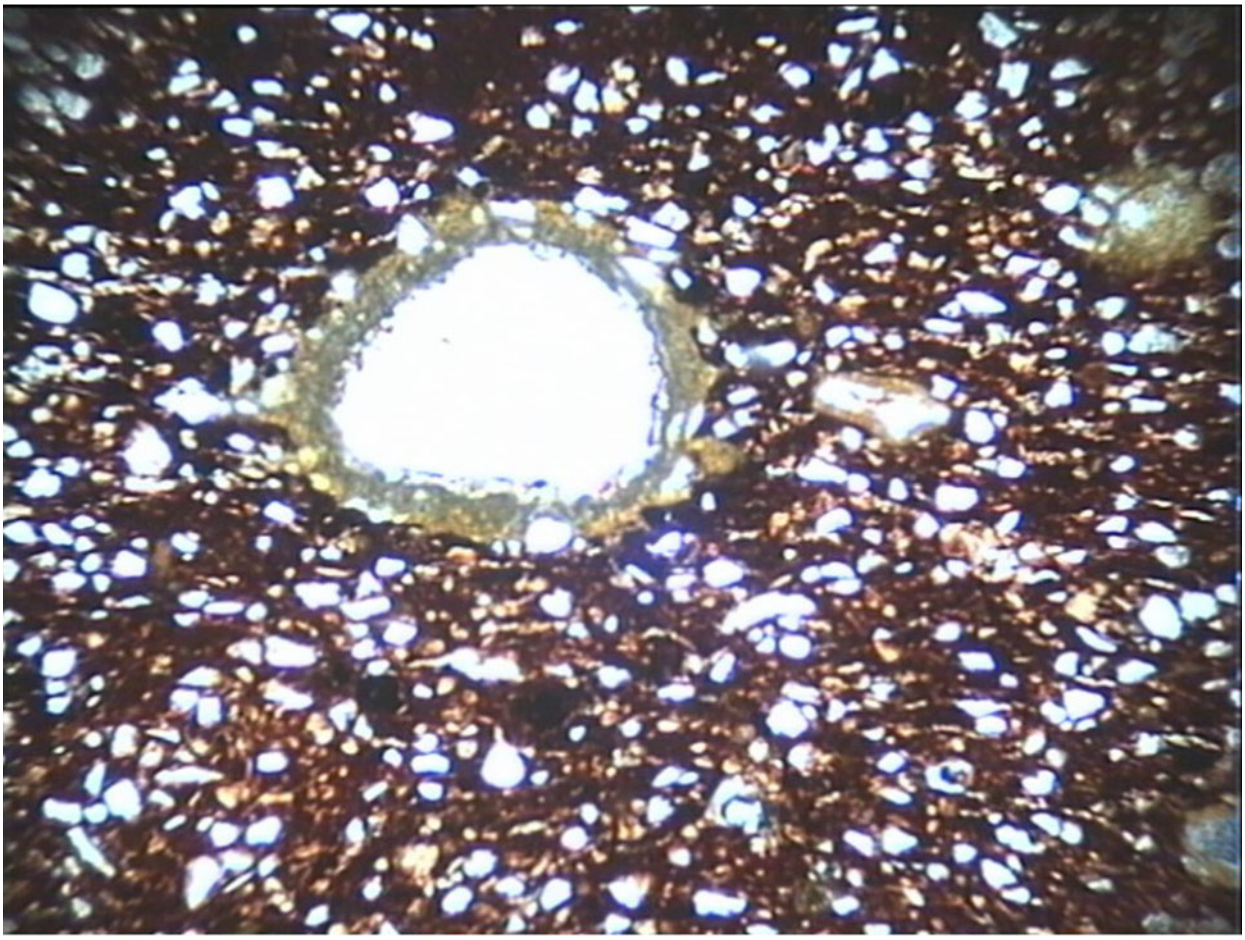

Figure 2. Petrographic thin section, PPL, showing abundant quartz grains and a spherical void with carbonate halo. Width of field approximately 0.5 mm. (Photo: K. Swift)

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Cyrenaican marl clay fabrics

Extremely fine-grained and often powder, these calcareous clays typically fire to a light yellowish colour when oxidised and to greenish or grey colours in reducing kiln atmospheres. In Cyrenaica, seams of marl clays – argillaceous marine sediments laid down at the outflow of geologically ancient deltas – are found within the lithostratigraphic units of limestone which extend from Derna in the east almost as far as Benghazi in the west, and which form the Jebel Akhdar. The clays often contain microfossil inclusions characteristic of their sedimentary origin. In the fabrics local to Euesperides and Berenice these microfossils consist entirely of *Heterostegina* foraminifera (Figures 3 and 4). This is a result of narrow environmental parameters in the formation of the marine clay deposits, a promising and important means of differentiating them from marl clays and lithostratigraphic units elsewhere in Cyrenaica. For example, a wider range of other species of Nummulitidae (Figure 5) along with pecten bivalves are common in fabrics from Cyrene.

Marl clays were long an important source of raw materials for ancient Greek potters. This is most aptly attested, for example, by Corinthian ceramics with their typical yellowish, extremely fine-grained fabrics used for Archaic fine wares and, with the addition of mudstone fragments from the Acrocorinth, for more substantial vessels such as the widely distributed Corinthian amphoras and large-scale corplastic production (Whitbread 1995). Corinthian transport amphoras, *louteria* and mould-made Greek-type mortaria were observed in surface scatters at sites across Cyrenaica including Euesperides, Maaten el-Agla, Cyrene and Apollonia. Early Greek settlers in Cyrenaica, and particularly around Cyrene and the coastal plain below the Jebel Akhdar, would have had ready access to already familiar kinds of clay sources for local ceramic production.

In their raw state, marl clays were not usually used to produce cooking wares in ancient Greek pottery production. Their fine-grained matrices are susceptible to catastrophic propagation of microfractures from thermal stresses during use. Instead, ancient Greek and Roman cooking wares are usually coarse grained with frequent non-plastic material, often thermally conductive. But Cyrenaican marl clay fabrics are an unusual exception. Their abundant

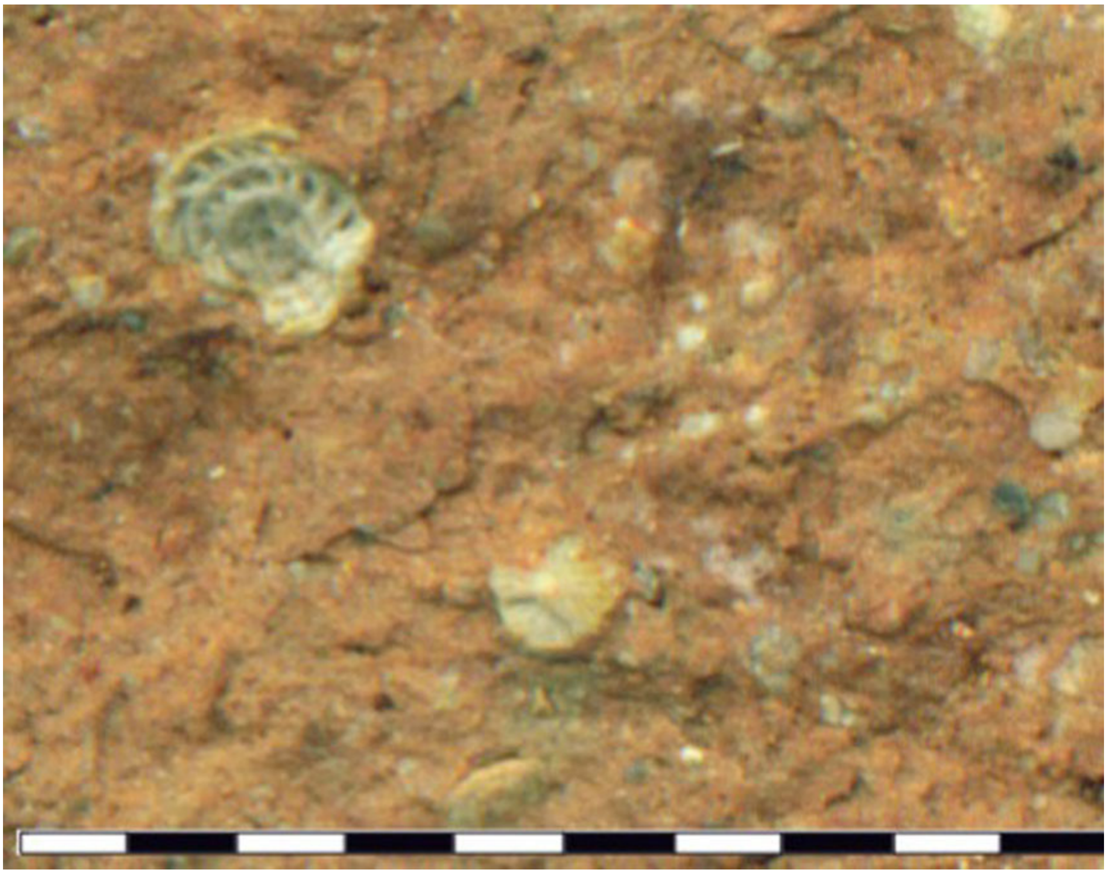

Figure 3. Marl clay fabric from Euesperides showing Heterostegina *microfossil inclusions. Scale 10 mm. (Photo: K. Swift)*

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Figure 4. Petrographic thin section, PPL, of marl clay fabric from Euesperides showing abundant microfossil inclusions. Width of field approximately 2 mm. (Photo: K. Swift)

microfossil acts as natural tempering making these clays well suited for cooking wares – since thermal expansions of the calcareous clay bodies and microfossils are very similar, thermal stresses during repeated heating and cooling during use would have been reduced significantly while the relatively large microfossil inclusions would also inhibit the propagation of microfractures across the otherwise perilously fine and consistent fired-clay bodies.

At Euesperides and Berenice, these fabrics were used primarily for cooking wares which represent a distinctive local ceramic tradition characterised by: (1) primary forming techniques including hand-formed as well as wheel-thrown examples – this is the only fabric associated with hand-forming, with other fabrics and the majority of the coarse ware assemblages, being wheel-thrown; (2) secondary forming techniques evident in the usual burnishing of the vessel surfaces; and (3) the production of flat-based pans, paralleled functionally by imported Aegean cooking pans, which were not found in other local fabrics at Euesperides, although these were much less common than *chytrai* and *lopades* in these fabrics (Figure 6).

This distinct, circumscribed and highly local production tradition probably started from at least the late Archaic period at Euesperides and continued into at least the first century AD at Berenice (Riley 1979). The burnishing technique probably follows that found on Aeginetan cooking ware imports, identifiable petrologically by their igneous inclusions and which are found at Euesperides in large numbers – almost one in four *lopades* are Aeginetan – as may the basic concept, though not specific morphology, of the flat-based pan which appears at Euesperides only in local marl clay and imported Aeginetan fabrics.

Perhaps the most striking feature from a technological perspective is that many of the pieces in this ware were hand-formed rather than wheel-thrown. This is extremely unusual for ancient Greek pottery production in general. They may have been produced domestically rather than by wheel-throwing in a workshop, although this would also represent a sharp contrast to the professional potter and workshop mode of production typical of the ancient Greek world.

As well as being produced locally at Euesperides (Swift 2005, 69) and at Berenice (Riley 1979, 94),

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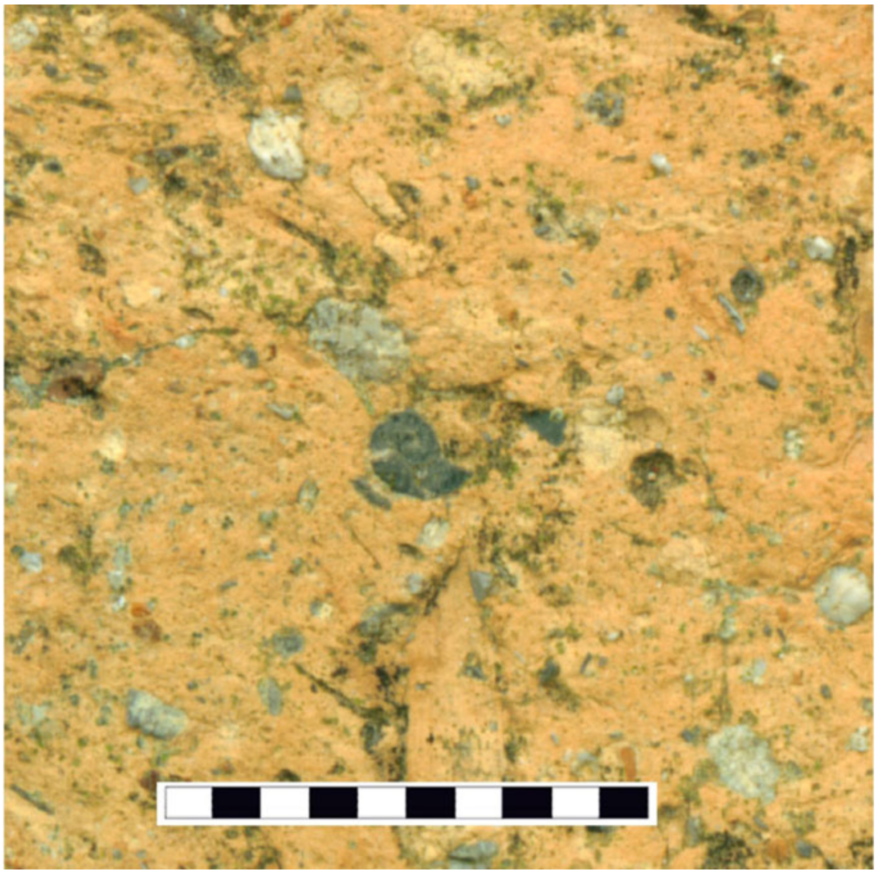

Figure 5. Marl clay tile fabric from Cyrene showing inclusions of Nummulitidae foraminifera. Scale 10 mm. (Photo: K Swift)

marl clay fabrics have been identified at numerous other sites in Cyrenaica. On the coastal plain, they have been at Apollonia, Ptolemaïs, Tocra and Maaten el-Agla. On the Jebel Akhdar, examples have been identified from Balagrae. Marl clay fabrics containing microfossils are very common at Cyrene, found for example in plain wares and in roof tiles, and they were used for the production of Hellenistic braziers (Riley 1979). The limestones and Shahat Marl underlying Cyrene contains pecten bivalves, which can be seen for example in the ashlar blocks in the pediment of the Temple of Zeus.

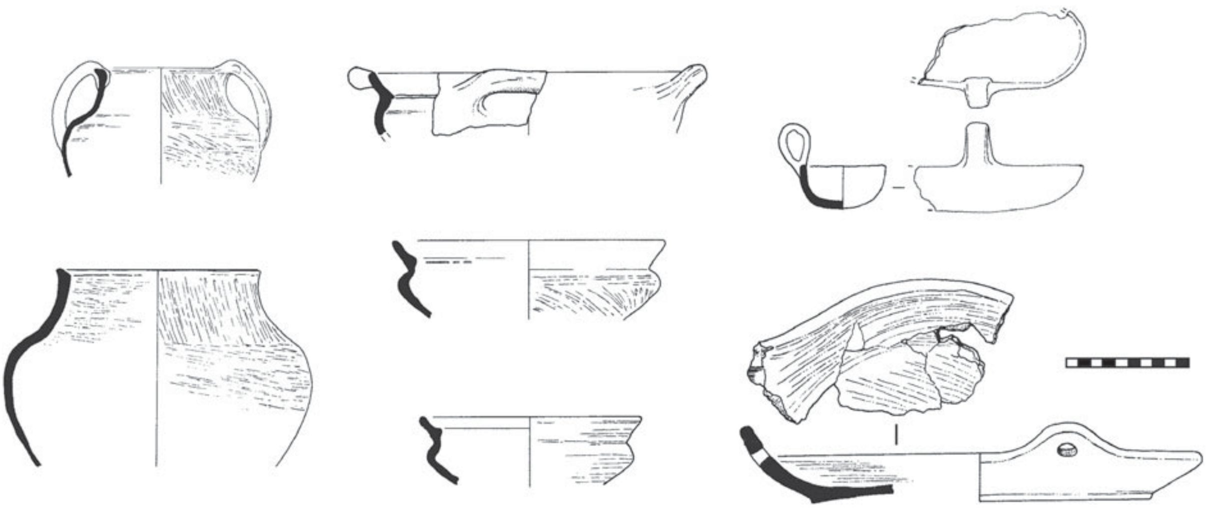

Figure 6. Examples of typical shapes in the distinctive hand-formed and burnished cooking wares in marl clay fabrics local to Euesperides. Scale 10 cm. (Illustration by K. Swift after D. Hopkins)

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They are a common feature in Cyrenean ceramic fabrics. Examples of fabrics with these inclusions were identified in Cyrenaican-type transport amphoras at Cyrene. A similar piece was identified at Euesperides (Swift in Wilson et al. 2005), suggesting that it was a regional import produced from marl clays of Cyrenaica further to the east, plausibly from the area around Apollonia and Cyrene. As this example shows, the fossil inclusions in the source clays provide a promising means of intra-regional differentiation and sourcing of Cyrenaican marl clay fabrics through comparisons with the biostratigraphy. For example, the fabrics from Euesperides contain a single species, but a wider range of marine microfossils is present in the Derna and Al Beida formations of the Jebel Akhdar, and found in fabrics from Balagrae and Cyrene. Multisite, palaeontological study of marl clay fabrics holds the promise of identifying intra-regional distribution, as the example of a plausibly Cyrenean transport amphora from Euesperides suggests.

Sebkha (lagoonal) fabrics

These fabrics were produced from deposits associated with quiet-water *sebkha* (salt lagoon) environments. The origin of these fabrics is indicated by inclusions of shell fragments from quiet-water species and, at Euesperides, rounded grains of calcareous sand derived from weathering of the calcarenite bedrock of the Sidi Abeid. These diagnostic inclusions were also observed in hand-augured samples of clay-rich sediments from the *sebkha* adjacent to Euesperides. *Sebkha* fabrics appear in a range of textures and firing colours but are usually pale orange to reddish, approaching *terra rossa* fabrics – a continuum which may result from sediments washing into the lagoon. Some examples have iron-rich clay aggregates within them, firing reddish, which may be the *terra rossa* component which was either mixed in naturally or through deliberate addition (Figure 7).

These fabrics are typically lightweight, porous and unusually friable, perhaps as a result of the high salt content. At Euesperides, these fabrics were used primarily for plain wares, particularly jug-like forms. The porous fabric probably helped to lower the temperature of the liquid contents through evaporation. Cooking wares do not appear to have been produced in these fabrics, which is not surprising given their friable and powdery consistency.

A production site with kiln and wasters in these fabrics was located and excavated within the urban area of Euesperides (Buzaian and Lloyd 1996). Fabrics with similar textures were observed in the area of Alexandria, with its adjacent lagoon. A variant lagoonal fabric was also observed at Alexandria, resulting from lagoonal sediments mixed naturally with inflows of silt-rich sediments from the Nile Delta.

Admixture of clays and sediments

Sebkha fabrics seem likely to have been mixed naturally in the lagoonal environment. Admixture of other fabrics was likely intentional. Micro-textural, compositional, pyrotechnological and physical properties of clays could be altered through mixture with other types of clays and sediments, for example to increase workability and plasticity through the addition of calcareous marl clays or to increase physical strength and thermal toughness through the addition of finely granular, quartz-rich *terra rossa* sediments (Figure 8).

Admixture of marl clays with *terra rossa* sediments results in a continuum of compositions and textures, the fabrics mixed to varying degrees depending on the desired properties of intended product. It is therefore possible to classify an infinite number of 'fabrics' which are in fact produced from the mixture of two basic sediment types, which are

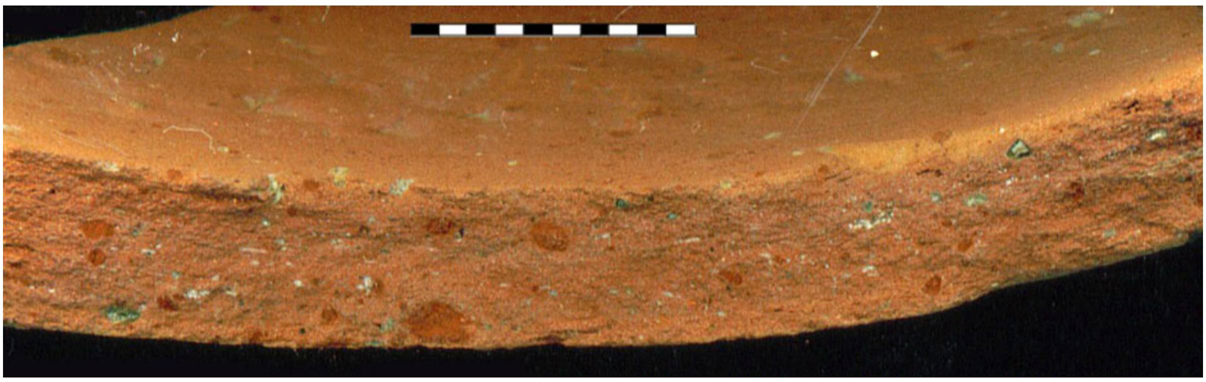

Figure 7. Lagoonal fabric showing iron-rich clay aggregates from admixture of terra rossa *sediments. Scale 10 mm. (Photo: K. Swift)*

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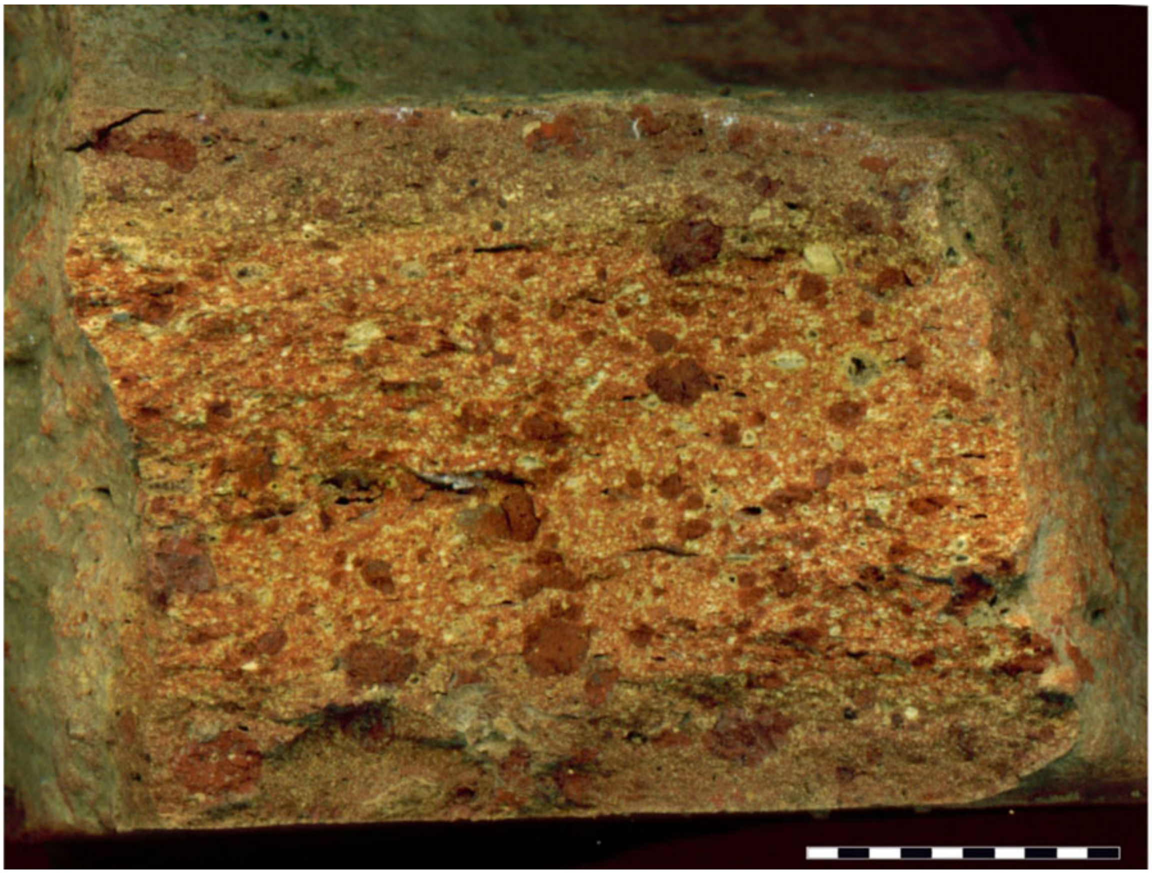

Figure 8. Tile from Cyrene showing admixture of marl clay and terra rossa *sediments. Scale 10 mm. (Photo: K. Swift)*

themselves homogenous throughout Cyrenaica. Such a continuum serves as an example against classification based on minor differences in fabrics, but rather with reference to the petrological and geological environment and common features consistently encountered in large collections of pottery and other ceramics.

Argillaceous aggregations are a common feature and indicator of admixed fabrics. In poorly mixed marl clay-rich fabrics, the addition of iron-rich clays is indicated by clay concentrations of reddish, finely granular aggregates which are basically the same as *terra rossa* fabrics or sediments (for example, Figures 7 and 8). Conversely, the addition of marl clays to *terra rossa* fabrics, perhaps to increase workability of the clay, is seen in aggregates of calcareous, finer clay fired to a lighter colour than the deep reds typical of *terra rossa* fabrics. Finer, more plastic and workable, these marl clay aggregates seem to be much less common, perhaps because as pure clays they were easier to mix with coarser clays derived from quartz-rich *terra rossa*.

Admixed fabrics with marl clay and *terra rossa* components are common in Cyrenaica for ceramics which were produced on a relatively large scale and with a more complex and organised production, particularly black-gloss fine wares and Cyrenaican transport amphoras, as well as ones where there needed to be a trade-off between workability of the clay, drying shrinkage and structural strength, such as basins, Greek-type mortaria and other substantial vessels such as *pithoi*.

Cyrenaican fabrics in production, distribution and use

Articulations in fabrics, forms and functions are apparent in the pottery assemblages from Euesperides and pieces from other sites in Cyrenaica. Ceramic fabrics were produced from selected clay sources depending on the intended function of the fired vessels. The suitability of a particular clay source for particular vessel functions is clear in the assemblages from Euesperides. The physical properties of the fabrics could be modified based on careful selection of clays and manipulation through admixture with different sediments, including other types of clays. In this way, not only are the properties of ceramic fabrics derived from the kinds of clay sources selected for their production, linking the microscopy of fabrics to the macro-scale of geological processes,

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but they are also integral to the artifactual *chaîne opératoire*, from clay exploitation, manipulation, forming and pyrotechnology to distribution and use, before final discard and incorporation into the archaeological record.

Terra rossa fabrics are associated with all vessel types but make up the main fabric used for cooking wares at most sites. Marl clay fabrics are usually used for cooking wares at Euesperides and are associated with braziers from Cyrene. They were also used for roof tiles and architectural terracottas at Cyrene. Admixed fabrics produced from a combination of marl and *terra rossa* clays are usually found on non-cooking wares and on substantial vessels like *pithoi*, basins, *louteria*, Greek-type mouldmade mortaria and roof tiles. Typically very porous, permeable and friable, lagoonal fabrics are mostly associated with jug-like forms including *hydriai*, where their permeability no doubt helped to keep the contents cool through evaporation.

Functional articulation of fabrics is also apparent in the imported wares at Euesperides, particularly those from central Greece. The articulation of Aeginetan cooking wares, Corinthian coroplastic ceramics and Attic fine wares provides an important example of the ways in which the physical properties of fired clays from different types of clay sources led to specialisation in large-scale production and distribution of ceramics around the ancient Greek Mediterranean.

Petrographic analyses of fabrics from Euesperides provenanced imported cooking wares from Aegina, which appear in the assemblages from Euesperides in significant quantities: nearly one in four *lopades* are Aeginetan imports. Attic black-gloss pottery is present at Euesperides (Zimi in Wilson et al. 2003), and it seems likely that these two wares were distributed together via the Saronic Gulf. Corinthian coroplastic ceramics in distinctive fabrics with argillaceous inclusions (Whitbread 1995) are also present at Euesperides, including *louteria* and mortaria (Swift 2005).

Produced on a very large scale, the major distributed types from these three areas correspond well to the properties of the fabrics which could be produced from their locally available clay sources; Aeginetan cooking wares with their heat-tolerant and conductive inclusions from weathered andesites; black-gloss and red-figure wares with their lustrous slips, produced from finely granular clays weathered from the Attic schist; and coroplastic vessels such as *louteria* and Greek-type mortaria produced in plastic, readily workable marl clays of Corinthia. As they are found at Euesperides, these imports comprise functionally articulated 'distributed assemblage' and connote a clear articulation in the main products of major production centres – an example of microscopic details having a bearing on macro-scale material-cultural interactions between different regions of the ancient Mediterranean.

The quantified assemblage from Euesperides indicates that these wares were distributed in quantity and they also provided models for local potters to emulate, sustaining consistent conceptions of shape in the wider Greek tradition. Adopted and adapted into pre-existing traditions, the geographically wide distribution of traded wares accounts for the relative conservatism in Greek shapes, making them easily recognisable typologically. But this also presents problems for the differentiation of local and regional wares based solely on vessel morphologies, which can be mitigated by combined study of forms, fabrics and production technologies. In this sense, 'shape geographies' are as important as shape histories for formulating and applying typologies and classifications to study of the archaeology of the ancient Greek world.

Future directions

Much has changed in Libya since the fieldwork conducted for this study in the early 2000s. The identification and provenancing of Cyrenaican fabrics has come to have an urgency and relevance beyond the academic. Ceramic fabric research and the wide dissemination of the results of such studies now has a critical role to play in provenancing and recovering looted ceramic antiquities which, though seemingly ubiquitous in archaeological contexts, represent the primary artifactual vestiges of our collective past.

References

Buzaian, A., and Lloyd, J. A. 1996. Early urbanism in Cyrenaica: new evidence from Euesperides (Benghazi). *Libyan Studies* 27: 129–52.

Dore, J., and Keay, N. 1989. *Excavations at Sabratha 1948–1951*, vol. 2: *The Finds*, part 1: *The Amphorae, Coarse Pottery and Building Materials.* Society for Libyan Studies Monograph 1 (eds M. Fulford and M. Hall).

Kenrick, P. M. 1985. *Excavations at Sidi Khrebish, Benghazi (Berenice)*, vol. 3, part 1: *The Fine Pottery*. Department of Antiquities, Tripoli.

Lloyd, J. A. 1977. *Excavations at Sidi Khrebish, Benghazi (Berenice)*. Supplements to *Libya Antiqua*, vol. 1. Department of Antiquities, Tripoli.

Riley, J. A. 1979. Coarse pottery. In J. A. Lloyd (ed.), *Excavations at Sidi Khrebish, Benghazi (Berenice)*. Supplements to *Libya Antiqua* 5, vol. 2. Department of Antiquities, Tripoli: 91–467.

Swift, K. 2005. *Classical and Hellenistic coarse pottery from Euesperides (Benghazi, Libya): archaeological and petrological approaches to pottery production and inter-regional distribution*. DPhil dissertation, University of Oxford.

Whitbread, I. K. 1995. Greek transport amphorae: a petrological and archaeological study. Fitch Laboratory Occasional Paper 4. British School at Athens.

Wilson, A., Bennett, P., Buzaian, A., Buttrey, T., Göransson, K., Green, C., Hall, C., Helm, R., Kattenberg, A., Swift, K., and Zimi, E. 2001. Euesperides (Benghazi): preliminary report on the spring 2001 season. *Libyan Studies* 32: 155–77.

Wilson, A., Bennett, P., Buzaian, A., Buttrey, T., Göransson, K., Hall, C., Kattenberg, A., Scott, R., Swift, K., and Zimi, E. 2002. Euesperides (Benghazi): preliminary report on the spring 2002 season. *Libyan Studies* 33: 85–123.

Wilson, A., Bennett, P., Buzaian, A., Buttrey, T., Fell, . V., Found, B., Göransson, K., Guinness, A., Hardy, J., Harris, K., Helm, R., Kattenberg, A., Morley, G., Swift, K., Wootton, W., and Zimi, E. 2003. Euesperides (Benghazi): preliminary report on the spring 2003 season. *Libyan Studies* 34: 191–228.

Wilson, A., Bennett, P., Buzaian, A., Fell, V., Found, B., Göransson, K., Guinness, A., Hardy, J., Harris, K., Helm, R., Kattenberg, A., Tébar Megías, E., Morley, G., Murphy, A., Swift, K., Twyman, J., Wootton, W., and Zimi, E. 2004. Euesperides (Benghazi): preliminary report on the spring 2004 season. *Libyan Studies* 35: 149–90.

Wilson, A., Bennett, P., Buzaian, A., Buttrey, T., Fell, V., Found, B., Göransson, K., Guinness, A., Kattenberg, A., Morley, G., Swift, K., Wootton, W., and Zimi, E. 2005. Euesperides (Benghazi): preliminary report on the spring 2005 season. *Libyan Studies* 36: 135–82.

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