The Ancient Mediterranean Trade in Ceramic Building Materials: A Case Study in Carthage and Beirut

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Roman and Late Antique Mediterranean Pottery 2

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Abbreviations usd in the text

No	Number of fragments
Wt	Weight (in grams)
Cnr	No of corners
Min	Minimum number of tiles per context
N	Total quantity

Chapter 1 Introduction and Theory

1.1 Introduction

The main question that this study will address is the level of interregional trade of ceramic building material (CBM), traditionally seen as a high bulk low value commodity, within the ancient Mediterranean between the third century BC and the seventh century AD. It examines the impact of different modes of production, distribution and consumption of CBM and how archaeological assemblages differ from what is predicted by current models of the ancient economy. It also explores how CBM can be used to investigate cultural identity and urban form.

CBM has great potential in investigating these topics. It survives in large quantities in the archaeological record; it is transported as a commodity in its own right, not as a container for other products like amphorae. The amount of CBM used in a building can be estimated, and this can be extrapolated to urban centres to model consumption in ways that are not possible for other goods. This allows the potential derivation of economic information to a higher level of precision than is the case for other materials.

CBM is rarely recorded in any detail at sites from which it is recovered, as it is bulky and not seen as potentially informative. The material used in this study derives from stratified assemblages from two major ports of the ancient Mediterranean: Carthage and Beirut. CBM as a material is comparable to pottery, only does not exhibit the same range of forms. This leaves fabric as a major means of analysing CBM samples. For this reason a programme of petrological thin sectioning has been carried out on these assemblages. These data have been combined with the taphanomic and dating evidence from the excavations. The results showed that the levels of imports of CBM into these two cities were much higher than would normally be expected from the orthodox model of the consumer city. They also suggest that CBM can be used as a tool to investigate cultural identity.

1.2 The Structure of the Study

This study comprises six chapters, two appendices and an online database. This chapter continues with an outline of the current debate on the nature of the ancient economy. It defines CBM and traces the history of its development and use in the classical world. This is followed by an overview of how CBM can be related to different aspects of the ancient economy in the wider Mediterranean, with particular reference to the evidence from shipwrecks, and previous studies of CBM. Finally, there is a description of the sites in Carthage and Beirut that have been used in this project.

Chapter 2 examines the methods used for the different excavations, and the theories behind them. It outlines the development of my methodology for the retention and recording of CBM recovered from the excavations. It finishes with a summary of the fabric and form definitions made in the field.

Chapter 3 discusses the data relating to the fabric analysis. It starts with the information from the thin section programme, and proceeds to analyse these data in terms of the forms manufactured in each fabric and the trends across the phases of each site.

Chapter 4 reviews the information, beyond fabric, relating to the analysis of the CBM assemblages. Firstly an analysis of the changing ratios of imported to local material over time is presented. Secondly, there is an examination of the colour, style and taphonomy of the material. Finally, the markings from manufacture, use and deposition are investigated.

Chapter 5 examines the idea of constructing a cultural biography of the different CBM types from the two cities. This is followed by a detailed discussion of the use of CBM in Carthage and Beirut within the broader cultural context of historical developments and other imports and exports to the two cities. It moves to a discussion of the way the patterns observed relate to economic models. It finishes with a consideration of how broader political and social aspects of the use of CBM can be related to cultural identity and urban form.

Chapter 6 summarises the main conclusions of the research. It also outlines areas where future investigations can test the ideas presented in this book to develop a better understanding of the use of CBM in the Ancient World, as well as specifically in Carthage and Beirut.

Appendix 1 outlines the structure of the database used for the analysis of the data compiled for this study, while Appendix 2 presents the methodology of the thin section programme. The online section comprises the complete Access 2000 database used for the recording and the analysis of the CBM assemblages used in this project.

1.3 The Consumer City Model

The consumer city model is an influential strand of the minimalist school of thought about the ancient economy. This is primarily linked to the work of Moses Finley (1985, 134-40). The key aspects of this model which relate to this study are the propositions that:

Little manufacturing in the modern understanding of the concept, was carried out by the economy as a whole (Finley 1985, 137).

Interregional trade was largely in luxury items, and on a generally small scale (Finley 1985, 138). Cities operated as centres of consumption for local production and rents (Finley 1985, 140).

This model of the Ancient World emphases the importance of social status based on landed wealth, with traders and craftsmen seen as low status. Wealth achieved through these lesser routes would be converted to the more respectable form of land ownership and status display through conspicuous consumption, rather than ploughed back into development, growth or industrial specialisation. This concept has been criticised as too general an application of an ethic that may have applied at best to the elites of Rome, underplaying the differences between the different regions of the Empire (Frederiksen 1975, 165, 168). It also seems to overstate the level of agricultural stagnation, implied by consumption geared to display, rather than economic growth (Harris 1993b, 28).

That the ancient economy was dominated by agriculture is uncontroversial. In fact, it is only since the industrial revolution that societies have developed where manufacture is dominant (Dark 1995, 139). Thus, saying that the Roman economy was not the same as the post-industrial revolution economy is not very helpful. What is clear from the archaeological evidence is that non-agricultural production was on a large enough scale to suggest that agricultural systems were developed sufficiently to allow substantial numbers of people to be involved with work not related to food production. This understanding relies on levels of quantification that are not easily inferable from the literary sources, and not readily available from archaeological data. Many of those who support the extreme minimalist/primitivist position are ancient historians, whilst those supporting a more developed economy are often archaeologists (Kingsley 1999, 26).

According to Finley (1985, 136), the ancient economy was built up of self-sufficient cells, with the city existing as a self-sufficient consumer of products from its own hinterland. The rents from the land were used in supporting the local elite. Thus, there was no need for long distance trade, except in luxury goods and the redistribution of food. This point of view has been criticized as being more characteristic of the Hellenistic city state. The development and growth of empires would have produced new links for traders, amongst others, to exploit (Frederiksen 1973, 164). Quantifiable evidence from recent archaeological work (e.g. Reynolds 1995) implies a much broader range of commerce than suggested by the literary sources. Greater emphasis is placed on the need for any city to import necessities that could not be created locally. Large-scale field walking programmes and analysis are producing evidence, for example, of surplus production of wine in Palestine (Kingsley 1999; Kingsley 2001, 49), and some cities seem to have acted as foci for much larger areas than their immediate hinterland (Mattingly *et al.* 2000).

Hopkins (1980) argued for the recognition of growth in the ancient economy. Hopkins' concept of taxes as a means of encouraging economic interdependence and growth has been questioned by Duncan-Jones (1990, 31), who suggested that observed patterns in coin distribution across the Empire could be explained by redistribution from a central source, rather than by some model of equilibrium. Problems with coin distribution have also been pointed out by Whittaker (1990, 112-3), where, in the exceptionally militarised context of Britain most coins come from late third century AD. He (1990, 113) also points out that in the western empire, at least, much of the evidence of industrial activities comes from rural locations. The evidence of shipwrecks (Parker 1992, fig. 3) and pottery (e.g. Going 1992) also shows distribution consistent with economic growth and cycles of some sort, as shown in Figure 1.4.

Further revisions to the consumer city model have been suggested. Hopkins (1980; 1983a) has argued that there was a greater volume of trade than suggested by the minimalist model. He proposed (1980, 119) that trade would have been encouraged by monetary taxation, in as much as the location where taxes were spent was often different from where they were raised. His work also implied a form of economic growth peaking in the first two centuries AD. This concept is borne out by shipwreck evidence (Parker 1992, fig. 5) that shows a peak in the first two centuries AD, followed by steep decline, an apparent small recovery in the fourth century and a subsequent decline into the medieval period. Hopkins' examination of the orders of magnitude of different types of trade (local, intraregional and interregional) led him to conclude that the level of trade was more considerable than initially assumed. He went on to suggest that the levels of cost involved in the size of ships, imply the use of wealth only available to the landed elite. This implies that whilst social pressure may have acted against elite involvement in trade, it still existed. If such pressure had been strong enough there would have been no necessity for laws to try to control such behaviour. This observation is echoed by Parkins (1997b).

Rome itself can be seen as the ultimate consumer city, taxes and rents from throughout the Empire being spent there by political overlords. Other great cities of the Empire (Carthage, Alexandria and Antioch) became centres for the local collection of revenue for Rome, where they had previously collected revenues of their own as heads of their respective empires. Increasingly, archaeological work suggests that the model norm of the consumer city fails in the case of other maritime cities (e.g. Mattingly *et al*. 2000).

Hopkins (1983a, 104) suggests that the cost of land transport has been overstated as a hindrance to long term transport, quoting, with reservations, the costs in

Diocletian's Edict of Maximum Prices. The technology of land transport has also been reviewed (Greene 1986, 38; Laurence 1998, 129) and the archaeological evidence found to be more sophisticated than previously assumed. The economy characterised by the model as it stands, as well as the relevant proportions of market trade with reciprocal or redistributive methods will be explored with reference to a specific commodity, that of ceramic building material.

Reference will be made to concepts regarding the city as more than an economic entity (e.g. Mattingly *et al.* 2000, 66). For instance, the types of distribution practised in the Ancient World were more socially embedded than the product of economic rationality. Exchange through redistribution or reciprocity (gift exchange with tribal elites) was sometimes more dominant than market exchange. There is the problem of how culturally imbued the market value of a commodity may be (Appadurai 1988b, 3) as well as suggesting that economic rationality is some ahistorical universal constant whilst ignoring its general failure in terms of modern economics (Ormerod 1994). Even in the case of modern Anglo-American market economies, activities are socially and politically constrained, so it is important to study the social and political spheres of the Ancient World to model the economic sphere.

This study will demonstrate that the minimalist view overstates the case. Whereas agricultural production was the dominant economic activity in the ancient economy, the data available from the archaeological resource increasingly flies in the face of such a pessimistic interpretation of the classical literature. Whilst manufacturing activity remained relatively small scale, at best in the form of what Peacock describes as a manufactory (Peacock 1979, 7; Peacock 1982, 9), it is becoming increasingly apparent from archaeological projects (e.g. Wilson 2001) that the aggregate production and demand was far from trivial. One of the major factors would be the ownership of the raw materials, where profit would have been generated for the landowners rather than the traders.

Under the model proposed by Finley it would be expected that a high-volume low-value commodity such as CBM would have been locally produced for local consumption. The only exceptions to this would be in areas where resources such as clay were not suitable or if short-term demand outstripped local supply. This research will seek to test this assumption, first by defining what is meant by CBM, and thus seeing how the different processes of production, distribution and consumption may influence CBM assemblages.

CBM is an under utilised archaeological resource and one of the aims of this study is to try to demonstrate the potential worth of CBM as a tool for understanding some of the socio-economic structures of the Ancient World. Recovery and quantification of CBM from excavations has been relatively rare until recently. Comments such as 'Very few tiles from the excavations prior to 1990 were kept' (Allen 1993, 168), make for depressingly common reading in site reports. Where material has been kept, it is usually on the whim of the excavator, introducing random biases into the excavated sample, rendering meaningless most analysis. For instance at a recent excavation of Ely a medieval floor was excavated, but only decorated tiles were retained, making reconstruction of the original pattern impossible (Garside-Neville, *pers. comm*.). Where CBM has been recorded it has often been in the contexts of landscape projects, where large concentrations of tile have been used to suggest locations of buildings (e.g. van Leusen 1998).

Another important element of this study concerns an assessment of available methods for quantifying, categorizing and provenancing CBM. A set of integrated techniques adopted in this study are offered as a model of good practice for the recording of CBM. The data of the assemblages are analysed in terms of its fabric, taphonomy, function and other factors such as colour and provenance. This information is used to create a cultural biography of CBM in the two cities, which is used to explore the economic patterns and social and political meanings associated with CBM.

1.4 The Definition of Ceramic Building Material

CBM is defined as clay material that has been deliberately fired for use as part of a structure (ACBMG 2002). The main categories are brick, roof tile, floor tile, wall tile and hypocaust elements. More precise definitions include brick, defined (Harley 1974, 63) as '*an artificial product made in replicate units for building construction, each unit capable of being put into position by the hand or hands of one person*'.

The term brick or tile tends to be applied in a haphazard way in the literature, not helped as Roman bricks tended to be flatter and wider than their modern counterparts. Harley (1974, 70) defines the difference by calculating length added to breadth, and divided by thickness. If it is less than eight it is a brick, otherwise it is a tile. This definition is not especially useful in a Roman context and so wherever possible the specific Latin terms will be used (Section 2.10). 'Tile' will refer generically to roof tile, 'brick' will be used for the flat slabs of clay usually found in wall construction and CBM used for floors will be referred to as 'floor tile'.

1.5 The Origins of CBM

Fired clay bricks, rather than stone, in the classical world are mentioned in passing by the main source of building information from the era, the *De Architectura* of Vitruvius. Vitruvius, writing around 14 BC, was introducing Greek building ideas to an Italian audience.

The earliest use of fired clay as a roofing material in mainland Greece was in the early Helladic period (2500 – 2200 BC) where they have been found, *inter alia*, at the

'House of Tiles' at Lerna (Wikander 1988, 204). These were in the form of small square or rectangular tiles and were evidently substituted for stone tiles. The next appearance of ceramic tiles was in the Mycenaean period (1600 – 1100 BC) These took the form of a flanged tile, in the style of the Roman *tegula,* which were laid overlapping up a roof with the flanges adjacent to the next row. The abutting flanges were overlaid by round 'cover tiles'; in the fashion of the Laconian style *imbrex*. These types of roof were only sporadically constructed during this period, including Thebes, Athens and Tiryns (Wikander 1988, 204), and have parallels on the peripheries of the Greek world in central Italy and Asia Minor (Wikander 1988, 205). The third appearance of tiles in the region is in the Archaic period, from the seventh century BC (Winter 1993, 96). These comprised carefully made, and often slipped, pan-tiles and cover tiles, with separate ridge-tiles and hip tiles which were made to be interlocking (Wikander 1988, 205). This style is known as the 'Protocorinthian' (Winter 1993, 16). The earliest examples come from temples in central Greece: Corinth, Isthmia, Perachora and Delphi. This rapidly developed into the 'Corinthian' style by 600/ 620 BC, which had additional decorative pieces such as *simas* (gutters*)* and *antefixes* (upright tiles set on the eaves of a roof). The use of separate *tegulae* (the flanged tiles) and *imbrices* (the cover tile) is noted around 500BC (Winter 1993, 28). The similarity between these new styles and the Mycenaean type system of 500 years before has been noted (Wikander 1988, 205), but there are currently no examples from between these two periods. At the same time a number of different regional variations emerged, of which the main types are described below. Roof tile spread rapidly over the Greek world after this period. This spread has been linked by Wikander (1988, 207) to the growth of large Greek cities and their usefulness in controlling the spread of fire in densely built up areas. The three main styles utilising separate use of *tegulae* and *imbrices* are: Laconian, Corinthian and Sicilian (Figure 1.1).

The Laconian style comprises a curving concave slab-like *tegula* and a semi-circular *imbrex*. These were originally found at Corinth, Isthmia, Perachora and Delphi. The style was later popular for private buildings in Laconia, and survived in use in Bulgaria (Mills forthcoming b) and elsewhere until at least the sixth century AD. In modern Mediterranean structures a variant using only *imbrices* is often seen.

The Corinthian type consists of a *tegula* with an inset flange at the top end and a 'hook' at the lower underside end to facilitate overlapping, with a faceted *imbrex*. These were used on monumental buildings in central Greece in the sixth and fifth centuries AD. The fifth century BC structures at Gordion (Henrickson & Blackman 1999, 310-1, figs 3 and 4) are in this form.

Sicilian (or hybrid style) roofing involves a flanged *tegula* with the corners cutaway to aid slotting into the next one, with Laconian style rounded *imbrices* (Wikander 1988, 211). This style developed in the west (Winter 1993, 273). The Sicilian style was mainly adopted in the Italian mainland and spread with the expansion of Rome's empire, with military buildings such as forts being built using this style even in areas where other styles were in contemporary use. For instance in Bulgaria military fortresses such as *Novae* used the Sicilian style even though the local population had a long tradition of using the Laconian style, which became resurgent after about the third century AD (Mills forthcoming b.). The rise of the power of Rome coincided with the dominance of the Sicilian style in North Africa and the Western empire, as well as a general usurpation of the Corinthian style in locations in the east. The use of roofing tile for private buildings in the Roman world seems to have declined from the forth century AD, although there was the development of a new style, the 'Byzantine' (Wilson 1979, 23) , marked out by external decoration of the *imbrices* and sometimes the *tegulae* with parallel grooves lengthways along the body of the tile. The widespread use of *tegulae* does not seem to survive the transition to late antiquity and the emergence of the medieval world, and the widespread use of CBM undergoes something of a hiatus, remerging in the twelfth to fifteenth centuries in different parts of Europe. The most common terracotta roofing remains used now in the Mediterranean world would seem to be a variant of the Laconian style, made up of only curved *imbrex* style tiles (personal observation).

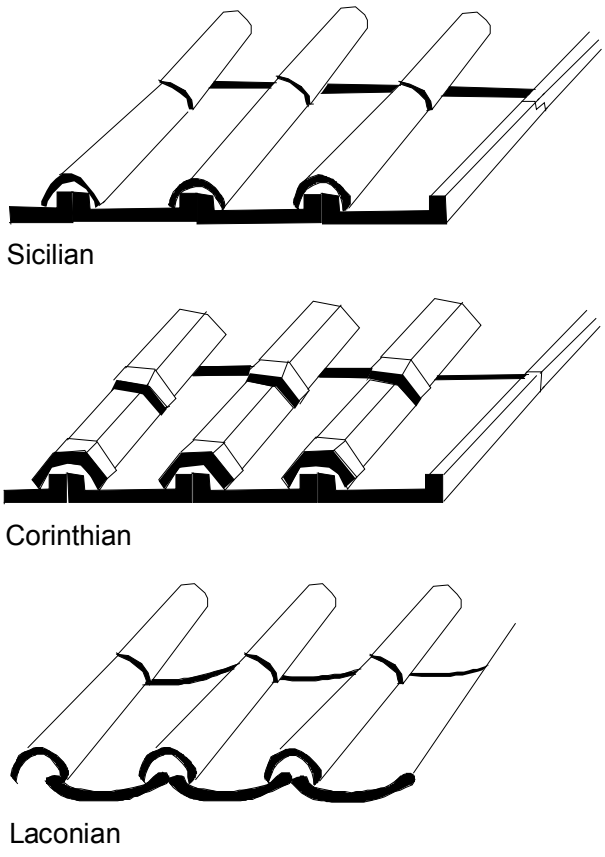

Figure 1.1 Classical roofing methods (after Lawrence 1982, 134, fig. 99)

Production of CBM is usually assumed to have been local, as it is seen as a bulky material with only a limited requirement during specific phases of construction, and slightly less during phases of repair and remodelling. For instance Rautman *et al.* (1993) used tile found in Cyprus as a 'control' for the Neutron Activation Analysis (NAA) study of Cypriot Red Slip (CRS), assuming that the roof tile was locally produced, and therefore evidence that CRS was also produced on Cyprus. In the event three separate groups of tile were reported by the NAA study: a red fabric Laconian roof tile type, a small yellow fabric Corinthian style and a brown fabric large Corinthian style tile. The first type of tile was found to be comparable with Cypriot red slip, and the other two formed distinct groups of their own (Rautman *et al*. 1993, 244, fig. 5b). Only the first type has apparently been found to be close to a clay source on the island (Rautman *et al.* 1993, 77). A study of tiles at Gordion also assumed a local production of tile (Henrickson and Blackman 1999, 33), though characterisation of the roof tiles showed that they came from a different clay source to other local ceramic industries. This clay source was still presumed to be local rather than as evidence that tiles were specially imported for the building. These examples show the importance of scientific provenance studies as a corrective to making assumptions about origin.

1.6 The Formation Processes of CBM Assemblages

Introduction

In order to be able to make inferences from an excavated assemblage of CBM it is important to be able to model the processes that the material has undergone between initial production and post-excavation analysis. This model must encompass the different modes of production, the different modes of transport, the requirements of the consumer, which may include using material for functions other than initial design (for instance as oven bases, drain capping or flooring functions - all seen as part of the Beirut Souks excavation) as well as the reuse of material. The disposal and reuse of CBM produces its own set of problems - complete objects may well be reused in their original role, but also as rubble make up. Material may also be disposed of, only to be reused again mixed with other refuse material, before finally being disinterred by archaeological activity. By modelling the different effects against their expected results we can suggest the most likely modes of supply and consumption in operation at a specific juncture.

Whilst Roman literary sources about CBM are scant, some literature is evidenced from the later medieval period (Salzman 1952, 230). Production of Roman CBM has been investigated and discussed especially for Britain (McWhirr 1979; McWhirr and Viner 1978; Darvill and McWhirr 1984), but also in relation to the brick stamps common in Italy (e.g. Steinby 1993; Graham 2002) and in terms of ethnoarchaeological modelling (Peacock 1979; Peacock 1982). Whilst medieval parallels for production and distribution (Drury 1981) are very useful, it is apparent when working with Medieval and Roman assemblages from the same area that there are differences in the nature of the respective industries. For instance from work that I have carried out in Lincolnshire, the area that was apparently serviced by four main types of Roman fabric subsequently made use of as many as 100 separate types of medieval fabric. Moreover quality of the finished product, in terms of level of firing, friability and colour consistency is consistently poorer for medieval material. This suggests that production was organized in radically different ways in the two periods. In the Medieval period it would seem to start off on a town by town basis, becoming more regulated in the course of time and eventually coalescing into the large centralised, but few in number, industries of the present era. By contrast Roman production may have been based on small-scale workshops, but in aggregate produced a very controlled product.

Production

The primary source of information on CBM production comes from tile kilns; however, excavated kilns of the Roman period are quite rare (Darvill and McWhirr 1984, 242). Tile kilns will not give the full story, as clamp-style kilns created on an *ad hoc* basis would not leave much in the way of archaeological traces. Tile kilns would need to be sited with respect to the availability of suitable clay, water and fuel. The availability of affordable fuel may have acted as a limiting factor on the development of larger scale tile manufactories. Like pottery, tile can be fired with a wide range of fuel (Swan 1984, 6-8). It is possible that in areas of extensive production, forms of landscape management, such as coppicing (Swan 1984, 7) would have been required.

Some aspects of the production of CBM have been researched in Roman and Medieval contexts. Peacock (1979, 6) has suggested a range of possible production types: household production, the small brickyard, the nucleated brickyard, the estate brickyard and the municipal brickyard. Using ethnoarchaeology he concentrated on apparent estate production as emphasised by brick stamps associated with the Roman brick stamps (Peacock 1982, 129-35). However the variation in stamping practices around the Empire and over time also suggests variation within this mode of production. Work on brick stamps in Italy and Britain has given insights into the role of the military in the exploitation of clay pits for production of CBM (Delaine 2000a; Delaine 2000b; Swan and Philpott 2000; Steinby 1993; Brodbribb 1969). This suggests that brick stamps represented a means of contract between the estate owner and the brick producer. Recently Graham (2002) has analysed stamp information with chemical analysis of the bricks and has shown that complex social networks of tile production centres, their workers and owners and their final destination exist.

Studies in tile production, including surviving literature, show that much of the work might be seasonal (Drury 1981, 135), even to the extent of including drying sheds. This pattern is apparently repeated around the Roman

Empire. There is also the problem of the highly cyclical nature of the demand for CBM, as between major building projects it would be minimally required for repairs, and would also have to contend with the reuse of building materials, for which there is increasing evidence, including the suggestion from Vitruvius that old tiles may be preferable for some purposes (Vitruvius II, 8.16). There is also the problem about the local use of CBM, where other materials such as stone or wood may be used because of local building traditions, available resources and the wealth of an area.

The mode and location of production can be explored through the analysis of CBM fabric. The number of fabric groups and their sources over time will give an indication of the importance of local to imported products over time. The range and quality of the products should also indicate the level of production. A large group of fabrics with very poor quality products would suggest a low level industry made up of a large number of semi-skilled tile makers, whilst a smaller amount of fabrics in well defined forms would suggest a more nucleated industry. Other work carried out on CBM has included volumetric studies, such as Delaine's (1997) study of the quantities on building material required for the bathhouse of CaracallaA more recent study has been made of the fortress at Inchtuthil (Shirley 2001). It is not possible, as part of this study, to calculate the quantities of bricks used in any of the structures, because of the absence of complete plans of reconstructions available to date. However it is possible to estimate the number of *tegulae* and *imbrces* required for the roof of a particular structure (Section 4.5 Table 4.14; Section 5.3, Table 5.3).

Transport

In the minimalist model of the ancient economy we would expect that CBM production would be local, unless there were extenuating circumstances such as the lack of a suitable infrastructure (tile makers, kilns or clay source), a large scale development outstripping local supply, or because CBM usage has significance beyond that defined by economic rationality. Thus if this view of the ancient economy were correct we would expect interregional or supra-regional transport of CBM to be very slight, as demand would be expected to be low. Accordingly archaeological evidence of CBM transport

ought to be weak and confined to a few exceptional regions. A case has been put that some CBM would act as a ballast cargo for returning grain ships (Peacock 1984a, 246; Tomber 1987, 162). However this case ignores the costs of transport to and from docks, loading, and the fact that some form of surplus would be required at the production centre, and some form of demand would be needed at the consumption centre. This also ignores the logistic difficulties of moving large quantaties of heavy items (Reynolds 2003, 545).

Sources of evidence for the transport of CBM include: literature, pictorial, fabric analysis and characterisation through such techniques as thin section petrology, and through analysis of brick stamps. A major source of archaeological evidence for the transport of CBM over long distances derives from shipwreck data.

Evaluation of the ship wreck gazetteer in Parker (1992) reveals 40 ships where CBM was definitely part of the cargo, based on the excavator's interpretation (Figure 1.2, Table 1.1). On several occasions this included stacked tiles. A further 39 wrecks had tile reported (Table 1.2), but where it was probably part of the ship structure – typically used in galleys. The biases of these data are much the same as for shipwrecks as a whole: not all areas have been equally explored; very shallow wrecks may have been partly salvaged in Antiquity and fewer deep wrecks have been located. Recent developments are allowing the further exploration of deep wrecks (McCann and Oleson 2004), but these are not studied here as they would bias the sample in favour of tile cargos.

The proportions of different cargos in Parker (1992) are shown in Figure 1.3. The tile reported from wrecks which were probably part of the ship's structure are shown in grey as the 'other' category. For stone, building stone is shown in black as the 'main' category' and other stone cargoes as part of the 'other' category. This shows that stone was slightly more common than tile as a cargo. Parker's own sample (1992, 20) of wrecks between 400 BC to AD 400 has 3% of wrecks with a cargo wholly or partly of tiles. This compares with the smaller percentage (2%) of wrecks observed to be carrying stone. This discrepancy is perhaps down to the sample sizes.

It is assumed that shipwrecks only represent a small proportion of all the material that was being transported around the Mediterranean at this time. Imported monumental stone at different sites, the results of successful shipping, is highly visible and exists in large quantities. This would imply that a substantial amount of CBM was being imported around the Mediterranean during this period, apparently concentrated in a few regions.

Figure 1.4 shows the number of shipwrecks with tile cargos compared to all shipwrecks from Parker (1992). The major period of tile wrecks is the first century AD, but there is resurgence from the fifth century AD. This reflects the overall pattern for all shipwrecks (Parker 1992, fig. 5). Thus no further bias is impinging upon tile wrecks over and above other shipwrecks. Figure 1.5 shows the proportion of tile cargos as a percentage of all shipwrecks by century. There was a slight decline from the third century BC, coinciding with changes in Hellenistic influence around the Mediterranean basin. The first century AD peak coincides with the expansion of the Roman Empire, and the associated increase in use of Roman styles of architecture, and material culture in general. In the fifth century AD, tile became a much more significant proportion of ship-borne cargos overall. This coincides with the rise of the Byzantine Empire in the East.

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Table 1.**1** Shipwrecks with tile cargos (after Parker 1992)

ID	Lat	Long	Period	Name	Cargo	Comments
34	40.3	8.17	Roman	Alghero	Tile	Press report of cargo of bricks
123	39.9	2.56	Early Roman	Cabrera a	Amphorae and Tile	Tiles overlay amphorae (African 2, containing articulated mackerel; Almagro 50 and 51 -fish sauce
158	43.6	5.17	Roman	Calangue de l'Ane	Tile	Roman tile cargo; 2 or 3 layers; very heavy built ship
202	35.4	34.4	Late Roman	Cape Andreas A	Tile	Roof Tiles
207	35.4	34.4	Roman	Cape Andreas F	Tile	Tiles still stacked in position
221	39.5	9.32	Roman	Capo Carbonara C	Tile	Wall tiles in two sizes, pipes stamp Bloch 1967 no 363; cargo apparently exclusively tiles and pipes
228	39.2	9.37	Roman	Capo Ferrato	Tile	Numerous roof tiles close in shore
245	36.4	15.9	Roman	Capo Passero	Tile	Broken up remains of a cargo of roof tiles.
377	43.2	6.49	Roman	Dramont G	Tile and pottery	Looted. Tegulae and imbrices: unstamped, course finish, possibly manufactured at Fréjus
387	37.4	0.43	Roman	Los Escollettes B	Amphorae and Vaulting Tubes?	Bag shaped amphorae (local Dr 38 fish sauce?) and 12cm long vaulting tubes
484	44.1	14.4	Roman	Grebeni	Tile	Tegulae and imbrices; no details
543	36.6	27.4	Late Roman	Kerme Gulf	Tile	5 000 tiles with amphorae and coarse pottery
549	36.4	27.2	Roman	Knidos B	Tile	Large cargo of roof tiles mixed with coarse pottery and some amphorae
553	38.1	26.2	Roman	Komi B	Tile, pipes	Tiles and terracotta pipes
601	43.2	6.46	Roman	Le Lion de la Mer	Tile	Several hundred tiles
610	43.2	5.17	Roman	La Luque A	Tile	200m from Pointe Debie (842) tile wreck; Identical tiles; Tegulae and imbrices small compared to other S France tile cargoes
687	43.1	6.14	Roman	Les Medes B	Tile	Tegula signatures but no stamps; fabric resembles that from Toulouse/Haute-Garonne
734	41.4	12.4	Unknown	Name C	Tile	Barge 5m long laden with tiles
749	43.1	6.4	Roman	Nord-Camarat	Tile	Tegulae and imbrices
754	37.3	15.7	Unknown	Ognina (Catania) B	Tile	Roof tiles
764	43.4	15.3	Roman	Opat	Tile	Cargo of tiles (probably Roman)
777	45.5	13.4	Roman	Palazzolo di Stella	Tile	Bricks with stamps
810	37.4	23.1	Hellenistic	Piadha	Tile	A cargo of Laconian tiles briefly reported
837	44.3	14.3	Roman	Plocice	Tile	No details, but tegula in photo
842	43.2	5.18	Roman	Pointe Debie B	Tile	Cargo of roof tiles, now looted
861	42.3	27.4	Roman	Pomorje B	Tile	Summary report
894	44.2	9.5	Roman	Porto Venere	Tile?	Imbrices and tegulae of large size, with Romano Etruscan antefixes; perhaps for a temple?
961	37.5	12.3	Roman	Punta Scario A	Tile	Large wreck, circular Latin stamp TI.CL; FELIC EX OFFICIN (A); Floor tiles, tegulae and imbrices
994	43.3	6.59	Roman	Les Roches d'Aurelle	Amphorae, pottery and tile	From Fréjus 250 tegulae and imbrices, chimney tile unused. 60 Wine amphorae (Laubenheimer G5 and G2); 1000 pieces coarse pottery; Roman coaster
1059	43.3	7.6	Roman	Le Secanion	Tile	Several hundred tegulae and imbrices; tegulae stacked in 3 rows; imbrices laid flat head to head
1086	44.2	14.4	Roman	Silba C	Tile	Tegulae and imbrices
1097	44.2	14.4	Roman	Skarda B	Tile	Tegulae and imbrices
1116	43.1	6.41	Roman	Sud Camarat	Tile	Tegulae and imbrices; stamped LVF, all or part retrograde incuse in a cartouche
1123	44.3	14.2	Roman	Susak	Tile	Presumed Roman roof-tiles
1133	40.2	17.2	Roman	Taranto C	Amphorae and tile	Hundreds of broken roof tiles; amphorae - Koan and Rhodian (wine)
1138	40.4	27.3	Medieval	Tekmezar Burnu	Tile	Byzantine roof tiles dated by glazed bowls not necessarily associated
1194	36.8	29.4	Medieval	Ulu Burun Area	Tile	Tegulae and imbrices
1216	41.5	16.1	Medieval	Vieste	Tile	Curved, 25x80cm; possibly medieval
1225	43.4	16.1	Roman	Vis F	Tile	Probably Roman

Table 1.2 Shipwrecks with CBM present, probably as part of ship structure (after Parker 1992)

Name	ID	Lat	Long	Period	Cargo	Comments
Albenga	28	44.3	8.15	Early Roman	Amphorae and Pottery	Handful of tile found
Las Amoladeras	39	37.4	0.42	Roman	Lead Ingots	Tiles mentioned as finds
Cala Rossano	153	40.5	13.3	Roman	Amphorae and others	Brick work galley
Cape Andreas B	203	35.4	34.4	Late Roman	Amphorae	Tiles from cabin roof
Capo Carbonara B	220	39.6	9.3	Roman	Amphorae	At least 1 vaulting tube reported
Les Catalans	280	43.2	0.44	Roman	Amphorae	Brick wall part of galley
Cavoli	289	39.5	9.32	Medieval	None	Glazed pottery and tiles
Cefalu	292	38.1	14.2	Roman	None	Bricks as part of galley
La Chretienne A	302	43.3	6.53	Hellenistic	Amphorae	Scatter of tile from fore deck
La Chretienne C	304	43.3	6.53	Hellenistic	Amphorae	Tile roof working area
Karabagla	534	51.5	5.25	Roman	Amphorae	Large deposit of tiles uncertain associationwith wreck
Lavelli F	588	41.2	9.15	Roman	Amphorae	At least three vaulting tubes
Lazaret	593	39.5	4.18	Roman	Amphorae	*Imbrices* and *tegulae* possibly from on board structure
Mahdia	621	35.9	11.4	Roman	Marble columns, works of art, lead ingots	Tiles part of ship board items
Marritza	659	40.5	8.36	Roman	Uncertain	Preliminary report roof tiles and timbers, possibly structural
Maesala	661	37.5	12.3	Hellenistic	None	Tiles from living area/ kitchen?
Marzamemi E	674	36.5	15.8	Hellenistic	Amphorae	Some roof tile mentioned in report
Mellieha	691	35.6	14.2	Roman	Mortaria, glass vessels, other	Roof tile from living quarters
Methone D	696	36.5	21.4	Roman	Sarcophagi	Some roof tiles
Nau Perduda Sa	728	41.6	3.13	Roman	Amphorae	Some Roman tile round. Not enough for a roof; a small ship
Ognina d	756	36.6	15.2	Hellenistic	Amphorae	Several roof tiles found
Le Petit Congloue	806	43.1	5.23	Roman	Amphorae and dolia	Over fired brick part of galley
Planier C	826	43.1	5.13	Roman	Amphorae, pottery and minerals	Tiles probably associated with structure
Ploumannac H	838	48.5	3.27	Roman	Lead ingots	Roof tile from galley
Port-Vendres E	878	42.3	3.6	Roman	Amphorae	Fragments of roof tile reported, possibly structural
Procchio	906	42.5	10.1	Roman	Amphorae, Sulphur ingots	Roof tiles part of cabin
Pudding-pan rock	908	51.3	1.9	Roman	Pottery	Tiles found near the area
Vulpiglia	1230	36.4	15.1	Hellenistic	Amphorae	Tiles possibly from structure
Yassi Ada A	1239	36.6	27.1	Roman	Amphorae	Tiles part of galley roof

The majority (83%) of wrecks with tile as a cargo have it as the only cargo. Unfortunately not many wrecks are reported with a catalogue of the numbers of tiles found, and none where the ship's overall capacity, or actual tile payload, has been estimated. The smallest quantity is given as 250 *tegulae* and *imbrices (*Les Roches d'Aurelle, Parker 1992, no 994), and the largest is a late Roman ship with 5000 tiles (Kerme Gulf, Parker 1992, no 543). Other cargoes are listed as having several hundred tiles, at least one of which, Porto Venere (Parker 1992, no 894) has been suggested to be a special cargo for a temple. Whilst further work would need to be done to estimate the likely amounts carried on these wrecks, it would seem that cargos of several hundred were more usual than those of several thousand. A small number of ships have CBM as a cargo with other goods, usually contained in amphorae. These include fish and fish sauce (2 examples), wine (2 examples), fine ware pottery (1 example) and coarse pottery with empty wine amphorae (1 example). Whilst there are only a few examples of such trade, it is telling that these mixed cargoes all comprise a ceramic element, albeit usually amphorae. The association of tile and amphorae may be to do with a common production site. Comparison of the amphorae and tile fabrics should help to confirm such a link. The finds from Fréjus (Parker 1992, nos 377 and 994) suggest that the pottery and tile fabrics are related.

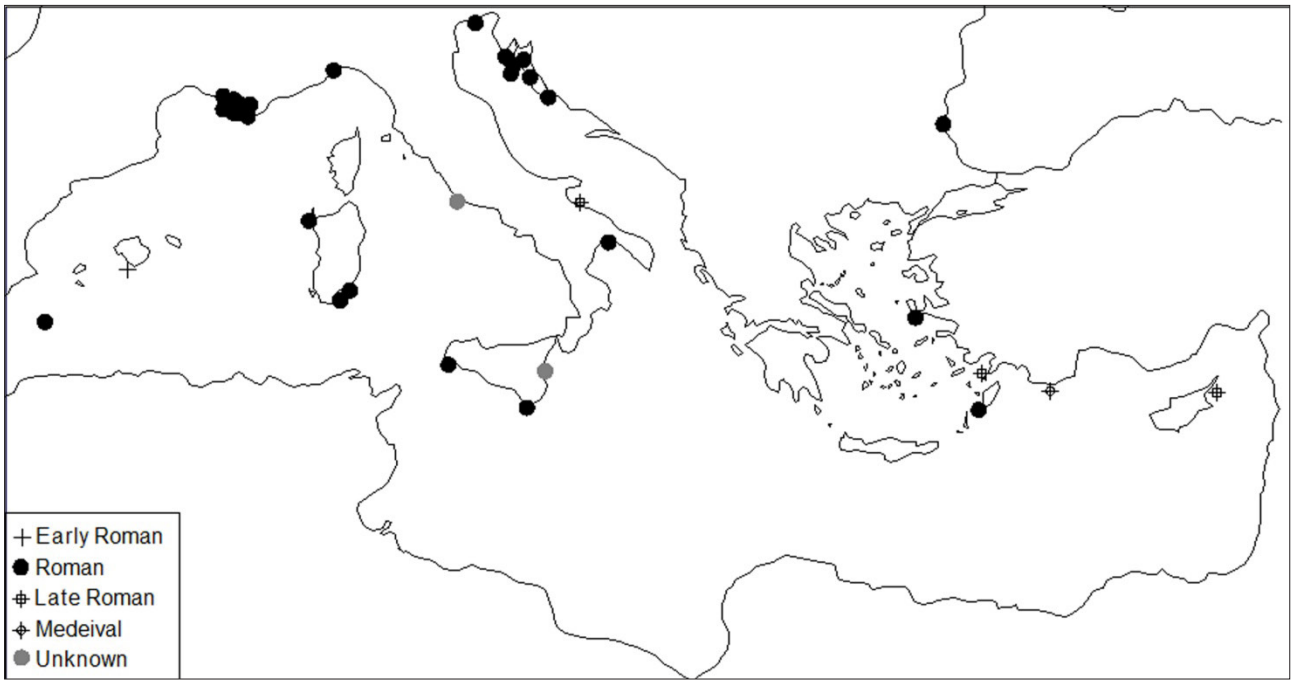

FIGURE 1.2 MAP OF TILE WRECKS OF THE MEDITERRANEAN

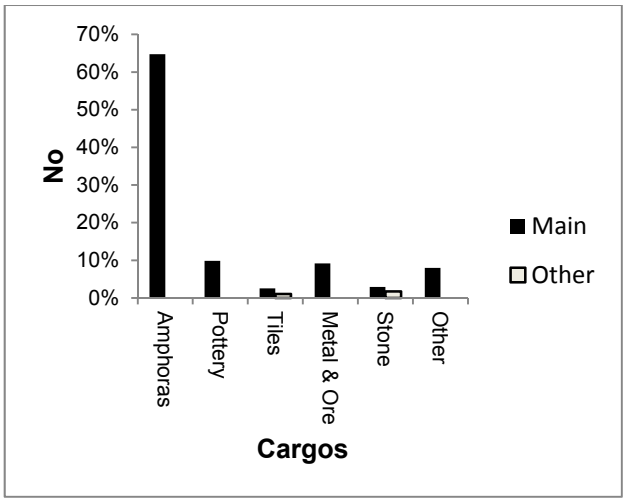

FIGURE 1.3 RELATIVE PERCENTAGES OF ALL DIFFERENT CARGO TYPES (AFTER PARKER 1992, 20)

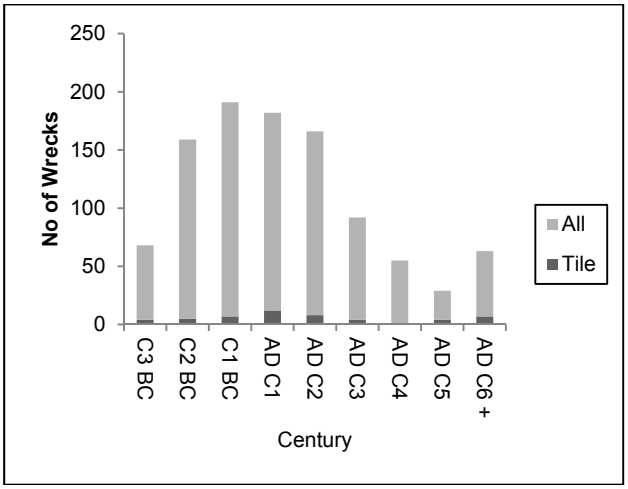

FIGURE 1.4 TILE CARGOES, COMPARED WITH ALL CARGOES, BY CENTURY (AFTER PARKER 1992, FIG. 5)

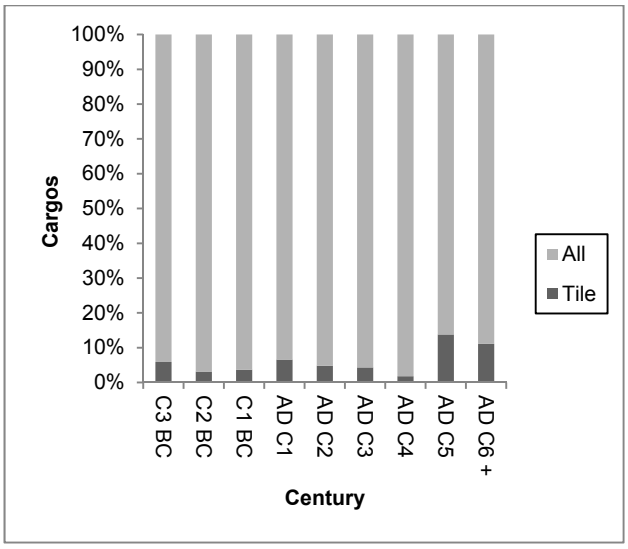

FIGURE 1.5 TILE CARGOES AS A PROPORTION OF ALL CARGOES, BY CENTURY

Stamps and fabric analysis also provide evidence of the transport of CBM (*CIL* VIII, 2173). Peacock (1984a, 246) showed that a significant proportion of the earlier tiles in Roman period came from the Campania area. Tomber (1987) has shown that several sources were exploited. More recently work on CBM at Leptiminus (Dodge 2001, 104; Wilson 2001, 25) has produced both stamp and fabric evidence for the import of CBM, particularly of *sesquipedalis* type from Campania into North Africa.

Fulford (1987) has explored the idea of the level of interconnectedness of trade in the Mediterranean by comparing the changing ratios of local pottery and imported pottery over time with events in the Roman world. Such an approach will be useful to compare the changing ratios of imported material in ancient Carthage

and to test the concept of ballast cargoes. Delaine (2000a, 2000b) has pointed out the large amounts of material that would have been required from the brickfields of Italy for the building programmes of Rome and Ostia. It may be expected that the periods of surplus production of CBM from these sources would correlate with high importation of material from Italy, but the dates do not to correspond.

Consumption

Darvill and McWhirr (1984, 242) suggested three types of consumption for CBM:

High, where demand was at consistently high level, for example a large town.

Medium, where there was occasional demand for construction but with occasional peaks, such as for a small town.

Low, for example villas that only required occasional repairs after initial construction.

Consumption operated in the social contexts of the locality in question, of the region and of the Empire as a whole. Demand would have reflected large-scale public building projects, but also private construction. Individual repairs would have been sporadic on individual buildings between rebuilds, but may have constituted, in aggregate, a large enough market to keep a series of nucleated tile producers in work. The buying mechanism could have been a single commission from a brickyard or the *ad hoc* use of tiles for repairs. The single commission for a new building could have involved ordering the manufacturing of a new batch of CBM to a specific standard in terms of dimensions or colour, or the ordering of a batch of readily available material. It may have also involved the reuse of material from other structures. Factors involved in the choices of consumption and indeed the final product are hard to trace archaeologically, and an understanding of the formation processes for an assemblage would play an important part to determine this. Some traces should be in evidence; however, again the range and quality of tile fabrics and forms at a specific time would reflect the choices available.

In the case of roof tiles and bricks used for facing, colour could have been an important attribute. This could be controlled by the firing process, or CBM could be painted or slipped. Colours of CBM could reflect dominant aesthetic requirements and their changes over time (Wilson 1979, 11). These colours could be used to help differentiate buildings within an urban context. Facing bricks were not found in the excavations studied, and are not studied here, but the colour of roof tiles is examined.

Disposal

There are several mechanisms by which CBM would enter the archaeological record. Firstly, there is wear and tear on the fabric of a structure. This could range from accidental breakage during construction, through to minor or major structural damage. Secondly, there is rebuilding, ranging from reroofing to extensions to a structure. Furthermore portable building elements, such as roof tiles and bricks, could be dismantled for use elsewhere. Finally, there is the total abandonment of the building followed by subsequent collapse, and probable robbing of materials, or disturbance through reoccupation.

Of these different possibilities the last one is the easiest to detect on the ground. Unfortunately, it is rare, but this has to be qualified by the bias because of the lack of recorded CBM assemblages.

Excavation

CBM is a bulky and heavy artefact, and can be present on archaeological sites in large quantities. As its potential for understanding the dating and formation together with the social and political context of a site is poorly appreciated, it tends not to be kept, or is recovered in an *ad hoc* manner. This makes the study of patterns based on the occurrence or absence of certain forms or fabrics problematic. In order to be able to reconstruct the formation processes acting on a particular assemblage, to be confident that the proportions of fabrics and forms recovered from a particular deposit are representative of a particular site as a whole, and to date a particular deposit's composition or deposition, the means of excavation needs to be understood. A prime requirement is that the project employs a coherent and consistent sampling strategy.

It is possible to gain information about the distribution of fabrics from unstratified material. Ideas about the relative amounts of different material can be gained from excavations where the site was stripped in layers or spits. However, the best data will be produced from sites excavated by context. Not only can more precise dates be attributed to the materials, but also the types of context (e.g. collapse, levelling, make-up etc.) can be compared within the site and between sites.

The Evidence

The role of CBM within the urban economy, society and politics will be examined in relation to two Mediterranean harbour cities in two different regions: Carthage in North Africa and Berytus (Ancient Beirut) in the East Mediterranean. These sites were chosen as published assemblages are extremely rare, and for both cities I was able to catalogue the material in detail. The cities have similar origins, comprising Phoenician foundations that were transformed into Roman *coloniae* in the late first century BC, and continued to the end of the seventh century AD. Both cities were important in their respective regions, and so should be good comparisons.

Comparing the similarities and differences between the CBM from these two cities and contrasting them against what we may expect from the consumer city model will allow us to test its relevance, as well as to examine the

different mechanisms involved in the distribution of the CBM and any changes over time. By characterising the economic, social and political contexts of these cities, how they changed over time, and reflecting on patterns of growth or decline in the economies of the respective cities, it is possible to examine divergences from the expected model. This is used to analyse the economies in their respective regions and in the Ancient World in general, and any changes over time.

One issue is the degree to which CBM was produced or commissioned for individual building projects or was readily available for private projects. Roof tile and brick may have been bought in for specific commissions, or they may have been available in bulk to be procured by those commissioned to build a structure, rather than specifically designated by an architect or patron. It would seem likely that roof tile, as a prominent part of the public aspect of the structure, could be an important part of the patron's wishes, the architect's vision as well as the possibilities available to the builder.

1.7 Sites Investigated

Tunisia

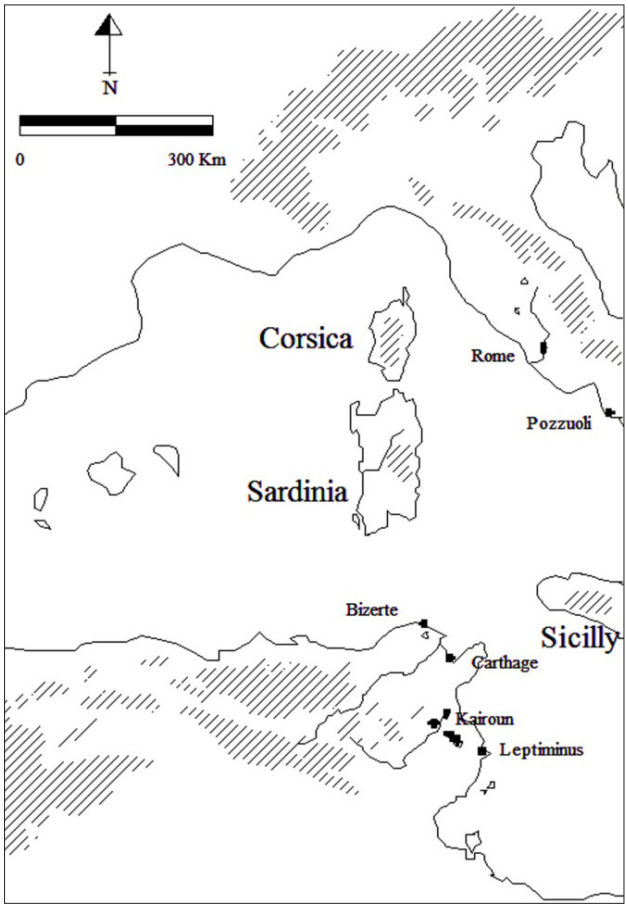

FIGURE 1.6 MAP OF TUNISIA AND THE CENTRAL MEDITERRANEAN

The ancient site of Carthage is situated in the bay of Tunis in Modern Tunisia. The state of Tunisia is centrally located on the North African coast to the Mediterranean (Figure 1.6). It comprises three distinct topographical zones: Northern Tunisia, Central Tunisia, and Southern Tunisia. The Northern zone is defined by the Northern Tell and High Tell mountain ranges, between which is the Medjerda valley. The Central Tunisian zone is a plateau of semi arid steppe, with seasonal salt lakes and extensive olive groves. The southern Tunisian zone is more arid, merging with the Sahara desert at the most extreme southern boundary. It is cultivated with date palm plantations. The earliest underlying geology (after Mtimet 2004) is structured by mountain–building movements that have exposed previously deep strata of sandstone and hard limestone (Bullard 1978, 3). Sedimentary material has been supplied chiefly by the Medjerda River, which has been responsible for the long term infilling of the Bay of Tunis, possibly encouraged by Roman deforestation of the region. This sedimentation is homogenous across North Africa, containing quartz and calcareous (limestone) sand (Fulford and Peacock 1984, 14).

Carthage

The Roman city of Carthage was located in the Roman province of Africa Proconsularis. It was built around the Byrsa hill, which acted as a focal point overlooking a harbour and dominating a large geographical hinterland. The city was founded as a Phoenician colony around the eighth century BC. (Lancel 1995, 34). Carthage came to dominate the Western Mediterranean and was at its greatest extent by *c.* 260 BC. Conflict with Rome, the Punic wars, occurred from 264 BC until the destruction of Punic Carthage in 146 BC. There were plans for re-founding the city as a Roman *colonia* for a number of years after that, but there is no definitive archaeological evidence for this.

A Roman colony was founded at the site, after 29 BC (Rakob 2000, 74). This was built on the ruins of the Punic city, which is thought to have remained unoccupied, but there seems to have been some degree of indigenous population inhabiting the Roman city, alongside the colonists (Rakob 2000, 82). The Byrsa hill was levelled down some 9m (Rakob 2000, 76) following the foundation of the colony. An urban and a rural grid, on different alignments, were imposed on the site, although the plan was influenced by the natural topography of the city (Rakob 2000, 77). Existing Punic structures were levelled to their foundations and rebuilt for the Roman city, and the remaining Punic cisterns used for the new city. Much of the material from the earlier city was reclaimed, sorted and used for the new Roman Carthage, mainly because of the lack of good quality building stone in the area (Rakob 2000, 78). During this early period monumental public architecture was built as well as private houses, which included a number of apparently high-status residences (Rakob 2000, 81). This period of construction continued until the second century AD. During this period, and continuing to the Vandal period, the proportion of imported pottery to local wares was relatively low (Fulford 1987, 60). By the second century AD the Roman city was at the height of its power. Carthage was the third largest city in the Empire,

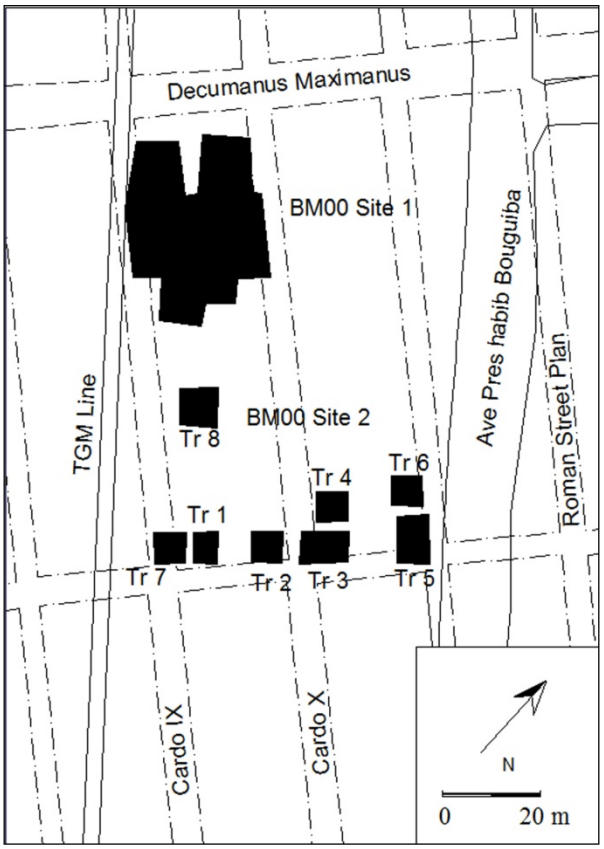

Figure 1.7 Plan of BM00S1 and BM00S2 (after Docter 2000)

after Rome and Antioch. It became an important centre for the church. It then underwent decline, and was taken by the Vandals in AD 440 (Manton 1988, 135).

Vandal Carthage was reconquered by the Byzantine Empire in AD 533, and there was a subsequent period of building of basilicas in order to reinforce the Christian and Byzantine identity of the city. This apparently did not halt the continuing decline of the city. By the time of the final capitulation to the Arabs in AD 698 deserted buildings, burials in cisterns and other evidence of decline characterized the city.

The monumental stonework of the city was robbed out over the following centuries, mainly to build Tunis, but also for projects further afield, such as the mosque at Kairouan. Excavations of the ancient city began in the nineteenth century under the French. Modern destruction of the archaeological remains increased in the latter half of the twentieth century as a response to the growth of Tunis; Carthage became an affluent suburb of the capital city.

The material for this project comes from two adjacent sites situated on land on the eastern slope of Byrsa hill known as the Bir Massouda, off Avenue Bourguiba in Carthage-Dermech (Figure 1.7).

BM00S1

BM00S1 is situated between *Cardines* IX, and X East and south of the *Decumanus Maximanus* (Figure 1.7). This site has a fourth or fifth century church basilica (Miles 1999; 2000) that underwent substantial redevelopment before final abandonment and collapse in the seventh or eighth century AD. The CBM recovered from this site (Mills 2000) included substantial primary collapse from the roof, some subsequently disturbed deposits, which had been redeposited owing to robber activity, and some hardcore and makeup comprising reused bricks. There was also evidence of the destruction of a small vaulted structure as a result of the construction of the basilica, evidenced by a number of vaulting tubes, some complete with their original mortar settings. This roof tile was made locally and in a single commission, with patches of different material suggesting repairs or rebuilds of the original structure. The spatial location of the tiles suggested that parts of the roof were more ornately presented than others. Fragments of earlier brick and tile seem to have been incorporated into the fabric of the building as makeup and possibly residual from earlier buildings near to the site.

BM00S2

This was an excavation area to the South of BM00S1, between *Cardines* IX East and XI East. The excavation comprised eight trenches attempting to intersect with the Roman street plan to examine the Punic and Phoenician strata beneath the Roman city (Figure 1.7). A number of Roman structures were identified including an *insula* foundation and a possible *nymphaeum* with some vaulted components. Other Roman, Vandal and Byzantine deposits included redeposited dumping from the Punic destruction layer of an artisan quarter, the refuse from apparently low key Roman industrial activity and several Roman and later mosaics. A small amount of CBM was recovered (Mills in press), in a wide range of fabrics, consistent with the observation (Hurst 1994, 307) that the majority of buildings in Carthage did not have terracotta roofs.

The spring 2001 season revealed the remains of a structure containing vaulting tubes associated with a mosaic workshop possibly related to the construction of the basilica on site 1. Initial phasing has been provided by Roald Doctor (Table 1.3). Overall, the two sites provide a complete sequence of CBM used in public and private buildings dating from the Punic period to the seventh century AD.

Table 1.3 The phasing of BM00S2

Phase	Description	Date range
1	Archaic	800 - 450 BC
2	Late Archaic	600 - 450 BC
3	Middle Punic	450 - 301 BC
4	Late Punic	300 - 146 BC
5	Roman I	75 BC - AD 100
6	Roman II	AD 101 - 400
7	Vandal	*C.* 400 - AD 530
8	Byzantine	AD 531 - 700
9	Medieval	AD 801-1900
10	Modern	AD 1900 - 2000

Lebanon

The city of Beirut, ancient Berytus, is located in Lebanon in the East Mediterranean (Figure 1.8). Lebanon is divided into three zones; the coastal mount Lebanon area, the Beqaa Valley and the Ante-Lebanon mountain range in the East. The surface geology is of poor quality limestone. In the Beqaa valley there are good soils, which have good water supply from the high rainfall, in the winter months. However, agriculture has been hampered by the mountainous nature of the landscape, making crops susceptible to weather damage. This has been increased by the soil erosion caused by the deforesting of the mountains over the millennia (Walley 1996)

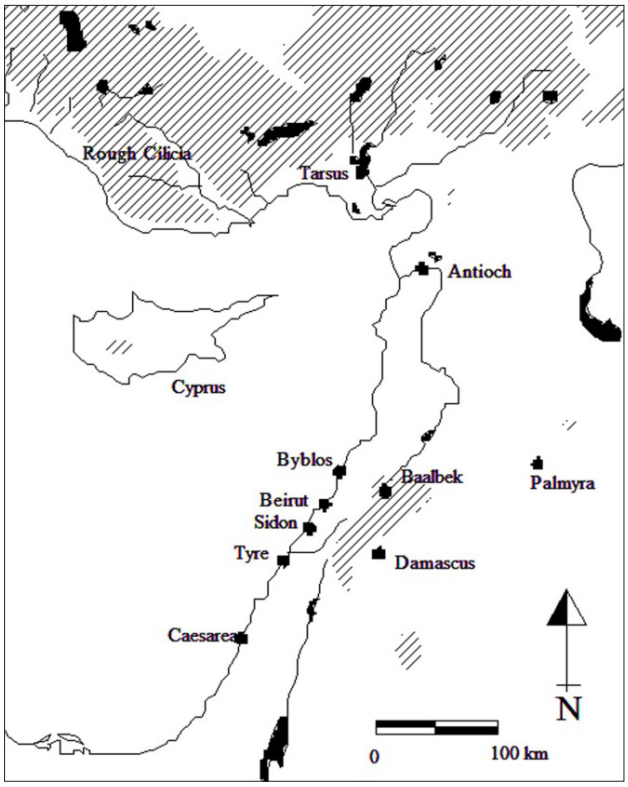

FIGURE 1.8 MAP OF THE LEVANT

The coastal zone has good shallow-water harbours with Cyprus sheltering the coast from the worst of the Mediterranean climate. The coastal area was also rich in the murex shellfish, exploited for the extraction of purple dye, used for the dying of silk (Jidejian 1997, 155; Hall 2004, 231-8; Reynolds 2010a, 83, 277-8, note 306).

The city of Beirut is situated on the Levantine coast, on the western lower slopes of Mount Lebanon. The surface geology is formed of quaternary coastal sands with outcrops of Miocene limestone and cretaceous fluvio-deltic limestone (c.f. Walley 1996, fig. 1).

Beirut

TABLE 1.4 THE PHASES OF THE BEIRUT EXCAVATIONS (AFTER REYNOLDS 2004)

Phase	Name	Date Range
1	Persian	C5 BC - c. 350 BC
2	Early Hellenistic/ Ptolemaic	LC4 - 225/175 BC
3	Seleucid	200 - c. 150 BC
4	Late Hellenistic	LC2 - 50/30 BC
5	Early Roman Colony	EC1 BC - AD70
6	Flavian- Early Imperial	AD 70 - MC2
7	Mid Roman	AD 150 - 300
8	Byzantine	AD C4 - 551
9	Post AD 551 Earthquake	AD 551 - 650
10	Umayyad	AD 650 - 750
11	Medieval	AD 750 +

The first settlement at the site of Beirut dates to the second millennium BC. The town is situated on a fertile plain between two hills, on top of several fault lines; the cause of the city's history of earthquakes, and probably the reason the cult of Poseidon was associated with the classical city (Jidejian 1997, 98). It was a Phoenician city, but came under Egyptian influence with brief periods of independence before coming under the sway of Assyria, Babylon and Persia. In *c*. 333 BC it recognised the suzerainty of Alexander the Great. After Alexander's death, it became part of the Ptolemaic Empire until c. 200BC (Cohen 2006, 205), when it passed into the control the Seleucids, following the battle of Panion Phoenica, and was later sacked by Tryphon in 144 BC (Strabo XVI, ii, 9), as part of the struggle for the Seleucid Empire (Butcher 2003, 27). The city was incorporated into the Roman Empire in 64 BC, after the conquest by Pompey the Great. In the late first century BC a Roman *colonia* was established by Augustus (*Colonia Julia Augusta Felix Berytus*) (Butcher 2003, 112), which resulted in the settlement of a number of Italian veterans. By the third century AD the city had become a centre of learning for Roman (Latin) law in the culturally Greek part of the Empire. Beirut was severely damaged by an earthquake and tsunami on 9th July AD 551 (Darawcheh *et al.* 2000, 403), reputedly killing 30,000 people. Despite aid given by Justinian to help rebuild the city, it does not seem to have recovered. It fell to the Muslim invasions by AD 636 (Norwich 1988, 302).

The downtown area of the Central district of Beirut was excavated by a Lebanese/British team from the summer of 1994 to winter 1996, as part of a number of Lebanese and international teams working in the city ahead of the extensive reconstruction of the city (Perring 2003), shown in Figure 1.9. The three sites being used for this project are: BEY006, the site of the Souks area, BEY007, the site of the original harbour frontage, and BEY045, part of a large multi-period bath complex. Preliminary reports have been produced (Perring 2004; 2003; Butcher and Thorpe 1997; Thorpe 1998; Williams *et al.1995*; Perring *et al.* 1996; Beyhoum *et al.* 1997). The major period groupings

of the ceramic phasing, published by Reynolds (2004), are shown in Table 1.4. These larger groupings have been used for the dating analysis in this project, to keep this level of analysis manageable.

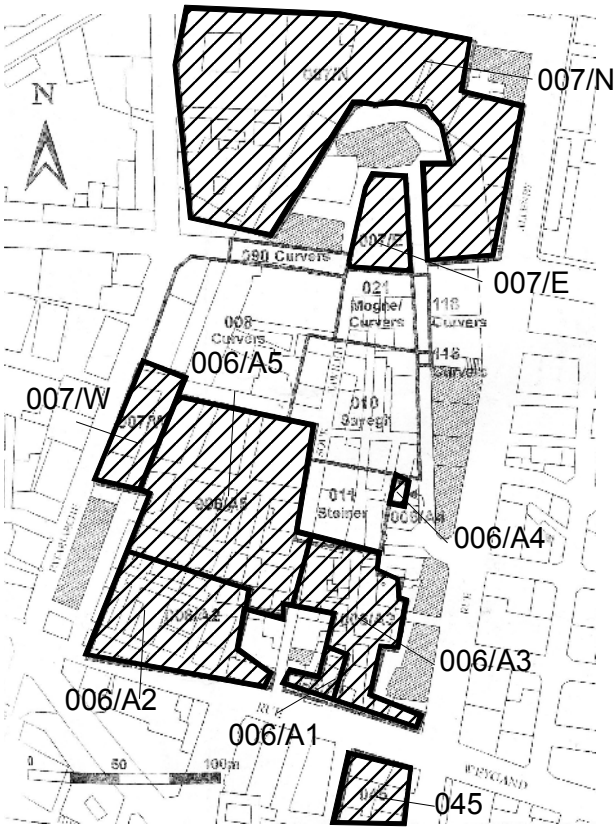

Figure 1.9 Beirut excavations (after Perring 2004, fig.1) with AUB/ACRE areas shaded

BEY006

This site was excavated in five areas (Figure 1.9) under a range of different conditions including controlled areas of detailed single context recording and watching brief areas, where archaeological remains were recorded rapidly as they were revealed by development work.

Area 1 was excavated in 1994 as a controlled small-scale excavation into medieval sequences, with stratigraphy going back to the Hellenistic period, with detailed environmental sampling (Perring 1999, 18-19).

Area 2 was an area of controlled excavation. A summary of part of this area has recently been produced by Perring (2003). This revealed some pre Hellenistic finds, but the first structural evidence came from the Seleucid period, when a rectangular street grid was developed, and extensive terracing was cut into the limestone promontory. The remains suggested the existence of a probable boundary ditch, a wall and some low status buildings that may have acted as shops (buildings 1, 2 and 3 in Figure 5.1). Some of the buildings were retained into the Roman period. The Roman period saw the area developed with the building of several courtyard house type blocks in addition to the continued use of the Hellenistic building (buildings 3 and 4 a-f, Figure 5.3), which were to undergo several phases of redevelopment. There was the construction of a colonnaded street with shop frontages in the second century AD (building 5 in Figure 5.5). A possible fuller's establishment was built in an adjacent *insula*. The area was developed into a large well appointed town house (the 'House of Fountains') in the Byzantine period (Building 6, Figure 5.5), which incorporated elements of buildings 3 and 4. The majority of the structures were destroyed in the mid sixth century, probably as a result of the AD 551 earthquake, although sporadic demolition and occupation continued in the later periods (Jidejian 1997, 167).

Area 3 was an area of controlled excavation revealing a large town house constructed in the Byzantine period, the 'House of the Peristyle Gardens' built on a series of dumps following disuse apparently before the AD 551 earthquake (D. Perring *Pers. comm*.).

Areas 4 and 5 were part of a series of watching brief areas where notable archaeological remains were recorded or excavated by keyhole sondages during the demolition work. The remains from these areas included the 'House of Jealousy', a large Byzantine townhouse with several mosaic floors. This was also destroyed in the AD 551 earthquake.

Initial analysis of the CBM from all periods of this site suggested it comprised imported rubble from external rubbish deposits that were used for levelling and makeup for subsequent building. However, a number of primary deposits were revealed, including several ovens using *tegulae* as bases for their construction, and *tegulae* used as drain capping. The majority of the structures excavated were of ashlar blocks, with bricks used for internal structures within the bathhouse; the majority of the CBM examined was roofing tile.

BEY007

The majority of this site comprised Ottoman and medieval features that had largely truncated the underlying periods. However some classical structures, including oven sequences and Hellenistic structures were located. The CBM was from makeup deposits for construction, but was also from dumping deposits, perhaps from adjacent structures (Seeden and Thorpe 1999; Thorpe 2002a).

BEY045

This area originally comprised a Bronze Age cemetery. An early Hellenistic cemetery was then built over by a Hellenistic building, possibly a gymnasium (Thorpe 2002b, 62). In the early Roman period this was replaced by a bathhouse that was then developed over a number of different phases of reconstruction. The original bathhouse seems to have been built in the first century, possibly as a result of Herodian patronage (Butcher and Thorpe 1997, .301). Later changes included the insertion of a new drain

complex and vaulting, and the infilling of cisterns with roofing rubble. It was rebuilt as an Imperial *Thermae* in the Hadrianic or Trajanic period and was further developed in the Severan and Byzantine periods. Parts of the bathhouse were apparently continuing as an Islamic *ham' am* in the early medieval period. (Thorpe 2002b; Thorpe 1998).

The CBM from this site was largely fragmentary from in-filled cisterns, presumably original roofing and hypocaust material dumped during reconstruction phases of the building. A number of *in situ* CBM features were recorded including the use of inverted *tegulae* to form a floor and the use of bricks in walls and hypocausts. The fifth-century rebuild used stamped bricks imported from Constantinople. (Thorpe 1998).

1.8 Conclusions

This chapter has given a brief overview of the potential that study of CBM has for an understanding of the ancient economy. Previous work suggests that the manufacture, transport and use of this material were the result of complex patterns.

It is suggested that a good way of utilising this potential is by the examination of CBM fabrics from systematically collected assemblages for which additional taphanomic data can be provided. Furthermore, the shipwreck evidence and previous petrological work indicates that there is a good case to be made to undertake additional scientific analysis of CBM fabrics to gain an idea of variations of supply to specific sites. The presence of tile cargos mixed with other products suggests a possible link with areas of ceramic production, over and beyond associations with agricultural products such as wine and fish sauce.