

Mobility, Meaning
and the
Transformations of Things

edited by

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Preface

Movements of things mark the relevance of material culture in shaping identities and negotiating cultural relations. Things move close to people, they recede or they create connections between people. With every shift, they change their role and meaning. People expend a great deal of energy and resources to bring things closer to them, but also to get rid of them. In some contexts, the value of an object is determined by the journey it has made before coming within one's reach. This book addresses a wide range of movements of things and the corresponding shifts in their valuation. It intends thereby to overcome the perception of objects as static and unchanging. It focuses on how the objects change through movements in time, space or social spheres.

Combining approaches from archaeology and social anthropology, this book amasses evidence of the variability of things in relation to their mobility. Avoiding the pitfalls of overemphasizing the agency of things, the different contributions reflect on the adequate metaphor to capture the transformations of things through their mobility, as well as the transformation of people through the acquisition and appropriation of things. All of the contributions share the assumption that a closer examination of the shifts of meanings, time and materiality, grants a deeper understanding of objects themselves.

The contributions to this book are based on presentations and discussions at a conference, held in October 2011, entitled 'Itineraries of the Material: Shifting Contexts of Value and Things in Time and Space' at the Goethe University in Frankfurt. The event was part of the scientific program of the Research Training Group 'Value and Equivalence' (GRK 1576). The publication of this book and the conference proceedings were supported by the German Research Foundation (DFG). We would like to express our gratitude to Robert Parkin and Björn Schipper for helping with the editing process. We also want to thank the anonymous referees whose close readings and trenchant advice have contributed substantially to the quality of the texts in this volume. Finally, we extend our sincere gratitude to all of the contributors to this publication.

The conference and this book bring together some accomplished and experienced researchers in the field of material culture and object biographies with the doctoral students of the Research Training Group that organized the event. We are pleased to have found common ground for a fruitful discussion, and to have established a high standard for communicating the range of studies and perspectives. The book presents the most compelling insights achieved through the conference, and we expect it to be an important contribution to the study of material culture.

*Hans Peter Hahn
Hadas Weiss*

Against the *throw-away-mentality*: The reuse of amphoras in ancient maritime transport

Selma Abdelhamid

Introduction

Three concepts are often evoked in discussions about ancient ship itineraries: travellers, ideas and objects. Of these three, the material objects are easiest to trace, even though they represent a particular challenge when they are removed from their cultural context and meaning. Setting aside the innumerable items that have disintegrated, those that have been preserved can be interpreted in various ways, though unfortunately, many shipwreck studies still rely on preconceived interpretations. The recovered objects are examined neither neutrally nor carefully, and choices in interpreting them are made much too soon.

Amphoras in particular are rarely questioned. They will therefore be taken as a prime example for discussion in this paper, partly because they occur frequently, but also because they sometimes followed multiple itineraries. This assumption might appear controversial, at least in Roman archaeology, since Monte Testaccio in Rome – a hill made of innumerable amphora sherds – as well as waste deposit studies have established the acceptability of a *throw-away-mentality* where antique amphoras are concerned. A further assumption is that these objects were conceived as transport containers for a specific purpose and became worthless once the journey was over, therefore experiencing a generalized and idealized history with a beginning and an ending. Yet, in light of the huge amount of amphora reuse attested in land excavations (e.g. Lawall 2000 for Classical Greece; Callender 1965, 23–36 and Peña 2007 for the Roman world), it becomes obvious that empty amphoras were not always regarded as useless in antiquity. From the moment they were produced, a long time could pass until they were finally discarded, recycled or lost.

There can be no doubt that the primary function of amphoras was their use in maritime transport (e.g. Twede 2002). It is therefore legitimate to ask whether they were reused for shipping before serving other purposes.

Careful examination reveals several indications of the reuse of amphoras within the maritime sphere, as I will demonstrate in the first part of this paper. I will then discuss the criteria indicating these situations before finally developing further theoretical thoughts about amphoras, their use and value.

The basic principles of the amphora trade

Antique amphoras differed greatly according to the area in which they were produced: not only did their type and size present distinctive features, so did the clay. We can therefore retrace the provenance of an amphora, if not to a single kiln, at least to a broader geographical area and culture. In the same way, it is possible to determine the period in which the amphora was produced because amphora morphology evolved with time. With regard to shipwrecks, an essential question to ask is whether the shipped amphoras form a typologically and chronologically homogeneous group. Indeed, it is to be expected of prime-use containers that they were made in the same place, filled, closed with a stopper often made of cork and covered with chalk or resin, and then shipped together. On the other hand, if the recovered amphoras appear heterogeneous, this suggests either that these jars were marketed following different and complex itineraries involving several stop-overs and diversifications of the cargo, or that they were reused and therefore responded to functional requirements, being incidentally collected, refilled, randomly stoppered and then distributed. Even though noted in the past, the reuse of amphoras has often been attributed to the storage methods of the crew, who had to stock the ship's supplies, as with an amphora that is supposed to have contained water on the Mazarrón-2 in Spain (Negueruela Martínez *et al.* 2004, 477, 480). However, the idea that jars could be reused as a commodity is often overlooked.

Empty amphoras were accorded a value. Ancient literary sources repeatedly show evidence of trade in empty containers, for instance, in Athens (Amyx 1958, 175–178). There are several examples of old and new empty jars being imported into Egypt, as demonstrated by the Ahiqar scrolls (Yardeni 1994; cf. Briant and Descat 1998, however, who stresses that these containers may not be amphoras). Furthermore, an ostrakon (O. Bodl. I 346) makes reference to Kolophonian amphoras being reused as containers for local wine (Kruit and Worp 2000, 82–83). There may also be evidence for Alexandria (Fraser 1972, 165–168). Last but not least, the often quoted passage in Herodotus, III. 6, even though it might not report a historical fact, confirms the realistic possibility of the collecting and refilling of amphoras in Egypt. However, as Lund (2004 211, note 1) points out, this may not be typical of the situation elsewhere. For the Roman world, Diocletian's price edict issued in the AD 301 (Peña 2007, 27 f.) states that the price of ceramic containers should be proportional to their capacity, ranging from 2 *denarii communes* for a small vessel of 2 *sextarii* (approximately 1.1 litres) to expensive 1,000 *denarii communes* for a large *dolium* of a capacity of perhaps 1,000 *sextarii*. Small amphoras referred to as *lagonae* with a volume of 24 *sextarii* cost 12 *denarii communes*. Compared with wine prices, it appears that the jar itself was valued at only 1% to 6% of its content. In addition, it has been suggested that some amphoras were exported to be filled elsewhere, for example, vessels traded in Lebanon (Mallowan 1939). It has also been argued that the kilns of El Rinconcillo near Algeciras provided the city of Baelo Claudia with amphoras and that a kiln in Los Matagallares supplied workshops in Almuñecar (Bernal Casasola 1999). Moreover, amphoras produced on Ebusus/Ibiza were used to carry Majorcan wine (Etienne 2006). Even shipwrecks may show traces of the transport of empty amphoras.

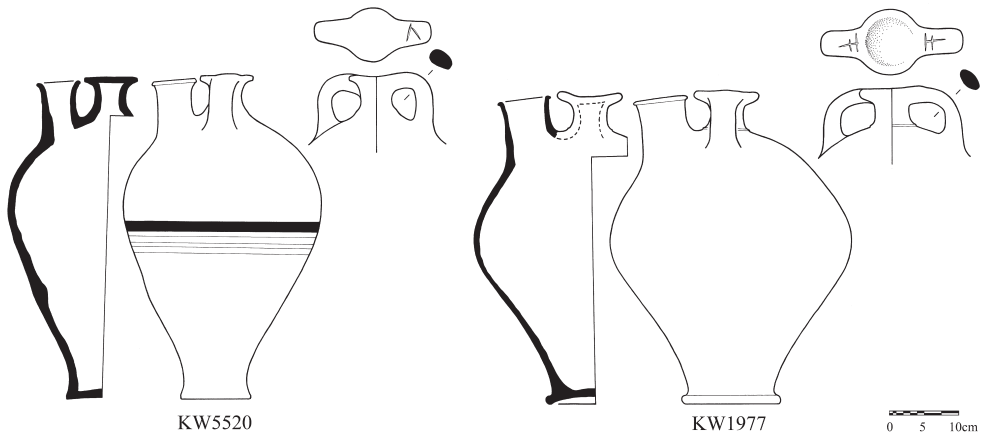


Figure 7.1. Marks applied on the handles of transport stirrup jars recovered from the Uluburun shipwreck are interpreted as signs for a previous diffusion by Cypriot merchants (Drawings by Doug Faulman and Julia Pfaff).

Amphoras reused in commerce: The evidence from underwater finds

In listing the known cases of amphora reuse in the widest possible range of shipping, my aim is not to point out similarities between cultures, practices and periods – specific amphora findings can only be considered within their cultural and chronological contexts. Nonetheless I would like to demonstrate the situations that may potentially arise on shipwrecks in order to broaden our perspective and discussions.¹

Already mentioned some 30 years ago (Haskell 1981, 236, footnote 35), the theme of the possible reuse of transport jars in the Bronze Age has subsequently been provided with fresh data. The *Uluburun* wreck, found in Turkey but probably sailing between the Levant and the Aegean around 1300 BC, was carrying a large amount of raw materials, as well as manufactured goods and some artefacts interpreted as personal possessions (e.g. Pulak 2010). A group of 18 Aegean stirrup jars from the LH/LMIIIA2 period was recovered showing use wear, suggesting that they had already been in use previously (Bachhuber 2006, 347). This is confirmed by the observation of marks applied after firing on the handles of four vessels, interpreted as indicating previous diffusion by Cypriot merchants (Hirschfeld 1993; 2001; Fig. 7.1). Moreover, the stirrup jars form a heterogeneous group, some of them having been produced in western Crete, others in the centre of the island (Ben-Shlomo *et al.* 2011, 339). In a broader sense, it should be noted that a wide range of vessels of multiple origins was in use (and some of them in re-use) in the Eastern Mediterranean during Late Bronze Age, including Aegean stirrup jars, short-necked amphoras, Cypriot pithoi, Canaanite and Egyptian vessels (e.g. Day *et al.* 2011).

A varied picture is also provided by the *Giglio* wreck, which sank off the Tuscan coast around 600 BC. Amphora contents revealed the probable reuse of more than

130 vessels (Bound 1991). The majority are identified as having been produced in the Etruscan sphere and can be divided roughly into a flat-bottomed and a round-bottomed amphora type. They contained a large quantity of olives, pitch and maybe wine. Probably they were all coated with resin or pitch, which was usually done to make them impermeable while holding wine or fish conserves but is rather surprising in this context, since coating was even observed on amphoras proved to have held up to 70% of pitch. The hypothesis of their reuse is reinforced by the broad variety of fabrics, rim profiles, proportions and capacities. Besides, two amphoras showed “deep scratch marks that had been worn smooth well before the ship sank” (ibid., 24).

On the 7th–6th c. BC **Coltellozzo** A wreck near Nora, at least one amphora had been mended, indicating previous use (Parker 1992, 151–152). Moreover, a group of Punic amphoras belonging to the Bartoloni B, C and D forms were found to contain animal bones, mostly of lambs or sheep, again suggesting their reuse (Lawall 2011b, 30, footnote 31).

Rare contents are also attested on a shipwreck at **Tektaş Burnu** in Turkey, dated to around 425–400 BC (Carlson 2003). Indeed, nine Mendean amphoras were found to be filled with pitch. A further amphora of the same type and a pseudo-Samian jar revealed a large quantity of cattle bones. Pitch residues on the inside of the Mendean amphora led Carlson (2003) to suggest its having been formerly lined with pitch, inducing a secondary use for at least this amphora. However, it is possible that all the Mendean amphoras, which are generally thought to be wine containers, were being reused here. Yet the question should be raised whether at least the meat could be interpreted as the crew’s provisions. The author argues against this on the basis that Athenaeus (*Deipn.* i 27. e) reports the importation of Thessalian beef in classical Athens, proving meat to have been a trading good. This amphora would then have been re-employed for commercial use. Additional indications of the reuse of jars on this shipwreck are the differences in dating certain vessels, in particular two Chian bulbous-necked amphoras dated respectively to 450–440 and 440–430/25 BC, as well as two Samian amphoras of types dated to within 20 to 25 years’ time difference, indicating a long period of use and reuse and/or a temporary interruption and revival of trade.

A much shorter but still notable difference in dating has been reported for amphoras from the **Kyrenia** shipwreck, which sank off Cyprus in the 4th c. BC (Swiny and Katzev 1973). The stamps of the c. 345 Rhodian amphoras refer to four different years. Holes and important use-wear such as “completely worn off rims, worn down handle breaks, etc.” (Lawall 2011a, 44) clearly reveal their reuse (Fig. 7.2). The same can be stated for other amphora types carried by this ship (ibid.).

As well as being dated to the 4th c. BC, the *El Sec* shipwreck is located in the mouth of Palma bay on Majorca. Although there might have been more than one wreck on the site, if all the amphoras belonged to the same ship, their great diversity of types, origins and above all dating, in combination with *graffiti*, suggests that they were reused (Lawall 2011b, 30–31).

Concerning the 2nd c. BC **Heliopolis II** wreck found in the south of France, Lawall reports “Graeco-Italic amphorae of a wide range of dates [with] missing handles and toes [...] and all filled with resin” (Lawall 2011b, 31, footnote 31), this indicating their reuse.

The same rare content was noted for the Lamboglia 2 amphoras on the nearby **Sud-Caveaux 1** wreck (Long and Delauze 1996). These amphoras from the end of the 2nd–1st

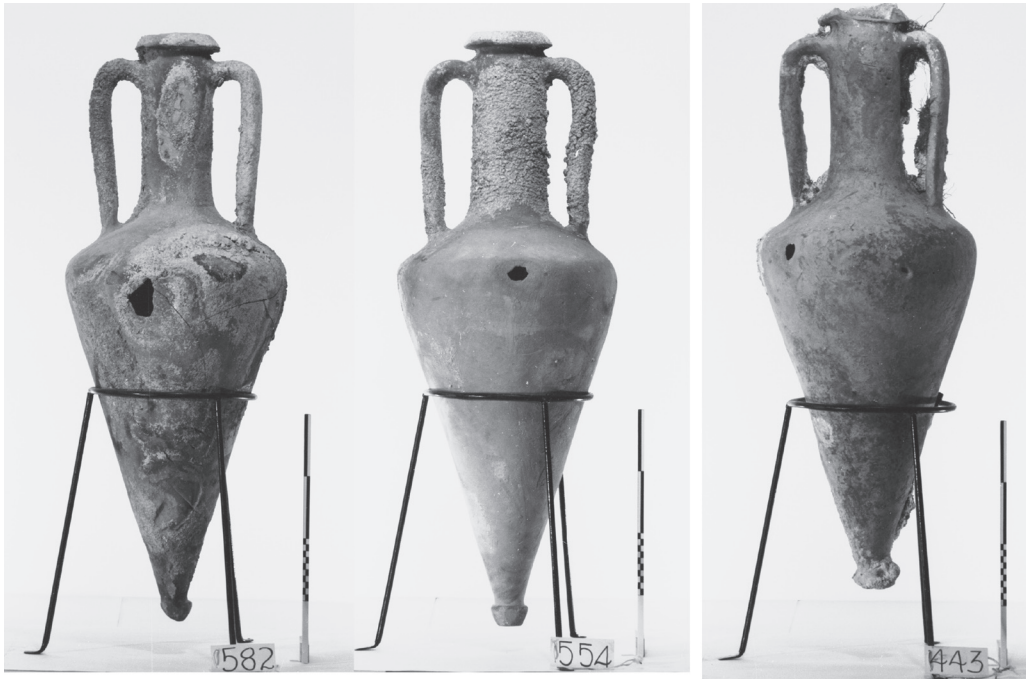


Figure 7.2. Use-wear and holes indicate that amphorae aboard the *Kyrenia* ship had already been used on a previous journey (Photo by S. W. Katzev).

c. BC often held wine and were attested as a complementary cargo. In this case, however, they seemed to have constituted the main freight and are proved to have contained resin.

A Brindisi-type amphora found on the *Maire A* site next to Marseille held **pozzolana** (Benoît 1956, 25, fig. 2, 28.), volcanic ash which was widely employed in building. However, it is difficult to imagine how these could be useful on a ship, except maybe as ballast. Another surprising aspect is the 3×1 cm rectangular stamp on one handle, which seemed to have been erased. In addition, the original closure was apparently missing, having been replaced by a stopper carved out of an amphora sherd.

A similar situation may occur in Pisa on the late-Augustan wreck *San Rossore B*, which was loaded with Dressel 6A and Lamboglia 2 amphorae containing various substances (Bruni 2000). Besides volcanic sand, arsenic sulphide and red ochre, an assortment of fruits like peaches, plums and cherries were also found, as well as hazelnuts and chestnuts. These might, however, be the crew's supplies, not exchange goods.

Culip IV or Culip D, a ship sunk off the Spanish coast in Vespasian times, contained 76 Dressel 20 amphorae, which were suggested as having been filled with oil (Nieto Prieto *et al.* 1989, 59–83). Most interesting from our perspective are the great diversity of the 22 stamps that have been identified, as well as the rough-fitting stoppers made of amphora sherds, which were observed on about half of the amphorae. The excavators stress that they could not detect any traces of pozzolana, suggesting that the stoppers



Figure 7.3. The solid content consisting of scales and fishbones revealed that the amphoras of the Grado shipwreck did not hold oil, as expected, but preserved sardines (Photo by courtesy of R. Auriemma).

would not have been airtight. As oil rapidly goes rancid in contact with the air, they suggest that this oil could have been intended for the production of other goods, for instance, cosmetics.

The best example for Roman times is probably the shipwreck found near **Grado** in the Adriatic Sea, which sank in the early to mid-2nd century AD (Auriemma 2000). It was loaded with approximately 350 amphoras, of which more than 200 belonged to the African I type, which is largely attested as an oil container, but in Grado scales and fish bones revealed the presence of preserved sardines (Fig. 7.3). The amphora stoppers were carved out of the same amphoteric material, probably being made of containers broken during a previous trip. Similar phenomena were observed for c. 20 Tripolitanian I amphoras, also known as oil containers but here filled with mackerel, and Aegean-type wine amphoras containing sardines.

Dated slightly later, the **Procchio** wreck on the island of Elba also contained

amphoras amongst which stand out African IA specimens containing fig seeds. An additional amphora of the same type held an unidentified yellow liquid (Zecchini 1982, 162–166).

Similar vessel types were retrieved from the **Plemmirio B** shipwreck off the Sicilian coast, dated to AD 200 (Gibbins and Parker 1986, 279, 290). African IIA amphoras and a single pear-shaped Mauretanian amphora, though usually considered oil containers, were in this case found to be lined on the inside, perhaps having been subjected to secondary refilling.

The **Cabrera III** shipwreck off Majorca, dated to the middle of the 3rd c. AD, carried at least 124 amphoras which could be categorised into nine classes, among them 32 African II amphoras. The latter surprisingly turned out to belong to the African IIA, IIC and IID types, that is, to distinct categories which are usually assumed to have a different chronology (Bost *et al.* 1992, 137–144). The fabrics were similarly heterogeneous, and 13 of these amphoras presented distinct stamps, thus suggesting their production in different workshops. All amphoras were lined with pitch; two contained fish residues and two others olive pits, indicating that they had probably been collected on the Iberian Peninsula and refilled with local products.

Heterogeneous material is also revealed by the **Dor D** shipwreck found near the southern end of Mount Carmel and dated to the last quarter of the 6th c. AD (Kingsley 2003a; 2003b). Of 749 recovered amphora fragments, 89% were bag-shaped

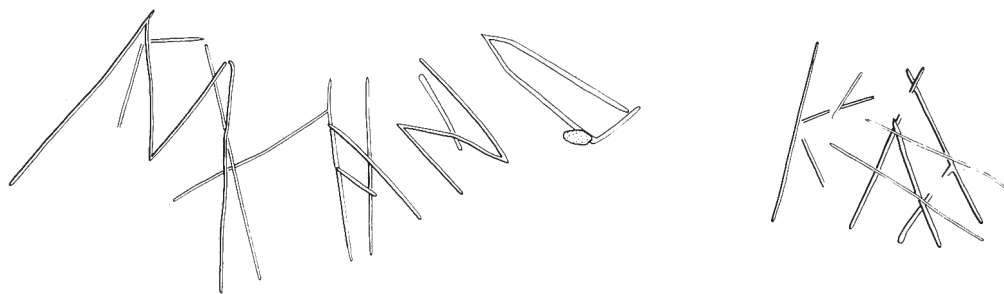


Figure 7.4. Some amphoras recovered from the *Yassiada* shipwreck show overwritten and scratched out graffiti. © Institute of Nautical Archaeology

LR 5 amphoras, including three subtypes and five different clay fabrics. Petrological evidence of domestic wares, tiles and ballast stones indicates that the ship started from or went via Cyprus. All the amphoras were lined with pitch, and grape seeds found in the resin of LR 5 specimens suggest that they had at one time been filled with wine. On basis of their heterogeneity and five tons of ballast stones intended to increase the cargo's weight, Kingsley proposes the rather unconvincing hypothesis that the ship was freighted with empty amphoras produced in several parts of southern Palestine that were destined to be returned and refilled or sold there. He supports this thesis by noting the strong consumer demand for the wine of the Holy Land in times of economic decline. Although we cannot exclude the possibility that other goods had been carried in these amphoras, their reuse seems certain. An additional indication is provided by an LR 5 vessel on which a lead plug was found closing an opening which could have served to release fermentation gas (Kingsley 2003b, 128) or to pour out the liquid the vessel contained (Adan-Bayewitz 1986, 92–97).

Only a few decades later, around 600–625 AD, the *Saint-Gervais 2* shipwreck sank in the south of France. Amphoras found in the aft of the ship contained pitch, which Parker (1992, 372–373) interprets as a local product of southwest Gaul.

The most obvious evidence comes from the Turkish coast. A 7th c. AD shipwreck found in *Yassiada* had more than 800 amphoras loaded, of which 719 belonged to globular types, with four main classes and various subtypes, some of the latter being dated considerably earlier than the rest (van Doorninck 1989). Examining these amphoras, more than 100 graffiti applied after firing were discovered, the overwhelming majority of them on globular amphora subtypes. Some pieces even had two to four graffiti. These inscriptions were identified as owners' names, digits, content indicators and sometimes allusions to the Christian religion. In several cases, graffiti were scratched out and overwritten, attesting to a change of ownership or content (Fig. 7.4). On the ship's last voyage, a majority of the amphoras were carrying wine; some, olive oil; and a few, sweet liturgical oil. The more recently made globular amphoras had precision-made mouths that accommodated bark stoppers of standardized sizes. The remaining amphoras with less precisely made mouths had stoppers made of rounded sherds. The more recently made globular amphoras provide a unique testimony for amphoras

being made for multiple use as military transport jars. In a soon to be published paper, van Doorninck (in press) rejects the thesis of a commercial voyage: referring to the war between the Byzantine Empire and Persia from 603 to 628, he postulates a church ship transporting emergency supplies of wine and olive oil, most probably in the summer of 626, to troops then campaigning against the Persians in the East.

A shipwreck sunk around 1025 in *Serçe Limanı* off southern Anatolia provided similar evidence (van Doorninck 1989; Bass *et al.* 2009, 3–4). It was carrying a total of 104 Byzantine amphoras varying in type and capacity. Most of them had *graffiti*, many two to five *graffiti*. A majority of the *graffiti* have been interpreted as being the marks of at least twelve owners and of makers of the jars. In addition, more than half of the amphoras had been damaged before this ship sailed. Even though surface erosion and discoloration often occur after the jar's recovery, van Doorninck was able to make out five jars with surfaces showing wear prior to sinking, in particular at the maximum body diameter, thus inducing that these amphoras had at some time been transported in an upright position while touching other jars. In some cases, ridges had been completely worn away, which suggests that they had been transported several times. In addition, more than 50 jars had been damaged by previous stopper removal or by blows. In some instances, complete rims, necks or handles broke away (Fig. 7.5). Remaining rim parts or handle stubs were then carved smooth in order to prevent further tear. Supplementary



Figure 7.5. Like several jars, an amphora retrieved from *Serçe Limanı* had lost its neck prior to the ship's wreckage. © Institute of Nautical Archaeology

maintenance work is seen in the repair of a hole, which had its edges carved down and was then mended with a pitch plug. The fact that three severely damaged amphoras were found together at the stern might be an indication for their separate function, which might not have been transport. It is indeed difficult to imagine how jars without neck were used for carriage, whether they were closed or not. Significantly, a considerable amount of glass cullet was also on board, demonstrating a general awareness of material exploitation and recycling. Van Doorninck further points at piriform amphoras like those on the wreck recovered from other underwater sites, and which are on display in museums in Athens, Sozopol, Varna, Constanța, Bodrum, Çanakkale, Istanbul, Amasya and Taşucu. They particularly often show use wear, which leads him to the conclusion that such amphoras were widely reused for transport, maybe in a period in which they had, for reasons not yet entirely clear, become more expensive (F. H. van Doorninck, Jr., personal communication).

Clues to recognizing reused amphoras

As these examples demonstrate, amphora reuse is in some cases obvious, in others more difficult to discern. It is not revealed by recurrent features (see Table 7.1, which lists the observations I could find concerning the amphoras retrieved from the wrecks cited above).

First of all comes the often reported unusual content. But can we always determine what is usual content and what is not? And can we know for sure what the amphoras we find in wrecks actually contained? Generally speaking, it can be stated that Roman

	Uluburun	Giglio	Coltellazzo A	Tektaş Burnu	Kyrenia	El Sec	Heliopolis	Sud-Caveaux 1	Maire A	San Rossore B	Culip IV	Grado	Procchio	Plemmino B	Cabrera III	Dor D	St-Gervais	Yassı Ada	Serce Limani
Unusual content																			
Heterogeneity of types																			
Use-wear																			
Applied marks/indications																			
Heterogeneity in dating																			
Surface treatment																			
Repair																			
Replacement of stoppers																			
Heterogeneity of stamps																			
Removal of indications																			

Table 7.1. Amphora properties cited in the respective publications.

archaeologists tend to link particular contents with specific amphoras – which is sometimes convincingly demonstrated, as for certain African types (Bonifay 2007). Hellenists, though, are more inclined to the *multi-use view*, which is “supported by the presence of pitch lining amphora shapes traditionally associated with oil [and] both by the rarity of multiple shapes from a single production area despite textual and other evidence for diverse crop production [...] and by descriptions of primary-use contents from Hellenistic papyri” (Lawall 2011a, 43). Probably neither of these positions is adequate on their own. Precise reconstruction of the contents, however, is anything but easy. Physical remains might give some indications, for instance, olive pits or nuts, even though these solid elements have a greater chance of being preserved and might be misleading as reflecting a numerical bias. Further clues are how the amphora has been treated, such as a resin or pitch coating applied on the inner side of wine and fish containers to make them impermeable to water (e.g. Jackson 2008 [1994], 4) and the marks applied, in combination with knowledge drawn from ancient written sources (Lund 2004, 212). In the absence of physical residues, however, it is hard to determine whether the amphora surface treatment corresponds to the actual voyage or whether the vessel was reused. In cases of doubt, excavation reports remain hopelessly similar, as shown by a review of 27 journal articles published between 1946 and 2011 referring to 5,549 Greek amphoras dated from the 5th to 3rd c. BC (Foley *et al.* 2012, 391). In 95% of these cases, the authors assumed that the amphoras contained wine, probably because they were repeating a commonly held belief and neither critically observing nor questioning the facts. In recent years, however, molecular methods have been developed that can detect ancient DNA enclosed in the clay of jars preserved under water, thus revealing the former contents of empty vessels (Hansson and Foley 2008). The presence of multiple substances can be attested within the same containers, which is interpreted either as proof of the transport of products made from several ingredients, and/or an indication of the reuse of these amphoras for the consecutive carriage of different goods.

It is much easier to recognize a reused amphora by marks due to use-wear: altered rims and handles, as well as surface abrasions testify to intensive manipulation, an impression confirmed when sharp edges prove to have been deliberately smoothed. Definitive proof is provided when scratch marks on the inside of amphora necks indicate stopper removal.

Precious clues are also given by amphora surface treatment, like coating of the inside, which strikes one in some instances as unnecessary, as shown by the lined pitch-carrying amphoras recovered from the Giglio wreck. Further indications are marks referring to previous marketing activity and *graffiti* and *tituli picti* attesting to a previous owner, the contents or an earlier storage situation. After studying *dipinti* on amphoras recovered from Pompeii, Elizabeth Lyding Will (2001) suggested that these were applied only in the case of amphora reuse. Indeed, she assumes that amphora contents were standardized and are normally deducible from the vessel type; exceptions therefore have to be pointed out (*ibid.*). The presence of marks should nonetheless draw our attention to possible reuse. Most obvious cases show multiple indications testifying to repeated amphora manipulation and different goods being carried. In the same way, the removal or invalidation of applied indications may indicate that a vessel has been

reused. This is seen when a stamp has been erased, as in Maïre A, or *graffiti* scratched out and overwritten, as in the case of the Yassiada amphoras.

A further valid indicator, within the amphora cargo, is the wide heterogeneity of types, fabrics, stamps, provenances, proportions, capacities and dates, above all when a similar content is attested. In recent years, the importance of stopovers has won growing recognition, establishing the idea that amphoras might pass through several harbours and that a merchant's cargoes might therefore consist of many different items. However, particularly heterogeneous cargoes, above all with amphoras differing in dates and those showing several of the characteristics mentioned above, are likely to contain reused vessels.

Similarly traces of repair might indicate a secondary context, as was shown in the case of the mended amphoras recovered at Coltellazzo, Dor and Serçe Limanı. This is particularly interesting because flawed containers – for example, those holed to take out the content (e.g. Bonifay 2004, 467–468; Adan-Bayewitz 1986, 92, 98) – were thought to have been considered less useful and more likely to be hacked to pieces and employed for building or other purposes than maritime trade. Nevertheless, repair might be a marginal phenomenon occurring in specific regions or at times of material scarcity.

Equally obvious is the replacement of original stoppers. These amphora closures were quite standardized and are almost exclusively known from underwater contexts, as amphoras lost at sea often had their closures preserved. In the Roman world, for instance, most stoppers were made of cork and recovered with **chalk**, on which a stamp was sometimes impressed (Hesnard and Gianfrotta 1989). Improvised stoppers, however, were often made of locally available material, like sherds of broken amphoras, as can be observed at Maïre A, Grado, Culip IV and Yassiada. These sherds were roughly carved into round shapes and therefore loose-fitting, the gaps sometimes being filled with **plaster**. Probably can we deduce similar phenomena for the stoppers improvised on ships, though the absence of pozzolana or chalk stressed by the excavators of Culip IV might be an exception. Thomas and Tomber (2006) list diverse stopper types with particular reference to Egypt and the reuse of amphoras in Berenike.

If all the points previously cited also apply to a limited number of amphoras possibly reused by a ship's crew, the quantity of relevant items is determinant in inferring a whole cargo and therefore a commercial or exchange background.

When the reuse situation is clearly demonstrated, further items found on the shipwreck can help the interpretation, among them the goods being carried and the historical background. Indeed, a general awareness of material use-value is to be expected on a ship loaded with other recyclable or processable items, for instance, raw glass as found on the wrecks at Uluburun and Serçe Limanı. The historical or economic background, on the other hand, might help us understand extreme forms of reuse, as mentioned for the ships at Yassiada and Serçe Limanı, which in the one case is thought to have been at sea engaged in a military supply operation and in the other case engaged in small-scale commerce (van Doorninck 2002), in which sometimes severely damaged vessels continued to be employed.

The industry of reused amphoras: Conditions and motivation

Why were amphoras reused, and how was this achieved in practice? In fact, amphoras, when reused on a grand scale, could not simply be gathered up and refilled: their reuse involved a complex organization and the availability of a sufficient quantity of containers. Also labour was necessary to collect, clean and refill the vessels, as well as working and storage areas. Such places have probably been identified in Pompeian houses, where several amphoras were found stacked or leaning against walls in inverted, upright positions, probably for drying after being cleaned (Curtis 1979; Jashemsky 1967). Furthermore, amphoras were not necessarily in possession of the person using them: one cannot exclude the possibility that they were rented as is related in the Procheiros Nomos, a text issued 907 AD (Gofas 2002, 1101) and which penalises that one who rents flawed and leaky wine jars (Procheiros Nomos chapter 17, paragraph 14; Freshfield 1928, 99).

Regarding the shipwrecks mentioned above, the motivation for reusing amphoras was probably practical and/or financial. Often locally processed goods, for example, the fish conserves in Grado, were put into amphoras available in the vicinity that had probably formerly been imported into the area: maybe was there no specific amphora production, or collecting and refilling were considered cheaper or easier. A further reason could be that the local clay did not allow the production of high-quality containers, in particular in Egypt. In the case of institutions, as van Doorninck suggested for the church, a single owner and circuit could appear as a plausible explanation for reuse. In addition, historical events, like wars or other times of crisis, might reduce amphora production and force merchants to reuse old vessels. Custom, finally, should not be forgotten – at some periods, use of amphoras might have decreased in favour of other containers, such as barrels or animal skins, making amphoras and potters less available.

It is very difficult to estimate the frequency of amphora reuse, which must be specific to periods and regions. It might, however, have taken place much more often than we suppose. The Pompeian workshops cited above provide clear evidence of a region and period for which amphora reuse had been largely excluded on the basis of the high degree of commercial activity and production.

Conclusion

All these examples demonstrate that empty amphoras were regarded as valuable. The flawed containers repaired with plugs and those which were simply reused in spite of missing parts are most appealing. At that moment, only bare functionality was important, and it was acceptable to reuse an old vessel rather than obtain a new one. Moreover, a possible sign of value could be seen in the owner *graffiti* and *tituli picti* stamped on the amphoras when their commercial circulation was temporarily interrupted; however, this might rather relate to the goods contained in the amphora rather than the amphora itself. In addition, with regard to the Dor D shipwreck it has been suggested that empty amphoras were subject to trade. Thus is there always an initial content to look for? In the ongoing debate, Katzev raised an interesting point by

demonstrating by experimental means that empty amphoras do not rest on the seabed but always rise to the surface (see Lawall 2011a, 44).

The significance of amphoras in particular is seen in their retention for multiple journeys. Itineraries are recorded in commercial signs or toll marks, which mostly refer to the contents. It should not be forgotten, however, that travelling amphoras and objects in general were not necessarily linked with commerce: gift exchange or institutional transfers still remain options. When tending towards a commercial interpretation, however, an amphora reused in shipping is a commodity according to Kopytoff's definition: "a thing that has use value and that can be exchanged in a discrete transaction for a counterpart, the very fact of exchange indicating that the counterpart has, in the immediate context, an equivalent value" (Kopytoff 1986, 68). Most of the time involving amphoras and their contents, this equivalent had to compensate for these two values combined. Shipwrecks directly attest to the moment of actual exchange, in this case revealing complex and multilayered amphora itineraries: amphoras crossed not only geographical space but also time. They changed owners and contents, deteriorated, were repaired and modified. In the end, this also meant undergoing certain transformations. These are all aspects we have to keep in mind when recovering amphoras, whether from shipwrecks or land excavations. Linear and simplistic interpretations certainly do not do justice to such multifaceted objects.

It is essential to look carefully at objects retrieved from underwater contexts. The systematic listing of observations made about the reused amphoras cited in this article (see Table 7.1) reveals that the most often reported element is the unusual content, followed by the heterogeneity of amphora types, use-wear and applied marks and indications. The combination of two or more features allows one to argue strongly for a reuse situation. Furthermore, negligence may also have concealed additional examples of reused amphoras. The systematic reconsideration of previously recovered jars could probably yield more evidence, as van Doorninck suggested with regard to the Bodrum museum. A larger amount of data could help determine recurrent features to demonstrate the increased reuse of certain amphora types at specific places or periods, for the transport of given goods or on restricted categories of ships. Only in this way will it be possible to determine to what extent amphora reuse was a more general practice, or, on the contrary, a truly marginal phenomenon. As a first step, however, preconceived interpretations must be set aside because, before intensive reflection can take place, an unlimited number of possibilities can apply to the jars recovered from a shipwreck. A crucial point, for instance, is the contents. Very often, only a few items of each amphora type are recovered from a site, similar contents and properties being deduced for all the others. This problem has to be addressed by, for example, introducing systematic sampling. In the same way, we should not be influenced by other cultures and spheres. The possibly rare reuse of amphoras in Imperial Italy does not signify that reuse was rare in Late Antique Italy, Classical Greece or Bronze Age Egypt: archaeologists might tend to generalise too much. This is not only valid for amphoras – presented here as particularly appealing cases – but for every other kind of cargo, and even the ships themselves, which in the past have attributed vague concepts such as *identity*. Already begun, the deconstruction of these meanings, which make no sense in maritime archaeology, must be continued in the future.

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Note

- 1 Peña (2007) also mentions some shipwrecks containing reused material in his exhaustive publication on Roman pottery. This list is here extended and completed.

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