

CHICKEN OR EGG? RETHINKING THE RELATIONSHIP BETWEEN THE SILVER AND TINNED CERAMIC VESSEL ASSEMBLAGES

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Since the 1960s, when the existence of tinned ceramic vessels in the Late Bronze Age Aegean was first recognised, our knowledge of this phenomenon and the catalogue of known examples have expanded significantly. Even before the nature of these objects was fully understood, scholars had suggested that their primary purpose was to imitate metal, particularly silver, vessels. Several silver vessel assemblages, including one from the tholos at Kokla, have been singled out for their perceived special relationship with tinned ceramics. However, closer analysis of tinned vessels has suggested that they were less similar to silver vessels than previously thought, especially in terms of their range of forms, details of shape and even colour. Recent scholarship has also emphasised that the concept of imitation is very complex and its investigation requires a more nuanced approach. Yet references to tinned vessels as straightforward imitations of, or even substitutes for, silver vessels remain common. In 2014, an opportunity arose to examine the Kokla silver vessels in greater detail. A strong connection between the Kokla group and tinned vessels is evident, although this does not mean that the latter depended upon assemblages such as the former for inspiration. The unique features of the Kokla group suggest it may have been a local innovation to emulate the usage of tinned vessels while simultaneously stressing the higher social status of its users. This paper concludes that situating tinned vessels within the ceramic tradition and thus regarding them as an enhanced form of ceramic, rather than an inferior form of metal vessel, better explains the nature of this phenomenon.

INTRODUCTION

Tinned ceramics¹ have been found in many places around the Aegean, including Crete, the Greek mainland and Rhodes. They are simply ceramic pots originally covered with a thin layer of tin. Tinned vessels have generally been considered a Mycenaean phenomenon (Driessen and MacDonald 1984, 66; Popham et al. 1984, 301 n. 23; Godart and Tzedakis 1992, 91), although recent evidence may indicate that such a conclusion was premature. Many scholars still connect them with the period of Late Helladic (LH) IIIA1 (Rutter 2010, 418; Davis, Bennet, and Shelmerdine 1999, 447). This is probably because when the earliest in-depth analysis of the phenomenon was published (Immerwahr 1966), almost all known examples were contemporary with that period. However, further finds have demonstrated that their chronological range was much wider than previously suspected; the earliest context in which a tinned vessel has been recovered dated to Middle Minoan (MM) II–III (Alberti 2001, 185), and they have also appeared in Late Minoan (LM)/LH IIIB contexts.

Initially the consensus interpretation regarded tinned vessels as imitations of silver vessels. Work by Gillis on tinning undermined many arguments used to support this hypothesis, yet somehow it has remained the dominant explanation for their existence. Why is this problematic? As well as affecting the interpretation of the role of tinned ceramics in Late Bronze Age Aegean societies, it has also impacted upon analysis of the contemporary silver vessel assemblage. Metalwork, due to its convertibility, is under-represented in the archaeological record (Wiener 1991, 326; Aulsebrook 2017). The majority of precious metal vessels found in well-dated contexts on the Greek mainland come from the Mycenae shaft graves (Aulsebrook 2012; Karo 1930; Mylonas 1972–3). Given the relative scarcity of silver vessels, and metal vessels more generally, after LH I

¹ Also called ‘Tin-coated Ware’ (Hatzaki 2007).

scholars have looked for alternative ways to study them; therefore, the presumed link between tinned and silver vessels has been used to justify applying observations concerning the former to the latter. This has been especially significant for the interpretation of silver vessel assemblages, which are exceedingly rare.

One of these silver vessel assemblages comes from the Kokla tholos tomb (Demakopoulou 1990; 1993; 1997). During 2014 the metal vessels from Kokla were undergoing conservation at the Athens National Museum and I was granted access to examine them.² As the least well studied of the three post-LH I silver vessel assemblages that have been specifically linked by scholars to tinned ceramics,³ insights gained from the analysis of the Kokla group should help clarify the relationship between tinned and silver vessels. This paper begins with an examination of the evidence concerning tinned ceramics. It then discusses the relationship between silver and tinned vessels, the silver vessel assemblages and the significance of the data from Kokla. A list of sites from which tinned vessels have been recovered and a catalogue of individually published tinned vessels are given in the Appendix, within which detailed reference citations are provided.

THE PHENOMENON OF TINNED CERAMICS

There was much speculation on the nature of this distinctive surface treatment before scientific analysis provided an answer. Evans described it as a ‘curious dark varnish’ that ‘may have been intended to produce the illusion of metal work for funereal show’ (Evans 1905, 515). Furumark called it a ‘special kind of surface treatment . . . a coating of an unfixed pigment of greyish colour applied, as it seems, *after* the firing’ (Furumark 1972a, 12).⁴ Immerwahr carried out the first systematic investigation, after more examples came to light at the Athenian Agora excavations, and conclusively demonstrated that these ceramics had been originally covered with tin (Immerwahr 1966).⁵

Identifying tinned ceramic is not a straightforward task. In the cold atmosphere of tombs the foil suffers from an affliction known as ‘tin pest’, a process of oxidation that causes the tin to become powdery and flake away (Gillis 1997, 134; Cardarelli 2008, 204; Noll and Heimann 2016, 194). When excavated, tinned pottery usually has a smattering of small irregular grey-black spots, which can be mistaken for some form of dirt. It can easily be overlooked, and in some cases traces have only been recognised during a later re-examination of sherds (Immerwahr 1966, 395; Alberti 2001);⁶ therefore, it is likely that further unidentified tinned ceramics from older excavations are still awaiting discovery (Gillis 2000, 232). Tin readily dissolves in hydrochloric acid, which was often used to clean sherds (Farnsworth 1966, 396).⁷ The colour of the traces

² I would like to thank Dr K. Demakopoulou, who very kindly granted permission for me to study the Kokla metal vessels, and the staff of the Athens National Museum for their help during my visit.

³ The others are from Dendra Chamber Tomb 10 (Persson 1942) and the South House at Knossos (Mountjoy 2003).

⁴ Emphasis originally in the text. For a detailed history of the reaction of earlier excavators to tinning see Immerwahr 1966, 382–3.

⁵ The analysis of two sherds from the Athenian Agora tombs suggested the supplementary usage of tin-lead foils (Noll, Holm and Born 1980, 35–7; Noll and Heimann 2016, 194–5), although they have not been identified in any subsequent analyses.

⁶ This can happen even when the ceramics were otherwise well published. For example, Carl Blegen did not mention the clearly visible traces of tinning on vessels found at Prosymna or Pylos, despite the fact that his close collaborator, Alan Wace, had published similar vessels from Mycenae and had also discussed them at some length (Wace 1932).

⁷ See Popham and Catling 1974, 208 n. 9, where reference is made to a tinned kylix found in the Unexplored Mansion at Knossos that was mistakenly placed in an acid bath. A diluted preparation may cause the tin to hydrolyse and later dry to become tin oxide, but this process would remove other impurities originally present in the foil (Farnsworth 1966, 396); this hypothesis has been disputed by another research group (Noll and Heimann 2016, 193).

can vary from brown (Dimaki and Parageorgiou 2015, 854) to a thin black-grey layer over a white substance (Immerwahr 1966, 382),⁸ and even green to blue (Popham and Catling 1974, 209). Taking these factors into consideration, it is possible that the phenomenon of tinning ceramics may have been significantly more common and widespread than current evidence suggests.⁹

Research has taken place to determine how the tin coating was applied. Experiments have demonstrated that a similar effect can be produced by spreading a protein-based glue on the surface, and then dipping the entire vessel into molten tin (Holmberg, K. 1983, 384; Mountjoy 1993, 66). The use of this method would explain why the underside of the base was sometimes coated, even on closed shapes (Mountjoy 1996, 54–5).¹⁰ However, close examination of the surface of some sherds from Asine showed wrinkles that were comparable to those produced from overlapping strips of tin foil (Gillis 1991–2, 27). The use of tin foil in elongated strips was also argued for by Pantelidou (1971, 435; 1975, 173), due to her observation of grooves visible in the coating on a kylix from an Athenian tomb. Furthermore, the tin had flaked away from the ceramic surface in a way that only happens when tin has been made into foil (Gillis 1991–2, 28; Gillis and Bohm 1994, 219–20). Similar findings were reported by another research group (Noll, Holm and Born 1980, 30; Noll and Heimann 2016, 193). The foil may have been extended onto the base in order to create a neater effect (Gillis 1994, 58).

During a series of experiments to test various methods of applying the tin coating, only the use of foil consistently produced a shiny, smooth and even surface (Gillis 1994, 57).¹¹ Analysis of the underside of the coating suggested a binder was used, most probably colophony (pine resin) (Gillis 1994, 61; 1995, 36).¹² The binder would have secured the foil in place and filled in defects in the ceramic surface to produce a more even finish (Gillis 1994, 58). Applying the foil in strips would have been time-consuming and particularly difficult where the surface morphology was complicated, for example near and on the handles (Mountjoy 1995, 31).¹³ The binder would have mitigated this problem to some extent (Gillis 1994, 58). On the other hand, less tin would have been required than that needed for a molten tin bath. Although the majority of the evidence points towards the use of foil, it is possible that different workshops utilised either technique or a combination of both.¹⁴

A series of analyses demonstrated that the tin used on some vessels from Asine had undergone a specific heat treatment, which caused it to oxidise to a golden colour (Gillis 1991–2, 28; Gillis and

⁸ In this case the dark layer is SnO and the white layer SnO₂ (Noll and Heimann 2016, 193).

⁹ Conversely, not all dark-coloured encrustations can be attributed to tinning. For example, an XRS examination of sherds found that the encrustation on some did not contain tin but was rich in iron (Kanta 1980, 327). Similar marks can also result from sediment, burning or paint (Gillis 2000, 452). Needless to say, verifying the presence of tin through scientific analysis should be considered best practice but this is not always feasible.

¹⁰ Although there are also many examples of vessels where the coating did not extend onto the base (Immerwahr 1966, 382), including on vessels from Sellopoulo (Popham and Catling 1974, 206) and Varkiza-Vari (Polychronakou-Sgouritsa 1988, 100). On the alabastron from Isopata Tomb 5 held at the Ashmolean Museum, which I have personally examined, the tin residue extended only 1.5 cm onto the surface of the base. I would like to thank Dr Anja Ulbrich and Iaria Perzia of the Ashmolean Museum for allowing me to view this vessel and arranging my visit. Unfortunately, in many cases a detailed description of the position of the remaining tin spots is not always supplied.

¹¹ Contra Holmberg, K. 1983. Gillis found that dipping sherds into molten tin did create a shiny surface, but it was generally uneven in thickness and consistency, as was the coating on the Holmberg replicas; this method also required precise temperature control (Gillis 1994, 57; Gillis and Bohm 1994, 223), which would have been difficult to achieve in the Late Bronze Age.

¹² A colour illustration of replica vessels produced during these experiments can be found in Gillis and Bohm 1994, fig. 4. Noll, Holm and Born (1980, 32) had already concluded that a binder must have been used but were only able to carry out limited analysis.

¹³ Gillis and Bohm (1994, 224) reported that, after some initial awkwardness, the process of using the foil was relatively easy. However, the forms they were covering were quite simple and did not include features such as handles or false necks.

¹⁴ Other suggested methods, such as the tin oxide slip proposed by Marinatos (1972, 296) can now be safely discounted (Noll and Heimann 2016, 198).

Bohm 1994, 223; Gillis, Holmberg and Widelöv 1995, 259; Gillis 1999a; 1999b).¹⁵ The deposition of both golden and silvery tinned ceramics has been proven in Chamber Tomb I:1 at Asine through XPS analysis (Gillis 1999b, 291–3; 2000, 233). The foil must have been treated prior to attachment, as otherwise the effectiveness of the binder would have been compromised (Gillis 1994, 59; Gillis and Bohm 1994, 224).

Unlike tinning copper, which has practical applications such as preparing copper vessels for long-term food storage (Untracht 1968, 51), the tinning of ceramic has no functional purpose. Nevertheless, tinned vessels are known beyond the Late Bronze Age Aegean; similar vessels have been found on Cyprus, in the Iron Age cemetery at Salamis (Karageorghis 1974, 16–18, 55–7; Muhly 1978, 47),¹⁶ in Late Classical and Hellenistic Macedonia (Kotitsa 2012) and in prehistoric Italy, Austria, Hungary, France, Germany and Switzerland (Noll and Heimann 2016, 197). The usage of metals to cover ceramics is found in many other societies as well (Gillis 2004, 56). This close relationship between metals and another material is not unprecedented in the Aegean vessel assemblage. A tin-lined ivory pyxis was recovered from tomb I at the Athens Agora (Immerwahr 1971, 166 [I-16]), and a partially gilded ivory bowl from chamber tomb 10 at Dendra (Persson 1942, 91), while fragments of ivory and bronze from tomb XXVI at Prosymna were interpreted as the remains of a conical rhyton (Blegen 1937, 98, 354). Faience vessels were often gilded or plated with bronze (Foster 1979, 131–2), and faience and metal were also combined simultaneously to decorate ostrich egg rhyta. Fittings and ornamentation of bronze and gold were sometimes added to stone vessels (Warren 1969, 162–3).

Tinned ceramics also add to our understanding of the East Mediterranean metals trade. No references to tin have been found in Linear A or B,¹⁷ and pure tin is rare on the Greek mainland throughout the Bronze Age (Gillis and Clayton 2008, 134). With the exception of the tinning of ceramics, it is rare to find this metal used in the Aegean for any other purpose than as a constituent of bronze.¹⁸ No tin vessels have been found in the Aegean, despite their appearance elsewhere in the East Mediterranean, for example on the Ulu Burun shipwreck (Bass et al. 1989, 12). The presence of tinned ceramics therefore reaffirms the presence of unalloyed tin in the Aegean, although it is not yet possible to determine its origin.¹⁹

The Distribution and Chronology of Tinned Ceramics

Tin-coated ceramic vessels have been found at a range of sites across the Aegean (Fig. 1). These concentrate in three regions; the Greek mainland, Crete and Rhodes. No examples have been reported from the Cyclades; this may be because there are so few known Late Bronze Age (LBA) Cycladic tomb sites.²⁰ The following section provides an overview of their find locations. For further details see the Appendix.

¹⁵ This ability to produce golden-hued tin foil has been disputed by Kotitsa and Schüssler (2002, 75), who were unable to completely replicate the same effect at a similar temperature; this failure does not justify the outright rejection of Gillis's evidence, as suggested by Kotitsa (2012, 119–21), given the plethora of factors that influence oxidation processes in metals. Further experimentation is required to find the exact conditions under which golden-hued tin foil can be produced.

¹⁶ A direct connection to Late Bronze Age Aegean practice has been suggested, despite the gap of several centuries (Noll and Heimann 2016, 196).

¹⁷ One suggestion put forward is *ka-to-ro* (Michailidou 2001, 87). The term for tin should be similar to *ka-si-te-ro*, but this word or any associated derivations have not been found in the Linear B archives (Freeman 1999, 223). The term *ka-si-ko-no* has been identified as a possible candidate (Stella 1965, 196), but this is not widely accepted.

¹⁸ The probable intended fate for the tin ingot found at Mochlos (Soles 2008, 153).

¹⁹ There is no space here to adequately discuss the merits of the many suggested sources for tin. Although tin isotopy can differentiate between some tin ore sources (Haustein, Gillis and Pernicka 2010, 829), this field is still in its infancy. One particular difficulty is isotopic variability within ore sources (Gillis and Clayton 2008, 138, 140). For an overview of suggested Aegean tin sources see Gillis 1991, 3–8 and Gillis and Clayton 2008 fig. 2.

²⁰ In her wide-ranging study of the material culture of the Cyclades, Schallin (1993, 95) lists fewer than 20 confirmed or suspected LBA tomb sites.



Fig. 1. Map of the Aegean, showing the sites from which tinned vessels are known or have been reported. (1) Archanes; (2) Armenoi; (3) Gournes; (4) Isopata; (5) Katsambas; (6) Knossos; (7) Kritsa; (8) Ligortyno; (9) Mavro Spelio; (10) Phylaki Apokoronou; (11) Sellopoulo; (12) Zapher Papoura; (13) Voudeni; (14) Argos; (15) Asine; (16) Berbati; (17) Dendra; (18) Mycenae; (19) Nauplion; (20) Prosymna; (21) Athens; (22) Varkiza-Vari; (23) Vravron; (24) Prosilio; (25) Tanagra; (26) Thebes; (27) Ambelofytou Lagou; (28) Ellenika Antheias; (29) Myrsinochorion Routsis; (30) Nichoria; (31) Peristeria; (32) Pylos; (33) Tourliditsa; (34) Tragana; (35) Kalapodi; (36) Kazanaki; (37) Ialysos; (38) Maritsa. Map by author.

Crete

There are 12 Cretan sites from which tinned vessels have been published or reported, including the earliest known example of a tinned vessel found thus far. No tinned ceramics have been reported in LM IIIC contexts.²¹ The chronology of the Cretan finds is set out below with the exception of those from Archanes, for which there is no information beyond the fact of their existence (Kanta 1980, 315).²²

Neopalatial Period (MM III–LM IB)

Recognised after a restudy of material from the Mavro Spelio cemetery,²³ a tinned MM III–LM I conical cup was recovered from Tomb IX, which was in use from MM II–III (Alberti 2001, 185, 179 n. 24 fig. 6e). The archaeological record then seems to indicate a hiatus in their manufacture, as no

²¹ Contra Hallager (1997, 42), Kanta (1980, 315) does not list any tinned kylikes from LM IIIC contexts.

²² Gillis (1991, 28) also reported tinned ceramics from Kato Zakros; however, examination of her source (Platon 1975, 345) suggests this was based upon a mistranslation.

²³ The publication of Mavro Spelio (Forsdyke 1926–7) did not report any unusual encrustation on the ceramics.

tinned vessels have been reported from LM IA or IB contexts (Hatzaki 2007, 208). This lacuna may stem from a lack of analysis (Alberti 2001, 179 n. 24) rather than a temporary lapse in production; scholars have simply not expected tinned ceramics to appear in Cretan contexts pre-dating LM II.

Final/Postpalatial Period (LM II–IIIB)

Tinned ceramics have been recovered from two LM II contexts: Katsambas Tomb Γ (Alexiou 1967, 47–8) and Isopata Tomb 5 (Evans 1914, 24–5). The latter also contained ceramic vessels with polychrome decoration.²⁴ The existence of such decoration highlights an apparent interest in the selective transformation of ceramics upon entry to the mortuary sphere that reached beyond tinning. LM IIIA1 tinned ceramics were also recovered from the Knossian region, at Katsambas and Sellopoulo (Table 1). Another possible contemporary example may have been found in the Temple Tomb²⁵ at Knossos (Gillis 1991, 28).

Tinned ceramics continued to be deposited in this region during LM IIIA2 (Table 2). They were also present at Mavro Spelio during LM IIIA: a sherd from Tomb XIII tested positive for tin (Kanta 1980, 327). As noted by Hatzaki (2007, 230), tinned ceramics were apparently not deposited in the Knossian region after LM IIIA2 (with the possible exception of Zapher Papoura Tomb 99).²⁶ The assemblages at Zapher Papoura are smaller than those from Katsambas and Sellopoulo, although this may reflect the relative paucity of pottery from this site.

From LM IIIA2 onwards, tinned ceramics were found outside the Knossian region in West Crete at Phylaki Apokoronou and Armenoi, on the Mesara at Ligortyno and elsewhere in Central Crete at Gournes and Kritsa (Table 3). The number of vessels deposited in these contexts was also smaller, suggesting a possible decline in the tinned vessel assemblage size over time, although the extent of the presence of tinned ceramics at Armenoi has not yet been confirmed.

Greek Mainland

Tinned ceramics have been found at 24 sites on the Late Bronze Age Greek mainland. They are predominantly concentrated in the Argolid, Attica and Messenia (Table 4). The number of examples from Messenia is probably significantly underestimated because the majority have not been published; Korres reported tinned ceramics from Tourliditsa, Myrsinochorion Routsis,²⁷ and Peristeria, and that examples were held at the Museums of Pylos, Chora and Athens (Korres 1974, 152; Mountjoy 1996, 55 n. 46). Pantelidou (1975, 173) also reported at least eight further tinned vessels in the National Museum stores, which were apparently from Attica.²⁸ Gillis suggested that other tombs at Mycenae and Dendra contained tinned ceramics (Gillis 1996b, 1202 n. 18) and reported further sherds from an unknown tomb or tombs at Asine (Gillis 1996a, 98). Four tinned kylikes from the cemetery at Tanagra, dated to LH IIIA–B, were

²⁴ Polychrome pottery is decorated with bright powdery unfixed colours, such as crimson, red and blue. Examples have been found at several sites including tomb 5 at Isopata (Evans 1914, 25–6), Zapher Papoura (Evans 1905) and tombs III and V at Mavro Spelio (Forsdyke 1926–7, 254, 257). Similarly to tinning, polychromy would not have withstood repeated handling and was only intended for funereal show (Evans 1914, 26; Popham and Catling 1974, 209). Evans (1905, 515) suggested its usage was to evoke non-ceramic materials and later drew parallels between it and fresco painting (Evans 1930, 309).

²⁵ Gillis (1991, 28) suggested a date of LM II for this vessel, but the only conical cup illustrated by Evans formed part of the LM IIIA1 assemblage (Evans 1935, 1017 fig. 965j).

²⁶ The dates for these Zapher Papoura tombs were passed to Preston by Dr E. Hatzaki, who re-examined the material from this cemetery (Preston 2004, 332, 533–4). An overview of the cemetery is given in Hatzaki 2005. Immerwahr (1966, 388 especially n. 32) was highly sceptical of the tinned vessels found in Tomb 99, as they did not match the range of forms nor dates of deposition for the majority of examples known at that time. Continued research has widened the range of tinned shapes and their chronology. My examination of the tinned Isopata alabastron confirms that Evans was familiar with their appearance and was unlikely to have confused tinning with another surface treatment.

²⁷ Certainly in Tholos 2 at least (Korres 1982, 95).

²⁸ Athens NM nos. 9526, 9527, 9528, 9533, 9667, 9679, 9680 and 9681 (Pantelidou 1975, 173 n. 6).

Table 1. Finds of tinned ceramics within LM IIIA1 assemblages.

Context	Frequency	Reference
Katsambas Tomb H	6	Alexiou 1967
Sellopoulo Tomb 3	4	Popham and Catling 1974
Sellopoulo Tomb 4	7	

Table 2. Finds of tinned ceramics from the Knossian region after LM IIIA1.

Context	Date	Frequency	Reference
Katsambas Tomb Θ	LM IIIA2	7	Alexiou 1970
Zapher Papoura Tomb 7	LM IIIA2	1	Evans 1905
Zapher Papoura Tomb 66	LM IIIA2	2	
Zapher Papoura Tomb 67	LM IIIA2	3	
Zapher Papoura Tomb 99	LM IIIA2 or LM IIIB1	2	

Table 3. Finds of tinned ceramics on Crete beyond the Knossian region.

Context	Date	Frequency	Reference
Ligortyno Tomb II	LM IIIA2	2	D'Agata 2015
Phylaki Apokoronou	LM IIIA2	1	Tzedakis 1981
Armenoi Chamber Tomb 159	LM IIIA2 and IIIB	3+(?)	Tzedakis and Martlew 1999
Kritsa, large chamber tomb	LM IIIA/B–B	1	Kanta 1980
Gournes Tomb 2	LM IIIB	3	

Table 4. Number of sites in each region of the Greek mainland at which tinned vessels have been found and estimate of the total number of tinned vessels from each region.

Region	Number of Sites	Number of Tinned Vessels
Achaea	1	6+
Argolid	7	87+
Attica	3	75+
Boeotia	3	16+
Messenia	8	9+
Phthiotis	1	6
Thessaly	1	1

previously on display at the Thebes Archaeological Museum (Demakopoulou and Konsola 1981, 85, 87); these are awaiting publication, and it is possible that further tinned vessels were recovered from this site. No LH IIIC tinned ceramics have been positively identified.

Prepalatial Period LH I–II

The earliest known mainland tinned vessel is perhaps from a built chamber tomb, T.164, at Argos (Papadimitriou 2001, 55–6 [P11] fig. 11a, pl. 8a). It was an unusual shape and is discussed in more detail below. Several tinned vessels were found associated with later burials in the same tomb (Papadimitriou 2001). Three tinned goblets were found with other LH IIB vessels deposited during an early usage phase in Asine Tomb I:7 (Sjöberg 2004). There are no known examples outside of the Argolid from this period.

Table 5. Known examples of LH IIIA₁ tinned ceramics.

Context	Frequency	Reference
Asine Tomb I:1	12+	Mountjoy 1996
Athens Agora Tomb I	4	Immerwahr 1971
Athens Tomb 13	1?	Pantelidou 1975
Dendra Tomb 10	5	Persson 1942
Ellenika Antheias Tomb Tsagli 4	3+	Koumouzelis 1989
Kalapodi Tomb IV	6	Dimaki and Papageorgiou 2015
Varkiza-Vari	1+	Polychronakou-Sgouritsa 1988

LH IIIA

The number and range of sites with tinned ceramics expanded dramatically during this period. Two pit graves in the southern cemetery at Athens, dated LH IIB–III_{A1}, contained sizeable assemblages of tinned vessels (Pantelidou 1975). LH III_{A1} tinned ceramics are known from Asine,²⁹ Athens, Dendra, Ellenika Antheias, Kalapodi and Varkiza-Vari³⁰ (Table 5). A tinned jug from Kalapodi had a separate piece of gold sheet around the base of its neck (Dimaki and Papageorgiou 2015, 854 fig. 7). This may indicate that the artisans who tinned it were unaware of the technique to recolour tin to resemble gold, even though the process was relatively simple (Gillis, Holmberg and Widelöv 1995, 259).³¹

LH IIIA₂ tinned ceramics have been found at Asine, Berbati,³² Mycenae, Nichoria, Prosilio,³³ Thebes, Varkiza-Vari and Vravron (Table 6). Several contexts, which cannot be more precisely dated within LH IIIA, have also yielded tinned vessels. These are Athens Agora Tomb III (Immerwahr 1971), Mycenae Tomb 502 (Wace 1932), Nauplion Evangelistria Tomb 3 (Piteros 2008; 2015),³⁴ Tragana Tholos 1 (Kourouniotis 1914; Gulgielmino 1979), Kazanaki tholos (Adrymi-Sismani and Alexandrou 2009) and Voudeni Tombs 4 and 75 (Kolonas 2009). A tinned kylix sherd from Ambelofyto Lagou was also suggested to date to LH IIIA (Davis, Bennet, and Shelmerdine 1999, 447).³⁵

²⁹ The figures given in Gillis 1996a do not accord with those in Gillis 1996b and earlier publications, which Gillis explained were based upon incomplete analysis (Gillis 1996a, 95 n. 10). In the catalogue Mountjoy omits the traces of tinning on two stirrup-handled jugs (Mountjoy 1996, 65 nos. 23 and 24); no. 23 was analysed positively for tin (Gillis 1996a, 100) and an image of no. 24 shows it too was originally tinned (Gillis 1996a fig. 2, right).

³⁰ Tinned vessels were not mentioned in the preliminary report (Vavritsas 1968). Their existence was first reported by Pantelidou (1975, 173–4) under the site name Kamini Varkiza. Only one can be attributed to a specific tomb.

³¹ This was the only example I could find of another metal aside from tin being used to cover ceramic pots in the study area during the Late Bronze Age. Noll and Heimann (2016, 199) maintain that the gilding and silvering of pottery did take place, citing Neuberger. Neuberger claimed Harriet Boyd Hawes unearthed examples of such vessels (Neuberger 1919, 145) but I could find no evidence to substantiate this. A bull head rhyton from Gournia had been covered with a shiny white slip in imitation of silver, but this vessel was not tinned, silvered or gilded (Boyd Hawes et al. 1908, 52, 60 pl. I:1). Neuberger (1919, 145) also stated that a silvered Cycladic pottery vessel dated to c.2500 BC was on display at the Athens National Museum; this was a small Early Cycladic jug from Naxos (Stephanos 1906, 88; Dumas 1977, 60).

³² Three vessels are missing. The remainder have been moved to the Mycenae Museum with other finds from this tomb.

³³ Galanakis, pers. comm.; this tomb was excavated in 2017 and is currently under study.

³⁴ In addition to these, two tinned vessels from Chamber Tombs AE and AET are on display at Nauplion Museum (see Appendix). Both tombs were excavated in 1973 and have not been published; the preliminary report did not mention tinned ceramics (Protonotariou-Deilaki 1973–4). Pantelidou also mentions a tinned vessel from Nauplion (Pantelidou 1975, 173 no. 3570); the museum numbers are not given in the current display.

³⁵ It is not clear whether this date was obtained through analysis of the sherd or because the authors believed that tinning was restricted to LH III_{A1}–2 (Davis, Bennet, and Shelmerdine 1999, 447, including n. 258). LH III_B material was also discovered (Davis, Bennet, and Shelmerdine 1999, 448), especially kylix stems (McDonald and Hope Simpson 1961, 237).

Table 6. Known examples of LH IIIA2 tinned ceramics.

Context	Frequency	Reference
Asine Tomb I:1	16+	Mountjoy 1996
Asine Tomb I:7	4	Sjöberg 2004
Berbati Chamber Tomb	14	Holmberg, E.J. 1983
Mycenae Gortsoulia Tomb I	1	Shelton 2000
Mycenae Kapsala N Tomb V-II	1	
Mycenae Tomb 515	4	Wace 1932
Nichoria MME Tholos	1	Wilkie and Dickinson 1992
Prosilio Tomb 2	8+	Galanakis pers. comm.
Thebes Tomb 14	1+	Keramopoulos 1917
Thebes Tomb 21	2	Keramopoulos 1917
Varkiza-Vari	6+	Polychronakou-Sgouritsa 1988
Vravron Tomb 13	1+	
Vravron Tomb 19	1+	Papadopoulos and Kontorli-Papadopoulou 2014
Vravron Tomb B	1+	

Many tinned vessels seem to have been deposited at Prosymna, although this was not noted in its publication (Blegen 1937). Immerwahr was the first to note nine tinned vessels³⁶ from Prosymna on display at the Athens National Museum, one of which could be securely identified as kylix no. 712 from Tomb XXXVII (Immerwahr 1966, 395). Later, Pantelidou identified another 19 in the National Museum stores (Pantelidou 1975, 173), confirming that at least six tombs contained tinned ceramics. Dimaki and Parageorgiou (2015, 850) listed another three from the same site.³⁷

LH IIIB

Four tinned vessels were recovered from Tholos III at Pylos (Blegen et al. 1973; Pantelidou 1975),³⁸ two from Asine Tomb I:2 (Gillis 1996a; Sjöberg 2004), and one from Vravron Tomb 3 (Papadopoulos and Kontorli-Papadopoulou 2014). Tinned ceramics continued to be deposited in Asine Tomb I:1 (Mountjoy 1996; Gillis 1996a) and at Varkiza-Vari (Polychronakou-Sgouritsa 1988).

Rhodes

There are two sites on this island from which tinned ceramic vessels have been recovered, 20 in total. The majority come from Ialysos, from 10³⁹ tombs in assemblages dating from LH IIIA1–B (Benzi 1992).⁴⁰ A single tinned kylix was found at a second cemetery site, Maritsa,⁴¹ in a tomb used during LH IIIA2–B (Benzi 1992, 410).

³⁶ Three handleless bowls, one Type 271 kylix, three Type 272 kylikes, one Type 266 kylix and one Type 267 kylix (Immerwahr 1966, 395).

³⁷ The authors did not explain how they came to obtain this information, so the vessels have been listed as possible examples in the Appendix. Immerwahr also suggested that tinned ceramics were present in Tomb II based upon illustrations in Blegen 1937. There are potentially many more examples from Prosymna. Not every vessel was illustrated and tinning is difficult to recognise using photographs alone, especially on painted vessels.

³⁸ As with Prosymna, the publication made no reference to the clearly visible traces of tinning.

³⁹ Immerwahr (1966, 394) listed tinned kylix A861 as a find from Old Tomb 5. This cannot have been the case. Only two kylikes were recovered from this tomb (Furtwängler and Loeschcke 1886, 8), both of which are listed by Forsdyke (1925, 154 A866 and 153 A860); no context is given for A861 (Forsdyke 1925, 153). A860 is entry 21 in Furtwängler and Loeschcke 1886, not 21a as listed in Forsdyke; this mistake originated in the labelling of Furtwängler and Loeschcke 1886 pl. III. The assignment of A850 to Tomb A is speculative (Forsdyke 1925, 139). No vessel matching its description is present in the inventory for Tomb A listed in Furtwängler and Loeschcke (1886, 5–7).

⁴⁰ Another vessel (A862) was thought to exhibit the same technique (Forsdyke 1925, 153) but upon later examination was found to have a dark glaze (Immerwahr 1966, 388 n. 32).

⁴¹ Referred to as Maritso-Kapsalovouno (Coccala) in Mee 1982, 49.

Table 7. Categories of shape found in the tinned vessel assemblages of the Greek mainland, Crete and Rhodes. SAB = Shallow angular bowl.

	Cup/Bowl				Mixing/Serving				Storage	
	Handleless	Stemmed	SAB	Other	Jug	Lekane	Dipper	Feeding Bottle	Alabastron	Stirrup Jar
Mainland	31	135	15	7	5	2	1	1	0	2
Crete	4	32	3	4	1	0	0	0	2	2
Rhodes	0	17	4	0	0	0	0	0	0	0
Total	35	184	22	11	6	2	1	1	2	4

Tinned Vessel Shapes

Some tinned vessels were recovered in too fragmented a state for their original form to be recognised. However, it has been possible to identify the shapes of 268 individually published vessels. A summary of their forms can be found in Table 7.⁴² They can be broadly split into three categories; cups and bowls (Fig. 2),⁴³ mixing and serving vessels (Fig. 3), and storage vessels (Fig. 4). Currently there are no known examples of tinned cooking vessels or tinned rhyta. Certain distinctive shapes are also absent from the tinned vessel assemblage, such as deep bowls and kraters. Clearly a process of selection took place.

The most diverse range of tinned shapes is found on the Greek mainland, which may be because its published dataset is so much larger than that of Crete and Rhodes. The form of 199 individually published vessels from the Greek mainland could be identified. The majority are stemmed goblets, followed by handleless and shallow angular bowls. Tinned versions of several shapes, including the dipper, feeding bottle, mug and lekane, are known only from Varkiza-Vari. It has been suggested that the motivation to tin so many unusual shapes was to hide their worn paint (Polychronakou-Sgouritsa 1988, 100). This does not explain why the users of the tomb chose to deposit those specific vessels, once tinned, rather than less worn examples. Other rare forms include the stirrup jar, known from Asine and Nauplion, and a shallow cup, from Prosymna. An unusual deep cup was recovered from T.164 at Argos. It may have been derived from the Cycladic cup and its shape and handle are reminiscent of metallic forms; it was accompanied by LH I-IIA sherds, but the cup itself should be dated to final Middle Helladic (MH) or early LH I (Papadimitriou 2001, 55). It may have been an antique when deposited, perhaps indicating why it was singled out for tinning. All known tinned jugs belong to the stirrup-handled type.

The majority of the 48 Cretan vessels for which details of shape have been published are stemmed cups (goblets, kylikes and champagne cups). As with the mainland assemblage, the shallow angular and handleless bowls are the next most popular tinned shapes. *Pace* Preston (2004, 329), tinned drinking vessels have been found in a LM II context, Katsambas Tomb Γ (Alexiou 1967). The alabastra, from Isopata Tomb 5, are the only known tinned examples of this form. Two tinned stirrup jars were found at Zapher Papoura, and a tinned shallow cup and unusual tinned two-handled dish at Katsambas.⁴⁴ Only one Cretan tinned jug is known, of a different form to mainland tinned jugs.

Only two tinned shapes are known from Rhodes: the kylix and shallow angular bowl. The former outnumbered the latter by 4:1. No handleless bowls have been found. However, these findings are based upon just 21 vessels, and therefore must be treated with caution.

Thus an apparent core of three tinned shapes can be recognised: the stemmed cup, the handleless bowl and the shallow angular bowl. As shown in Fig. 5, they collectively accounted

⁴² It does not include piriform and hole-mouthed jars, which are only categorised as 'possibly tinned'.

⁴³ The Minoan conical cup has been treated as a separate form to the mainland handleless bowl (French and Tomlinson 1999, 259).

⁴⁴ The two-handled bowl from Gournes (Kanta 1980, 48 no. 5) was not illustrated and may be a shallow angular bowl.



Fig. 2. Sketches of the known tinned cup and bowl forms. Only the most frequent tinned kylix variants are illustrated. From left to right; top: FS 267 kylix, FS 272 kylix, FS 265 kylix, FS 264 kylix; middle: handleless bowl FS 204, shallow angular bowl FS 295, Minoan conical cup; bottom: mug, deep cup, shallow cup. Drawing by author.



Fig. 3. Sketches of the known tinned mixing and serving forms. Clockwise from top right: feeding bottle, stirrup jug, lekane, beaked jug; centre: dipper. Drawing by author.



Fig. 4. Sketches of the known tinned storage forms. Left: stirrup jar; right: alabastron. Drawing by author.

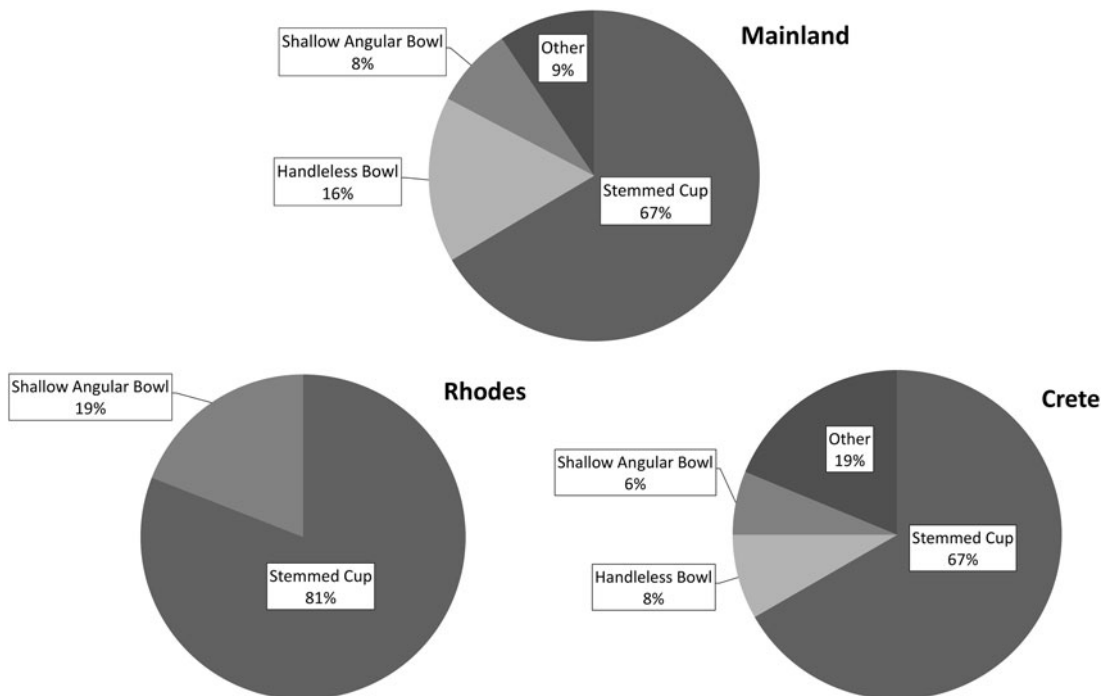


Fig. 5. Pie charts comparing the percentage of stemmed cups, handleless bowls, shallow angular bowls and other shapes in the tinned vessel assemblages of Mainland Greece, Crete and Rhodes.

for over 80 per cent of the tinned forms on Crete, over 90 per cent on the Greek mainland and 100 per cent on Rhodes. Establishing this core range took time; several of the earliest known assemblages, including Isopata Tomb 5 (Evans 1914), Argos T.164 (Papadimitriou 2001) and Katsambas Tomb Γ (Alexiou 1967) contained different shapes. All three forms were only certainly present in a few contexts, which date to LH/LM IIIA at the earliest.

Mountjoy (1996, 55) suggested that Asine Tomb I:I contained a set of tinned vessels, consisting of one closed pouring vessel and a variety of open shapes. However, three tinned jugs were found in this tomb,⁴⁵ and it cannot be confirmed that the entire 'set' was deposited simultaneously. Tinned jugs are relatively rare; only two other contexts contained both a jug and open shapes. Non-tinned jugs may have been used instead, as Mountjoy (2003, 166) suggests, although this undermines the notion that tinning was intended to create a distinct assemblage for mortuary rituals. Jugs are larger than cups and bowls, and require more tin for complete coverage; however, some tombs contained so many smaller tinned vessels that it is difficult to argue the rarity of tinned jugs was due to cost. This issue is discussed further below. It seems that small individualised pots, rather than larger communal vessels, were prioritised for tinning.

It is also evident from Fig. 5 that the stemmed cup dominated the tinned vessel assemblage in all three regions. They are absent from only five contexts yet are the sole constituent of 15 tinned assemblages.⁴⁶ This indicates that, despite the core triad of tinned shapes, stemmed cups were the real focus of tinning. It is therefore interesting that they were not among the first known examples.

In many cases the variant of stemmed cup could be recognised; these are shown in Table 8.⁴⁷ On the Greek mainland 57 stemmed cups with rounded bowls were recovered from 27 different contexts, whereas 40 stemmed cups with angular bowls were recovered from 15 different contexts. On Rhodes the figures are eight rounded stemmed cups from seven different contexts, and seven angular stemmed cups from five different contexts. Among the rounded stemmed cups there is no clear predominant form in either region.

In every context on the Greek mainland and Rhodes where tinned shallow angular bowls are present tinned angular stemmed cups are also found, although the converse is not true.⁴⁸ Such a relationship does not exist between handleless cups and angular stemmed cups. A special relationship between angular kylikes and shallow angular bowls has been mooted by Thomas (2011), and this may provide additional evidence to support such a hypothesis. Whether this means that tinned vessels can be linked to the deliberate archaising move away from continuously curving to angular profiles discussed by Thomas (2011, 303) is less certain. Almost all examples of tinned angular stemmed cups were accompanied by rounded bowl versions as well.⁴⁹ Although the latter are commonly interpreted as drinking vessels, it has been argued that the angular type should be associated with food consumption, as should the shallow angular bowl (Tournavitou 1992, 200; Lis 2008, 145; Thomas 2011, 301). The widespread presence of the angular kylix therefore demonstrates that tinned vessels were used for eating as well as drinking rituals. Coupled with the rarity of tinned jugs, the use of tinned sets as evidence for drinking rituals specifically must be treated with caution.

Tinned Vessel Production

Immerwahr (1966, 382) noted that the majority of tinned vessels recovered from Athens Tomb III were technically inferior or unfinished, with preliminary smoothing but no technical slip or final polishing. This could indicate that these vessels were earmarked for tinning before their manufacture was complete. However, examples with well-finished surfaces have been found at other sites, such as Asine (Mountjoy 1996) and Argos (Papadimitriou 2001), and also in Athens Tomb III, alongside unfinished examples.⁵⁰ Furthermore, some vessels were clearly already

⁴⁵ See n. 29.

⁴⁶ Only counting contexts with completely published contents.

⁴⁷ This information was available for 71.9% of mainland vessels, 88.2% of vessels from Rhodes but only 15.6% of vessels from Crete, hence their exclusion from this discussion. This is because the terminology applied to Cretan stemmed cups, especially in older publications, lacks standardisation (Hallager 1997).

⁴⁸ This applies to 11 different contexts. Ialysos Old Tomb A has been excluded from this analysis because there is some doubt over its contents (see n. 39).

⁴⁹ Ialysos New Tomb 4 is the only exception (Benzi 1992). Only one tinned angular kylix has been positively identified in Prosymna Tomb XLI, but the size of this tomb's tinned assemblage is unknown.

⁵⁰ For example, Immerwahr 1971, 173 P17, 775 III-8.

Table 8. Comparison of the variants of stemmed cups on the Greek mainland and Rhodes. The first figure shows the total frequency, the figure in brackets the number of contexts in which each variant was found.

	Rounded											Angular
	255	258	259	263	264	265	266	269	271	272	273	267
Mainland	1 (1)	1 (1)	1 (1)	1 (1)	13 (9)	10 (8)	2 (2)	0 (0)	7 (5)	14 (12)	7 (4)	40 (15)
Rhodes	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (3)	4 (4)	0 (0)	1 (1)	0 (0)	7 (5)

painted before tinning took place. Examples are known from Asine,⁵¹ Varkiza-Vari,⁵² Nauplion,⁵³ Armenoi,⁵⁴ Ialysos,⁵⁵ and possibly Argos.⁵⁶ Pantelidou stressed that, in some cases, their paint was well worn, implying that these vessels had had a significant use life before being tinned and deposited (Pantelidou 1975, 174). A similar pattern is visible at Varkiza-Vari. Unfortunately, investigation of these trends is hampered by the patchiness of the information provided on surface treatment, which is only available for a limited number of tinned vessels.

Their quality also varied widely, even at the same site. This was the case on Rhodes (Benzi 1992, 6). At Varkiza-Vari many tinned vessels were poorly manufactured (Polychronakou-Sgouritsa 1988, 100). On Crete, they tended to be made using a fine buff fabric (Hatzaki 2007, 216). The tinned vessels from Kalapodi were made from good-quality ceramic but details of their construction were poor, causing problems such as lopsidedness; Dimaki and Papageorgiou (2015, 850) suggested this showed indifference from the potter. It is possible that some vessels selected for tinning directly after manufacture were seconds, especially if they were only to be used once. However, there are also many examples of tinned vessels that met the same quality standards as ordinary pottery. Overall, this variability in quality and process of manufacture demonstrates that there was no single *chaîne opératoire* for the production of tinned vessels. The patterning of this variability indicates that it was not the result of regional or chronological differences.

Immerwahr (1966, 392) suggested that tinned ceramics were primarily manufactured in workshops situated at Knossos and Mycenae, due to their known distribution and apparent connection to C and D Type swords. This hypothesis has been undermined by discoveries of tinned vessels across a much broader area of the Aegean. Pantelidou (1975, 174) argued against the supply of tinned vessels to Athens by a Mycenae-based workshop, as 19 of the 20 examples found in the southern cemetery had the same clay as ordinary unpainted Athenian pottery. Immerwahr (1966, 393) also accepted that some vessels must have been tinned locally, such as those from Ialysos that were originally painted or had a fine surface treatment. A provenance analysis of A863 from Ialysos first gave east Attica as a production centre, which was then altered to Knossos–Thebes, although this should be treated with caution (Jones 1986; Benzi 1992, 7). Tinned vessels may have been exported (D’Agata 2015, 89) or perhaps used in gift exchange (Reeves 2003, 248); however, it is likely that the coating would have been damaged by lengthy periods of transit. Their strong association with mortuary contexts implies that, even if some tinned ceramics were exchanged prior to deposition, this was unlikely to have been the primary motivation for their production. It is perhaps more probable that vessels were traded before being tinned. Further research through provenance analyses would be welcome, in order to examine the networks behind the manufacture of tinned vessels.

⁵¹ Mountjoy 1996, 64 no. 7; 65 nos 23, 24; 66, no. 73.

⁵² Polychronakou-Sgouritsa 1988, 60–1 no. 1; 67 no. 30; 69 no. 38; 70 no. 45.

⁵³ On display in Nauplion Museum.

⁵⁴ Tzedakis and Martlew 1999, 177 fig. 170; 248 fig. 255.

⁵⁵ Forsdyke 1925, 153 A860.

⁵⁶ Papadimitriou 2001, 54 P9.

Tinned Ceramics in the Mortuary Sphere

Tinned ceramics have been found within a variety of different mortuary assemblages. In most cases it is not possible to tell exactly which other objects accompanied the tinned vessels into the tomb. This is because grave goods, including tinned vessels, and previous burials were often displaced when a new burial took place.⁵⁷ They were therefore treated the same as other ceramics. Objects were sometimes removed from tombs (Wolpert 2004, 135), so only part of the assemblage remains. Some tombs containing tinned ceramics were later reused, providing another opportunity for objects to be removed (Dickinson 2006, 178), or were looted.⁵⁸ However, a general overview of the preserved assemblages can provide some information about the treatment of tinned ceramics during and after deposition in tombs.

Generally, tinned ceramics are found alongside untreated vessels. In some cases, both tinned and non-tinned versions of the same type have been found in the same tomb;⁵⁹ therefore, tinned ceramics do not wholly replace ordinary ceramics in mortuary assemblages. There are several tombs from which both metal and tinned ceramics were recovered⁶⁰ and it is occasionally possible to see that both formed part of the same burial assemblage.⁶¹ Therefore, it is difficult to argue that tinned ceramics were always conceptualised as direct *replacements* for metal vessels; this issue is discussed in more detail below. Tinned vessels have also been found alongside stone⁶² and ivory vases.⁶³ Thus tinned vessels formed part of a wider vessel assemblage. There is no evidence to suggest that they were singled out for deposition in shafts, niches or other features in tombs (contra Borgna 2004, 268). Where tinned vessels have been found within such features, they were accompanied by other ordinary ceramics.⁶⁴

The number of tinned vessels per tomb varies widely from a single specimen to an assemblage of at least 31. These large tinned groups were rarer and need not have been deposited together. For example, as the tinned vessels in Asine Tomb I:1 range from LH IIIA1–IIIB (Mountjoy 1996, 64–6), it is more likely that this assemblage was built up through multiple acts of deposition. The size of the tinned assemblage may have depended upon the frequency of ceramic deposition practised within a cemetery, as seen at Zapher Papoura.

Several scholars have remarked on the fact that tinned vessels seem to have been associated with richer tombs (Immerwahr 1966, 388; Mee 1982, 18; Gillis 1996b, 1202–3). In contrast, less extravagant mortuary assemblages containing tinned vessels, such as at Berbati, have been used to argue that tin was relatively plentiful and easily accessible (Warren 1985, 207).⁶⁵ As discussed above, the original contents of each tomb are difficult to ascertain. The definition of a ‘wealthy’ tomb is also not straightforward.⁶⁶ However, such a relationship does seem possible, given the

⁵⁷ For example, in Mycenae Chamber Tomb 502 (Wace 1932).

⁵⁸ Suggested for Prosymna Tomb XV (Blegen 1937) and Sellopoulo Tomb 3 (Popham and Catling 1974).

⁵⁹ For example, Zapher Papoura Tomb 7 (Evans 1905) and Vravron Tomb B (Papadopoulos and Kontorli-Papadopoulou 2014).

⁶⁰ Including Dendra Chamber Tomb 10 (Persson 1942), Athens Tombs I and III (Immerwahr 1971), Sellopoulo Tombs 3 and 4 (Popham and Catling 1974), Mycenae Tomb 515 (Wace 1932) and Berbati (Holmberg, E.J. 1983).

⁶¹ For example, Dendra Chamber Tomb 10, which was only used once (Persson 1942).

⁶² For example, Gournes Tomb 2 (Kanta 1980).

⁶³ Argos Tomb T.164 (Papadimitriou 2001), Athens Tomb I (Immerwahr 1971) and Dendra Chamber Tomb 10; it is interesting to note that the latter had been gilded (Persson 1942).

⁶⁴ At Asine, the excavators suggested that the vessel group near the entrance to Tomb I:1, which included tinned examples, had been placed on a table (Frödin and Persson 1938, 377). However, there was no physical evidence to support this, and since the vessels are of different dates, they were probably swept together in preparation for later burials (Mountjoy 1996, 53).

⁶⁵ Warren (1985, 207) refers to the coating as a tin oxide slip but, as discussed above, it was originally tin foil; the tin oxide currently present on the vessels is the preserved remains of the tin after transformation by various post-deposition and post-excavation processes.

⁶⁶ Various attempts have been made to examine social structure and social change by comparing the wealth of different tombs (for example, Mee and Cavanagh 1990; Graziadio 1991; Voutsaki 1995); however, investigating the emic values used as the basis for mortuary assemblages is not easy, and modern value assumptions are difficult to avoid. For a fuller discussion of this issue see Aulsebrook 2012, 10–14, 103–4.

proportion of tombs containing both tinned vessels and gold: 57.5 per cent.⁶⁷ This gives only a rough impression, as several tombs without gold did contain other probable high-value materials, such as silver or ivory, alongside tinned ceramics. Tin itself was costly (Gillis 2000, 231); that it can change colour may have added to its value (Gillis 2000, 234), as might its rarity in the Aegean as an unalloyed metal. It is important, therefore, to approach tinned vessels as a luxury item (Mountjoy 1995, 31); this viewpoint makes the discovery of tinned ceramics in well-furnished tombs unsurprising.

Tinned Vessels outside the Mortuary Sphere

Almost all tinned vessels have been found in mortuary contexts. One exception is the tinned kylix stem found at Ambelofyto Lagou⁶⁸ in Messenia (Davis, Bennet, and Shelmerdine 1999, 447). This small habitation site, suggested to be the remains of an unfortified agricultural centre (McDonald and Hope Simpson 1961, 237 no. 40), has been badly eroded by intensive cultivation (Hope Simpson 1965, 65; McDonald and Rapp 1972, 267). It seems an unlikely find location, given that many tinned vessels are associated with well-furnished tombs. This find could indicate that tinned ceramics had a role outside the mortuary sphere, although it may equally have been a stray from a workshop, perhaps indicating their production in the locality. Unfortunately, the damage wrought upon this site during recent decades has severely lessened the likelihood that further investigation will take place in the foreseeable future.

The other exception was a kylix from the LM II destruction levels at the Unexplored Mansion at Knossos (Popham and Catling 1974, 208 n. 9). Unfortunately any traces were destroyed by acid and it is impossible to verify whether the coating was tin or another substance.⁶⁹ *In situ* remains from these levels suggested that it or a neighbouring area had been used for metallurgical activities (Popham et al. 1984, 262). The tinned vessel does not provide evidence of domestic usage, but may indicate that tinning was carried out by metallurgists, not potters.⁷⁰ However, the extent of the involvement of metalworkers in tinned ceramic manufacture cannot be resolved by one untested sherd. Further evidence is needed before such issues can be addressed.

THE RELATIONSHIP BETWEEN TINNED CERAMIC AND METAL VESSELS

Many scholars have suggested that tinned ceramics were intended to imitate metal vessels, especially those in silver, and were used as less expensive substitutes for the funerary sphere.⁷¹ Skeuomorphing of silver vessels in ceramic has been proposed for a number of East Mediterranean cultures, particularly for glossy black-grey wares (Reeves 2003, 234; Philip and

⁶⁷ Gold has been chosen because its high value is generally accepted (Whittaker 2008, 94; Sherratt 1994, 62; Gillis 2012, 584; Aulsebrook 2012, 137–8), and because it is relatively easy to identify (since it does not tarnish or perish, and is resistant to heat damage). Gold is more likely to be mentioned in excavation reports and, although a target for looters, the common Mycenaean usage of foils means some scraps usually survive.

⁶⁸ Site I21 in PRAP site catalogue; no. 202 in Hope Simpson 1965, 65; no. 19 in McDonald and Rapp 1972, 266–7; D19 in Hope Simpson and Dickinson 1979, 134.

⁶⁹ This vessel was not mentioned in the publication of the Unexplored Mansion (Popham et al. 1984).

⁷⁰ Although these levels are most strongly associated with bronze-working (Popham et al. 1984, 203–22), the find of a crucible containing a gold-silver-copper alloy demonstrated that gold and silver were also worked (Catling and Jones 1977, 62; Popham et al. 1984, 254). The handling of gold and tin foils would have been very similar (Gillis 1994, 57 n. 2).

⁷¹ Vermeule 1964, 225; Immerwahr 1966, 384; Alexiou 1967, 62; Warren 1969, 163; Immerwahr 1971, 171; Pantelidou 1971, 436; Marinatos 1972, 296; Matthäus 1980, 259; Muhly 1980, 46; Noll, Holm and Born 1980; Laffineur 1993, 267 n. 79; Mossman 1993, 348; Mountjoy 1993, 66, 75; Wright 1995, 300; Mountjoy 1996, 53; Rehak 1997, 57; Preston 2000, 144; Evely 2000, 438; French 2002, 115; Mountjoy 2003, 166; Reeves 2003, 253; Wright 2004, 99; Borgna 2004, 268; Preston 2004, 329; Rutter 2010, 418; Noll and Heimann 2016, 193, 195.

Rehren 1996, 144; Vickers 1985, 108). Tinning could therefore be understood as a more luxurious method of imitation (Mountjoy 1995, 31; Immerwahr 1966, 386).

Scholars have also connected tinned vessels to three specific silver vessel assemblages, from the South House at Knossos, Dendra chamber tomb 10 and Kokla tholos tomb, and used this link to discuss their significance and social role. Mountjoy (2003, 166) used tinned vessels to help support her argument that the Kokla and South House silver vessel assemblages could be interpreted as ceremonial groups. Wright (2004, 99) used tinned ceramics to suggest increased standardisation in silver vessel sets, such as the Dendra group, during LH IIIA1. It is important to note that there are two other silver vessel assemblages contemporary with the usage of tinned ceramics, from the Dendra and Vapheio tholoi (Persson 1931, 33–4, 38; Tsountas 1889), which have not been linked in the literature to the practice of tinning.⁷² The characteristics of these assemblages with reference to tinned vessels are also discussed below.

Imitation is complex, as are the motivations that lie behind imitative actions. Recent work on the nature of imitation and skeuomorphs has emphasised their diversity (McCullough 2014). Describing tinned ceramics as imitations of silver vessels is therefore not sufficient; it is necessary to ask in what ways this imitation was manifested before their relationship can be fully examined. To achieve this, it is necessary to compare and contrast the silver assemblages that tinned vessels are assumed to imitate. First, however, the background to this claimed imitation must be examined.

If imitation was their primary purpose, it is perhaps surprising that no tinned ceramics discovered thus far have any additional features referencing metal vessels. This practice is reasonably common in Aegean pottery and includes fake rivets, base and neck rings to imitate seams, and central grooves on handles to mimic wired edges (Mountjoy 1993, 38). To individuals familiar with the appearance of metal vessels, the lack of such features would have been immediately obvious. Furthermore, no tinned vessels found thus far have exhibited any attempts to imitate the decoration often found on metal vessels by, for example, manipulating the topography of their surface prior to tinning.

Tinning does not reproduce a perfect imitation of the appearance or colour of silver (Gillis 1991–2, 32). The manufacture of gold-coloured tinned ceramics also weakens their connection to silver specifically. It is worth remembering that gold-coloured tinned ceramics would also have resembled high-tin bronze (Fang and McDonnell 2011, 54–6).

Of the three core shapes discussed above, only the stemmed cup and handleless bowl are found in the metal vessel corpus; there are no known examples of shallow angular bowls.⁷³ Gillis also highlighted that the range of tinned forms included closed shapes, such as stirrup jars, not known and unlikely to have ever been produced in metal (Gillis 1997, 133; 1999a, 142).⁷⁴ Furthermore, the numbers of known tinned versions of the most common silver shapes, the shallow and Vapheio cups (Aulsebrook 2012, 162), are three and zero respectively. Admittedly,

⁷² I have not included LH I contexts in this analysis as there is no definite evidence for the deposition of tinned ceramics on the Greek mainland during this period.

⁷³ Although Furumark (1972a, 52) describes the shallow angular cup as having a ‘metallic character’, there are simply no convincing parallels in the metal vessel corpus that share the fundamental characteristics of the shallow angular cup. The use of a metallic style in pottery or the incorporation of features common within the metal vessel assemblage into a ceramic vessel does not constitute evidence for a specific metal prototype.

⁷⁴ Evans (1928, 640) suggested that the decorative features of a particular ceramic stirrup jar from Zapher Papoura demonstrated the existence of metal prototypes, especially the inclusion of a fake rivet on its spout and the use of plastic shield ornaments. In fact, plastic ornamentation is exceedingly rare in the metal vessel corpus; in a study of 179 decorated metal vessels from the Late Bronze Age Greek mainland only 10, or 5.6 per cent, incorporated plastic ornamentation (Aulsebrook 2012, 478–793). The fake rivet was located in a position that would have been illogical on an actual metal spout; fake rivets should not be taken as evidence of direct imitation of metal prototypes, as they are rarely placed in the same position as rivets found on metalware (McCullough 2014, 109). These metallic features should be understood as a general decorative style rather than a faithful rendering of objects not otherwise preserved in the archaeological record. Furthermore, the unique shape of the stirrup jar, first developed in MM III (Hallager 2010, 410), would have been too complex for contemporary Cretan metalsmiths to produce (Clarke, pers. comm.; 2013).

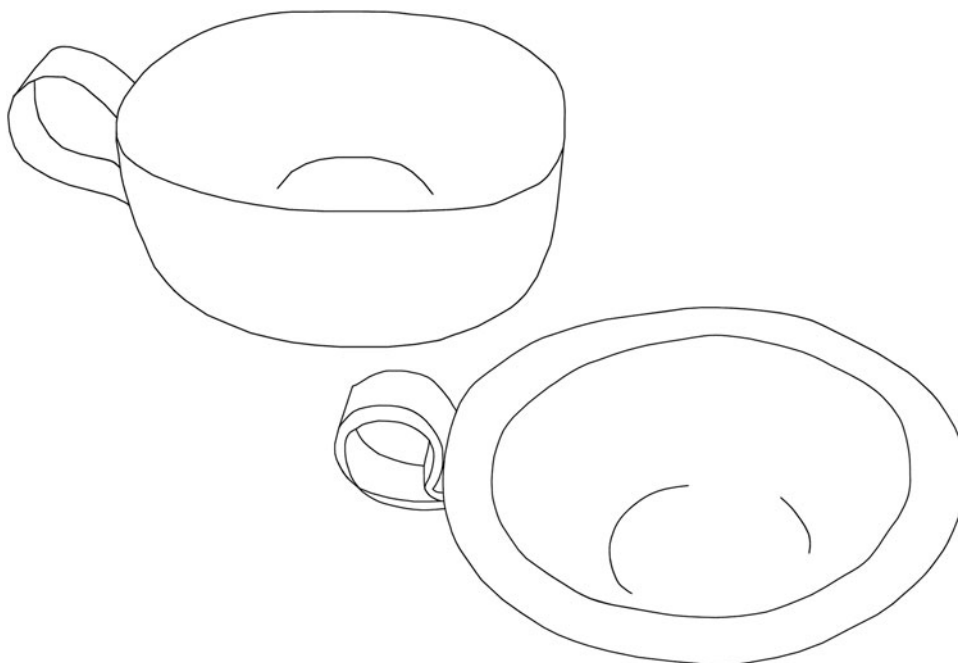


Fig. 6. Comparison of the ceramic shallow cup (left) and the most frequently found version of the silver shallow cup (right). Drawing by author.

the number of metal Vapheio cups falls significantly after LH I and the ceramic version does not seem to last beyond LH IIB, but the same cannot be said of the shallow cup. Moreover, the distinctive features of the most common form of metal shallow cup, with a wide decorated rim and co-ordinated ring handle, were not imitated by tinned versions (Fig. 6).

The decay caused by ‘tin pest’ occurs so rapidly that it was already in train while the tomb was in use, leaving visitors in no doubt as to the true nature of these objects (Gillis, Holmberg and Widelöv 1995, 259; Gillis 1997, 135; 2001, 453–4). This underlines the short-term importance of their visual appearance, which is emphasised by their inability to withstand prolonged handling (Holmberg, E.J. 1983, 384; Gillis 1991–2, 28; Gillis and Bohm 1994, 226). This delicacy could explain why settlements have yielded only two tinned sherds, as post-depositional conditions may have been too harsh for identifiable traces to remain.

The points raised above imply that the term ‘imitation’ needs to be applied in a more considered way. It is time now to consider evidence from the silver vessel assemblages themselves.

The Silver Vessels from the South House at Knossos

The South House, constructed in MM III/LM IA, stood at the south-west corner of the palace at Knossos (Mountjoy 2003, 1). It was not perhaps an elite residence per se, as it lacked substantial storage facilities, but may have been used for special purposes, such as receiving or accommodating important visitors (Lloyd 2011, 175). This building was destroyed in LM IA, possibly by an earthquake (Mountjoy 2003, 25). Three silver bowls and a silver jug were discovered in the tough clayey debris from this destruction event, in the north-west corner of the Pillar Crypt 0.75 m above its floor; it is presumed that they fell from an upper storey (Evans 1928, 387; Mountjoy 2003, 10). As they were discovered nested together Evans (1928, 387) suggested they were originally stored in a wooden box, which kept them together as they fell.

All four vessels were raised from silver plate and, except for one bowl, were without ornamentation (Davis 1977, 105–7). The decorated bowl had a row of six large repoussé running spirals with two parallel grooves under the rim; it had an offset foot and no handle (Davis 1977, 106 no. 15 figs 79, 80; Evans 1928, 387 fig. 221a [HM 403]). The largest bowl was also

handleless with a simple rim, although its lower section was not preserved (Davis 1977, 107 no. 16 fig. 82; Evans 1928, 387 fig. 221*d* [HM 401]). The third bowl could also be described as a cup. It had a single loop handle above an everted rim with a flat bottom and offset foot (Davis 1977, 107 no. 17 fig. 83; Evans 1928, 387 fig. 221*c* [HM 402]). The accompanying jug had a flat base, continuously curving walls and everted rim, with a handle formed from a silver-plated copper rod, fastened by three rivets (Davis 1977, 105–6 no. 14 fig. 78; Evans 1928, 387 fig. 221*b* [HM 404]). Evans (1928, 387) noted that all four had exceedingly thin walls.

Mountjoy (2003, 166) suggested that these silver vessels may have constituted a ceremonial group on the basis of similar but later tinned sets. None of the South House silver vessel shapes have appeared in tinned ceramic. As discussed above, tinned jugs are infrequent finds, and therefore tinned sets containing drinking and pouring vessels are rare. Furthermore, such sets are also common in ordinary pottery; there seems to be no strong reason to link the South House group to a specific practice that was also conducted using tinned ceramics. Rather, the association of drinking and pouring vessels appears to be a standard convention. It therefore seems somewhat counterintuitive to use *tinned* ceramic vessels to support the interpretation of the South House group as a ceremonial vessel set, when the joint deposition of drinking and pouring vessels that were not tinned was far more frequent.

The Silver Vessels from Chamber Tomb 10 at Dendra

Five tinned kylikes were recovered from Dendra chamber tomb 10, in Shaft II (Persson 1942, 92–3 nos 41–5). Deposited within the same pit were four other ceramic vessels, a gilded ivory bowl, a silver spoon and five silver vessels (Persson 1942, 87–94). It had not been sealed with slabs or the like, although four pots were placed directly above it (Persson 1942, 87). The tomb's only skeletal remains were located in Shaft I, alongside pieces of gold, glass, faience and amber jewellery, gold rosettes, a sealstone and a gold cup (Persson 1942, 74–87). The chamber contained two scale pans, gold and glass beads and 11 ceramic jars, jugs and alabastra (Persson 1942, 63, 65–70, 73). This tomb was apparently used only once for a single interment in LH IIIA1 (Persson 1942, 95). It contained an unusually high number of metal vessels, even within this relatively wealthy cemetery.⁷⁵

The appearance of silver and tinned ceramic vessels side-by-side in Shaft II is very intriguing and has been used to argue for a special relationship between the tinned and silver vessels; the former carefully chosen to reflect the latter. The similarities between the assemblages are clear, but their differences have been overlooked.

The silver vessel set contained a common standard form of shallow cup, with a gilded rim (Persson 1942, 90–1 no. 39). The contents of Shaft II do include a ceramic version; however, it was not tinned. As mentioned above, only three examples of tinned shallow cups are known, none of which attempt to emulate the wide decorated rim found on so many silver versions including the Dendra chamber tomb example (Fig. 6). Therefore, as discussed above, although they shared similar profiles and handles, such tinned shallow cups lacked an important feature that was often deliberately emphasised on their metal counterparts through elaborate decoration and gilding. This highlights yet again the separation in visual appearance between tinned ceramic and metal vessels.

The assemblage includes no silver analogue for the tinned FS 272 kylix (Persson 1942, 93 no. 45). There is also no more than a passing resemblance between the one-handled gilded silver goblet decorated with birds (Persson 1942, 89–90 no. 37) and the tinned FS 271 kylix (Persson 1942, 93 no. 44).

In fact, only three vessels from each group can be said to share a strong resemblance. The most striking of these concerns the silver stemmed krater (Persson 1942, 87–8 no. 34) and the large tinned FS 263 kylix (Persson 1942, 92 no. 41). Despite a minor discrepancy in size, it is very likely that their deposition sprang from a conscious decision to link the two groups. The silver

⁷⁵ The only comparable assemblages were those of the tholos (Persson 1931), Chamber Tomb 2 (Persson 1931) and Chamber Tomb 12 (Åström 1977).

stemmed krater is the only known example of its type in metal and is the largest silver vessel from a securely dated post-LH I context on the Greek mainland (Aulsebrook 2012). The FS 263 kylix is the only certain tinned example of this variant. The presence of these two similar, yet unusual, vessels in the same context is unlikely to be a coincidence.

The other four vessels are two tinned FS 267 kylikes (Persson 1942, 92 no. 42 and 93 no. 43) and two almost identical silver versions (Persson 1942, 88 no. 35 and 89 no. 36). There are only minor discrepancies between them in terms of size and exact profile.

Analysis of the three silver vessels suggests a shared production source. All three have a plate riveted inside the bowl to seal off the stem, the same rim formation and the same handle type, and share the same details of their handle attachment (although the stemmed krater has an additional rivet, probably to counteract the greater weight of the vessel) (Davis 1977, 273–5).

The correspondence between the sets has therefore been exaggerated.⁷⁶ Three tinned and three silver vessels appear to have been chosen for deposition due to their close similarity. However, the other tinned and silver vessels in the same shaft are much more akin to other vessels in the same material than to each other.

The Silver Vessels from the Tholos Tomb at Kokla

The tholos tomb at Kokla contained a set of seven silver vessels, four kylikes and three handleless bowls, as well as a gold shallow cup and ivory plaque. There was little pottery in the tomb, but the finds seem to indicate a date of LH IIB–IIIA₁ (Demakopoulou 1997, 104). The tomb itself is architecturally unusual, combining the characteristics of a tholos and chamber tomb; the dromos and part of the entrance were cut into bedrock, whereas the chamber walls and stromion jambs were of dressed stone (Demakopoulou 1997, 104).

The silver vessels were all associated with the bench; four upon it and three on the floor beneath, the latter neatly stacked within each other (Demakopoulou 1990, 117–19 figs 6–12). There is good reason to believe that the four kylikes were made in the same workshop and possibly even by the same artisan.⁷⁷ The handleless bowl shape is too simple for any similar interpretations to be drawn. It is a relatively rare shape in the Aegean metal vessel repertoire.⁷⁸

One notable difference between tinned kylikes and the Kokla kylikes is the latter's decoration.⁷⁹ However, it was relatively simple, unobtrusive and not particularly apparent from even a short distance away. Both the kylix and handleless bowl were frequently tinned. The redundancy of forms in this group is also reminiscent of tinned vessel assemblages, and very unusual in post-LH I precious metal assemblages. The probable common workshop for the four kylikes suggests they were made for use together as a set. The placement of the silver vessels around the focal point of the bench also indicates a possible role for them within the mortuary ritual (Demakopoulou 1990, 121–2).

⁷⁶ This may have arisen due to the illustrations accompanying Persson's discussion of the ceramic and silver vessels from this tomb. Fig. 117 provided a visual comparison of the silver vessel assemblage from Shaft II with the range of ceramic shapes, both tinned and untreated, from the tomb. However, the caption does not make it clear that some of the illustrated clay vessels were not tinned (as is apparent from the catalogue descriptions). This has apparently misled some later scholars into believing that fig. 117 proved a direct one-to-one correspondence between the silver and tinned vessel forms (for example, Immerwahr 1966, 383; Mountjoy 1993, 66). The issue was further compounded by the accompanying text. Persson incorrectly stated that '(I)t is exactly those clay vessels from our shaft which are counterparts of silver vases that have the greyish incrustation' (Persson 1942, 137). This obviously has had a significant bearing on the interpretation of the tomb's tinned ceramics, which were in fact illustrated separately in fig. 103.

⁷⁷ The evidence for this will be discussed in a forthcoming report by Dr Demakopoulou and me.

⁷⁸ These are the only examples known in silver. Others in bronze or copper have been found in the Tomb of the Genii at Mycenae (Wace et al. 1921–3, 386 f), Chamber Tomb 14 at Zapher Papoura (Evans 1905, 433 14m fig. 33 pl. LXXXIX) and Tomb 35 at Armenoi (Tzedakis and Martlew 1999, 258).

⁷⁹ See n. 77.

The Silver Vessels from the Dendra and Vapheio Tholoi

Scholars have not drawn either of these two silver vessel assemblages into the debate concerning the relationship between silver and tinned vessels. A brief glance at their shapes suggests why this may have been the case. In the Dendra tholos four silver vessels were uncovered in the undisturbed LH IIIA1 Pit I. A stemmed goblet (Persson 1931, 33 no. 5), a shallow cup (Persson 1931, 33 no. 6) and a Vapheio cup (Persson 1931, 33–4 no. 7) were found together at the north end, while at the southern end lay a wishbone-handled hemispherical cup (Persson 1931, 38 no. 1). This pit also contained a gold shallow cup, bronze objects, jewellery, sealstones and the skeletons of a man and woman; other finds within the tholos, also contained within pits, include a further burial, other human and animal skeletal material and a significant quantity of ash and charcoal mixed with the burnt remains of ivory, metal and stone objects (Persson 1931). The form of the silver stemmed goblet bears little relation to those found in the contemporary ceramic corpus and the other three shapes are apparently either rarely or never tinned.

The untouched LH IIA cist grave in the otherwise looted Vapheio tholos contained two silver Vapheio cups (Davis 1977, 258–60 nos. 105 and 106), an incomplete silver jug (Davis 1977, 261–3 no. 108) and two further silver cup fragments: a segment from a rim and part of a handle (Davis 1977, 261–2). Other finds include the two famous gold Vapheio cups decorated with scenes of bull-catching, a collection of bronze weapons and vessels, pottery and a significant number of seals (Tsountas 1889). The two Vapheio cups and jug share the same decoration, a simple motif of parallel grooves grouped in triplets; this may indicate that they were intended to be used together as a vessel set. Also to be considered alongside these silver vessels is a complete shallow cup manufactured from silvered copper,⁸⁰ which would have had the appearance of solid silver (Davis 1977, 260–1 no. 107) and a fragment from another silvered copper shallow cup (Davis 1977, 262). Therefore, this tomb contained at least six silver or silvered copper vessels. Their forms, where discernible, are apparently either rarely or never found in the tinned ceramic corpus, just like those in the Dendra tholos.

Discussion

To understand whether tinned ceramics were imitating a specific practice linked to silver vessels, or were imitative of metal vessels in a more general sense, it is necessary to compare the features of the five silver vessel assemblages discussed above. It is important to bear in mind that these assemblages may not be complete. Nevertheless, the recovered contents of each show important similarities and distinctions.

There are few similarities between the assemblages from the South House, Dendra chamber tomb, Dendra tholos, Vapheio and Kokla. The different forms of the South House assemblage can be ascribed to its earlier date and Cretan find location; the Vapheio group is also earlier than the other mainland silver vessel assemblages. Only these two groups included a pouring vessel; it is possible, but perhaps unlikely, that any originally included in the other assemblages were later removed. There are stronger associations between the Dendra chamber tomb and Kokla assemblages, such as the inclusion of kylikes, certain manufacturing similarities in the kylikes and the accompanying gold shallow cup. These associations are stronger than the similarities between the two Dendra silver vessel groups, both of which contained shallow cups and stemmed goblets. This is despite the fact that the two Dendra groups come from the same site and were both deposited in LH IIIA1. However, each assemblage differs significantly in the number and form of the vessels deposited. It is difficult to argue that they were specially linked or formed a distinct phenomenon. This undermines any notion of a standardised silver vessel mortuary set that could have provided the inspiration for the composition of tinned ceramic assemblages. It also calls into question the use of the much more standardised tinned sets as a basis for interpreting silver vessel groups.

⁸⁰ A term to describe copper thinly coated by silver via a chemical fusion process, which enables the two metals to be worked together as a single material (Charles 1968, 278; La Niece 1993, 205).

Except for their material, there is nothing to distinguish the silver vessel assemblages from other metal vessel sets, such as the four gold goblets from the Acropolis Treasure (Thomas 1938–9). Their links to tinned ceramics are also variable. There is little reason to posit a connection between tinned vessels and the South House group, Dendra tholos group or Vapheio group. Part of the Dendra chamber tomb silver vessel assemblage does show general similarities with tinned vessels, and specific tinned shapes that emphasised this link were selected for deposition alongside them. However, the rest show closer ties to the general silver vessel corpus. The strongest links are visible in the Kokla group, in terms of shapes, redundancy of forms and minimal decoration. These characteristics also distinguished it from the contemporary precious metal repertoire.

Kokla: Chicken or Egg?

Although the above discussion has demonstrated that the link between tinned and metal vessels is less strong than previously believed, it is still necessary to account for the very close ties between the Kokla group (and, to a lesser extent, the Dendra chamber tomb group) and the tinned ceramic phenomenon. The first known Aegean tinned vessels are earlier than the use of either the Kokla tholos or Dendra tomb 10, yet it took time to establish a standard repertoire of tinned shapes. The use of these tombs and the increased standardisation of tinned assemblages were apparently roughly contemporaneous. Given their similarities, and putting the more complex Dendra chamber tomb group to one side for a moment, it is worthwhile considering two different scenarios:

1. Standardisation in tinned vessel assemblages was inspired by the use of silver vessel groups with a similar composition to that found at Kokla.
2. Standardised tinned vessel assemblages inspired the manufacture of specialised silver vessel groups with a similar composition to that found at Kokla.

Scenario One

The first scenario is predicated on the assumption that silver vessel assemblages with the same composition as that found at Kokla appeared before the introduction of the standard triad of tinned shapes; the use and deposition of tinned vessels was therefore intended to imitate these supposed precious metal vessel groups. In this case, tinned vessels were already in existence but the creation and use of the Kokla group instigated a change in meaning, which led to the establishment of the three core tinned types and general stabilisation in the composition of tinned assemblages.

The standard triad of core tinned forms eventually spread quite widely across the Aegean. It seems unlikely that this could have been sparked by the single group at Kokla; nothing indicates that Kokla was particularly important during this period or that it held some form of ritual significance within Mycenaean culture. Similar groups may have been melted down (Aulsebrook 2017), but the surviving evidence suggests there was little or no standardisation between silver vessel assemblages. This hypothesis also fails to account for the inclusion of the shallow angular bowl in the core triad of tinned shapes.

Scenario Two

The alternative scenario is that the Kokla group was a specific local response to the ritual significance of tinned ceramics. This possibility has not been discussed before. Scholars tend to regard emulation as a phenomenon that moves only in one direction: from the elite sphere to the non-elite sphere. However, there is no a priori reason to exclude the possibility that high-status individuals chose to imitate a widespread practice, while imposing their own special conditions upon it to create a new restricted version.

Although tinned vessels have not been reported from Kokla itself, they were deposited in nearby cemeteries, including Argos, Dendra, Mycenae and Nauplion. Thus it is probable that people using Kokla cemetery were aware of their existence. Tinned ceramics were costly and the majority were

associated with well-furnished tombs. However, it is likely that silver versions were even more restricted in circulation and ownership.⁸¹ Solid silver vessels would have required more metal and access to specialists able to skilfully work the material. The ability to deposit such objects within a funerary assemblage is therefore a strong statement of economic and social status. Such a message would be strengthened if any special meanings attached to tinned ceramics were incorporated. In this scenario, it is not necessary to assume the existence of similar silver vessel assemblages, or that Kokla played an important role in the trajectory of tinned ceramics. Rather, the Kokla group would represent a specific local innovation: the manufacture of a special and distinct group of silver vessels that deliberately resembled a tinned ceramic assemblage. This does not mean that these silver vessels were produced especially as a funerary service. A silver version of a tinned ceramic set may have been intended to bring the rituals associated with the latter into the sphere of the living. The later deposition of these special vessels in the Kokla tholos as a group could have been an acknowledgement of their original inspiration.

The Evidence from Dendra Chamber Tomb 10

The link between the Dendra chamber tomb group and tinned ceramics also makes it significant to this discussion. Again, given the choice of shapes deposited, it is difficult to argue that the Dendra tomb 10 silver group played an important role in establishing the three core tinned forms. However, the two silver kylikes and stemmed krater share many characteristics with the Kokla group and were apparently manufactured as a set. It is possible that they too were meant to convey a particular meaning or used in a particular way during the funeral process, which was enhanced by the inclusion of identical tinned versions in the same assemblage.

CONCLUSIONS

This thorough review of the phenomenon of tinned ceramics has reaffirmed many of the objections raised by Gillis against their interpretation as imitations of metal vessels. Ceramics can reference metal vessels in two different ways: by imitating appearance or shape. Tinned ceramics reproduced the surface appearance of metal vessels but went no further. In most other respects they exhibited closer ties with the ceramic corpus. Indeed, with the exception of their coating, no attempt was made to visually differentiate tinned ceramics from ordinary pottery. There was therefore no intention to create a wholly separate class of material culture.

If we then interpret tinned vessels as enhanced ceramics, rather than emulators of silver, their characteristics become more understandable. This idea was already present during Immerwahr's seminal treatment of the phenomenon; she described tinning as the dressing-up of simple clay containers for funeral display (Immerwahr 1966, 387), and queried whether it really owed much to the original metallic derivation of their shapes (Immerwahr 1966, 386). Yet she also drew a simplistic link between silver and tinned vessels which came to dominate their interpretation. This has led to scholars using tinned ceramics to make judgements about the silver vessel corpus, an interpretative framework which, given our better knowledge of the tinned vessel phenomenon, can no longer be justified.

⁸¹ Gillis (1999a, 142) suggested that tin may have been more highly valued than silver. Her argument assumed that the long-distance exchange networks required to acquire tin outweighed in value terms any other consideration. Value is rarely that simple. The use of silver in the manufacture of metal vessels from the Late Bronze Age Greek mainland indicates it was valued second to gold, although its relationship to tin is impossible to determine in this way because tin was only ever incorporated into these metal vessels when alloyed (Aulsebrook 2012, 137–9). Silver has to be recovered through cupellation (Stos-Gale and Gale 1982, 467) and had a special economic role in the Eastern Mediterranean as a standard of exchange (Sherratt 1994, 68; Kelder 2016, 317), which may have given it a unique socio-cultural as well as economic status.

Granting tinned vessels this autonomy from metal prototypes and concentrating on their links to the ceramic corpus helps to confirm that they had their own trajectory of distribution and change, and may have had a special role within Late Bronze Age Aegean culture that linked the two. The loss of shapes directly imitating metal forms in LH IIIA, such as the ring-handled and Vapheio cups, may have been compensated for by the expansion in tinning, because it represented an alternative way to link the ceramic and metal assemblages (Shelton 2008, 222). Looking at the Kokla and Dendra chamber tomb groups from this perspective also allows us to reassess their significance. Rather than trying to force the meagre evidence from silver vessel groups to demonstrate a level of standardisation that could have acted as the inspiration for the manufacture of tinned ceramics, it is possible to view the Dendra chamber tomb and Kokla groups specifically as an innovative strategy to co-opt the meanings behind tinning while simultaneously employing exclusionary tactics.

Some may regard tinned ceramics as yet another way to express affluence in the competitive mortuary sphere (Reeves 2003, 234). Such an interpretation may be applicable to the use of tinned ceramics in certain other cultures; in Macedonia tinned and even gilded examples of almost all the common shapes encountered in fourth-century BC mortuary contexts have been found (Kotitsa 2012, 113). However, in the Middle and Late Bronze Age Aegean there was a clear process of selection for tinning, particularly with the establishment of the core triad of shapes, that implies the existence of other factors apart from status display. Moving beyond the paradigm of imitation can help to open up other possibilities. Gillis (1999b, 293) argued that the inclusion of both golden and silvery versions demonstrated that their presence was driven by symbolism, not socio-economic reasons. She suggested that the desire was to incorporate yellow and white shiny objects, due to colour symbolism, not imitate metal vessels (Gillis 2012, 584). Tinning would therefore enable a vessel to be coloured gold or silver while using a less valuable resource (French and Tomlinson 1999, 260). In addition, the decay of the tin, leaving bare ceramic, could have been associated with the decay of the flesh of the dead, which leaves bare bones (Dimaki and Papageorgiou 2015, 851). The focusing of tinning upon kylikes in particular would suggest that the tinned sets either were used by a perhaps select group of mourners during the funeral for drinking and/or eating rituals, or were intended to symbolise the partaking of the deceased in feasting activities. The emergence of the core triad of tinned shapes may demonstrate that the use of tinned vessels within mortuary contexts became more formalised over time. However, it is also important to consider that, although there are many similarities between tinned assemblages across all three regions of their use, their meaning was not necessarily uniform. Unusual assemblages, like that at Varkiza-Vari, caution against such an assumption.

The production of single-use objects for mortuary rituals may have been intentional. Assemblages such as that in Chamber Tomb I:1 at Asine prove that new tinned vessels were brought into the tomb on multiple occasions and those deposited previously, the shiny surface of which was already beginning to decay, were swept aside. The degeneration of the tin made the retrieval of tinned vessels pointless, unlike other precious items that were sometimes removed from tombs. The use of tinned vessels was therefore an obvious and potent act of conspicuous and irreversible consumption; it was a permanent offering by the living to the realm of the dead.

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APPENDIX

Part One – Site Catalogue (Table A1)

A catalogue of all the Late Bronze Age Aegean sites from which tinned ceramics have been published or reported.

Part Two – Tinned Vessel Catalogue (Table A2)

A catalogue of individually published tinned ceramics. The following conventions are used:

- Vessels marked in **bold** have had their tin coating scientifically confirmed.
- Vessels marked in *italics* are only suspected to be tinned.
- Dates marked in *italics* refer to the vessel only, not its context.
- Vessels marked with an * were probably heat treated to turn them into a golden colour, according to analysis carried out by Gillis (1999b, 292).
- Vessels marked with a 'P' before their description were previously painted.
- 'SAB' stands for 'shallow angular bowl'.

Table A1. Site catalogue.

Area	Site	Evidence for Tinned Vessels	Date	Find Details	References
Crete	Archanes	Tinned vessels reported by Kanta.	?	No details have been given in publications of this cemetery.	Kanta 1980, 315
	Armenoi	Tinned vessels reported from Chamber Tomb 159; see Table A2.	LM IIIA–B	At least three kylikes. Tomb unpublished. Large imposing tomb with two column bases either side of entrance; remains of wooden stretcher on which the deceased was carried.	Tzedakis and Martlew 1999, 176–7, 248 Godart and Tzedakis 1992, 87–8, 91
	Gourmes	Three tinned vessels in Tomb 2; see Table A2.	LM IIIB1	Tinned kylix, champagne glass and two-handled bowl; three sarcophagi, bronze implements, stone vases, seal stone, beads and other ceramic vessels.	Kanta 1980, 48 Furumark 1972b, 105
	Isopata	Three tinned vessels in Tomb 5; see Table A2.	LM II	Two tinned alabastra at east of only intact burial, tinned beaked jug just inside entrance. Tomb looted, probably in antiquity; silver ring and five vessels recovered, four decorated with polychromy.	Evans 1914, 21–2, 24–6, 30 Evans 1935, 881 Preston 1999, 289–92 Preston 2007
	Katsambas	Two tinned vessels in Tomb Γ; see Table A2.	LM II	A tinned goblet and tinned one-handled shallow cup; other finds were small unidentifiable fragments.	Alexiou 1967, 47–8 Preston 2004, 329
		Six tinned vessels in Tomb H; see Table A2.	LM IIIA1	Two tinned kylikes in north-west corner of the chamber, two tinned champagne cups (one along the southern edge), tinned handleless cup in southern part near skeletal material and tinned shallow angular bowl; also stone vases and weights, items of bronze, gold, faience and ivory.	Alexiou 1967, 52–8 Preston 2004, 329
		Seven tinned vessels in Tomb Θ; see Table A2.	LM IIIA2	Four tinned kylikes, two tinned handleless cups and small tinned dish with horizontal handles in south-west corner of chamber. Two uncoated ceramic vessels in fragments across north and west. Tomb probably looted; also recovered were the remains of a boar-tusk helmet, silver ring bezel, and fragments of bronze and gold.	Alexiou 1970, 233–4, 236
	Knossos	Tinned vessel reported by Gillis from Temple Tomb.	LM IIIA1?	Possible tinned conical cup seen by Gillis.	Gillis 1991, 28
		Possible tinned vessel reported from Unexplored Mansion.	LM II	Possible tinned kylix; coating destroyed in acid bath.	Popham and Catling 1974, 208 n. 9
	Kritsa	Tinned vessel in larger chamber tomb; see Table A2.	LM IIIA/B – LM IIIB	Tinned kylix, three sarcophagi, incense burner, two stone vases and knife.	Kanta 1980, 134–7
	Ligortyno	Two probable tinned vessels in Tomb II; see Table A2.	LM IIIA2	Two probable tinned kylikes associated with larnax 1; also rhyta, stone vase, seals, bronze knives.	D'Agata 2015, 62–4, 70
	Mavro Spelio	Tinned vessel in Tomb IX; see Table A2.	MM II–III	Large, poorly preserved multi-chambered tomb; assemblage included gold, faience and amethyst jewellery, larnakes and small items of bronze, ivory and silver.	Alberti 2001 Forsdyke 1926–7, 264–9
		Tinned sherd from Tomb XIII; see Table A2.	LM IIIA	Small chamber tomb with larnax and five painted vessels.	Kanta 1980, 327 Forsdyke 1926–7, 272
	Phylaki Apokoronou	Tinned vessel from tholos.	LM IIIA2	Tomb partially looted; multiple burials; tinned kylix, ivory inlays, gold, silver and stone jewellery, bronze weapons and vessels, sealstones, few pots.	Tzedakis 1981, 398–9 Catling 1981–2, 58
	Sellopoulo	Four tinned vessels in Tomb 3; see Table A2.	LM IIIA1	Four tinned kylikes, bronze vessels and implements, gold rosettes, three other ceramic vessels; tomb had been looted.	Popham and Catling 1974, 197–8, 206, 208
		Seven tinned vessels in Tomb 4; see Table A2.	LM IIIA1	With burial I, tinned kylix near left elbow, tinned angular bowl near right shoulder, another tinned kylix, plain ceramic jug, silver bowl, gold jewellery, three other ceramic vessels, bronze vessels, weapons and implements; tinned conical cup and two tinned kylikes with either burial I or II.	Popham and Catling 1974, 199 201–2, 206, 209
	Zapher Papoura	Tinned vessel in Tomb 7; see Table A2.	LM IIIA2	Tinned kylix, gold jewellery, bronze implements, ivory boat, three-handled amphora and undecorated kylix.	Evans 1905, 416–17 Preston 2000, 533–4

	Two tinned vessels in Tomb 66; see Table A2.	LM IIIA2	Two tinned kylikes, gold jewellery, glass (and perhaps faience) objects, bronze mirror, three polychrome vessels and three other ceramic vessels.	Evans 1905, 461–2 Preston 2000, 533–4
	Three tinned vessels in Tomb 67; see Table A2.	LM IIIA2	Two tinned kylikes and one tinned shallow angular bowl, glass beads, small ceramic cup and bronze mirror.	Evans 1905, 462–3 Preston 2000, 533–4
	Two tinned vessels in Tomb 99 (Evans 1905); see Table A2.	LM IIIA2 or LM IIIB1	One of the richest in this cemetery; two tinned stirrup jars, bronze and stone vessels, Egyptian scarab, various beads and jewellery, three further stirrup jars and five ceramic vessels.	Evans 1905, 479–80 Preston 2000, 535
Achaea	Voudeni	LH IIB/IIIA1–IIIC	At least three LH IIIA tinned kylikes; also bronze weapons, gold, glass and stone jewellery.	Kolonas 2009, 15–17
		LH IIIA–Sub-Mycenaean	At least two LH IIIA tinned kylikes, tinned handleless bowl and tinned bowl; also gold and amber jewellery, boar tusks, ivory inlays, bronze implements.	Kolonas 2009, 27–9
Argolid	Argos	LH I–IIA; LH IIA–IIIA1	Unusual tinned cup and possible tinned hole-mouthed jar in Pit A; also bronze bowl, bone pin, other vases and skeletal material. Two tinned handleless cups with skeleton 2; also other vases and clay objects. Possible tinned goblet in Pit B; also skeletal material, knife, glass beads, fragments of ivory pyxides; chamber contained rock crystal fragment, animal bones, obsidian flakes, bronze dagger.	Papadimitriou 2001, 52–6, 61–2
	Asine	LH IIIA1–B	Tinned kylix on bench by north dromos, two tinned kylikes in centre of chamber behind a later burial, three tinned kylikes grouped together near entrance with a tinned stirrup jar, tinned stirrup jug and three other vases (one possibly tinned); also ten tinned kylikes, seven tinned handleless bowls, four tinned shallow angular bowls, two tinned stirrup jugs, two possible tinned kylikes, one possible tinned handleless bowl, gold, stone and faience jewellery, silver vessel, seals, ivories, steatite buttons and iron ring.	Mountjoy 1996, 50–1, 53, 63–6 Gillis 1996a, 99–100 Frödin and Persson 1938, 371–7
	At least two tinned vessels in Tomb I:2 reported by Gillis.	LH IIIB	Tinned handleless cup and tinned kylix; gold, glass and stone jewellery, ivories, bronze implements and stone vessels.	Gillis 1996a, 98 Frödin and Persson 1938, 378, 386–91 Sjöberg 2004, 98
	At least seven tinned vessels in Tomb I:7 reported by Gillis.	LH IIB; LH IIIA2	Seven tinned kylikes; glass and amethyst jewellery, ivories, fragments of gold leaf, bronze implements, steatite buttons and lead wire.	Gillis 1996a, 98 Frödin and Persson 1938, 420–1 Sjöberg 2004, 98 Gillis 1996a, 98
	Tinned sherds of at least 11 kylikes and fragmented ? tinned vessel reported by Gillis.	?	It is not possible to match these to a specific tomb.	Gillis 1996a, 98
Berbati	Fourteen tinned vessels in chamber tomb; see Table A2.	LH IIIA2	Ten tinned kylikes, two tinned shallow angular bowls and two tinned handleless bowls in lowest level of tomb, commingled with remains of at least eighteen burials, thirty-two ceramic vessels, four figurines, two bronze knives, bronze bowl, six bronze arrowheads, three gold foil pieces, five steatite buttons, lead wire.	Holmberg, E.J. 1983, 14–16, 34, 37, 40–1, 48–9
Dendra	Five tinned vessels in Tomb 10; see Table A2.	LH IIIA1	Five tinned kylikes in Shaft II, alongside four other vases, gilded ivory bowl, silver spoon and five silver vessels; Shaft I contained a gold cup, gold, amber and faience jewellery and skeletal remains; chamber had further jewellery, bronze scale pans and large vases.	Persson 1942, 87–94
Mycenae	Four tinned vessels in Tomb 515; see Table A2.	Early LH IIIA2	Three tinned kylikes and one tinned shallow angular bowl; many other vases, untreated kylikes; silver vessel fragments, gold ornaments, small bronze implements and many beads in dromos.	Wace 1932, 54, 58, 60 Immerwahr 1966, 387 n. 30
	Tinned vessel in Tomb 502; see Table A2.	LH IIIA	Tinned kylix along northeast side with other vases, two other kylikes, sherds and bones; secondary deposit material; tinned kylix = LH	Wace 1932, 5, 8–10

Continued

Table A1. Continued

Area	Site	Evidence for Tinned Vessels	Date	Find Details	References
				III A1 but surrounding vases = LH III A2 (French pers. comm.); also other vases, gold rosette, faience and amethyst beads.	
		Tinned vessel in Gortsoulia Tomb I; see Table A2.	LH III A2	Tinned kylix in unstratified dromos fill, close to stomion at a depth of 1.30 m; chamber contained bronze fibula and mirror, glass jewellery, stone mortar and pestle, other vases.	Shelton 2000, 27, 29
		Tinned vessel in Kapsala North Tomb V-II; see Table A2.	LH III A2	Tinned kylix in niche in east wall of chamber with three vases, plaster fragments and remains of at least two burials; secondary deposit of material in LH III A2; other vases in dromos, skeletal material in chamber.	Shelton 2000, 48, 50
	Nauplion	At least five tinned vessels in Evangelistria Tomb 3 reported by Piteros.	LH III A	Five tinned kylikes in chamber with other similarly dated ceramics; further tinned kylix sherds in pit 2, also two figurines and two steatite buttons.	Piteros 2008, 270–1
		At least one tinned vessel in Evangelistria Tomb AE.	?	Painted tinned stirrup jar. Unpublished. On display in Nauplion Museum.	Seen by author.
		At least one tinned vessel in Evangelistria Tomb AET.	?	Tinned FS 272 kylix. Unpublished. On display in Nauplion Museum.	Seen by author.
	Prosymna	At least one possible tinned vessel in Tomb II reported by Dimaki and Papageorgiou; tinned vessels reported by Immerwahr; see Table A2.	LH IIA–III A1	Possible tinned piriform jar with three vases in outer left corner of chamber; Immerwahr recognised tinned vessels in the illustrated pottery of this tomb; large tomb, fresco on door jamb; also gold, glass, amber jewellery, fragments of gold, ivory and bronze objects.	Dimaki and Papageorgiou 2015, 850 Immerwahr 1966, 395 Blegen 1937, 178–80 Shelton 1996, 8, 168–9
		At least one tinned vessel in Tomb XV; see Table A2.	LH III A2	Looted tomb; tinned kylix on floor at back of chamber in lower LH III A2 layer; same layer had other vases, bronze implement.	Pantelidou 1975, 173 Blegen 1937, 172–3 Shelton 1996, 35, 191
		At least one tinned vessel in Tomb XXXIII; see Table A2.	LH III A2	Tinned kylix in side chamber on left side with five vases and skeletal remains; tomb contained figurines, bronze implements, glass jewellery, ivory rosettes, many vases and burials.	Pantelidou 1975, 173 Blegen 1937, 109–10 Shelton 1996, 94, 226
		At least one possible tinned vessel in Tomb XXXIV reported by Dimaki and Papageorgiou; see Table A2.	LH III A1	Possible tinned piriform jar in cist IV; cist contained bones and pottery; also in chamber bronze objects, sealstone, arrowheads, glass jewellery.	Dimaki and Papageorgiou 2015, 850 Blegen 1937, 114, 116 Shelton 1996, 103, 230
		At least eight tinned vessels in Tomb XXXVII; see Table A2.	LH III A1–A2	Tinned vessels in lower chamber level; tinned kylix with centre skeleton, rest in two groups on left side with heaped bones, other vases; also bronze weapons including gold and ivory decorated sword, glass jewellery; multiple burials.	Pantelidou 1975, 173 Blegen 1937, 126–8 Shelton 1996, 112–14, 239
		At least six tinned vessels in Tomb XXXVIII; see Table A2.	LH III A2	Three tinned kylikes and tinned cup with skeleton on floor inside door, bronze implements, several vases, animal figurine; tinned kylix and tinned shallow angular bowl with heap of bones in south-east corner, small bronze objects; also glass and stone jewellery.	Pantelidou 1975, 173 Blegen 1937, 129–31 Shelton 1996, 115–17, 241
		At least one tinned vessel in Tomb XLI; see Table A2.	LH III A2	Tinned kylix with heap of bones and vases along rear of chamber; also gold, amber and glass jewellery, ivory comb, bronze weapons, lead weight.	Pantelidou 1975, 173 Blegen 1937, 145, 147 Shelton 1996, 123, 245
		At least three tinned vessels in Tomb XLIII; see Table A2.	LH III A1–A2	Tinned kylix in corner recess of chamber wall with amphora and large jug; tinned kylix in chamber centre with vases and bones; tinned handleless cup fragments across tomb; also silver spoon, bronze weapons and implements, fragments of ivory and jewellery.	Pantelidou 1975, 173 Blegen 1937, 188–98 Shelton 1996, 131, 138
		At least one possible tinned vessel in Tomb XLIV reported by Dimaki and Papageorgiou; see Table A2.	LH III A2–B1	Possible tinned piriform jar in centre of upper layer, bones, seven other vases; also gold, amber, ivory, stone, glass jewellery, silver spoon, bronze implements, amethyst sealstone.	Dimaki and Papageorgiou 2015, 850 Blegen 1937, 211, 214–15 Shelton 1996, 144, 256
Attica	Athens	At least four tinned vessels in Agora Tomb I; see Table A2.	LH III A1	Two tinned kylix fragments near bench; tinned kylix sherd and at least one tinned handleless bowl from either west bench area or central part	Immerwahr 1971, 159–69

		Twelve tinned vessels in Agora Tomb III; see Table A2.	LH IIIA1–2	of chamber; copper lamp, bronze mirror, ivory pins, ornaments and pyxides, gold ornaments. Two tinned kylikes, tinned shallow angular bowl and tinned stirrup-handled jug in west part of chamber; tinned handleless bowl just inside door; three tinned kylikes, tinned shallow angular bowl, two tinned handleless bowls with burial 2 in south part of chamber; tinned kylix in south of chamber; wooden table in south-east corner with two swords and small bronze shallow dish; ivory inlays, gold ornaments.	Immerwahr 1971, 172–7
		Possible tinned vessel in Southern Cemetery (Galatsi) Tomb 13; see Table A2.	LH IIIA1	Possible tinned kylix on chamber floor; five pits with vases and skeletal material, two stone whorls.	Pantelidou 1975, 80–6, 91–2
		Twelve tinned vessels in Southern Cemetery (Galatsi) Tomb 15; see Table A2.	LH IIB–III A1	Tinned kylikes and handleless bowls in pit grave; only other finds were other vases.	Pantelidou 1975, 95–7, 101–6
		Nine tinned vessels in Southern Cemetery (Galatsi) Tomb 16; see Table A2.	LH IIB–III A1	Tinned kylikes and cup fragments in pit grave; also bronze weapons, gold objects, glass and stone jewellery.	Pantelidou 1975 97–106
	Varkiza-Vari	Tinned vessel from Tomb 1; see Table A2.	LH IIIA1–A/B	Tinned lekane, glass and bronze jewellery, bone pin, steatite whorls.	Polychronakou-Sgouritsa 1988, 51, 54 Pantelidou 1975, 173–4
		Approximately thirty tinned vessels from unknown tomb(s); see Table A2.	LH IIIA–B	Tinned kylikes, handleless bowls, shallow angular bowls, shallow cup, mugs, feeding bottle, lekane, dipper.	Polychronakou-Sgouritsa 1988, 60–78 Pantelidou 1975, 173–4
	Vravron	Tinned vessel in Tomb B; see Table A2.	LH IIIA2	Unlooted tomb with two phases of use; tinned kylix, four other kylikes, twelve pots, eighteen whorls, three lead objects, bone pin; piles of bones in east side, scattered bones, sherds, vases in west.	Papadopoulos and Kontorli-Papadopoulou 2014, 36, 40
		Tinned vessel in Tomb 19; see Table A2.	LH IIIA2	Tinned kylix, other vases, animal figurines, skeletal material.	Papadopoulos and Kontorli-Papadopoulou 2014, 84, 93
		Tinned vessel in Tomb 13; see Table A2.	LH IIIA2	Tinned kylix, steatite buttons, glass objects, bronze sword and bronze arrowhead; multiple burials.	Papadopoulos and Kontorli-Papadopoulou 2014, 70, 72
		Tinned vessel in Tomb 3; see Table A2.	LH IIB	Tinned shallow angular bowl, steatite button, bronze and glass beads, sherds, bones and pebbles.	Papadopoulos and Kontorli-Papadopoulou 2014, 55, 57
		Three tinned vessels from excavations of Papadimitriou and Stais; see Table A2.	?	Not possible to associate these tinned vessels with a particular tomb.	Papadopoulos and Kontorli-Papadopoulou 2014, 31, 34, 114, 116
Boeotia	Prosilio	At least eight tinned vessels in Tomb 2.	LH IIIA	Tinned kylikes, one-handled cups, shallow bowl with flat handles; also other vases, gold, faience and glass jewellery, bronze and bone objects, single burial.	Galanakis pers. comm.
	Tanagra	At least four tinned vessels; see Table A2.	LH IIIA–B	Four tinned kylikes; not possible to associate them with a particular tomb.	Demakopoulou and Konsola 1981, 85, 87
	Thebes	At least two tinned vessels in Tomb 14; see Table A2.	LH I–IIIC	Two tinned kylikes; also bronze clasp, animal figurines, many vases, lead wire, steatite buttons, other bronze objects.	Keramopoulos 1917, 150–1 Tzavella-Evjen 2014, 63, 128 Dimaki and Parageorgiou 2015, 850
		At least two tinned vessels in Tomb 21; see Table A2.	LH IIIA2	Two tinned kylikes; also other vases, little bone, figurines, gold objects, pieces of jewellery.	Keramopoulos 1917, 181–3 Tzavella-Evjen 2014, 63, 127–8 Dimaki and Parageorgiou 2015, 850
Messenia	Ambelofytou Lagou	Tinned vessel; see Table A2.	LH IIIA?	Tinned kylix stem found in surface scatter of small habitation site as part of Pylos Regional Archaeological Project (PRAP).	Davis, Bennet, and Shelmerdine 1999, 447
	Ellenika Antheias	Tinned vessels in Tomb Tsagli 4 reported by Koumouzelis.	LH IIIA1	Tomb unpublished. Tinned shape range apparently same as from Crete, Isopata and Athens; tinned handleless cups, tinned kylikes with high-swung handles; stem of tinned kylix in shaft grave with bronze ivory-handled mirror, gold seal ring, bronze knife and skeletal remains.	Koumouzelis 1989, 111 Koumouzelis 1996, 1224, 1226

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Table A1. Continued

Area	Site	Evidence for Tinned Vessels	Date	Find Details	References
	Myrsinochorion Routsis	Tinned ceramics in Tholos 2 reported by Korres.	LH I–IIIC	Tomb possibly constructed in LH I and later remodelled; multiple burials; also objects of gold and ivory, seals, bronze weapons and implements, glass bead necklace, amber bead necklace.	Korres 1974, 152 Korres 1982, 91, 93–5
	Nichoria	One tinned vessel in MME Tholos; see Table A2.	LH IIIA2	Tinned kylix from Pit 1, which had been moved from chamber; also gold band, bronze weapons and implements, amber beads, sealstone and skeletal remains.	Wilkie and Dickinson 1992, 249, 321
	Peristeria Pylos	Tinned ceramics reported by Korres. At least four tinned vessels in Tholos III; see Table A2.	? LH IIIB	Not possible to associate these tinned vessels with a particular tomb. Three tinned kylikes, tinned shallow angular bowl, all LH IIIB; tomb used from LH II–IIIB; also fragments of gold, silver, ivory, bronze weapons, various jewellery and possible animal sacrifice.	Korres 1974, 152 Pantelidou 1975, 173 Blegen et al. 1973, 73, 79, 92–3
	Tourliditsa	Tinned ceramics reported by Korres.	LH II–IIIA	Probably from tholos tomb; two pits in floor; only three pots recovered, stone lamp, bronze knife.	Korres 1974, 152 Banou 2008, 45
	Tragana	At least five tinned vessels in Tholos 1 and further sherds reported by Korres; see Table A2.	LH IIA–IIIC	Catalogue of ceramics unpublished. At least five tinned kylikes and tinned handleless cups, other tinned sherds recovered from spoil. Tomb built in LH IIA, possible abandonment in LH IIIB, reuse in LH IIIC; significant number of burials; amethyst seal, gold objects, boar tusks, many bronze vessels, weapons and implements.	Kourouniotis 1914, 110–11 Orlandos 1980, 34 Catling 1981–2, 25 Guglielmino 1979, 434–5, 449–51 Dimaki and Papageorgiou 2015, 850
Phthiotis	Kalapodi	Six tinned vessels, including one gilded example, in Tomb IV; see Table A2.	LH IIIA1	Five tinned kylikes, tinned jug with band of gold foil around base of neck found at head of one of the three surviving burials.	Dimaki and Parageorgiou 2015, 850, 853–4
Thessaly	Kazanaki	One tinned vessel in tholos; see Table A2.	LH IIIA1–2	One tinned kylix; also gold, glass and faience jewellery, sealstones; four shaft graves and multiple pits, two phases of use and extensive evidence for burning.	Adrymi-Sismani and Alexandrou 2009, 137–40, 142
Rhodes	Ialysos	Tinned vessel in Old Tomb A2; see Table A2.	LH IIB–IIIC	Tinned shallow angular bowl (possibly from another tomb); also other vases, gold and glass jewellery.	Forsdyke 1925, 151 Furtwängler and Loeschcke 1886, 7 Mee 1982, 8, 11, 23, 27
		Tinned vessel from Old Tomb 5; see Table A2.	LH IIIA2	Tinned kylix; tripod braziers, figurines, beads, glass ornaments, silver wire ring.	Forsdyke 1925, 153 Furtwängler and Loeschcke 1886, 8–9 Mee 1982, 11
		Tinned vessel from Old Tomb 7; see Table A2.	LH IIIB	Tinned kylix and three other vases.	Forsdyke 1925, 153 Furtwängler and Loeschcke 1886, 9 Mee 1982, 23
		Two tinned vessels in New Tomb 4; see Table A2.	LH IIIA2	Two tinned kylikes, bronze weapons, gold and amber jewellery, lead wire, other pots including plain kylikes.	Benzi 1992, 235–9
		Three tinned vessels in New Tomb 5; see Table A2.	LH IIIB	Two tinned kylikes and tinned shallow angular bowl, glass and gold jewellery, vases, lead wire.	Benzi 1992, 239–40
		Two tinned vessels in New Tomb 28; see Table A2.	LH IIIA2	Two tinned kylikes, glass and faience jewellery, vases, lead fragments.	Benzi 1992, 291–4
		Two tinned vessels in New Tomb 31; see Table A2.	LH IIIA1–2	Two tinned kylikes, broken ostrich egg, gold and faience jewellery, vases.	Benzi 1992, 297–302
		Three tinned vessels in New Tomb 50; see Table A2.	LH IIIA1–2	Two tinned kylikes and tinned shallow angular bowl, bronze weapons, gold and agate objects, vases.	Benzi 1992, 335–8
		Three tinned vessels in New Tomb 53; see Table A2.	LH IIIB	Two tinned kylikes and tinned shallow angular bowl, bronze weapons, vases, faience, rock crystal, amber, gold and silver jewellery.	Benzi 1992, 343–7
		Tinned vessel in New Tomb 56; see Table A2.	LH IIIA2	Tinned kylix, copper vessels, plain kylikes, gold and faience objects, vases.	Benzi 1992, 351–3
	Maritsa	Tinned vessel in tomb; see Table A2.	LH IIIA2–B	Tinned kylix, ten vases placed along the back wall, part of a tripod vessel, bronze razor.	Benzi 1992, 410

Table A2. Tinned vessel catalogue.

Area	Site	Context	Date	Form	Reference
Crete	Armenoi	Chamber Tomb 159	<i>LM IIIA2/B</i>	FS 274: Kylix	Tzedakis and Martlew 1999, 176 (RM 3459) fig. 167
			<i>LM IIIA2/B</i>	P Kylix	Tzedakis and Martlew 1999, 177 (RM 3460) fig. 170
			<i>LM IIIB</i>	P FS 273: Kylix	Tzedakis and Martlew 1999, 248 (RM 3455) fig. 255
	Gournes	Tomb 2	<i>LM IIIB1</i>	Kylix	Kanta 1980, 48 no. 2 (HM 7184) fig. 22:9
				Champagne Cup	Kanta 1980, 48 no. 6
	Isopata	Tomb 5	<i>LM II</i>	Two-Handled Bowl	Kanta 1980, 48 no. 5
				Alabastron	Evans 1914, 24–5 b fig. 35
	Katsambas	Tomb Γ	<i>LM II</i>	Alabastron	Evans 1914, 24–5 c
				Beaked Jug	Evans 1914, 24–5 d fig. 36
				Two-Handled Kylix	Alexiou 1967, 47 no. 1 (10004) pl. 14γ left
		Tomb H	<i>LM IIIA1</i>	One-Handled Shallow Cup	Alexiou 1967, 48 no. 2 (10005) pl. 14γ third from left
				Two-Handled Kylix	Alexiou 1967, 52 no. 4b (14670) pl. 25α left
				Two-Handled Kylix	Alexiou 1967, 52 no. 6 (14672) pl. 27γ left
				Champagne Cup	Alexiou 1967, 53 no. 17 (14681) pl. 26α third from left
				Two-Handled Kylix	Alexiou 1967, 53 no. 26 (14683) pl. 25α right
Shallow Angular Bowl				Alexiou 1967, 54 no. 32 (14689) pl. 27α right	
Champagne Cup				Alexiou 1967, 54 no. 33 (14690) pl. 26α second from left	
Tomb Θ	<i>LM IIIA2</i>	Two-Handled Kylix	Alexiou 1970, 233		
		Two-Handled Kylix	Alexiou 1970, 233		
		One-Handled Kylix	Alexiou 1970, 233		
		One-Handled Kylix	Alexiou 1970, 233		
		Dish with two Horizontal Handles	Alexiou 1970, 233		
Kritsa	Chamber Tomb	<i>LM IIIA/B–B</i>	Handleless Cup	Alexiou 1970, 233	
			Handleless Cup	Alexiou 1970, 233	
Ligortyno	Tomb II	<i>LM IIIA2</i>	Kylix	Kanta 1980, 137 no. 160 fig. 54:6	
			Kylix	D'Agata 2015, 70 no. II.20 (CA 893) fig. 6, 13	
Mavro Spelio	Tomb IX	<i>MM II–III</i>	Kylix	D'Agata 2015, 70 no. II.21 (CA 894) fig. 13	
			Conical Cup	Alberti 2001, 179 n. 24 fig. 6e	
Sellopoulo	Tomb XIII	<i>LM IIIA</i>	Unknown	Kanta 1980, 327	
			<i>LM IIIA1</i>	Kylix	Popham and Catling 1974, 208 P3
				Kylix	Popham and Catling 1974, 208 P4

Continued

Table A2. Continued

Area	Site	Context	Date	Form	Reference
Argolid	Zapher Papoura	Tomb 4	LM IIIA1	Kylix	Popham and Catling 1974, 208 P5
				Kylix	Popham and Catling 1974, 208 P6
				Handleless Bowl	Popham and Catling 1974, 209 P1
				Kylix	Popham and Catling 1974, 209 P2
				Kylix	Popham and Catling 1974, 209 P3
				Kylix	Popham and Catling 1974, 209 P4
				SAB	Popham and Catling 1974, 209 P6
				Kylix	Popham and Catling 1974, 209 P8
				Handleless Bowl	Popham and Catling 1974, 209 P11
				Kylix	Evans 1905, 415–7 f
	Tomb 66	LM IIIA2	Kylix	Evans 1905, 461–2 h	
			Kylix	Evans 1905, 461–2 n	
	Tomb 67	LM IIIA2	Kylix	Evans 1905, 462–3 b	
			Kylix	Evans 1905, 462–3 c	
	Tomb 99	LM IIIA2 or LM IIIB1	SAB	Evans 1905, 462–3 a	
			Stirrup Jar	Evans 1905, 480 l	
	Argos	Tomb T.164	LH I–IIA	Stirrup Jar	Evans 1905, 480 m
				Deep Cup	Papadimitriou 2001, 55 P11 (ANM 9084) fig. 8a
	Asine	Tomb I:1	LH IIB–IIIA1	<i>P FS 100/101: Hole-Mouthed Jar</i>	Papadimitriou 2001, 54 P9 (ANM 9082) fig. 10 pl. 6d
				FS 204: Handleless Bowl	Papadimitriou 2001, 52 P4 (ANM 9077) fig. 7b
FS 204: Handleless Bowl				Papadimitriou 2001, 53 P6 (ANM 9079) fig. 7d	
<i>FS 254/263: Kylix</i>				Papadimitriou 2001, 61 P27 (ANM 10000) fig. 10e	
P FS 165: Stirrup Jar				Mountjoy 1996, 64 no. 7 (Stockholm 1007) fig. 6	
P FS 154: Stirrup-Handled Jug				Mountjoy 1996, 65 no. 23 (Stockholm 1023) fig. 6	
<i>P FS 150: Stirrup-Handled Jug</i>				Mountjoy 1996, 65 no. 24 (Stockholm 1024) fig. 3	
FS 272: Kylix*				Mountjoy 1996, 65 no. 39 (Stockholm 1039) fig. 4	
<i>FS 272: Kylix*</i>				Mountjoy 1996, 65 no. 41 (Stockholm 1041) fig. 4	
<i>FS 273.5: Kylix</i>				Mountjoy 1996, 65 no. 42 (Stockholm 1042) fig. 7	
FS 265: Kylix	Mountjoy 1996, 65 no. 43 (Stockholm 1043) fig. 7				
FS 265: Kylix*	Mountjoy 1996, 65 no. 44 (Stockholm 1044) fig. 7				
<i>FS 265: Kylix</i>	Mountjoy 1996, 65 no. 45 (Stockholm 1045) fig. 17				
<i>FS 264: Kylix</i>	Mountjoy 1996, 66 no. 47 (Stockholm 1047) fig. 7				

		FS 266: Kylix	Mountjoy 1996, 66 no. 48 (Stockholm 1048) fig. 4
		FS 264: Kylix	Mountjoy 1996, 66 no. 49 (Stockholm 1049) fig. 4
		FS 267: Kylix	Mountjoy 1996, 66 no. 50 (Stockholm 1050) fig. 4
		FS 267: Kylix	Mountjoy 1996, 66 no. 51 (Stockholm 1051) fig. 18
		FS 267: Kylix	Mountjoy 1996, 66 no. 52 (Stockholm 1052) fig. 6
		<i>FS 267: Kylix</i>	Mountjoy 1966, 66 no. 53 (Stockholm 1053)
		FS 267: Kylix	Mountjoy 1996, 66 no. 54 (Stockholm 1054) fig. 8
		FS 267: Kylix	Mountjoy 1996, 66 no. 55 (Stockholm 1055) fig. 6
		FS 267: Kylix	Mountjoy 1996, 66 no. 56 (Stockholm 1056) fig. 6
		FS 267: Kylix	Mountjoy 1996, 66 no. 58 (Stockholm 1058) fig. 4
		FS 267: Kylix	Mountjoy 1996, 66 no. 60 (Stockholm 1060) fig. 8
		FS 295: SAB	Mountjoy 1996, 66 no. 61 (Stockholm 1061) fig. 8
		FS 295: SAB	Mountjoy 1996, 66 no. 62 (Stockholm 1062) fig. 6
		FS 204: Handleless Bowl	Mountjoy 1996, 66 no. 67 (Stockholm 1067) fig. 8
		FS 204: Handleless Bowl*	Mountjoy 1996, 66 no. 68 (Stockholm 1068) fig. 6
		FS 204: Handleless Bowl	Mountjoy 1996, 66 no. 69 (Stockholm 1069) fig. 8
		FS 204: Handleless Bowl	Mountjoy 1996, 66 no. 70 (Stockholm 1070) fig. 3
		FS 204: Handleless Bowl	Mountjoy 1996, 66 no. 71 (Stockholm 1071) fig. 6
		P FS 204: Handleless Bowl	Mountjoy 1996, 66 no. 73 (Stockholm 1073) fig. 8
		<i>FS 204: Handleless Bowl</i>	Mountjoy 1996, 66 no. 74 (Stockholm 1074) fig. 8
		FS 204: Handleless Bowl	Mountjoy 1996, 66 no. 76 (Stockholm 1076) fig. 3
		FS 295: SAB	Mountjoy 1996, 66 no. 77 (Stockholm 1077) fig. 3
		FS 295: SAB	Mountjoy 1996, 66 no. 78 (Stockholm 1078) fig. 8
		FS 150: Stirrup-Handled Jug	Mountjoy 1996, 66 no. 79 (Stockholm 1079) fig. 5
Tomb I:7	LH IIB	FS 271: Goblet	Frödin and Persson 1938, 414 no. 35 fig. 271:1
		FS 271: Goblet	Frödin and Persson 1938, 414 no. 36 fig. 271:2
		FS 271: Goblet	Frödin and Persson 1938, 414 no. 37 fig. 271:3
	LH IIIA2	FS 264: Kylix	Frödin and Persson 1938, 414 no. 39 fig. 271:5
		FS 264: Kylix	Frödin and Persson 1938, 414 no. 40 fig. 271:6
		FS 267: Kylix	Frödin and Persson 1938, 416 no. 42 fig. 271:8

Continued

Table A2. Continued

Area	Site	Context	Date	Form	Reference
Berbati	Chamber Tomb	LH IIIA2	FS 267: Kylix	Frödin and Persson 1938, 416 no. 44 fig. 271:10	
			FS 267: Kylix	E.J. Holmberg 1983, 34 no. 31	
			FS 267: Kylix	E.J. Holmberg 1983, 34 no. 33 (NM 8373) fig. 22 top left	
			FS 267: Kylix	E.J. Holmberg 1983, 34 no. 34 (NM 8372) fig. 22 top right	
			FS 267: Kylix	E.J. Holmberg 1983, 34 no. 35 (NM 8374) fig. 22 middle row	
			FS 267: Kylix	E.J. Holmberg 1983, 34 no. 36 (NM 8371) fig. 22 bottom left	
			FS 267: Kylix	E.J. Holmberg 1983, 34 no. 37 (NM 8370) fig. 22 bottom right	
			FS 273: Kylix	E.J. Holmberg 1983, 34, 37 no. 38 (NM 8376) fig. 23 top left	
			FS 273: Kylix	E.J. Holmberg 1983, 37 no. 39 fig. 23 top right	
			FS 273: Kylix	E.J. Holmberg 1983, 37 no. 40 (NM 8378) fig. 23 bottom left	
			FS 273: Kylix	E.J. Holmberg 1983, 37 no. 41 fig. 23 bottom right	
			FS 295: SAB	E.J. Holmberg 1983, 40 no. 45 (NM 8386) fig. 25 second row	
			FS 295: SAB	E.J. Holmberg 1983, 40 no. 46 (NM 8384) fig. 25 third row	
FS 204: Handleless Bowl	E.J. Holmberg 1983, 41 no. 49 (NM 8384) fig. 25 bottom left				
FS 204: Handleless Bowl	E.J. Holmberg 1983, 41 no. 50 (NM 8385) fig. 25 bottom right				
Dendra	Chamber Tomb 10	LH IIIA1	FS 263: Kylix	Persson 1942, 92 no. 41 fig. 103 centre	
			FS 267: Kylix	Persson 1942, 92 no. 42 fig. 103 second from left	
			FS 267: Kylix	Persson 1942, 93 no. 43 fig. 103 second from right	
			FS 271: Kylix	Persson 1942, 93 no. 44 fig. 103 far left	
			FS 272: Kylix	Persson 1942, 93 no. 45 fig. 103 far right	
Mycenae	Chamber Tomb 515	LH IIIA2	FS 265: Kylix	Wace 1932, 60 no. 48 pl. XXXI	
			FS 266: Kylix	Wace 1932, 60 no. 49 pl. XXXI	
			FS 295: SAB	Wace 1932, 60 no. 51 pl. XXXI	
			FS 267: Kylix	Wace 1932, 60 no. 52 pl. XXXI	
			FS 272: Kylix	Wace 1932, 8 no. 17	
	Chamber Tomb 502	LH IIIA1-2			

Prosymna	Goutsoulia I	LH IIIA2	FS 265: Kylix	Shelton 2000, 27		
	Kapsala North V-II	LH IIIA2–B1	FS 264: Kylix	Shelton 2000, 50		
	Tomb II	LH IIIA–III A1	FS 31: <i>Piriform Jar</i>	Blegen 1937, 179 no. 174 fig. 438		
	Tomb XV	LH IIIA2	FS 265: Kylix	Blegen 1937, 173 no. 104 (NM 6804) fig. 425		
	Tomb XXXIII	LH IIIA2	FS 273: Kylix	Blegen 1937, 110 no. 1091 (NM 6947) fig. 239		
	Tomb XXXIV	LH IIIA1	<i>P FS 31: Piriform Jar</i>	Blegen 1937, 116 no. 1053 fig. 260		
	Tomb XXXVII	LH IIIA1–A2	FS 272: Kylix	Blegen 1937, 128 no. 710 fig. 294		
			FS 255: Goblet	Blegen 1937, no. 715 fig. 296		
			FS 295: SAB	Blegen 1937, no. 717 fig. 296		
			FS 204: Handleless Cup	Blegen 1937, no. 718 fig. 296		
			FS 204: Handleless Cup	Blegen 1937, no. 719 fig. 296		
			FS 265: Kylix	Blegen 1937, no. 720 fig. 296		
			FS 272: Kylix	Blegen 1937, no. 712 (NM 6945) fig. 297		
			FS 267: Kylix	Blegen 1937, no. 714 fig. 297		
	Tomb XXXVIII	LH IIIA2	FS 264: Kylix	Blegen 1937, 131 no. 750 fig. 305		
			FS 220: Shallow Cup	Blegen 1937, 131 no. 751 (NM 7023) fig. 305		
			FS 267: Kylix	Blegen 1937, 131 no. 752 fig. 305		
			FS 273: Kylix	Blegen 1937, 131 no. 754 fig. 305		
			FS 272: Kylix	Blegen 1937, 131 no. 727 fig. 307		
			FS 295: SAB	Blegen 1937, 131 no. 749 fig. 307		
	Tomb XLI	LH IIIA2	FS 267: Kylix	Blegen 1937, 147 no. 773 (NM 6954) fig. 357		
	Tomb XLIII	LH IIIA1–A2	FS 272: Kylix	Blegen 1937, 190 no. 958 (NM 7062) fig. 483		
			FS 204: Handleless Cup	Blegen 1937, 190 no. 990 fig. 484		
			FS 264: Kylix	Blegen 1937, 190 no. 943 fig. 472 (labelled as 963)		
			<i>FS 39: Piriform Jar</i>	Blegen 1937, 215 no. 1038 fig. 536		
Attica	Athens	Tomb XLIV	LH IIIA1			
		Agora Tomb I	LH IIIA1	Kylix Kylix Kylix		
				FS 204: Handleless Bowl	Immerwahr 1971, 164 P27,101 I-11 pl. 31	
				FS 150: Stirrup-Handled Jug	Immerwahr 1971, 164 P27,100 I-12 pl. 31	
				FS 295: SAB	Immerwahr 1971, 165 uncat	
			Agora Tomb III	LH IIIA1–2	FS 150: Stirrup-Handled Jug	Immerwahr 1971, 165 uncat
					Immerwahr 1971, 172 (P17,738) III-1 pl. 35	
					Immerwahr 1971, 172–3 (P17,763) III-4 pl. 35	
				FS 272: Kylix	Immerwahr 1971, 173 (P17,764) III-5 pl. 35	
				FS 267: Kylix	Immerwahr 1971, 173 (P17,765) III-6 pl. 35	
		FS 271: Kylix	Immerwahr 1971, 173 (P17,754) III-7 pl. 35			
		FS 264/265: Kylix	Immerwahr 1971, 173 (P17,755) III-8 pl. 35			
		FS 267: Kylix	Immerwahr 1971, 174 (P17,756) III-9 pl. 35			

Continued

Table A2. Continued

Area	Site	Context	Date	Form	Reference
				FS 267: Kylix	Immerwahr 1971, 174 (P17,760) III-10 pl. 35
				FS 295: SAB	Immerwahr 1971, 174 (P17,759) III-11 pl. 35
				FS 204: Handleless Bowl	Immerwahr 1971, 174 (P17,761) III-12 pl. 35
				FS 204: Handleless Bowl	Immerwahr 1971, 174 (P17,758) III-13 pl. 35
				FS 204: Handleless Bowl	Immerwahr 1971, 175 (P17,762) III-16 pl. 35
	Tomb 13		LH IIIA ₁	Kylix	Pantelidou 1975, 84 no.24 pl. 28 α
	Tomb 15		LH IIB-III A ₁	FS 264: Kylix	Pantelidou 1975, 96 no.1 pl. 34 β
				FS 267: Kylix	Pantelidou 1975, 96 no.2 pl. 34 γ
				FS 267: Kylix	Pantelidou 1975, 96 no.3 pl. 35 α
				Kylix	Pantelidou 1975, 96 no.4 pl. 35 β
				FS 264: Kylix	Pantelidou 1975, 96 no.5 pl. 35 α
				FS 204: Handleless Bowl	Pantelidou 1975, 96 no. 6 pl. 35 γ left
				FS 204: Handleless Bowl	Pantelidou 1975, 96 no. 7 pl. 35 γ centre
				FS 204: Handleless Bowl	Pantelidou 1975, 96 no. 8 pl. 35 γ right
				FS 204: Handleless Bowl	Pantelidou 1975, 96 no. 9 pl. 36 α right
				FS 204: Handleless Bowl	Pantelidou 1975, 96 no. 10 pl. 36 α left
				FS 204: Handleless Bowl	Pantelidou 1975, 96 no. 11 pl. 36 β
	Tomb 16		LH IIB-III A ₁	FS 204: Handleless Bowl	Pantelidou 1975, 96 no. 12 pl. 36 γ
				Kylix/Cup?	Pantelidou 1975, 99 no. 6 pl. 41 β
				FS 264: Kylix	Pantelidou 1975, 99 no. 7 pl. 41 β
				Kylix/Cup?	Pantelidou 1975, 99 no. 8 pl. 41 β
				Kylix/Cup?	Pantelidou 1975, 99 no. 9 pl. 41 β
				FS 271: Kylix	Pantelidou 1975, 100 no. 12 pl. 43 α
				FS 267: Kylix	Pantelidou 1975, 100 no. 13 pl. 43 γ left
				FS 267: Kylix	Pantelidou 1975, 100 no. 14 pl. 43 γ centre
				Kylix	Pantelidou 1975, 100 no. 15 pl. 43 γ right
				FS 264: Kylix	Pantelidou 1975, 100 no. 16 pl. 41 β
Varkiza-Vari	Chamber Tomb 1		LH IIIA-B	FS 290: Lekane	Polychronakou-Sgouritsa 1988, 54 no. 11 (PM 4930) pl. 28
	Chamber Tomb 1, 2 or 3		LH IIIB	P FS 258: Kylix	Polychronakou-Sgouritsa 1988, 60-1 no. 1 (PM 4878) pl. 35 α top

<i>LH IIIA</i>	FS 204: Handleless Bowl	Polychronakou-Sgouritsa 1988, 61 no. 2 (PM 4872) pl. 35
<i>LH IIIB</i>	FS 222: Shallow Cup	Polychronakou-Sgouritsa 1988, 61 no. 3 (PM 4873) pl. 36
<i>LH IIIA1</i>	FS 263/264: Kylix	Polychronakou-Sgouritsa 1988, 61 no. 4 (PM 4874) pl. 36
<i>LH IIIA2</i>	FS 267: Kylix	Polychronakou-Sgouritsa 1988, 61 no. 5 (PM 4875) pl. 36
<i>LH IIIA2</i>	FS 267: Kylix	Polychronakou-Sgouritsa 1988, 61–2 no. 6 (PM 4876) pl. 36
<i>LH IIIA</i>	FS 204: Handleless Bowl	Polychronakou-Sgouritsa 1988, 62 no. 7 (PM 4877) pl. 35
<i>LH IIIA/B</i>	FS 295: SAB	Polychronakou-Sgouritsa 1988, 63–4 no. 15 (PM 4887) pl. 38
<i>LH IIIA</i>	FS 204: Handleless Bowl	Polychronakou-Sgouritsa 1988, 66–7 no. 28 (PM 4912) pl. 41
<i>LH IIIB</i>	P FS 226: Mug	Polychronakou-Sgouritsa 1988, 67 no. 30 (PM 4915) pl. 41
<i>LH IIIA</i>	FS 295: SAB	Polychronakou-Sgouritsa 1988, 68–9 no. 37 (PM 4923) pl. 43
<i>LH IIIA2</i>	P FS 226: Mug	Polychronakou-Sgouritsa 1988, 69 no. 38 (PM 4924) pl. 43
<i>LH IIIA/B</i>	P FS 160: Feeding Bottle	Polychronakou-Sgouritsa 1988, 70 no. 45 (PM 4932) pl. 45
<i>LH IIIA2</i>	FS 267: Kylix	Polychronakou-Sgouritsa 1988, 71 no. 47 (PM 4934) pl. 45
<i>LH IIIA2</i>	FS 267: Kylix	Polychronakou-Sgouritsa 1988, 72 no. 51 (PM 4938) pl. 46
<i>LH IIIA2</i>	FS 264: Kylix	Polychronakou-Sgouritsa 1988, 72 no. 53 (PM 4940) pl. 46
<i>LH IIIA/B</i>	FS 264/5: Kylix	Polychronakou-Sgouritsa 1988, 73 no. 58 pl. 48
<i>LH IIIA/B</i>	FS 236: Dipper	Polychronakou-Sgouritsa 1988, 75 no. 64 pl. 49
<i>LH IIIA/B</i>	FS 301: Lekane	Polychronakou-Sgouritsa 1988, 75 no. 68 pl. 51 <i>α.β</i>
?	FS 204: Handleless Bowl	Polychronakou-Sgouritsa 1988, 76 uncat
?	FS 295: SAB	Polychronakou-Sgouritsa 1988, 76 uncat
?	Kylix/Cup?	Polychronakou-Sgouritsa 1988, 76 uncat
?	Unknown	Polychronakou-Sgouritsa 1988, 76 uncat pl. 51 <i>α.ε</i>
?	P unknown	Polychronakou-Sgouritsa 1988, 76 uncat pl. 51 <i>α.δ</i>
?	P unknown	Polychronakou-Sgouritsa 1988, 76 uncat pl. 51 <i>α.γ</i>
?	Conical Cup?	Polychronakou-Sgouritsa 1988, 76 uncat
?	Lekane/SAB?	Polychronakou-Sgouritsa 1988, 78 uncat

Continued

Table A2. Continued

Area	Site	Context	Date	Form	Reference
			?	FS 267: Kylix	Polychronakou-Sgouritsa 1988, 78 uncat β
			?	FS 267: Kylix	Polychronakou-Sgouritsa 1988, 78 uncat β
			?	Kylix/Cup?	Polychronakou-Sgouritsa 1988, 78 uncat γ
	Vravron	Unknown	?	FS 270/271: Kylix	Papadopoulos and Kontorli-Papadopoulou 2014, 31 no. 69
			<i>LH IIA/B</i>	FS 270/271: Goblet	Papadopoulos and Kontorli-Papadopoulou 2014, 34 no. 120 (BE 31) fig. 3.74 pl. 24
			<i>LH IIIA2</i>	FS 214/245: Hemispherical Cup	Papadopoulos and Kontorli-Papadopoulou 2014, 116 NM 3855 pl. 100
		Tomb B	LH IIIA2	FS 265: Kylix	Papadopoulos and Kontorli-Papadopoulou 2014, 40 no. 166 (BE 2675) pl. 26
		Tomb 19	LH IIIA2	FS 265: Kylix	Papadopoulos and Kontorli-Papadopoulou 2014, 93 no. 370 (BE 312) fig. 3.236
		Tomb 13	LH IIIA2	FS 265: Kylix	Papadopoulos and Kontorli-Papadopoulou 2014, 72 no. 411 (BE 225) fig. 3.177 pl. 57
		Tomb 3	LH IIIB	Handleless Angular Bowl	Papadopoulos and Kontorli-Papadopoulou 2014, 57 no. 426 (BE 528) fig. 3.138 pl. 38
Boeotia	Tanagra	Unknown	LH IIIA	Kylix	Demakopoulou and Konsola 1981, 85 (case 6 middle shelf)
			LH IIIA–B	Kylix	Demakopoulou and Konsola 1981, 85 (case 5 top shelf)
				Kylix	Demakopoulou and Konsola 1981, 85 (case 5 top shelf)
				Kylix	Demakopoulou and Konsola 1981, 87 (case 8 top shelf)
	Thebes	Tomb 14	?	Kylix	Keramopoulos 1917, 153 no. 17
			<i>LH IIIA2</i>	FS 272: Kylix	Keramopoulos 1917, 154 no. 18 fig. 115:5
		Tomb 21	LH IIIA2	FS 272: Kylix	Keramopoulos 1917, 181 no. 1 fig. 130:2
				FS 267: Kylix	Keramopoulos 1917, 181 no. 2 fig. 130:3
Messenia	Ambelofyto	Surface	LH IIIA–B?	Kylix	Davis, Bennet, and Shelmerdine 1999, 447 no. I94-921000-01
	Lagou				
	Nichoria	MME Tholos	LH IIIA2	FS 273: Kylix	Wilkie and Dickinson 1992, 321 (P3017) fig. 5–39 pl. 5–144
	Pylos	Tomb III	LH IIIB	FS 267: Kylix	Blegen et al. 1973, 92 (9121) fig. 173:4
				FS 267: Kylix	Blegen et al. 1973, 92 (9122)
				FS 259: Kylix	Blegen et al. 1973, 93 (9124) fig. 173:7
				FS 295: SAB	Blegen et al. 1973, 92 (9132) fig. 173:1
	Tragana	Tholos 1	LH IIIA	FS 264: Kylix	Kourouniotis 1914, 110–11 no. 15 fig. 20:1

Phthiotis	Kalapodi	Tomb IV	LH IIIA ₁	FS 272: Kylix	Kourouniotis 1914, 111 no. 16 fig. 20:2
				FS 204: Handleless Cup	Kourouniotis 1914, 111 no. 17 fig. 21
Thessaly	Kazanaki	Tholos	LH IIIA ₁₋₂	FS 264: Kylix	Dimaki and Papageorgiou 2015, 853 (K2152) fig. 2
				FS 272: Kylix	Dimaki and Papageorgiou 2015, 853 (K3729) fig. 3
				FS 271: Kylix	Dimaki and Papageorgiou 2015, 853 (K3730) fig. 4
				FS 267.2: Kylix	Dimaki and Papageorgiou 2015, 854 (K3728) fig. 5
				FS 267: Kylix	Dimaki and Papageorgiou 2015, 854 (K4360) fig. 6
				FS 150: Stirrup-Handled Jug	Dimaki and Papageorgiou 2015, 854 (K3732) fig. 7
				FS 272: Kylix	Adrymi-Sismani and Alexandrou 2009, 137 (BE 36047) fig. 7
				FS 295: SAB	Forsdyke 1925, 151 A850 pl. X
				P FS 269: Kylix	Forsdyke 1925, 153 A860 pl. X
				FS 266: Kylix	Forsdyke 1925, 153 A863 pl. X
Rhodes	Ialysos	Tomb A?	LH IIIA ₂	FS 267: Kylix	Benzi 1992, 237 no. 16 (2930) figs 3 <i>b</i> , 174 <i>e</i>
		Old Tomb 5	LH IIIA ₂	FS 267: Kylix	Benzi 1992, 237 no. 17 (2931) fig. 3 <i>c</i>
		Old Tomb 7	LH IIIB	FS 266: Kylix	Benzi 1992, 240 no. 4 (2943) fig. 4 <i>d</i>
		New Tomb 4	LH IIIA ₂	FS 267: Kylix	Benzi 1992, 240 no. 5 (2940) fig. 4 <i>e</i>
		New Tomb 5	LH IIIB	FS 295: SAB	Benzi 1992, 240 no. 8 (2944) fig. 5 <i>a</i>
				FS 264/267: Kylix	Benzi 1992, 293 no. 18 <i>bis</i> (3108) fig. 50 <i>g</i>
		New Tomb 28	LH IIIA ₂	FS 264/267: Kylix	Benzi 1992, 293 no. 19 (3109) fig. 50 <i>h</i>
		New Tomb 31	LH IIIA ₁₋₂	FS 269: Kylix	Benzi 1992, 299 no. 19 (2892) fig. 54 <i>i</i>
				FS 267: Kylix	Benzi 1992, 299 no. 20 (2896) fig. 54 <i>l</i>
		New Tomb 50	LH IIIA ₁₋₂	FS 272: Kylix	Benzi 1992, 337 no. 13 (4772) figs 79 <i>d</i> , 174 <i>a</i>
				FS 267: Kylix	Benzi 1992, 337 no. 14 (4773) figs 78 <i>f</i> , 174 <i>b</i>
		New Tomb 53	LH IIIB	FS 295: SAB	Benzi 1992, 337 no. 16 (4775) figs 79 <i>g</i> , 170 <i>b</i>
				FS 295: SAB	Benzi 1992, 345 no. 17 (4833) fig. 83 <i>b</i>
				FS 267: Kylix	Benzi 1992, 345 no. 20 (4836) fig. 82 <i>f</i>
FS 267: Kylix	Benzi 1992, 345–6 no. 21 (4837) fig. 82 <i>g</i>				
New Tomb 56	LH IIIA ₂	FS 269: Kylix	Benzi 1992, 353 no. 11 (4894) fig. 88 <i>e</i>		
		Unknown	Forsdyke 1925, 153 A861 fig. 205		
Rhodes	Maritsa	Tomb	LH IIIA _{2-B}	FS 266: Kylix	Benzi 1992, 410 no. 2 figs 128 <i>f</i> , 175 <i>a</i>

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Η Κόκλα ή το Αυγό; Αναθεωρώντας τη Σχέση μεταξύ Συνόλων Αργυρών και Επικασσιτερωμένων Κεραμικών Αγγείων.

Από τη δεκαετία του 1960, όταν πρωτοαναγνωρίστηκε η ύπαρξη επικασσιτερωμένων κεραμικών αγγείων στην Υστερη Εποχή του Χαλκού, η γνώση μας αυτού του φαινομένου και ο κατάλογος των γνωστών παραδειγμάτων επεκτάθηκε σημαντικά. Ακόμα και πριν γίνει πλήρως κατανοητή η φύση αυτών των αντικειμένων, ερευνητές είχαν προτείνει ότι η πρωταρχική τους χρήση ήταν να μιμηθούν μετάλλινα αγγεία, ιδιαίτερα αργυρά. Αρκετά σύνολα αργυρών αγγείων, συμπεριλαμβανομένου ενός συνόλου από το θολωτό τάφο στον Κόκλα, έχουν επιλεγεί για τη θεωρημένη ειδική σχέση τους με τα επικασσιτερωμένα αγγεία. Εντούτοις, η διεξοδικότερη ανάλυση επικασσιτερωμένων αγγείων έχει προτείνει ότι ήταν λιγότερο όμοια με τα αργυρά σκεύη από ότι θεωρούνταν προηγουμένως, ειδικά όσον αφορά το εύρος των σχημάτων τους, αλλά και τις επιμέρους λεπτομέρειες τους, ακόμα και τα χρώματα. Η πρόσφατη έρευνα έχει επίσης τονίσει ότι η έννοια της μίμησης είναι πολύ περίπλοκη και η μελέτη της απαιτεί μια πλέον ενδεδειγμένη προσέγγιση. Όμως οι αναφορές στην επικασσιτερωμένη κεραμική ως σαφείς απομιμήσεις, ή ακόμα ως υποκατάστατα των αργυρών αγγείων παραμένουν κοινές. Το 2014, προέκυψε μια ευκαιρία να εξεταστούν λεπτομερέστερα τα αργυρά αγγεία από τον Κόκλα. Είναι σαφές η ισχυρή σύνδεση μεταξύ του συνόλου του Κόκλα και επικασσιτερωμένων αγγείων, παρόλο που αυτό δε σημαίνει ότι τα τελευταία εξαρτώνται για έμπνευση από σύνολα όπως το πρώτο. Τα μοναδικά χαρακτηριστικά του συνόλου του Κόκλα υποδηλώνουν ότι ίσως ήταν μια τοπική καινοτομία να μιμηθούν τη χρήση των επικασσιτερωμένων αγγείων, τονίζοντας ταυτοχρόνως την υψηλή κοινωνική θέση των χρηστών τους. Αυτό το άρθρο καταλήγει στο συμπέρασμα ότι τοποθετώντας επικασσιτερωμένα αγγεία εντός της κεραμικής παράδοσης και έτσι θεωρώντας τα ως βελτιωμένη μορφή κεραμικών, παρά ως κατώτερη μορφή μεταλλικών αγγείων, εξηγείται καλύτερα η φύση αυτού του φαινομένου.

Μετάφραση: Στέλιος Ιερεμιάς.