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EARLY IRON AGE PHOENICIAN NETWORKS: AN OPTICAL MINERALOGY STUDY OF PHOENICIAN BICHROME AND RELATED WARES IN CYPRUS*

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Abstract

Ancient Phoenicia was fragmented into several, oft-times competing polities. However, the possibility of defining archaeologically the exchange networks of each Phoenician city remains rather unexplored. This paper presents such an attempt, regarding the Early Iron Age (late 12th–9th centuries BC). It is based on an Optical Mineralogy study of about 50 Phoenician ceramic containers in Cyprus, especially those of the 'Phoenician Bichrome' group. The latter are commonly employed as a major proxy for tracing the earliest Phoenician mercantile ventures in the Iron Age. This is the first systematic provenance analysis of these wares and the first attempt to pinpoint the regions/polities in Phoenicia which partook in this export to Cyprus. The results are interpreted in a wider context of Cypro-Phoenician interrelationships during this period.

Introduction

The collapse of most Late Bronze Age (LBA) socio-political entities around the eastern and central Mediterranean (*ca.* 1250–1150 BC) is marked, *inter alia*, by the failure of major interregional commercial mechanisms. Previous views, however, that the LBA/Iron Age transition exemplifies a complete cessation of Mediterranean interaction, have continuously been modified and in recent years ever-growing numbers of scholars argue for a considerable measure of continuity in this respect.[1]

Indeed, cross-Mediterranean traffic and flow of goods did not come to a standstill in the Early Iron Age. Exchange networks linking regions as far as the eastern Mediterranean and the Atlantic coast of Iberia are attested mainly by metal artefacts, the metals themselves, and by various 'luxuries', such as jewellery, faience objects

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[1] For example, Aubet 2008, 248; Bell 2009; Sherratt 2012.

and more.[2] Whether any of these exchanges can be associated specifically with Phoenician activities is difficult to assess and has indeed been extensively debated.[3]

Moreover, it is often acknowledged that economic/commercial activities of 'The Phoenicians' should be fragmented into the specific, at times competing networks in which each polity was involved.[4] Archaeologically, however, for the Early Iron Age, this conviction remains rather mute.

Our basic premise is that provenace analysis of pottery provides one the best tools to trace interaction spheres with high geographical resolution (see more below). However, as opposed to the LBA, when numerous classes of pottery move about the Mediterranean,[5] this is not the case for the Early Iron Age. Exceptions are mainly Euboean ceramics distributed to the eastern Mediterranean, the rather singular assemblage of Phoenician store jars at Kommos in Crete and the phenomenon we examine here – the shipment of numerous containers from Phoenicia to Cyprus (Figs. 1–3).[6]

In the present study we deal only with the Early Iron Age, here defined as the Ir1a–Ir2a time stretch in Phoenicia, paralleling Late Cypriote [LC] IIIB–Cypro-Geometric [CG] III in Cyprus.[7] This encompasses roughly the late 12th–mid-9th centuries BC. A more precise chronology depends on one's stance in the still unresolved debate regarding the Levantine and Mediterranean Early Iron Age absolute chronology.[8]

The paper proceeds as follows: after brief summaries of the main Phoenician ceramic categories in Cyprus and then specifically of the Phoenician Bichrome (PhBc) group, we describe the optical mineralogy analysis (OM) and the results are summarised in Table 1. The details of the OM groups identified are provided in Appendix 1 and the list of the vessels we sampled in Appendix 2. The commentary in Appendix 3 provides a more nuanced chronological resolution to the results and

[2] For example, Mederos-Martin 1996; Crielaard 1998; Kourou 2008; Nijboer 2008a–b; Maran 2012; Sherratt 2012; Gilboa 2013; Thompson and Skaggs 2013. For a trickle of Late Helladic IIIC pottery to the Levant, see, for example, D'Agata *et al.* 2005.

[3] Summary and references in Coldstream 2000, 24; Gilboa 2013, 315, 326–27. *Cf.*, for example, Fantalkin 2006.

[4] Peckham 1998; Aubet 2001; Fletcher 2004.

[5] For Carmel-coast-made jars on the Ulu Burun wreck, see most recently Goren 2013.

[6] For Euboean pottery, see, for example, Coldstream and Mazar 2003. For Kommos, see Bikai 2000. The exact provenances of the Kommos jars are yet unknown (Jones 2000).

[7] For the chronological terminology employed here and the correlation to Cypriote (and Greek) chronology, see Gilboa and Sharon 2003, especially 10–11 and table 21; Gilboa *et al.* 2008.

[8] Lately, for example, see Sharon *et al.* 2007; Kourou 2008; Nijboer 2008b; Pare 2008; Van Der Plicht *et al.* 2009; Mazar 2011; Fantalkin *et al.* 2011; Finkelstein 2011.

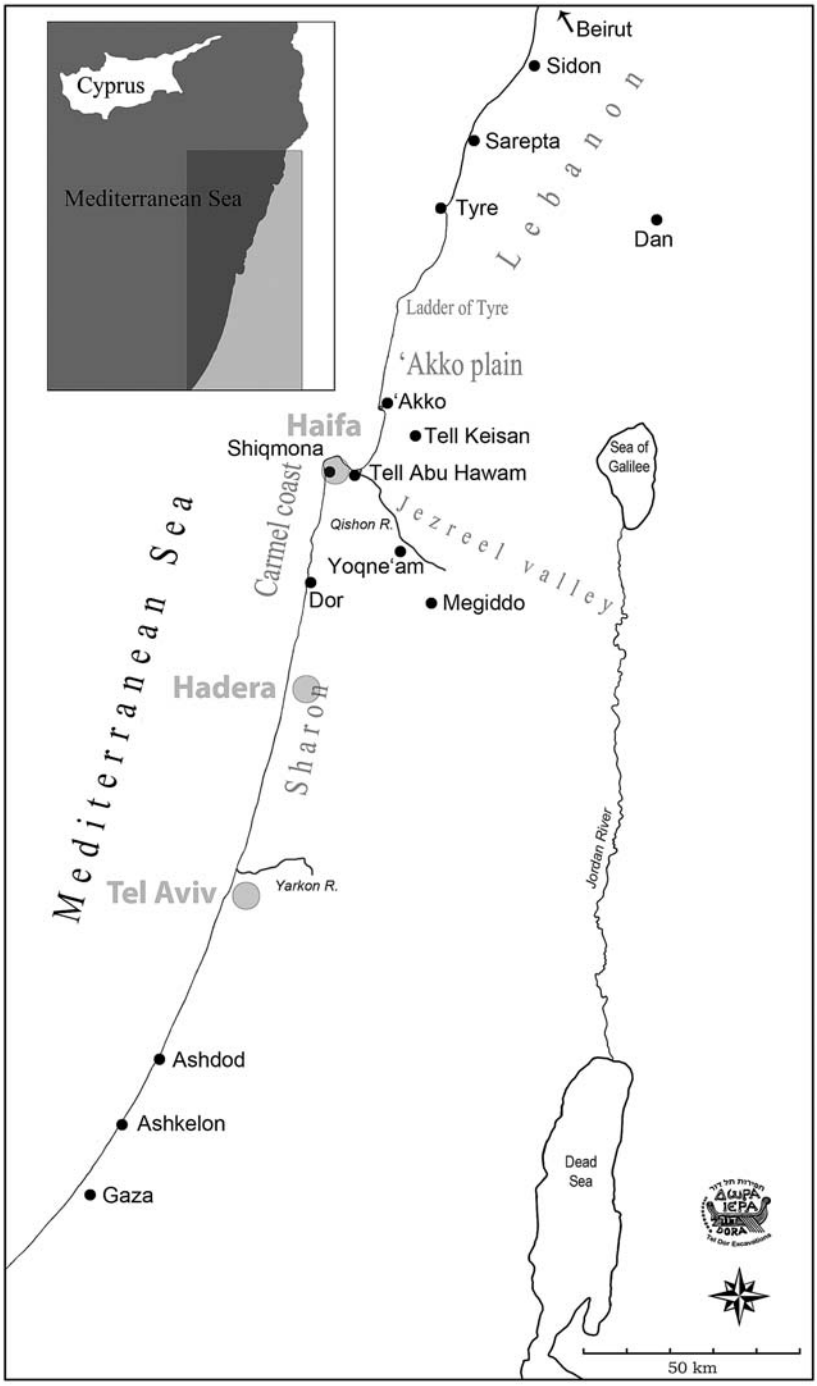

Fig. 1: Main Levantine sites mentioned in text.

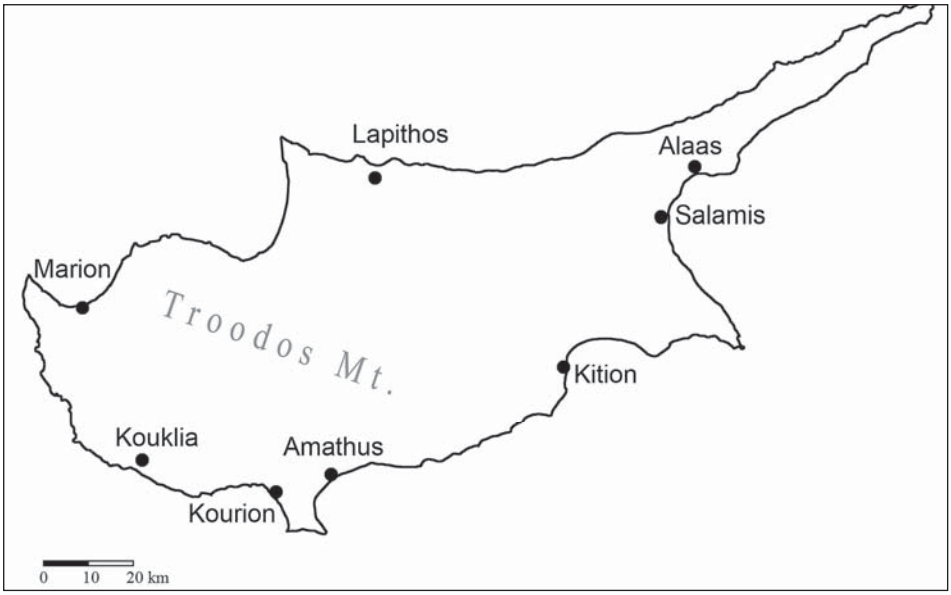

Fig. 2: Main Cypriote sites mentioned in text.

highlights selected contexts. The discussion provides preliminary comments regarding the manner in which to our minds the Early Iron Age Phoenician ceramics in Cyprus should be contextualised.

Early Iron Age Phoenician Containers in Cyprus

The conspicuous Phoenician Bichrome containers are customarily associated with early Phoenician westbound endeavours, destined to culminate, in Iron Age II, in more widespread and permanent overseas ventures. Therefore we concentrated our analysis on this group, and below we discuss it in some more detail. In the Early Iron Age this group comprises mainly 'globular' jugs/flasks[9] (Fig. 3.1), ring-based jugs (Fig. 3.2) and also small flasks (Fig. 3.3) and strainer jugs (Fig. 3.4). Other Phoenician containers in Cyprus may be roughly divided into four categories:

(1) Small flasks other than PhBc, usually roughly lentoid or rounded (Fig. 3.5). These flasks have received much less scholarly attention, but in fact they (and their contents) are the best attested Levantine export to the Island, by far

[9] We use this common term here, though this and other appellations such as 'spherical' are misleading. Many such vessels are, for instance, asymmetric or barrel shaped.

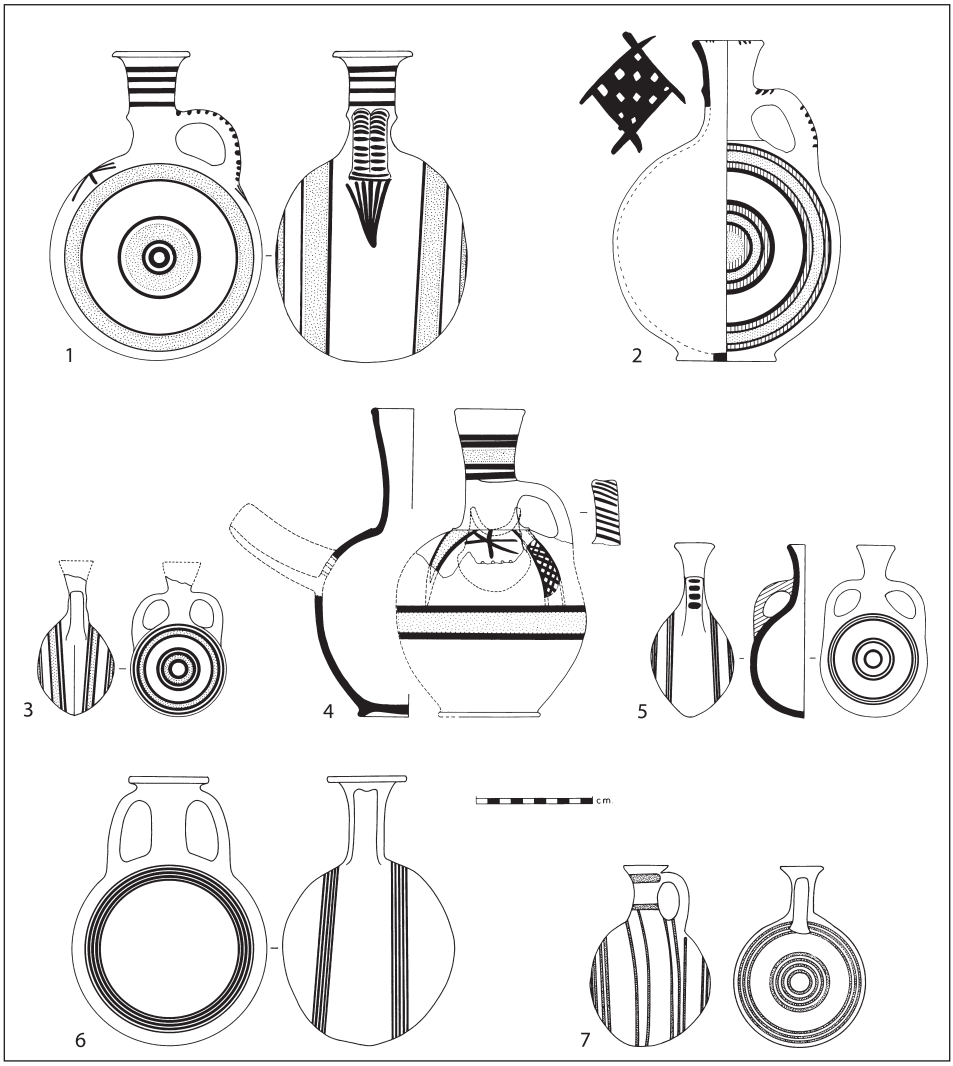

Fig. 3: Main types of vessels sampled:
1. Globular Bichrome jug (Kouklia 10);
2. Bichrome jug with ring base (Kouklia 27);
3. Bichrome flask (Kouklia 32);
4. Bichrome strainer jug (Kouklia 4);
5. Black monochrome flask (Amathus 11);
6. 'Red Ware' jug (Kouklia 11).
7. Miscellaneous decorated jug (Alaas 3)
(for references, see Appendix 2).

surpassing PhBc.[10] In the Iron Age, they are sporadically attested as of LC IIIB, then become prolific during CG I–II, subsequently disappearing during CG III.[11] They are usually simply adorned in one colour (here termed 'monochrome') or in two ('two coloured').[12]

(2) 'Red Ware' containers (for example Fig. 3.6). This group is rather rare in Cyprus – no more than 20 examples have been published to date. It comprises mainly dipper juglets of 'Canaanite' morphology, large two-handled flasks/jugs and globular jugs, which stand out in their brick-red fabric and usually black-circle decoration. Vessels of this group have been identified in the LC IIIB–CG IB/II range at Kouklia-Palaepaphos Skales, Kourion Kaloriziki and Kition Agios Prodromos.[13]

(3) Miscellaneous small decorated jugs/flasks not falling into one of the above categories (for example Fig. 3.7).

(4) Store jars, which are not many.[14]

Phoenician Bichrome Ware A: In the Levant

Distribution

The profusion of these vessels along the Lebanese coast and hinterland meant that their definition as Phoenician has never been contested.[15] In the Levant, beyond Lebanon, PhBc is known especially from sites farther south, such as Achziv, ʿAkko, Tell Keisan and Tell Abu Hawam along the coast of Galilee and in the Haifa/ʿAkko Bay.[16] These regions are perceived either as part of Phoenicia proper, or as external to it.[17] The latter view led some leading scholars to understand PhBc found south of the current Lebanon/Israel border (south of the Ladder of Tyre) as indicating external impetus – the first step in Phoenician 'expansion', and even a coercive takeover.[18]

[10] Bikai 1987a; 1987b, 10; Karageorghis and Iacovou 1990, 90; Gilboa *et al.* 2008.

[11] The specific contexts are detailed in Gilboa *et al.* 2008.

[12] For these definitions and the difference between 'two-coloured' and 'true Bichrome', see Gilboa 1999a; Gilboa *et al.* 2008.

[13] Karageorghis 1967, XI; Bikai 1983, 400–02; 1987b, 59–60, pls. II–III; Georgiou 2003, nos. 1, 10, possibly also no. 28.

[14] Examples and references in Bikai 1987b; Gilboa *et al.* 2008.

[15] Woolley 1921; Chapman 1972; Briese 1985; Bikai 1978; 1987 a–b; Anderson 1990.

[16] References in Gilboa *et al.* 2008.

[17] Summary and references in Gilboa 2005, 48–49 and n. 3, 52. For inclusion, see also Coldstream 2000, 16; for exclusion, Bikai 1992; Schreiber 2003, 26, 48; Iacovou 2004.

[18] Stern 1990; Bikai 1992, 133; Negbi 1992, 611; Aubet 2000, 81–82 and *passim*.

Proceeding southward along the coast, PhBc is mainly known at Dor, but also at other sites on the Carmel coast such as Tel Mevorakh and Shiqmona.[19] Based on these data, and on other material similarities between the Carmel coast and Lebanon, it has been argued that in the *Early* Iron Age not only the ʿAkko bay, but also the Carmel coast to its south were an integral part of the Phoenician cultural milieu and should not be considered an 'annexation' of any sort.[20]

It seems, however, that the distribution of PhBc vessels in the various Phoenician sites is not even – far from it. Considering only habitation sites where some quantitative assessment is possible, two sites produced the largest numbers: Tyre on the one hand and Dor on the other.[21] In contrast, well-published sites such as Sarepta and Tell Keisan hardly had any.[22] Quantities at other major Phoenician sites, such as Beirut, Sidon and ʿAkko, are currently unknown.

Beyond Phoenicia, PhBc occurs in the southern Levant only sporadically, usually no more than a handful of examples per site, if at all. It is somewhat more prolific in Israel's northern valleys, such as at Kinneret on the Sea of Galilee and Megiddo and Yoqneʿam in the western Jezreel valley.[23] In Syria, PhBc is extremely rare.[24]

Production Centres

Ongoing OM analysis of PhBc ware in Israel by the present authors and by Paula Waiman-Barak[25] indicates that beyond sites in Lebanon, Dor, indeed, was a major producer of PhBc and of other containers (small flasks, for example), distributing

[19] Information regarding Shiqmona was kindly provided by Shai Bar, currently excavating at this site.

[20] For the arguments, see Gilboa 2005; 2012; 2013; Gilboa and Sharon 2008; Sharon and Gilboa 2013.

[21] Obviously, comparing quantities between different sites is a complex endeavour, but the following figures are significant. For Tyre, see Bikai 1978, tables 6a, 8b, jug 10: During Ir1b, for example, from an area about 160 m^2 in extent, 34 PhBc fragments were recorded, constituting 5.92% of *all the indicatives* in substratum XIII-1, and in substratum XIII-1 there were 104 fragments, 10%. In the Tel Dor database, for the same chronological horizon and from one excavation area which is about the same size (D2; 175 m^2), *ca.* 200 PhBc examples are recorded.

[22] At Sarepta II/Y, from the same time-span, fewer than ten fragments were noted (Anderson 1988, table 35). For Keisan, see Briend and Humbert 1980, pl. 62.4–6, 8 (and no further examples are housed in the excavation's store room).

[23] We thank Stefan Münger for allowing us access to the Kinneret material and *cf.* Münger *et al.* 2011, figure on p. 83. For Yoqneʿam, see Ben-Tor, Zarzecki-Peleg and Cohen-Anidjar 2005, figs. I.17.8, I.28.1–2, I.31.5–7, I.37.11, I.40.1, I.41.9. For Megiddo, see Loud 1948, pls. 72.9, 80.2–3; Arie *et al.* 2006, figs. 13.54.3, 13.60.1, 13.69.4.

[24] Lehmann 2008, 221–22.

[25] We thank Paula Waiman-Barak for allowing us to cite data from her ongoing PhD dissertation.

them to various Levantine sites. Other unexpected locales of production of PhBc are Megiddo in the western Jezreel valley and Dan in the Hulah basin,[26] both lying outside the region customarily defined as Early Iron Age 'Phoenicia'.

Phoenician Bichrome Ware B: In Cyprus

Beyond Phoenicia, Cyprus is the main region from which PhBc containers are well known, starting in mid-CG I. As mentioned, they are unanimously interpreted as exemplifying early Phoenician commercial enterprises[27] or minimally people that 'controlled trade links with the East.'[28] Scholars linking PhBc in Cyprus to later Phoenician activities farther west usually discuss them under the 'pre-colonial trade' epithet.[29] This pottery has also been taken to indicate Phoenician *presence*, even colonial presence in Cyprus, spearheaded by Tyre or Sidon, or both.[30] The latter conviction apparently stems *inter alia* from implicit assumptions that they were produced in these two cities. Based on this understanding, several scholars place the beginning of Phoenician westward 'expansion' in the 11th/early 10th century BC, the conventional ('high') date for CG I (see above) when these vessels first occur in Phoenicia and in Cyprus.[31]

Distribution

The specific Early Iron Age contexts in Cyprus in which PhBc (and other Phoenician containers) occur have been detailed in the past[32] and here we present only a short summary, in order to put the vessels we sampled in some regional and quantitative perspective. Most of the vessels are from tombs.

Phoenician Bichrome containers are known primarily from Cyprus's south-west and south, chiefly from the cemeteries around Kouklia-Palaepaphos and Amathus. In the former site, most vessels are from Skales but they also occur at Kouklia Hadjiabdullah, Terastoudia and Plakes. At Amathus too, Phoenician imports derive

[26] For Megiddo (Neutron Activation and OM analyses), see, for example, Hancock and Harrison 2004, table 2, nos. 5, 8–10, 80; Arie *et al.* 2006, 562–63; Arie 2011, 332, 341, 342, figs. 8.2.4, 8.7.8; Ben-Shlomo 2013, table 32.1.18. For Dan, see Waiman-Barak and Gilboa forthcoming.

[27] Coldstream 1982, 53; Karageorghis 1983, 317; 2008, 191, 194; Bikai 1987b, 5; Aupert 1997, 23; Gilboa 1999a; Maier 1999, 83; Aubet 2000, 78; Bell 2009.

[28] Steel 1993, 153.

[29] Niemeyer 1993; Kourou 2000, 1072.

[30] Negbi 1992, 612; Bikai 1994, 31, 33–34; Aubet 2000, 80, 85; 2008, 250; Markoe 2005, 24, 29, 224; Bell 2009, 35.

[31] For all these issues, see also Bikai 1987b, 1; 1994; Stern 1990, 32; Stieglitz 1990, 11; Mazar 1991, 103; Morris 1992, 129; Iacovou 1999; Muhly 1999; Karageorghis 2008.

[32] Gilboa *et al.* 2008, with many illustrations.

almost exclusively from the cemeteries, including Ayios Tychonas Mandres and Pentakomo Shamna, and also from the so-called acropolis deposit. Lesser quantities of PhBc are known from other cemeteries in the south, mainly Ktima and Kourion-Episkopi (Bamboula and Kaloriziki).

Moving to other parts of Cyprus, the situation is rather different. Assessing quantities in and around Kition would have been important since this site is destined to become one of the principal Phoenician polities in Cyprus. In the occupation layers of Kition Kathari, extremely few PhBc fragments could possibly be assigned to the Early Iron Age[33] and no published tombs at Kition and vicinity have yet produced PhBc of the period discussed here. This ware, however, is represented in some partially published or unpublished tombs.[34] At Salamis, Marguerite Yon considered one Bichrome jug from T. 1 a Phoenician import, but most probably this is a Cypriote product.[35]

In the north of Cyprus PhBc vessels are extremely rare. This is true for the cemeteries excavated in and around Lapithos and for the Kythrea and Rizokarpaso cemeteries (for example Latsia Rizokarpaso, Anavrysi Rizokarpaso). One possible exception is from Lapithos Kastros T. 417.[36] Similarly, no PhBc containers have yet been reported from sites in the western part of the Island, such as Marion.

Admittedly, all these localities have not yet produced extensive CG cemeteries to match those of the south. The exceptions are the Lapithos cemeteries, from which dozens of tombs were published to date, some of them very rich in finds (mainly Kastros, Plakes, Ayia Anastasia and Karavas and the so called Lower Geometric cemetery). Part of the reason is that several of these tombs were not used beyond the very beginning of CG I, i.e. prior to the 'invention' of PhBc. However, they are also absent in tombs representing later CG horizons, such as those at the Lapithos Lower Geometric cemetery (20 tombs).[37]

To sum up, on present evidence PhBc in Cyprus in the Early Iron Age is only well represented in the south/south-west. Similar vessels were probably used in

[33] Bikai 1987b, 8; *cf.* Bikai 1981.

[34] Anna Georgiadou, personal communication.

[35] Yon 1971, pl. 27.93. Both the relatively elaborate design on this vessel (the circles under the handles and the dense linear decoration on the mouth), and especially the cup-shape and very prominent neck-ridge of the neck/mouth would be very unusual for a Phoenician product. On the other hand, these traits are typical of a variety of jugs produced in Cyprus: for the neck, for example, see Benson 1973, pl. 28.K408, K503, K505; *cf.* Karageorghis and Iacovou 1990, 90.

[36] Gjerstad *et al.* 1935, 232, no. 86, pl. CXXXIX. Judging from its photograph only, this vessel *may* be a genuine Phoenician import. We are grateful to Kristian Göransson of the Medelhavsmuseet, Stockholm for providing us with a photograph.

[37] Donohoe 1992. Even the small lentoid flasks of other ware groups are very rare in the north.

Kition. For the rest of the island, and especially for its north, the absence of PhBc looms large.

It is difficult to assess this phenomenon quantitatively. P.M. Bikai's seminal study,[38] which still lists most of the vessels known to date, includes for the time span in question (her 'Kouklia Horizon') about 55 complete PhBc examples (mainly catalogue nos. 22–62, 63–71, 114–118), representing about 150 years. It should, however, be borne in mind that for most of the tomb groups no data are available regarding fragmentary vessels. This hampers any attempt at more precise quantification.

Provenance study of Phoenician Bichrome and Related Wares in Cyprus

Goals

With all the above in mind, we posed the following, interlinked questions:

(1) Do all these 'Phoenician' vessels indeed originate in the Tyre/Sidon region, and therefore may attest to the earliest mercantile ventures of the two polities that played the central role in later Phoenician westbound activities?

(2) Do any of these vessels originate at Dor? This possibility gained some credence by visual examination of vessels in Cyprus prior to analysis.

(3) Do the production centres that shipped PhBc vessels (and their contents) to Cyprus correlate with sites that reveal other evidence for exchanges with Cyprus, especially the import of CG ceramics (for which see below in our discussion)?

Sample Selection

As mentioned, the analysis focused on PhBc. We sampled all the major shapes of this group (Fig. 3.1–4), from the sites where they are best represented (Kouklia and Amathus), and from the entire CG range. Altogether 30 vessels postulated to belong to the PhBC group were sampled (see Appendix 3 for the visual identification of these vessels by several scholars and by us). Selection was also dictated by curatorial considerations. Other Phoenician wares/shapes were sampled on an *ad hoc* basis dictated by accessibility. These include eleven small flasks in various modes of decoration, three 'Red Ware' vessels, three miscellaneous small containers and four store jars. In all, 51 vessels were sampled, of which 48 produced results.

[38] Bikai 1987b.

Method

The vessels' fabric was studied by means of thin-section optical mineralogy (OM, often misnamed petrography). As we demonstrate below, this method enabled us to determine the provenance of the wares in question and address the oriented questions. Most of the vessels were complete or near complete. Due to curatorial considerations, the samples were not cut throughout the vessels' walls but rather chipped from hidden or fractured facets using a delicate restorers' chisel and watchmakers' hammer. Yet sample sizes in all cases were sufficient for proper OM analysis, keeping in mind that fine tempered small vessels require smaller samples proportionally to larger vessels of coarser fabrics. In order to enable the preparation of polished standard thin-sections, the samples were set in small polyethylene moulds and dried in an oven at 60° C for a few hours. Then the samples were placed in a desiccator and impregnated under vacuum conditions with *Buehler Epo-Thin* low viscosity epoxy resin. After curing, the resulting pellets were used for the preparation of standard thin-sections and subjected to routine examination under a polarising microscope. The vessels analysed were divided into fabric groups based on the physical properties of their raw materials. The descriptive protocols and interpretative logic followed the methodology advocated by one of us (YG) elsewhere.[39]

Summary of the Fabric Groups

The detailed classification and interpretation of the fabric groups as defined by optical mineralogy is presented in Appendices 1 and 2 (below). The former presents a general classification and encoding method that we suggest for Levantine fabric groups following the methodology advocated by Goren *et al.* in 2004;[40] and Appendix 2 the results obtained in the course of the present study. Table 1 (below) summarises the bottom line of the results in terms of the distribution of each fabric group within the population of the analysed vessels.

The general methodology distinguishes between Levantine coastal-made vessels using granular differences between sands, commonly used for temper, from different parts of the East Mediterranean littoral area. In this region, currents flow from west to east along North Africa, then northward along the Levantine coast. The main source of sediments to this area is the River Nile, which drains the plutonic rock plateaus of East Africa. The most stable mineral of these rocks is quartz, which therefore constitutes the main component of the Nile sand. This sand is swept along

[39] Goren *et al.* 2004, 4–12, 15–17.
[40] Recently summarised in Goren 2013.

Sinai and northward along the Palestinian and Israeli coasts.[41] At the same time, the inland limestone hills off the Levantine coast contribute calcareous sand to the sediments. Since to a great extent Mt Carmel acts as a natural barrier to the Nile sand, north of it the quartz within the sand diminishes and the sediment becomes increasingly calcareous. Another contributing factor is the sea. Along the Levantine coast, shell fragments and parts of the coralline algae *Amphiroa* occur as a significant component of Quaternary beach deposits.

A closer look at the Levantine natural coastal sand, which was usually used as temper by the local potters, can inform us about the provenance of ceramic vessels from the relevant sites. When examined microscopically, the coastal sands between Gaza in the south and the coast of Ras Shamra/Ugarit in the north exhibit significant changes in terms of composition. For example, the sand near the Bronze and Iron Age cities of Gaza and Ashkelon, about 10 km apart, is made almost entirely of large and rounded quartz grains of Nilotic origin, with very little limestone or other calcareous components. Secondary silicate minerals appear in significant quantities, originating from the weathering of the igneous rocks that are widespread in the Nile headwaters. Moving 50 km north, to the beach of Tel Aviv, the grain size of the quartz becomes significantly smaller and the grains are well sorted because of the natural sorting of the sand by the currents. The secondary minerals, whose specific gravity is greater and are therefore heavier, appear only as very fine grains. Advancing another 50 km to the north, to the beach of Dor on the narrow coast near Mt Carmel, one can see that alongside the quartz there are over 30% of calcareous grains, representing the increasing contribution of the indigenous lithology to the sand and the closer proximity of the calcareous-based anticline of Mt Carmel to the coast. When advancing again about 50 km further north, to the coast near ʻAkko north of the Mt Carmel barrier, there is a sharp change in the composition of the sand. The quartz component decreases to form about 30% of the sand, which is made almost exclusively of limestone grains and skeletons of marine fauna, where *Amphiroa* alga fragments are very common. [42] Proceeding further north, the combined compositions of the sand temper and the clay go through more extreme changes. That is because different soil and clay types dominate the various regions along the southern Levantine coast. Hence by combining the data retrieved from the composition of the sand and the soil types, it is possible to slice the Levantine coast into segments, each representing a different combination of sand and soil.

[41] Rohrlich and Goldsmith 1984, 99; Nir 1989, 12; Goren *et al.* 2004, 109–10, 112–13.
[42] Goren 2013, fig. 2.

In the Mediterranean coasts of Lebanon and Syria the geology is by far more complex and therefore the changes are rather extreme.[43] In the coastal plain between Tyre and Sidon, particularly in the surroundings of Sarepta, where pottery production (albeit of other periods) has been recorded analytically, Miocene clays, unexposed further south, were used together with typical beach send as temper.[44] Further north, towards Beirut, the exposures of Lower Cretaceous sandstone and shale formations, overlapped by typical marine deposits, strongly affect the composition of the local littoral sands. Still further north, other compositions prevail.[45]

Regarding Cypriote fabrics, these are rather easily distinguished from those of Levantine coastal wares, owing to the fact that the geology of Cyprus is markedly different from that of the entire relevant section of the Levant, mainly due to the lack of ophiolithic environments in the latter region south of the northernmost Syrian coast.[46] Marl of the Pakhna formation is known to be a major clay source for pottery production in the general area of the southern Troodos foothills. The marl is remarkable by its cream to buff colour, by its plasticity and by the relatively hard fabric that it forms after hardening, and it is distinguished from the Levantine fabrics by the presence of detrital metamorphic and ophiolithic minerals that accompany it, all derived from the Troodos and circum-Troodos lithological complexes. Clays derived from the Mamonia complex of south-west Cyprus are easily distinguishable from Levantine wares by the abundance of metamorphic and igneous rock fragments,[47] unparalleled in the relevant part of the Levantine littoral area.

Results

To sum up the results of this study (Table 1), of the 48 containers for which we have valid OM results, 13, nearly 25%, were demonstrated to be Cypriote products, seven of which reflect the typical mineralogy derived from the lithology of the Mamonia complex, and consequently most probably produced on the south-western part of the Island. The rest indicate the use of the Pakhna formation, in yet undetermined regions around the Troodos anticline in Cyprus. Among the vessels that were demonstrated to be Cypriote made, only three were hitherto considered to be Cypriote, based on visual examination. The other ten were considered Phoenician imports by all experts who studied them (details in Appendices 2 and 3). This has

[43] Goren 2013, fig. 3.
[44] Griffiths 2003; Bettles 2003; Cohen-Weinberger and Goren 2004; Ownby and Griffiths 2009.
[45] Goren *et al.* 2004, 101–25.
[46] See Table 2 with references for each fabric group in Goren *et al.* 2004.
[47] Vaughan 1991.

the following implications: first, it reduces further the number of Phoenician ceramic exports to Cyprus, especially of PhBc wares. Second, Alaas 2, a flask which by its fabric group (Mamonia) must have come from south-west Cyprus, indicates that such containers were also distributed within Cyprus. This phenomenon is yet unexplored, nor do we deal with it here. Third, it underscores further the close similarity between containers produced in Cyprus and Phoenicia, a phenomenon we shortly revisit in our discussion.

Thirty-five vessels were demonstrated to be overseas imports. This figure includes all the categories of containers mentioned above, but the discussion below (and Table 1) relates only to the small decorated ones, excluding the four jars, for which we do not have good enough results.

The first thing to be said is that they all indeed originate in Phoenicia, as commonly assumed.[48] Considering the entire LC IIIA–CG IIIA time span, the overwhelming majority of vessels for which a specific origin could be pinpointed were produced in two regions, with about equal distributions: the Tyre–Sidon stretch on the one hand (15 vessels) and the Carmel coast on the other (15 vessels; Table 1 and Appendix 2). Production along the Carmel coast is probably to be associated with Dor, the major Early Iron Age site there,[49] which, as mentioned, produced copious amounts of PhBc vessels and small flasks. However, other nearby sites cannot be excluded at the moment, mainly Shiqmona and Tell Abu-Hawam. The latter served as a major port during the LBA, with extensive imports from Cyprus and beyond,[50] but it diminished in importance in the Iron Age. Northern Phoenicia is not represented at all, and other Phoenician production centres in the south (such as ʿAkko) – hardly so. Other southern Levantine regions that were recently shown to have their own production of PhBc, such as Megiddo, are not represented either.

[48] Therefore, hitherto prudent appellations for the small flasks, such as 'Levantine' (Karageorghis and Iacovou 1990) are not required anymore, for the most part at least.

[49] For surveys of Dor in the Early Iron Age, see, for example, Stern 1990; 2000; Gilboa and Sharon 2008; Sharon and Gilboa 2013. For Early Iron Age trade there, beyond publications already mentioned, see Waiman-Barak, Gilboa and Goren forthcoming.

[50] Artzy 2006b.

Table 1: Origin of various containers in Cyprus demonstrated to be imports by optical mineralogy (not including storage jars and Cypriote products; 'ballpark' percentages). Numbers in italics indicate PhBc vessels out of the total imports; the Tyre–Sidon group includes fabric group AM 3 ('North of the Ladder of Tyre').

	Total Imports	**Tyre–Sidon**		**Tyre–Sidon or 'Akko**		**'Akko Region**		**Carmel Coast**		**Coast from Beirut to Carmel/ Sharon**	
LC IIIA	1							1	100%		
CG IA	4	2	50%					2	50%		
CG IA/B	5	2	40%			1	20%	2	40%		
CG IB–II	15	6	40%	2	13%			7	47%		
CG II/III early	10	5						3		2	
Total *Bichrome*	35 *25*	15 *11*		2 *1*		1 *1*		15 *10*		2 *2*	

For the remaining vessels no specific Phoenician locale could be pinpointed, but one vessel probably also belongs to the Tyre–Sidon sphere, and similarly the vessels identified as coming from 'north of the ladder of Tyre'.

When considering only PhBc imports (25 vessels), the quantitative/regional distributions are practically the same (Table 1): eleven vessels from Tyre–Sidon, ten from the Carmel coast, one from the 'Akko region and another four from largely unspecified regions along the Phoenician littoral. The sample is not large enough to detect possible chronological fluctuations in this pattern, but currently it seems quite constant throughout the period under investigation.

A clear pattern seems to have emerged for this time span, representing at least 150 years, depending on the ('high' or 'low') chronology employed. Since the 25 PhBc vessels we sampled constitute nearly half of the 55 vessels catalogued by Bikai for CG I–III, we consider our sample representative.

Discussion

Our results show that regarding some Phoenician exchanges, interactions are not uniform across the board and that it is indeed possible to start to define specific orbits of contact. Undoubtedly the most surprising result of this study is that about half of the Phoenician vessels in Cyprus in the Early Iron Age do not originate in Lebanon but on the Carmel coast. This further underscores the crucial involvement of this region – most probably of its main harbour town at Dor – in Cypro-Phoenician interrelations during this period. Indeed, PhBc in Cyprus originates in

the two regions, and most probably specific sites, where at present they are most abundantly recorded (and the other types of containers in Cyprus originate from the same regions/sites).[51]

The other and, to our minds, most important result is that the same regions that distributed most of the Phoenician containers to Cyprus were also the ones that have been demonstrated to 'consume' significant numbers of ceramics moving in the opposite direction throughout most of the time-span investigated here. Both Tyre and Dor have produced CG pottery in quantities that surpass by far any other site outside Cyprus. They also stand out in that a very large portion of this import consists of open shapes and not containers, as opposed, for example, to other sites in the Levant which produced primarily (much lesser quantities) of Cypriote containers.[52]

This convergence does not seem to be accidental. It points to exchange networks operating specifically between Tyre (and Sidon?) and Dor with Cyprus. With the caveats mentioned above, we also propose that on the Cypriote side, mostly sites in the island's south/south-west, possibly also Kition, partook in these exchanges.[53]

Understanding this export to Cyprus is severely hampered by our ignorance regarding the contents of the PhBc containers, though for the small flasks, one possibility (prized liquids with South Asian spices) are presented in Namdar *et al.* 2013.[54] Clearly though, the motivation for this long-lasting maritime traffic between Cyprus and the Phoenician cities could not have been the exchange of pottery, however 'precious' its contents might have been (such as in the small flasks) and whatever social significance this exchange may have had (see below, future avenues of inquiry). Ships carried much more important cargoes, such as metals[55] and metal objects, timber, ship rigging, agricultural produce and, indeed, spices and other aromatics. These, however, are rather invisible for the period in question. Secondary cargoes, such as the ones investigated here, as well as the pottery moving from Cyprus in the opposite direction, can only serve as proxies for specific trade routes

[51] Sidon remains a lacuna in this respect. Whether or not this important city produced any substantial amounts of PhBc remains to be seen.

[52] For Tyre see Bikai 1978, table 13A; in the Dor database about 900 CG vessels/fragments are recorded; only a fraction of this assemblage has currently been presented and discussed (Gilboa 1989; 1999b; 2012; Gilboa and Sharon 2003). For a comparison of the CG 'profile' at Dor and Tyre to other sites in the Levant, see also Gilboa 2012.

[53] For a similar assessment regarding later Iron Age associations between specific sites in Phoenicia and Cyprus, see Smith 2008, 293.

[54] In the framework of that study several PhBc containers were sampled for residue analysis, but produced no results.

[55] Whether or not Cyprus continued to export significant amounts of copper to the Levant, and specifically to Phoenicia, is plausible, but currently unknown. See Kassianidou 2001; 2013, 69–71; Artzy 2006a; Yahalom-Mack 2007; Iacovou 2013, 22. For iron, see Sherratt 1994.

and interaction spheres in the framework of which other commodities were exchanged.

Could these phenomena be linked to later, Iron Age II, Phoenician overseas activities? Dor certainly did not take part in any such activity, nor did any other town on the Carmel coast. The reason is that in the course of Ir2a, in the 9th century BC, this region passes to the control of the kingdom of Israel and was thus subtracted politically from the Phoenician sphere. Recent analyses of the Dor sequence[56] demonstrate that this event was absolutely detrimental for all aspects of the site's maritime contacts and from this moment and on, for a long time, Dor plays no important role on the Mediterranean stage.

So the fact remains, as we can now demonstrate with some precision, that Tyre and possibly also Sidon – the two leading Phoenician entities in later westbound endeavours – were also the ones that maintained the closest relations with Cyprus throughout the Early Iron Age, as indeed argued by several scholars.[57] The close, direct and bi-directional Cypro-Phoenician contacts described above meant that Cyprus and especially the sea routes to its south were well known specifically to the Tyrians and possibly also the Sidonians. When historical circumstances in the Levant and in the Mediterranean in general were ripe for (or necessitated) longer range activities, these centuries-long liaisons must have had a profound impact.

Some Further Directions of Inquiry

Needless to say, further sampling of Phoenician ceramics moving about the Levant and in the Mediterranean in the early (and later) Iron Age will be instrumental in charting specific interaction spheres. Here, however, we would like to point out that the 'export' of PhBc to Cyprus may have had cultural significance beyond the mere exchange of goods. The following observations, for example, suggest as much:

(1) Some of the PhBc vessels shipped to Cyprus are strainer jugs with very protruding spouts (Fig. 3.4), hardly suited to serve as commercial containers and most probably serving (before being deposited in tombs) for drinking/pouring in socially significant occasions. These vessels exhibit the most extensive input in decoration (in Phoenician standards). Why such vessels were in demand in Cyprus remains to be explained.

[56] Gilboa, Sharon and Bloch-Smith forthcoming.

[57] Most explicitly in Aubet 2000; also Bikai 1994; Markoe 2005, 25–26. For the centrality of Cyprus in Early Iron Age maritime activities, see also Kourou 2008, 357; Torres-Ortiz 2008, 138.

(2) The PhBc decorative mode itself exhibits Cypriote traditions, in the syntax of its decorative circles and in most of its geometric designs.[58]
(3) There seems, in fact, to be a bi-directional stylistic discourse. Similar shapes, especially the 'globular' jugs, are produced in both regions – similar to the point that they fooled all (modern) experts;[59] the same ambiguity may have existed in the past. Oftentimes the same vessel types in both regions carry identical designs.[60] (4) PhBc containers had absolutely no role in Early Iron Age Greek or Cretan sites that were intensively engaged in cross-Mediterranean exchanges, nor, for that matter, in other Mediterranean regions.[61] These vessels 'operate' only in the Cypro-Phoenician milieu.

In short, developments in shaping and decorating these vessels in Cyprus and Phoenician centres are intertwined. This shared materiality between societies that were not too far apart and between which enduring multiple and in all probability direct interactions took place, requires further consideration. *Inter alia*, this must entail a closer study of the contexts in which these vessels act, and of the decorative designs and their possible functions and meaning. Whether this Cypro-Phoenician entanglement[62] also attests to Tyrians and Dorians in Cyprus, and/or *vice versa*, is also a possibility to be carefully appraised.

[58] Gilboa 1999a. At Dor, further Cypriote stylistic impact is attested on local pithoi (Gilboa 2001), tableware (for example, Gilboa 1999b, fig. 3.22–23; Yellin 1989) and on ivories (example in Stern 2000, fig. 52).

[59] *Cf.* Karageorghis and Iacovou 1982, 131; Bikai 1987b, 2; 1994, 31. For very similar vessels produced in Cyprus in regular Cypriote fabrics, see, for example, Benson 1973, pl. 28.K502, K509; Karageorghis and Iacovou 1982, pl. XXIII.8; Aupert and Tytgat 1984, pl. 6.23.

[60] Such as latticed lozenges and triangles arranged in various combinations on PhBc spouted jugs in Phoenicia: see Chapman 1972, figs. 2.6–7, 3.191, 5.57, 10.15, 13.272; Bikai 1978, pls. XXXI.11, XXXIII.22; Gilboa and Sharon 2003, figs, 9.4–6, 11.11, 13.14. On CG spouted jugs, see Benson 1973, pl. 26.K400; Flourentzos 1997, pl. XXX.19. On pendent triangles on PhBc spouted jugs in Phoenicia, see Balensi 1980, pl. 17.9; Anderson 1988, pl. 31.10. On White Painted CG spouted jugs, see Daniel 1937, pl. III.94; Yon 1971, pl. 23.71.

[61] For example, only two rather late (Ir2a) PhBc containers were found in the rich burial grounds of Lefkandi, for the entire Protogeometric and Sub-Protogeometric periods (Popham and Lemos 1996, pl. 79A.10–11).

[62] Thomas 1991, 14–16, 37–37; Hodder 2012. For the heuristic usefulness of the concept of entanglement in the Mediterranean context (or alternatively hybridity or creolisation), see Knapp 2008, 57–61; Dietler 2009, 29–31; and recently Stockhammer 2012 and various papers in Maran and Stockhammer 2012, especially Knapp 2012; Maran 2012; Yasur-Landau 2012.

Appendix 1: General Definitions and Encoding of Cypriote and Levantine Fabric Groups. Grey areas represent fabric groups not represented in this study.

Group	Definition	Sub-group	Details/ illustration	Provenance	Reference
Op	Ophiolitic minerals in sand	1	With radiolarian chert	Northern Syrian coast, Hatay, Cilicia	Goren *et al.* 2004, 88
		2	Without radiolarian chert	Cyprus, or as Op1	Goren *et al.* 2004, 60
Mc	Micaceous clay, metamorphic and ophiolithic minerals	1	Argillaceous matrix with metamorphic rocks (amphibolite, pyroxenite, schist), sandstone and/ or radiolarian mudstone; Fig. 4.1	Cyprus: Mamonia Complex or circum-Troodos 'melange'	Goren *et al.* 2004, 60
		2	Marly or argillaceous matrix with ophiolithic rocks/minerals; Fig. 4.2	Cyprus: circum-Troodos (Pakhna marl or alluvial sediments)	Goren *et al.* 2004, 60
Am	Coastal calcareous sediments	1	Calcareous temper with algae (e.g. *Amphiroa)*, chert and volcanic minerals or rock fragments	Akkar plain in Syria/Lebanon coast	Goren *et al.* 2004, 114
		2	Calcareous/quartzitic temper with algae and chert, no volcanic; Fig. 4.3	Lebanon coast: Tyre to Sidon	Goren *et al.* 2004, 134
		3	Calcareous/quartzitic temper with algae, no chert	The Phoenician coast north of Akko	Goren *et al.* 2004, 232
		4	Calcareous temper with chert, no algae	General inner Phoenician coast north of Akko	Goren *et al.* 2004, 232

Group	Definition	Sub-group	Details/ illustration	Provenance	Reference
Hm	Hamra soil or Hamric alluvial soil	1	Quartz is dominant (over 50%)	Coastal plain, roughly between Ashdod and Hadera	Goren *et al.* 2004, 292
		2	Quartz and carbonates appear nearly equally; Fig. 4.5–6	Carmel coast	Goren *et al.* 2004, 292
		3	Volcanics (tuff, weathered basalt) together with *ca*. equal quartz and carbonates	Carmel coast or the Haifa Bay	Goren *et al.* 2004, 232
		4	Coastal calcareous temper with algae (e.g. *Amphiroa*)	Southern Levantine coast north of Haifa	Goren *et al.* 2004, 292
Rd	Rendzina soil	1	With badly-sorted chalk fragments	Numerous possible Levantine locations	
		2	With carbonates and some volcanic tuff, rarely basalt	Mt Carmel area	Goren *et al.* 2004, 252
		3	Holocrystalline and hypocrystalline olivine basalts with carbonates, quartz, chert, and travertine	Central Jordan valley	Goren *et al.* 2004, 234
		4	Holocrystalline and hypocrystalline olivine basalts with carbonates and chert	Jezreel or Central Jordan valley	Goren *et al.* 2004, 228
		5	Olivine basalts as in Rd2 without carbonates or chert	Jezreel valley	Goren *et al.* 2004, 228
		6	Hypocrystalline basalts (glassy matrix) with or without carbonates and chert	Akkar plain in Lebanon	Goren *et al.* 2004, 114

Group	Definition	Sub-group	Details/ illustration	Provenance	Reference
Tq	Taqiye marl	1	Dominated by calcareous sand	Numerous possible Levantine locations	Goren *et al.* 2004, 191, 256
		2	Dominated by quartz sand	Lower Shephelah near Gezer or west of the Menashe Hills	Goren *et al.* 2004, 271
		3	Quartz, calcareous, and basaltic sand	Jezreel valley or inner Haifa Bay	N.D.
Mi	Miocene marl	1	Dominated by calcareous sand, some quartz, with *Amphiroa* fossils; Fig. 4.4	Lebanese littoral particularly between Tyre and Sidon	Goren *et al.* 2004, 134
Tr	Terra Rossa soil	1	Dominated by quartz	Upper Shephelah or Sharon	Goren *et al.* 2004, 282
		2	Quartz and carbonates appear equally	Judean Mountains, Upper Carmel	Goren *et al.* 2004, 282
		3	Temper dominated by carbonates	Numerous possible Levantine locations	Goren *et al.* 2004, 282
Ls	Loess soil	1	Dominated by quartz	Negev coastal plain	Goren *et al.* 2004, 112
		2	Quartz and carbonates appear equally	Northern Negev	Goren *et al.* 2004, 112
		3	Temper dominated by carbonates	Inner northern Negev, southern Shephelah	Goren *et al.* 2004, 112

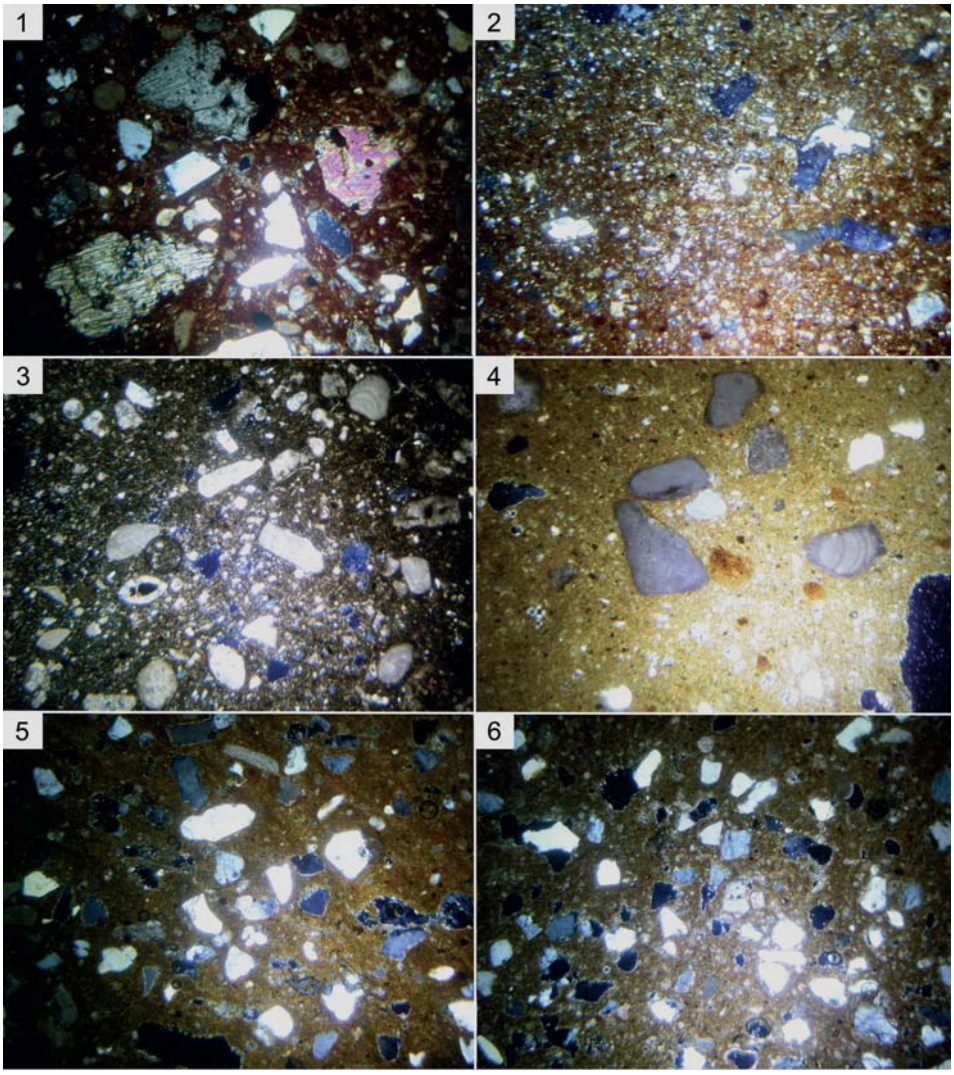

Fig. 4: Selected optical mineralogy fabric groups. All images are under crossed polarisers; field width: about 3 mm. 1. Fabric Mc1 (Kouklia 17), with coarse amphibole, pyroxene, feldspar and quartz in argillaceous matrix with abundant mica minerals; 2. Fabric Mc2 (Kouklia 21), with marly, highly micaceous matrix and sparsely spread inclusions including pyroxene (lower right) and feldspar (centre left); 3. Fabric Am2 (Amathus 1), of calcareous rendzinal matrix with dense sand inclusions including *Amphiroa* coralline alga fragments (upper right, centre right, bottom right and more), rounded limestone fragments and calcite; 4. Fabric Mi1 (Kouklia 9), sparsely spread sand of limestone (centre and top) and *Amphiroa* alga (centre right) fragments in Miocene foraminiferous marl with iron oxides (dark reddish-tan spots); 5. Fabric Hm2 (Amathus 5), with well-sorted quartz (clear white or grey) and calcareous (yellowish or tan) coastal sand set in alluvial soil matrix; 6. Fabric Hm2 (Kouklia 18), as 5 but with better sorted sand inclusions.

Appendix 2: List of Sampled Vessels and Results of the Optical Mineralogy Study.

Cat. No.	Site	Context	Vessel	Date	Reference	Fabric	Provenance
Alaas 1	Gastria-Alaas	T.17/26	Small monochrome rounded jug	LC IIIB	Karageorghis 1975, pl. LX.T. 17/26	Mc 2	Cyprus, Pakhna
Alaas 2	Gastria-Alaas	T. 19/25	Small two-coloured lentoid flask	LC IIIB	Karageorghis 1975, pl. LXIV.T. 19/25	Mc 1	Cyprus, Mamonia
Alaas 3	Gastria-Alaas	T.15/13	Small monochrome spherical jug	LC IIIB	Karageorghis 1975, pl. LV.T. 15/13	Mc 2	Cyprus, Pakhna
Amathus 1	Amathus	'Rashim's Coffee Shop robbers' cache'	Large rounded Bichrome jug with ring base	CG IB/II	Bikai 1987b, pl. V.69, Desborough 1957, fig. 2a	Am 2	Tyre–Sidon
Amathus 2	Amathus	T. 382/35	Very large globular/slightly barrel shaped Bichrome jug	CG III	Bikai 1987b, pl. VI.37	Am 2	Tyre–Sidon
Amathus 3	Amathus	T. 332/6	Pear-shaped Bichrome jug with ring base	CG IB/II	Bikai 1987b, pl. V.65	Hm 2	Carmel coast
Amathus 4	Amathus	T. 370/9	Rounded Bichrome jug with ring base	CG III	Bikai 1987b, pl. V.67	Thin-sectioning failed	-- (Carmel coast by visual impression)
Amathus 5	Amathus	T. 15/24	Small globular Bichrome jug	CG IB/II	Bikai 1987b, pl. V.23	Hm 2	Carmel coast
Amathus 6	Amathus	T. 15/34	Small spherical Bichrome jug	CG IB/II	Bikai 1987b, pl. V.24	Hm 2	Carmel coast

Cat. No.	Site	Context	Vessel	Date	Reference	Fabric	Provenance
Amathus 7	Amathus	T. 310/13	Very large barrel-shaped Bichrome jug	CG II or III	Bikai 1987b, pl. VI.28	Hm 2	Carmel coast
Amathus 8	Amathus	T. 310/30	Very large globular Bichrome jug	CG II or III	Bikai 1987b, pl. VI.29	Small sample, Am 2 or 3	North of the Ladder of Tyre
Amathus 9	Amathus	T. 312/71-2	Globular Bichrome jug	CG IB/II	Bikai 1987b, pl. IV.32	Am 3	North of the Ladder of Tyre
Amathus 10	Amathus	T. 333/15	Very large globular Bichrome jug with ring base	CG IB/II	Bikai 1987b, pl. V.66	Am 2	Tyre–Sidon
Amathus 11	Amathus	T.521/61	Small black/ brown-mono-chrome flask	CG IB/II	Karageorghis and Iacovou 1990, fig. 5.61	Hm 2	Carmel coast
Amathus 12	Amathus	T.521/65	Small black/ brown-mono-chrome flask	CG IB/II	Karageorghis and Iacovou 1990, fig. 5.65	Hm 2	Carmel coast
Amathus 13	Amathus	T.521/66	Small two-coloured lentoid flask	CG IB/II	Karageorghis and Iacovou 1990, fig. 5.66	Am 2	Tyre–Sidon
Amathus 14	Amathus	T. 521/71	Small asymmetric Bichrome flask	CG IB/II	Karageorghis and Iacovou 1990, fig. 5.71	Hm 2	Carmel coast
Amathus 15	Amathus	T.521/75	Small two-coloured flask with radial decoration	CG IB/II	Karageorghis and Iacovou 1990, fig. 5.75	Am 2	Tyre–Sidon
Amathus 16	Amathus	T. 329/51	Very small rounded Bichrome jug with ring base	CG IB/II	Bikai 1987b, pl. V.64	Am 2	Tyre–Sidon

Cat. No.	Site	Context	Vessel	Date	Reference	Fabric	Provenance
Kouklia 1	Eliomylia	T. 119/6	Small monochrome lentoid flask	LC IIIA	Karageorghis 1990, pl. LXXXVI.6	Hm 2	Carmel coast
Kouklia 2	Hadjiabdullah	T.135/43	Bichrome strainer jug	CG IB/II	Christou 1996, fig. 32	Hm 2	Carmel coast
Kouklia 3	Skales	T. 53/39	Bichrome strainer jug	CG II/III	Karageorghis 1983, fig. XCIX.39	Hm 2	Carmel coast
Kouklia 4	Skales	T. 80/89	Bichrome strainer jug	CG II/III	Karageorghis 1983, fig. CLIII.89	Am 3 or 4, possibly Hm 2; very small sample	Possible range: Carmel coat to south of Beirut
Kouklia 5	Skales	T. 58/130	'Red Ware' globular jug	CG IA	Karageorghis 1983, fig. CVIII.130; Bikai 1987b, pl. III.19	Hm 2	Carmel coast
Kouklia 6	Skales	T. 44/134	Store jar	CG IA	Karageorghis 1983, fig. LII.134	Am 1 (?)	Not southern Lebanese coast
Kouklia 7	Skales	T. 49/77	Store jar	CGI A–B	Karageorghis 1983, fig. LXXXVI.77	Close to MI 1, but without temper	Lebanese coast
Kouklia 8	Skales	T. 49/78	Store jar	CG IA–B	Karageorghis 1983, fig. LXXXVI.78	Close to MI 1, but without temper	Lebanese coast
Kouklia 9	Skales	T. 85/16	Large 'Red Ware' flask	CG IA	Karageorghis 1983, fig. CLXXIII.16	MI 1	Lebanese coast, probably Tyre–Sidon

Cat. No.	Site	Context	Vessel	Date	Reference	Fabric	Provenance
Kouklia 10	Skales	T. 89/22	Large globular Bichrome jug	CG IA–B	Karageorghis 1983, fig. CLXXXVIII.22	Am 2	Tyre–Sidon
Kouklia 11	Skales	T. 83/83	Large 'Red Ware' flask	CG IB/II(?), possibly later	Karageorghis 1983, fig. CLXVI.83	Am 2 or 3 (small sample)	Tyre–Sidon or 'Akko region
Kouklia 12	Skales	T. 75/78	Bichrome jug with ring base	CG III, possibly later	Karageorghis 1983, fig. CXXXVIII.78	Am 2	Tyre–Sidon
Kouklia 13	Skales	T. 49/67	Sub-globular Bichrome jug	CG IA–B	Karageorghis 1983, fig. LXXIX.67	Mc 1	Cyprus, Mamonia, plausibly Kouklia
Kouklia 14	Skales	T. 80/87	Medium squat Bichrome jug	CG II/III	Karageorghis 1983, fig. CLIII.87	Am 2	Tyre–Sidon
Kouklia 15	Skales	T. 49/73	Sub-barrel-shaped Bichrome jug	CG IA–B	Karageorghis 1983, fig. LXXX.73	Mc 2	Cyprus, Pakhna, probably southern coast
Kouklia 16	Skales	T. 49/80	Store jar	CG IA–B	Karageorghis 1983, fig. LXXXVI.80	Extremely highly fired, unsuitable for petrography, Am 2??	Possibly Tyre–Sidon
Kouklia 17	Skales	T. 49/61	Globular Bichrome jug	CG IA–B	Karageorghis 1983, fig. LXXIX.61	Mc 1	Cyprus, Mamonia, plausibly Kouklia
Kouklia 18	Skales	T. 49/76	Sub-globular Bichrome jug	CG IA–B	Karageorghis 1983, fig. LXXX.76	Hm 2 (reduced firing)	Carmel coast

Cat. No.	Site	Context	Vessel	Date	Reference	Fabric	Provenance
Kouklia 19	Skales	T. 80/88	Globular Bichrome jug	CG II/III	Karageorghis 1983: pl. CLIII.88	Am 2 or Hm 2, (extremely high firing)	Tyre–Sidon or Carmel coast
Kouklia 20	Skales	T.58/44	Globular orange-mono-chrome jug	CG IA	Karageorghis 1983, pl. CVIII.44	Am 2	Tyre–Sidon
Kouklia 21	Skales	T. 76/2	Small sub-globular Bichrome flask	CG IA–B	Karageorghis 1983, fig. CXL.2	Mc 2	Cyprus, Pakhna
Kouklia 22	Skales	T. 83/95	Small sub-globular Bichrome flask	CG IB/II	Karageorghis 1983, fig. CLXVI.95	Mc 1	Cyprus, Mamonia, plausibly Kouklia
Kouklia 23	Skales	T. 90/3	Small squat Bichrome flask	CG II/III	Karageorghis 1983, fig. CCI.3	Thin-sectioning failed	--
Kouklia 24	Skales	T. 49/195	Small sub-globular Bichrome flask	CG IA–B	Karageorghis 1983, fig. LXXX.195	Mc 1	Cyprus, Mamonia, plausibly Kouklia
Kouklia 25	Skales	T. 91/3	Small lentoid flask	CG IA	Karageorghis 1983, fig. CXCVII.3	Completly isotropic, un-identifiable, suites Cypriote WP fabrics, perhaps Mc 2	Cyprus
Kouklia 26	Skales	T. 58/113	Small Bichrome flask	CG IA	Karageorghis 1983, fig. CVIII.113	Mc 1	Cyprus, Mamonia, plausibly Kouklia
Kouklia 27	Skales	T. 81/94	Small rounded Bichrome jug on ring base	CG III	Karageorghis 1983, fig. CLVIII.94	Hm 2, small sample	Carmel coast

Cat. No.	Site	Context	Vessel	Date	Reference	Fabric	Provenance
Kouklia 28	Skales	T. 76/54	Large asymmetric Bichrome flask	CG IA–B	Karageorghis 1983, fig. CXL.54	Am 2	Tyre–Sidon
Kouklia 29	Skales	T. 49/74	Small squat Bichrome jug	CG IA–B	Karageorghis 1983, fig. LXXX.74	Hm 4	ʻAkko region
Kouklia 30	Skales	T. 49/189	Small two-coloured or black monochrome lentoid flask	CG IA–B	Karageorghis 1983, fig. LXXX.89	Thin-sectioning failed	--
Kouklia 31	Skales	T. 83/34	Small two-coloured flask	CG IB/II(?), possibly later	Karageorghis 1983, pl. CLXXI.34	Am 2	Tyre–Sidon
Kouklia 32	Skales	T. 44/111	Small lentoid Bichrome flask	CG IA	Karageorghis 1983, fig. LIV.111	Hm 2	Carmel coast
Kouklia 33	Skales	T. 49/194	Small undecorated lentoid flask	CG IA–B	Karageorghis 1983, fig. LXXX.194	Mc 2, pure Pakhna(?), few inclusions	Cyprus, Pakhna
Kouklia 34	Skales	T. 49/193	Small lentoid black-monochrome flask	CG IA–B	Karageorghis 1983, pl. LVI. 193	Hm 2	Carmel coast
Kouklia 35	Skales	T. 75/28	Small spherical Bichrome jug	CG III	Karageorghis 1983, fig. CXXXVIII.28	Am 2	Tyre–Sidon
Kouklia 36	Skales	T. 49/191	Small lentoid Bichrome flask	CG IA–B	Karageorghis 1983, fig. LXXX.191	Mc 1	Cyprus, Mamonia, plausibly Kouklia

Appendix 3: Commentary on Specific Vessels Sampled

The commentary is listed in chronological order, and then according to ware-groups and specific shapes.

Late Cypriote IIIA/IIIB

These periods antedate the PhBc group and the chronological stretch we are concerned with here and sampling was quite opportunistic. The only LC IIIA vessel sampled (**Kouklia 1**), a monochrome flask from Eliomylia Tomb 119, was considered by Karageorghis[1] a possible import, and by us too, mainly by virtue of its decorative syntax ('enclosed' circles) and the red hue of its design – both attributes being typical of flasks at Dor. Indeed, it was produced on the Carmel coast. This is the only hint that the export of small containers from the Carmel coast to Cyprus already commenced in this period.

The three LC IIIB containers are from Alaas, all defined as imports in the site report and subsequent publications.[2] **Alaas 2** is a small two-coloured flask and **Alaas 1** and **3** are one-handled near-globular jugs decorated in red/orange.[3] In form and decoration the latter two are very close to jugs in Phoenicia, for example at Dor and at Tell Keisan.[4] In contrast, their perpendicular handle is atypical of Phoenician products.

All three vessels were demonstrated to be Cypriote products. **Alaas 2** cannot have been produced at Alaas or vicinity since it was produced of the Mamonia petro-fabric of the south-western part of the island (see Appendix 1). These results have the following implications: (A) they overrule all previous convictions that these containers are Levantine imports and presently the Alaas cemetery remains devoid of overseas ceramics. (B) **Alaas 2** attests to some circulation of flasks within the Island.

Cypro-Geometric IA

Six vessels were sampled, from Tombs 44, 58, 85 and 91 at Kouklia Skales – out of about 15 potentially Phoenician vessels in this cemetery attributable exclusively to this period.

Small 'Red Ware' Containers. **Kouklia 5 and 9** belong to this group, respectively a globular jug and a large flask. **Kouklia 5** was manufactured on the Carmel coast and **Kouklia 9** probably in the Tyre–Sidon region. A CG IB/II example of this ware, **Kouklia 11**, was produced somewhere on the southern Lebanese coast or in the ʿAkko region. This provides some indication that such containers were manufactured in more than one locale. This ware, however, has not yet been recognised anywhere in Phoenicia. Since the 'Red Ware' vessels

[1] Karageorghis 1990, 79.

[2] Karageroghis 1975; Bikai 1987b, no. 103; Karageorghis and Iacovou 1990, 90; Gilboa 2005, 54. In Karageorghis 2008, 191 these vessels are considered influenced by Near Eastern prototypes.

[3] For a colour photograph of all three, see Karageorghis 2008, fig. 1.

[4] For example Briend and Humbert 1980, pls. 74–75; most, however, are two-handled.

are different in fabric, method of decoration and, to a certain degree, also in the range of shapes from the other concurrent Phoenician containers (see the Introduction), they may well represent a distinct sub-phenomenon in the framework of Cypro-Phoenician exchanges.

Containers Decorated in Monochrome. **Kouklia 25,** a small black-monochrome flask, judged as imported by Bikai and by ourselves,[5] is Cypriote-made. **Kouklia 20,** a rounded orange-monochrome jug with a perpendicular handle, was manufactured in the Tyre–Sidon range. No such vessels, however, are known at present from any Phoenician site.

Small Phoenician Bichrome Flasks. **Kouklia 26,** identified by the excavators as Cypriote Bichrome I,[6] was indeed produced in Cyprus, most probably at Kouklia itself or nearby, as indicated by its fabric (Mamonia). **Kouklia 32** was produced on the Carmel coast.

To sum up (Table 1), during CG IA, Phoenician imports to Cyprus originate at least in the Tyre–Sidon area (one or two vessels), and on the Carmel coast (two vessels). Noteworthy is the fact that very similar vessels are produced in Cyprus itself – so similar that several experts have considered them imports.

Cypro-Geometric IA–IB(?)

Under the CG IA-IB(?) category we consider 11 vessels originating in tombs that may encompass the entire CG I range. Eight of them are from the renowned Tomb 49 at Kouklia-Skales, the richest toms in this cemetery[7] and three are from Tombs 76 and 89 there.

Small Lentoid Monochrome and Unadorned Flasks. **Kouklia 33**, with no preserved decoration, was produced in Cyprus. Visually, this flask was considered an import by the excavators, by Bikai and by us.[8] With hindsight, a Cypriote origin should have been obvious, implied by its nipples, the light fabric and the handles that engulf the neck. The latter is a Late Bronze Age characteristic, which has by and large vanished from flasks produced in the Levant; thus, during CG I it may be considered a Cypriote trait. **Kouklia 34**, a small black-monochrome flask, was produced on the Carmel coast. This is somewhat surprising, since monochrome flasks in this region are mostly decorated in red, and black-painted ones are rare, found much more frequently in Lebanon.[9]

Lentoid/Asymmetric Phoenician Bichrome Flasks. **Kouklia 21, 24** and **36**, with handles that engulf the neck, were produced in Cyprus (for the engulfing handles, see above). This contradicts all visual assessments,[10] ours included (but no. 21 is indeed of very light fabric, typical to Island products). **Kouklia 28** was produced in the Tyre–Sidon region.

[5] Similarly in Karageorghis and Iacovou 1990, 90.

[6] Karageorghis 1983, 121.

[7] This tomb is usually assigned to CG IA only, but some ceramics in it indicate a more extended CG I use. This is consistent with the appearance of globular PhBc jugs there (which is not the norm for the earliest CG IA contexts).

[8] Bikai 1983, 400; Karageorghis 1983, 72.

[9] Gilboa 1999a, 2.

[10] Bikai 1983, 400; Karageorghis 1983, 72, 215.

Globular and Sub-Globular Phoenician Bichrome Jugs. We examined six 'globular' PhBc jugs, regarding which the consensus was that one (**Kouklia 17**) was of Cypriote Bichrome I ware, and five (**Kouklia 10, 13, 15, 18 and 29**) were Phoenician.[11] **Kouklia 17** was indeed produced in Cyprus, most probably in the south-west, since its fabric is from the Mamonia formation. Among the supposed imports, however, two are also Cypriote (**Kouklia 13** and **15**, with the former, again, produced of Mamonia Formation clay). Of the rest, **Kouklia 10** was produced in the Tyre–Sidon sphere, **Kouklia 29** in the ʿAkko region and **Kouklia 18** on the Carmel coast. For the latter two we initially also allowed for an island provenance because of the light fabric, and the meticulously executed decoration on the former.

Summary of Imports in Skales Tomb 49. In all, of 11 potentially-imported containers in this important tomb (not counting jars) we have results for nine. (The other two 'Phoenician' imports in this tomb are no. 49/189, a small lentoid black-monochrome flask,[12] and no. 49/184, a 'Red Ware' dipper juglet.) The potential imports are now reduced to a maximum of five. Vessels sampled were produced on the Carmel coast (two) and in the ʿAkko region (one).

Regarding the CG I horizon in general (Table 1), of 11 sampled 'imports', six are Cyprus-made. Actual imports originate in the Tyre–Sidon region (two), the ʿAkko region (one) and the Carmel coast (two).

Cypro-Geometric IB/II

Sixteen vessels were sampled from this horizon.[13] Four are from Kouklia (Skales Tomb 83 and Hadjiabdullah Tomb 135) and 12 are from the Amathus cemeteries, west (Tombs 15, 521, and the 'Robbers' Cache') and east (Tombs 135, 312, 329, 332, 333).[14]

'Red Ware' Flask. **Kouklia11** was produced either in the Tyre–Sidon range or in the ʿAkko region (see above, Kouklia 5 and 9 for Red Ware vessels produced elsewhere).

Small Two-Coloured and Monochrome Flasks. Four vessels were analyzed, all from Amathus Tomb 521. **Amathus 11** and **12** were produced on the Carmel coast and **Amathus 13** and **15** in the Tyre–Sidon region. The latter bears a rare radial design in Late Bronze Age manner. Karageorghis and Iacovou, following Mazar, regarded this decoration as Philistine.[15]

Small Phoenician Bichrome Flasks. Three vessels were sampled, of which one (**Kouklia 22**), was identified as *Cypriote* Bichrome.[16] Indeed, it was probably produced in the site's vicinity,

[11] Bikai 1983, 402; Karageorghis 1983, 65–66, 314.

[12] The analysis of this vessel, **Kouklia 30**, failed.

[13] For suggestions to amalgamate CG IB and II, see Gilboa and Sharon 2003; Smith 2009, 282; and *cf.* Coldstream 1999.

[14] The attribution of **Kouklia 2** from Hadjiabdullah to this horizon is probable but not certain. In Skales Tomb 83 some of the vessels may be somewhat later.

[15] Karageorghis and Iacovou 1990, 91; Mazar 1985, 72.

[16] Karageorghis 1983, 286.

since its fabric is of the Mamonia formation. **Kouklia 31** originates in the Tyre–Sidon region and **Amathus 14** on the Carmel coast.

Globular Phoenician Bichrome Jugs. Three were sampled. **Amathus 5** and **6,** relatively small and thick jugs from Tomb 15, were manufactured on the Carmel coast. **Amathus 9** was produced somewhere north of ʿAkko.

Ring-Based Phoenician Bichrome Jugs. Four were sampled. **Amathus 1, 10** and **16** are from Tyre–Sidon and **Amathus 3** from the Carmel coast. The latter has an unusual pear-shape.

Phoenician Bichrome Strainer Jug. **Kouklia 2** was produced on the Carmel coast. This is compatible with the fact that PhBc strainer jugs with similar designs of complex lozenges or triangles (of Cypriote ancestry), are known mainly from the Carmel coast and to a lesser extent the neighbouring western and central Jezreel valley – from Dor, Tel Mevorakh, Megiddo and Taʿanach.[17]

To summarise, of the 16 CG IB/II vessels sampled, 15 are imports. Six originate in the Tyre–Sidon region, one somewhere north of ʿAkko, one in either of those two regions and seven on the Carmel coast. In Amathus Tomb 521, from which we sampled five (about half) of the potential imports (all are small flasks), the only production regions attested are Tyre–Sidon and the Carmel coast.

Cypro-Geometric III

Here we consider 11 vessels,[18] mostly belonging to CG II/III and early CG III – from Amathus east Tombs 310*, 370, 382 and Kouklia-Skales Tombs 53*, 75, 80*, 81, 90* (asterisks mark tombs that also contain material which is somewhat earlier than CG III).

Globular and Barrel-Shaped Phoenician Bichrome Jugs. Six were sampled, of which **Amathus 2,** 7 and **8** are unusual since they are by far the largest PhBc vessels known anywhere (about 35 cm high). They were produced, respectively, at Tyre-Sidon, the Carmel coast and somewhere north of the Ladder of Tyre. **Amathus 8** bears a rare radial design between its concentric circles, similarly to **Amathus 15** (above) that was produced in the same region. Of the three 'regular sized' jugs, **Kouklia 14** and **35** were produced in the Tyre–Sidon region and **Kouklia 19** either there as well, or on the Carmel coast.

Ring-Based Phoenician Bichrome Jugs. **Kouklia 27** was produced on the Carmel coast. The analysis of **Amathus 4** failed; visually its fabric looks similar to Carmel coast specimens. **Kouklia 12** is the only so-called 'heavy-walled' juglet we sampled,[19] produced in the Tyre–Sidon region.

Phoenician Bichrome Strainer Jugs. **Kouklia 3**, adorned with vertical latticed panels, was produced on the Carmel coast. The origin of **Kouklia 4,** adorned with the same design and

[17] Gilboa 1999a, fig. 12.6–10; Arie 2011, fig. 8.2.4.

[18] **Kouklia 23,** the only PhBc flask sampled from this period, produced no results.

[19] These juglets, frequently adorned in the PhBc manner, are typified by thick walls and by very long necks relative to the body, see Bikai 1987b, pl. IX.

with pendent triangles, could not be pinpointed – anywhere on the Phoenician littoral between the environs of Beirut and the Carmel/Sharon coast.

Summing up (Table 1), of the 10 CG II/III–CG III vessels for which we have results, five were produced in the Tyre–Sidon region, three on the Carmel coast and two anywhere in or between these regions.

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