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‘The mantle of Vasilia’: have Stewart’s views on the centrality of the copper trade in prehistoric Bronze Age Cyprus stood the test of time?

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Abstract

Exploitation of the island’s copper resources and the internal dynamics of a ‘copper trade’ played a major role in Stewart’s understanding of shifts in population, settlement and centres of power in Early and Middle Bronze Age Cyprus. The importance of Vasilia is attributed to its location near a sheltered inlet suitable for early shipping and its control of overland routes to ore bodies in the northwest Troodos. *Vounous*, he thought, tapped a different source of copper, perhaps in the northeast Troodos; and the ‘spectacular’ growth of Lapithos from Early Cypriot III is attributed to a movement of the copper trade eastward from Vasilia and perhaps to ‘its population having a hand on both the sources of copper in northern Troodos’ (Stewart 1962: 289). At the same time Stewart was aware that little was known about mines or mining settlements. He nevertheless viewed metalworking as a specialised craft and suggested that roughly smelted ore was transported by trains of donkeys to the north coast. This chapter considers Stewart’s views in the light of more recent evidence, with a particular focus on what we now know about mining and metallurgy, and the changing patterns of settlement during this period.

Introduction

Exploitation of the island’s copper resources and the internal dynamics of a ‘copper trade’ played a major role in Stewart’s understanding of shifts in population, settlement and centres of power, particularly on the north coast, in Early and Middle Bronze Age Cyprus. At the same time he was aware that the production of metal was ‘still wrapped in obscurity’ (Stewart 1962: 288). He nevertheless viewed metalworking as a specialised craft and suggested that ore was roughly smelted on the spot and transported to the north coast where a number of major sites either independently or in some kind of uneasy truce derived their authority from the ‘copper trade’. Fifty years on, how does an explanatory model which views the ‘copper trade’ as a key determinant hold up as a basis for understanding prehistoric Bronze Age Cyprus?

This chapter argues that Stewart’s views on the importance of copper production have been strengthened by recent evidence, although significant questions regarding the scale and organisation of this industry in the Early and Middle Bronze Age remain.

Stewart’s prehistoric Bronze Age, circa 1962

Stewart’s construction of the prehistoric Bronze Age was in large part framed by his view of the Philia culture. He believed that it was a regional variant of mainstream Early Cypriot (EC), contemporary with the settlements at *Vounous* and Lapithos but restricted to the northwest and centre of the island, with a possible presence on the southwest coast extending as far east as Erimi. He treated it as ‘a separate entity’ which ‘died out almost without a trace’ and ‘until the end gave nothing’ (1962: 210–11, 270). He rejected Dikaios’ suggestion of an Anatolian origin for the Philia and proposed instead that the Philia and *Vounous* cultures were ‘divergent branches of a common stock’ which could be traced back to the Chalcolithic (Stewart 1962: 296). For Stewart the Philia culture was an isolated phenomenon with an indigenous past and no future; for Dikaios (1962: 190–91) it was a new development of external origin that stood at the head of the Bronze Age sequence (for a detailed discussion of this debate and its repercussions see Webb & Frankel 1999; Webb 2002; Georgiou 2004) (**Fig. 1**).

Stewart (1962: 297) had no doubt, however, of the importance of the Philia settlement at Vasilia and its role in the development of a ‘copper trade which made possible advances in wealth and organisation ... on the north coast’. He noted that ‘Vasilia commanded an excellent harbour for primitive craft, as well as a pass through the Kyrenia mountains,’ and proposed that it was the main land terminal of a copper route from which metal was exported by sea (Stewart, cited in Hennessy *et al*. 1988: 40). A sketch map (dated 1955) ‘of Philia remains and possibly associated copper routes’ suggests, more specifically, exploitation of the ore bodies around Lefka (i.e. Skouriotissa) with transportation routes north to Vasilia via the Panagra

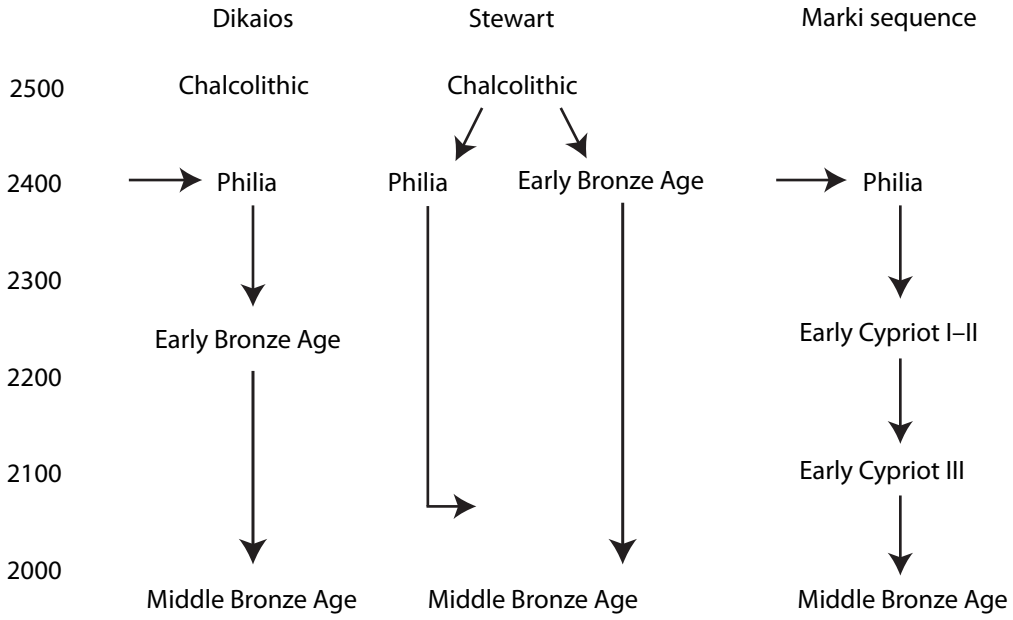

Figure 1. Schematic representation of the chronological and cultural position of the Philia culture, as suggested by Stewart (1962) and Dikaios (1962) and indicated by the stratigraphic sequence at Marki

pass and south to Anoyira and Episkopi (Hennessy *et al*. 1988: 40) (**Fig. 2**). In the southwest, life for Philia people was, he proposed, more isolated, 'though we should not discount the possibility of the exploitation of the metal deposits in south-western Troodos' (Stewart 1962: 289).

Elsewhere, for Stewart, the picture was an essentially rural one. *Vounous*, he suggests, was important in EC I, perhaps because it 'possessed a particularly renowned shrine', but otherwise non-Philia area people lived 'a peaceful life of mixed farming' until the rise of Lapithos and Nicosia *Ayia Paraskevi* in EC III (Stewart 1962: 289). The rise of Lapithos, in Stewart's (1962: 289) view, carried with it 'the suggestion that the copper trade was moving eastward from Vasilia'. He suggested further 'that in earlier times Vounous was tapping a different source of copper to Vasilia, perhaps the ores of north-east Troodos by way of Dikomo and Ayia Paraskevi, and the growth of Lapithos, with a superior water supply and better harbour facilities, may have been due to its population having a hand on both the sources of copper in northern Troodos' (Stewart 1962: 289). Stewart believed that Vasilia was 'exterminated by force' by Lapithos, which then absorbed its population and usurped its share of the copper trade. Similarly he linked a 'catastrophic decline in population at Vounous' with the 'spectacular' rise of Lapithos and suggested that this 'may well mark the establishment of a centralized state on the north coast' (Stewart 1962: 299) (on Stewart's views of the 'state', see Knapp, this volume).

Stewart was not particularly interested in the origin of the metallurgical technologies which appeared on Cyprus at the beginning of the Early Bronze Age (EBA), noting only that 'generic similarities between Cypriote [metal artefact] types and those in use elsewhere in the Near East suggest foreign prototypes' (Stewart 1962: 242). On the basis of analyses undertaken in 1939 he proposed that 'the metal used in the early Cypriote period came basically from Cypriote ores' (Stewart 1962: 241); and because these analyses indicated the presence of tin as an alloy at *Vounous* in EC I, he felt that 'we must face the possibility that tin or tin-rich metal was being imported into Cyprus ... and ... being added ... to native metal', or 'that manufactured metal objects with a relatively high tin content were reaching Cyprus from the mainland ... and ... the melting down of these supplied the traces of tin found in later objects made locally' (Stewart 1962: 241). Analyses of copper objects from Vasilia showed an absence of zinc and antimony, and less lead and nickel than artefacts from *Vounous*, leading Stewart (1962: 242) to suggest, again, that 'the people of the Philia culture drew their metal from a different source to those at Vounous'.

Stewart was aware of the importance of metal within the Philia cultural system. 'In the Philia culture', he wrote, 'copper seems to have been much commoner and more effectively used than in the rest of Cyprus'. He noted, also, that 'The men of Vasilia were better armed than their contemporaries' (Stewart 1962: 297); and that they 'carried formidable swords', while 'elsewhere the equipment was lighter, and barely useful even for hunting' (Stewart 1962: 292). For Stewart, tensions between Philia and non-Philia communities involved 'the possibility of frontier feuds', since 'both sides were equipped for war' (Stewart 1962: 297); he suggested, in particular, that

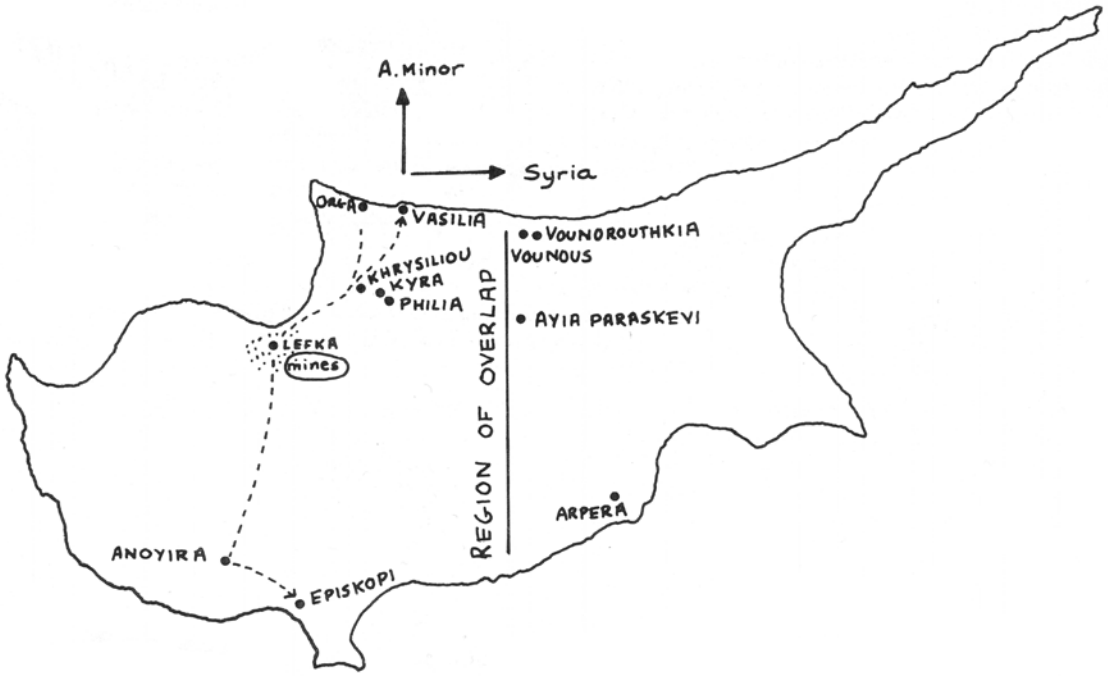

Figure 2. Stewart's 1955 sketch map 'of Philia remains and possibly associated copper routes' (Hennessy et al. 1988: 40)

the growth of Lapithos 'was not founded on peace and economics alone, but required that men could defend themselves and, if need be, attack others' (Stewart 1962: 299).

Stewart (1962: 300) knew that this picture would 'be greatly altered in the future' and this has certainly been the case with respect to the chronology and origin of the Philia culture. The 'copper trade', however, continues to play a defining role in discussions of prehistoric Bronze Age Cyprus, albeit within a different chronological and historical framework. Other elements of Stewart's picture, including the primacy of Vasilia and Lapithos and the distinctiveness of *Vounous*, have also stood the test of time.

The prehistoric Bronze Age, circa 2013

The Philia Early Cypriot

Excavations at Marki *Alonia* from 1991 to 2000 showed beyond doubt that the Philia culture is chronologically earlier and culturally ancestral to EC I–III (Frankel & Webb 2006) (see **Fig. 1**). This period is here referred to as the Philia Early Cypriot (Philia EC). It is also now widely agreed that this system developed following some population movement from Anatolia, although the processes involved and the nature of interaction with Chalcolithic communities continue to be matters of debate (for recent overviews and discussion see Webb 2013; Peltenburg 2013: 344–346; Knapp 2013a: 263–277). David Frankel and I have argued, as others have done before us, that copper is likely to have provided a major incentive for this movement (Webb & Frankel 2011; see also Mellink 1991), in particular a desire to find new sources of metal to feed into the prestige goods networks that linked southeastern Anatolia to the northeast Aegean, the Cyclades and mainland Greece in the early to mid-third millennium (Şahoğlu 2005; Efe 2007).

This move to Cyprus resulted in the first systematic exploitation of the island's copper resources. Metallurgical technologies introduced at this time are likely to have included the smelting of sulphide and polymetallic ores, for which there is good evidence from the Late Chalcolithic in the Upper Euphrates basin, around Malatya and Elaziğ, and from the beginning of the third millennium at Arslantepe; and the use of arsenical copper, which was widespread in Anatolia from the first half of the 4th millennium BC (Palmieri *et al*. 1999: 141; Yakar 2002: 21; Sagona & Zimansky 2009: 205). It may be set also in the context of major developments in metalworking in western Anatolia in the second half of EB II (ca. 2500 BC), including bi-mould casting, the lost wax process and the first alloy of copper and tin in this region (Efe 2002: 51–55). Metal objects became more numerous and typologically richer, with a similar repertory of metal objects across inland western Anatolia, including razors and toggle pins (Efe 2002: 54). A move to Cyprus during the Anatolian late EB II or at the beginning of EB III places it at the peak of these developments and prior to the ceramic innovations of EB III, which are not part of the Philia repertoire.

Vasilia's paramount role on the north coast has received unexpected support in the last decade. In 1959 Stewart bought nine Philia metal objects from a Nicosia dealer, which he believed to be from Vasilia. The Cyprus Museum bought another four (Karageorghis 1960: 245, fig. 3). Analyses carried out in 2005 on eight of Stewart's items identified three as tin bronzes (Webb *et al*. 2006: 266–267, table 2: 2, 4, 8). Two of these (a spearhead and sword) are typologically out of place in Cyprus and have lead isotope ratios consistent with a copper source in the central Taurus Mountains. This suggests that they were imported to Cyprus as finished artefacts. The third, an axe of Cypriot type, has a lead isotope ratio consistent with copper from the Limassol area. It suggests that ore bodies in the Limassol area were being mined in the Philia period, as Stewart suggested, and that Philia metalsmiths at least occasionally produced bronzes using local copper and imported tin. Tin bronzes have also been identified among Philia metalwork from Sotira *Kaminoudhia* (Swiny 2003: 376–377; Giardino *et al*. 2003: 388–390).

Another two of the artefacts acquired by Stewart appear to be of Cycladic copper (Webb *et al*. 2006: 271, table 5: 3, 5). These include a solid roughly cast rope of relatively pure copper bent into a circle with the ends joined. It is one of five objects of similar size, shape and weight probably or certainly from Vasilia, which have long been identified as arm-bands or bracelets (Stewart 1962: 251, fig. 101.1–3; Hennessy *et al*. 1988: 26, nos 8–9, 15; Karageorghis 1960: 245, fig. 3; Weinstein Balthazar 1990: 420). With minimum diameters of ca. 6cm and weights of ca. 450g, they are, however, better identified as ingots or, more broadly, as media of exchange, as suggested by Stewart (1962: 288–289). The second item, a perforated axe-shaped object, may also be an ingot, with the butt pierced so it could be strung for transport. While these items may have reached Cyprus from the Cyclades, the discovery of a casting mould with a matrix of this type in an early wall at Marki leaves no doubt that perforated axes or axe-ingots were also produced in Cyprus in the Philia period (Frankel & Webb 2006: 216–217, fig. 6.7, pl. 57) (**Fig. 3a**). Similar axes have been found at Soli-Pompeiopolis (Silifke), indicating their distribution also in coastal Cilicia (Bittel 1940: 194–197, pl. V, S3446, S3448, S3465).

These analyses suggest that Cyprus was receiving raw material from foreign sources and adopting 'international' ingot forms from the earliest phase of local production; they also suggest that Vasilia was participating in a long-distance exchange in metal at least as early as 2400 BC. The possible presence of Cypriot copper in Early Minoan Crete, moreover, suggests that the island was exporting copper at this time (Stos-Gale & Macdonald 1991: 267; Stos-Gale 2001). The analyses also leave no doubt that Philia metalsmiths could produce tin bronzes, and both these and other analyses indicate that they were using

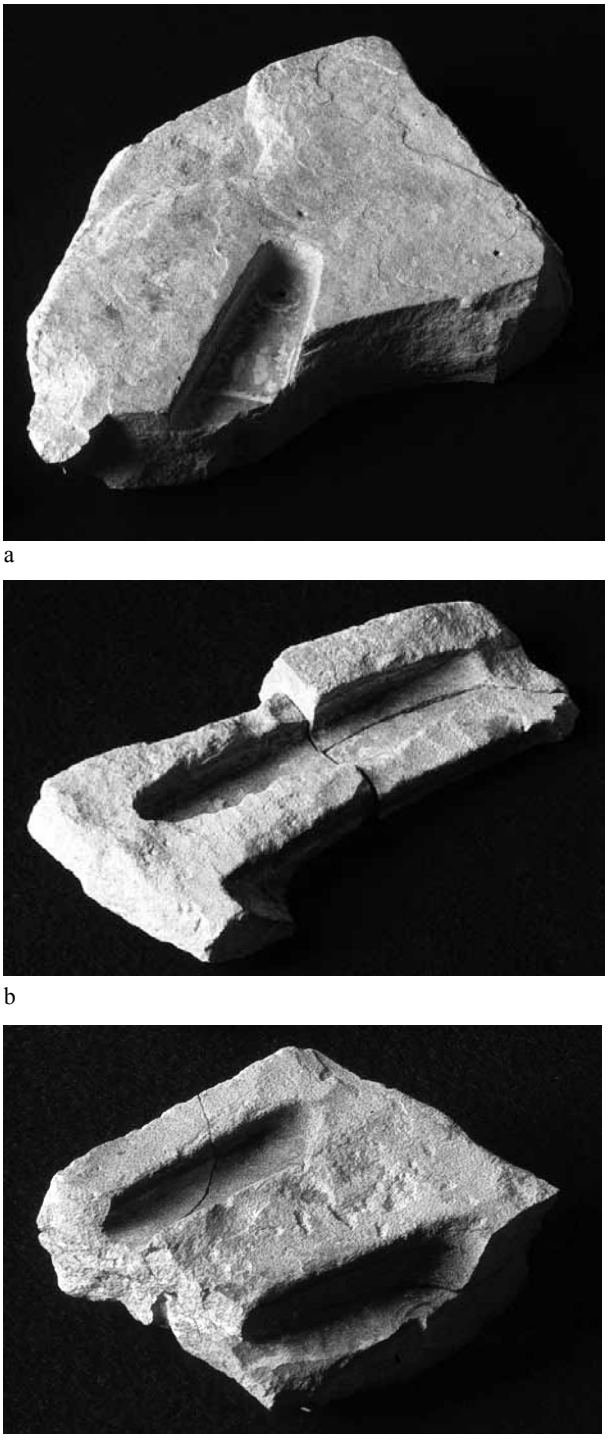

Figure 3. Chalk casting moulds from Marki: (a) S850, (b) S744, (c) S745 (photographs by Rudy Frank)

arsenical coppers (Weinstein Balthazar 1990: 46, 55, tables 24, 39, 71, 101; Giardino *et al*. 2003: 387–388, table 8.1.1; Webb *et al*. 2006: 271, tables 2, 5; Georgiou *et al*. 2011: table 6.2). The minimum presence of arsenic required to distinguish the deliberate addition of this mineral is a matter of debate, but the amount of arsenic in some Philia and EC I–II artefacts must represent deliberate alloys or exploitation of the high

arsenic ores which occur in the Limassol Forest area (Panayiotou 1980: table 5; Gale *et al*. 1996a: 392). An understanding of the technical advantages provided by even quite low concentrations of arsenic and the absence of local tin may have led prospectors in Cyprus to seek out these ores from the beginning.

The quantity of metal at Vasilia is also remarkable. Over 15% by number and a much greater percentage by weight of provenanced and published Philia metal come from a handful of looted tombs at Vasilia (Webb *et al*. 2006: table 6). If the objects acquired by Stewart and the Cyprus Museum in 1959 are added, it rises to 28.3%. While these numbers are skewed by differences in the extent of excavation and modes of deposition, the Vasilia region nevertheless stands out with regard to the quantity, size, weight and range of metal artefacts. The richness of the Philia period more generally in metal, in relation to later periods, is also clear at Marki, where 46% by weight of the 56 metal artefacts recovered came from Philia deposits, even though these deposits were much less well preserved than those of later periods (Frankel & Webb 2006: 185). Philia artefacts also represent the bulk of the metal objects found at Pyrgos *Mavroraki* (Belgiorno 2009: fig. 18).

Gale *et al*. (1996a: 401) have argued that the technology required to convert sulphides to oxides prior to smelting was not available until the Late Bronze Age and that the sulphide ores which make up the vast bulk of the copper deposits in Cyprus were not exploited until that time. There is now, however, increasing acceptance that sulphide ores were mined from the mid-third millennium (e.g. Constantinou 2012: 7; Knapp 2013a: 300–301). This is confirmed for the Middle Cypriot (hereafter MC) period by indications of underground mining at Ambelikou *Aletri* (see below) and analyses of slag from Pyrgos *Mavroraki*, which show that ore smelted at this site was a copper sulphide (Giardino 2000: 23). A piece of rock from an EC I context at Marki with inclusions of pyrite and chalcopyrite is also suggestive of the primary processing of sulphide ores (i.e. chalcopyrite) (identification by Walter Fasnacht, reported in Frankel & Webb 2006: 191).

The internal management and distribution networks are also now much better understood. Philia settlements were founded near ore bodies and on communication and transport routes (**Fig. 4**). They shared a remarkably homogeneous material culture and recent analyses of pottery clays show that most of the finer vessels were distributed from the north, perhaps in a reciprocal exchange with copper producing areas (Dikomitou-Eliades, this volume). One or more ore bodies in the Mathiatis area were certainly being mined and probably those in the Limassol area. A Philia presence in the Skouriotissa region may be indicated at Phlasou (Given *et al*. 2013). The Panagra pass and the Ovgos valley were key communication routes. Reports of Philia material at Mylos hint also at use of the Agirdha pass (Frankel & Webb 2004). There can be no doubt that prominent individuals at Vasilia played a key role in promoting these networks and ensuring a flow of metal to the north coast. These same individuals produced the

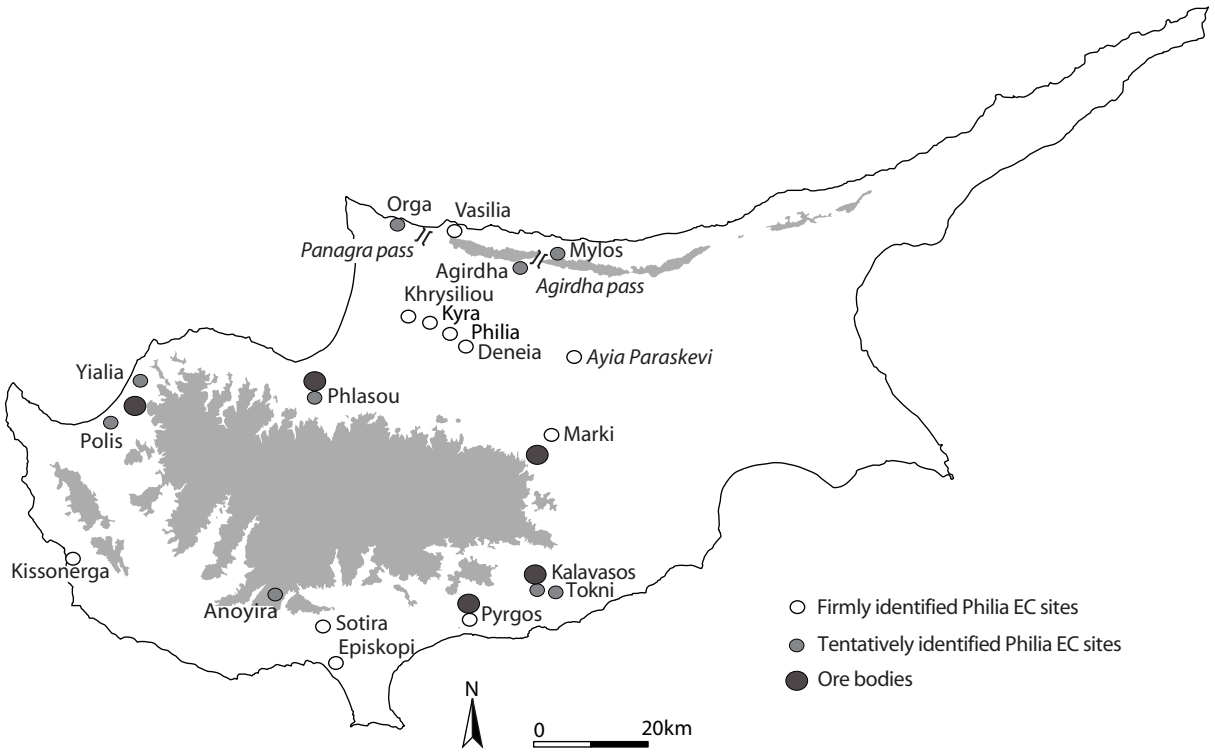

Figure 4. Map of Philia EC sites, showing the location of the main copper ore bodies

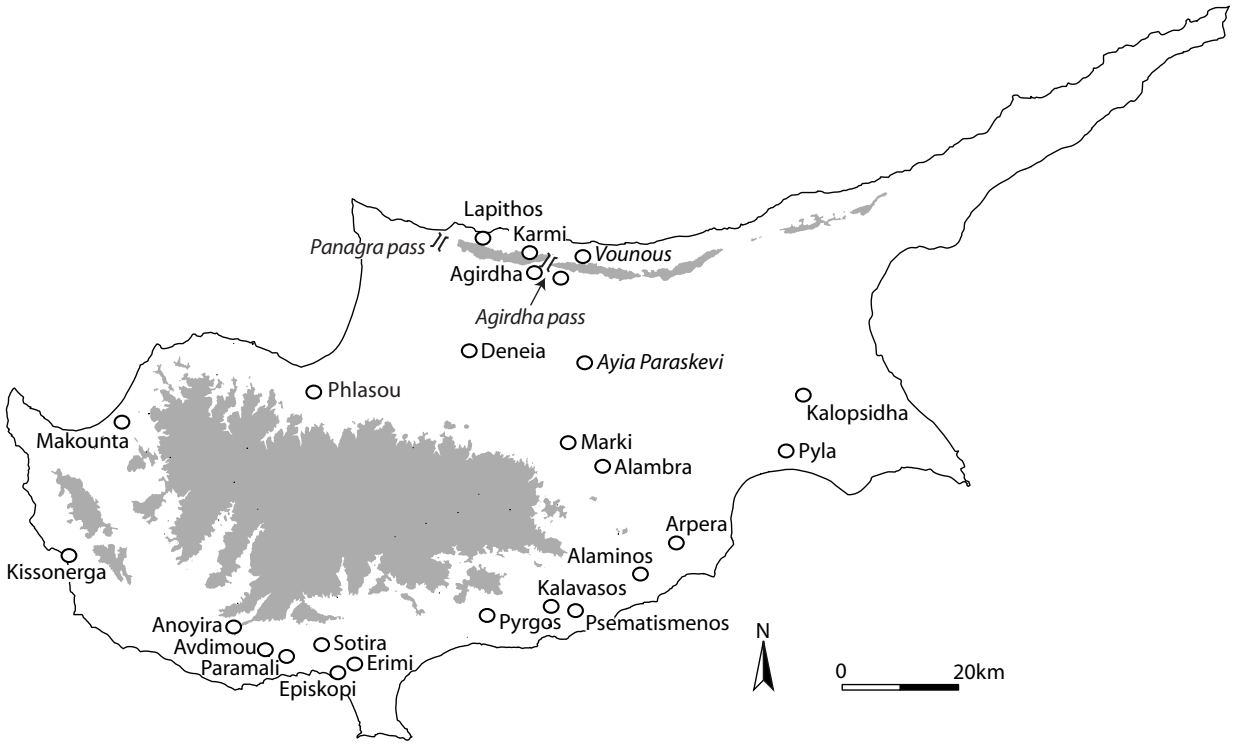

Figure 5. Map of EC I–II sites

remarkable funerary record excavated by Stewart, which remains unique to this site (Hennessy *et al*. 1988: 25–39).

From Vasilia to Vounous (EC I–II)

Sometime in the twenty-third century BC this relatively cohesive system devolved into a number of regional entities (see Webb & Frankel 2013a). One of the reasons is likely to have been the collapse of international trade, following urban decline across Mesopotamia, Anatolia and the Levant. The arid phase associated with this episode caused environmental degradation across the eastern Mediterranean (for a recent review, see Finné *et al*. 2011). These events may have removed much of the economic imperative for copper production in Cyprus. The effect is likely to have been felt most dramatically in the north, where the investment in external relationships was greatest, leading to a decline in the role of Vasilia and a reconfiguring of internal networks.

At some point a new settlement was established at *Vounous* northeast of the Agirdha pass (**Fig. 5**). Although the settlement or settlements here have not been investigated, excavations by Stewart and others of related burial grounds leave little doubt that *Vounous* was a paramount centre on the north coast for most of EC I–III. Villages founded somewhat later at Karmi and Lapithos remained substantially smaller until the ascendancy of Lapithos in EC III. At all three sites burial was a key arena for the creation of social prestige and alliances (Webb & Frankel 2010). At *Vounous* Site A, in particular, behaviours and beliefs associated with death, burial and the ancestors gave rise to a complex iconography and sets of symbolic artefacts, including ritual vessels, individualised drinking cups and modelled items (see Knox, this volume). Carved *dromoi* at *Vounous*, Karmi and Lapithos suggest, further, that particular architectural concepts and notions of dedicated ritual space were allied with cemetery locales (Webb *et al*. 2009: 128–34; Webb & Frankel 2010: 189–194).

The emergence of ritual authority at *Vounous* is a remarkable phenomenon, which may well have been based on the presence of 'an outstanding shrine of great sanctity', as Stewart (1962: 293) suggested. The singular nature of the central north coast more generally is increasingly evident (Webb & Frankel 2010: 204–206; 2013a). While north coast communities developed a diverse array of pottery forms and a complex visual symbolism, southern and central ceramic assemblages have a restricted range of shapes and minimal decoration. Similar discontinuities are visible in tomb architecture. EC I–II tombs on the north coast frequently have a monumental character, while those at Sotira *Kaminoudhia*, Pyrgos *Mavroraki*, Psematismenos *Trelloukkas*, Episkopi *Phaneromeni*, Kalavasos (Cinema Area), Marki *Davari* and elsewhere are simple chamber or pit tombs with small *dromoi* and few internal features (Georgiou *et al*. 2011: 341–344). Communities in the centre and south of the island appear to have been subject to lower levels of

social pressure than those in the north, suggesting the existence of more egalitarian community structures or, at the very least, that avenues to social and ritual authority did not involve the same degree of investment in burial display and ceramic innovation.

The narrow north coastal strip of Cyprus is flanked to the south by the Kyrenia range. This constrained the spread of settlement and channelled the movement of people and goods through the Agirdha pass, which served as the main route to copper production sites in the Troodos foothills. Use of this pass allowed north coast communities to acquire metal for their own needs in EC I–II and there is some evidence for pottery and perhaps other goods moving south (Frankel & Webb 2006: 110–112, 119). Metal was clearly a valued commodity on the north coast, but the emphasis appears to have been on the appropriation of social position rather than material power, through the manipulation of ancestral ties and the elaboration of ritual symbols. While the external demand for metal was low or non-existent and population expansion could be accommodated in the coastal plain and on adjacent hill slopes, north coast communities appear to have functioned largely within this region.

Elsewhere, villages established near ore bodies in the Philia period continued to mine and process copper. Several casting moulds from Marki, for example, leave no doubt that ingots were still being produced, probably for off-site distribution (Frankel & Webb 2006: 215–216, fig. 6.7, pl. 57) (see **Fig. 3b–c**, above). Communities at Kalavasos and Pyrgos are also likely to have been exploiting nearby ore bodies. Metal items, however, are relatively scarce in EC I–II and it seems likely that a significant reduction in the intensity of mining and metalworking followed the loss of an external demand for Cypriot copper. This appears to be indicated at Marki, where, of 61 metal items recovered, only four were associated with EC I–II deposits (Frankel & Webb 2006: 285). EC I and II metal items from across the island also show few typological distinctions (Philip 1991: 90–92; Webb & Frankel 2013a: 73). This suggests that they were made at a small number of sites, probably in settlements also engaged in preliminary processing and ingot production. The presence of north coast pottery at Marki suggests a northward trade in ingots or finished artefacts and supports Stewart's suggestion that *Vounous* was drawing its copper from the northeast Troodos ore bodies. The recovery of a blowpipe tip at *Vounous* Site A may indicate metal processing also on the north coast (Stewart 1962: 345, fig. CXLIX.25) (**Fig. 6a**). North coast communities were not, however, markedly more significant consumers of metal in EC I and II than those elsewhere (see Georgiou *et al*. 2011: 356–357), and their role, if any, in managing distribution is unclear.

From Vounous to Lapithos (EC III and MC I–II)

The situation changed again, probably quite rapidly, in late EC III and early MC I (**Fig. 7**). This has been attributed to a renewed foreign demand for Cypriot copper, perhaps allied with an increase in local 'ceremonial demand' (Keswani 2005: 391), leading to a re-establishment of internal supply networks, this time managed by an emergent Lapithos (Knapp 1990: 159–160; 2008: 81, 84–87; Webb *et al*. 2009: 251–252). It coincides with the reappearance of tin bronze in Cyprus, the establishment of Assyrian trading colonies at Kültepe and elsewhere and a decline of copper production in the Aegean, which may have contributed to the rise of a new export

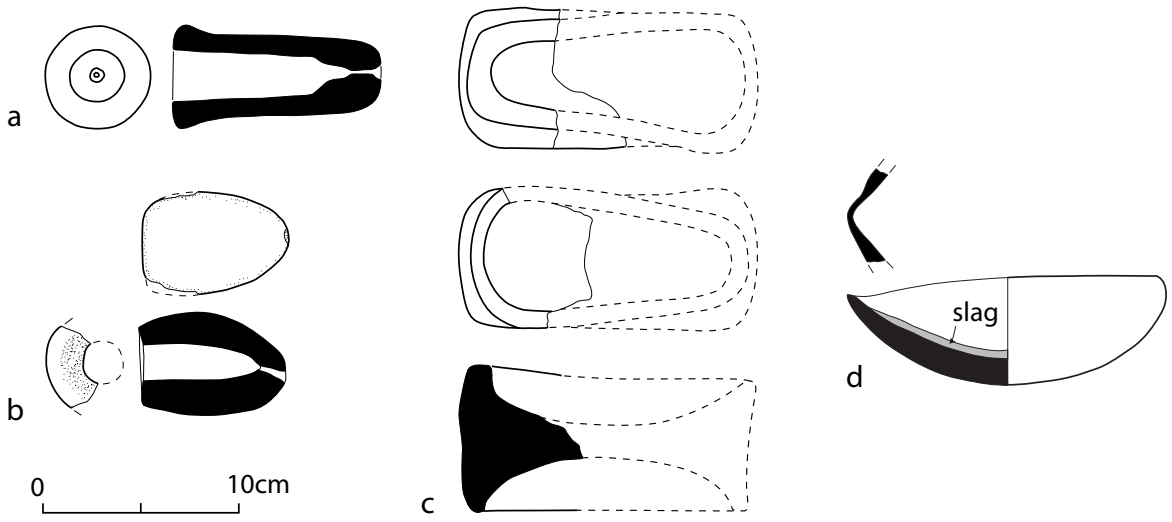

Figure 6. Blowpipe tip from Vounous Site A (a. drawing by Christopher Davey); blowpipe tip (b), mould (c) and crucible (d) from Ambelikou Aletri (drawings by Kathryn Eriksson)

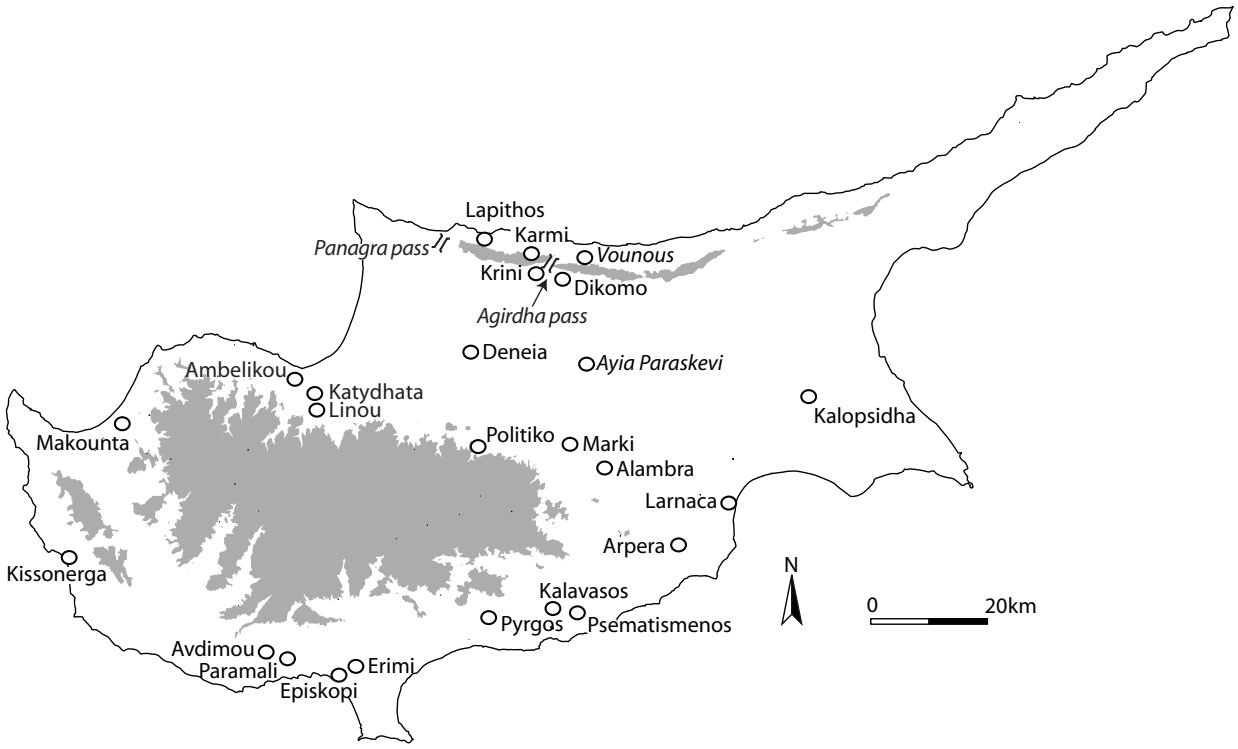

Figure 7. Map of EC III and MC sites

market in Cyprus (Weinstein Balthazar 1990: 161–162; Yener 2000: 15, 75; Bassiakos & Tselios 2012). Lapithos, located on the coast, was well placed to take advantage of these developments. There is evidence for considerable site expansion at this time and for large-scale status-related consumption of metal in late EC III and MC tombs (Keswani 2004: 208–213, tables 4.11b–c).

There was also a significant increase in population in the northwest Troodos, which suggests that ore bodies in the Mavrovouni and Skouriotissa area gained in importance at this time (Webb *et al*. 2009: 250–251, fig. 4.44; Webb & Frankel 2013b: 20, fig. 11.3). The inhabitants of Katydhata and Linou are likely to have been mining and smelting copper from MC I (Åström 1989: 59; Kassianidou 2008: 256). MC occupation is also recorded at Ambelikou *Aletri*, Kalokhorio *Chalandrikas*, Evrychou *Lemones*, Ayios Epiphanios *Yerontas* and Lefka *Aitlik*. This increase in activity is roughly contemporary with documents from Mari that refer to the import of Alashiyan copper (Knapp 2008: 307–308), and with evidence for the use of Cypriot copper at Malia in Crete (Poursat & Loubet 2005: 120). Workshops for smelting and casting have also been reported at Pyrgos *Mavroraki* (Belgiorno 2009: Belgiorno *et al*. 2012) and moulds and crucibles have been found at Alambra *Mouttes*, Politiko *Troullia*, Kalopsidha Site C, Nicosia *Ayia Paraskevi*, Paramali *Pharkonia*, Episkopi *Phaneromeni* and Kalavasos *Laroumena* (Gale *et al*. 1996b: 135–37; Falconer & Fall 2013: 108, fig. 9; Webb 2012: 52; Webb & Frankel 2012: 111; Swiny 1986: 68; Carpenter 1981: 64; Todd 1993: 93). The establishment of a copper mine at Ambelikou *Aletri* in MC I may be seen in the context of this increasing intensity in the extraction of copper ores and production of metal across the island in MC I (Webb & Frankel 2013b). It provides an important glimpse into how one element in this system worked. Red Polished sherds, stone axes and ring hammers found in modern mine shafts suggest the exploitation of copper sulphide ore and considerable technical expertise in underground mining. A fragment of furnace lining and remnant fire pits provide evidence for furnace smelting, and excavated units were used for grinding and crushing slag to remove trapped copper for melting and casting (**Fig. 8**). Melting and casting are also indicated by the recovery of a blowpipe tip, a crucible and a double-sided clay mould (see **Fig. 6b–d**, above).

The site at Ambelikou occupied at least three hectares. It produced domestic material, was associated with a cemetery and appears to have been a permanent settlement. Some unusual features, for example the double-sided mould, hint at local metallurgical traditions. Pottery vessels were produced in a pottery workshop, located next to one of the metalworking areas, and fired in a kiln (Webb & Frankel 2013b: 53–71, 213–219). Thirty-nine cutaway-mouthed jugs scattered across the workshop floor probably represent a single kiln load. They suggest a community large enough to require the services of a potter making vessels in batches by shape, and

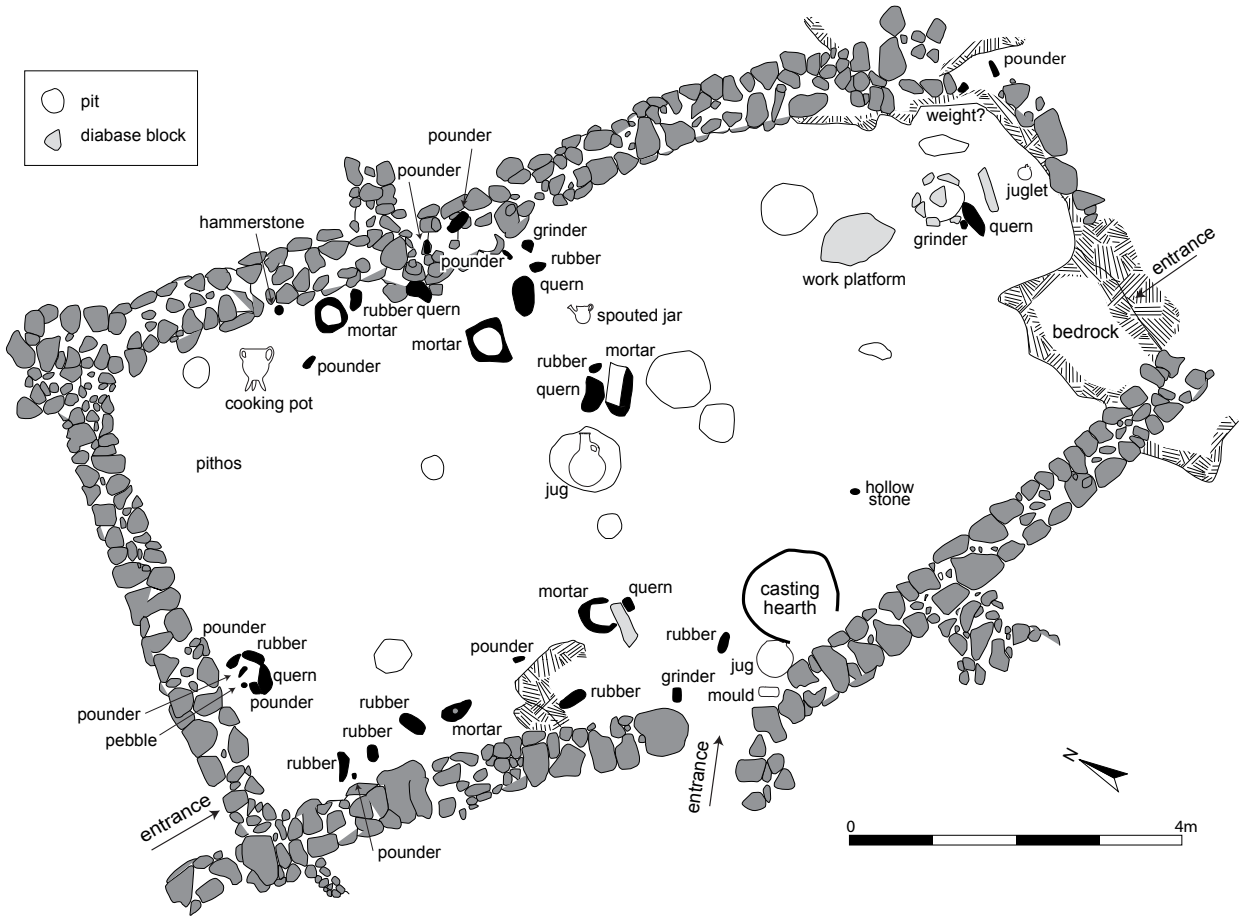

Figure 8. Area 1 Unit II at Ambelikou Aletri, showing installations and equipment used in slag processing and casting

a considerable degree of cooperation in mining, ore preparation, smelting, slag processing, casting and the production of fuel, food and equipment.

Ambelikou's strongest ceramic connections are with the north coast, and especially with Lapithos. This suggests that the distribution and export of copper mined at Ambelikou—and probably also in the area around Katydhata—were managed from the north coast and specifically from Lapithos. The almost complete absence of Black Polished ware at Ambelikou further suggests that copper was not travelling to the north coast via Deneia, where Black Polished was produced in quantity in MC I and II (Frankel & Webb 2007: 138–139), but by boat around Cape Kormakiti or overland via the Panagra pass. At the same time, there was a dramatic increase in population at Deneia and strong ceramic connections between Deneia and Lapithos imply that Deneia played an important role in Lapithos' intra-island networks (Frankel & Webb 2007: 159–161). Lapithos may then, as Stewart (1962: 289) suggested, have had 'a hand on both the sources of copper in northern Troodos' and been managing procurement networks operating through the Panagra pass to the Skouriotissa region and through the Agirdha pass to the northeast Troodos ore bodies.

Violence and warfare

Stewart suggested that the shifting alignments on the north coast may have involved 'frontier feuds' and warfare. This little explored aspect of the prehistoric Bronze Age is worth a brief review. Although only cemetery data are available, there are indeed hints that changes in settlement location and authority in this region were 'not founded on peace and economics alone' (Stewart 1962: 299). Once again, the evidence comes from Stewart's own excavations.

In the case of Vasilia, nine metal objects found beneath the plaster floor of the *dromos* of *Kafkallia* Tomb 1 and the 13 metal items offered for sale in 1959 noted above, which may have come from a similar deposit, suggest that at some time during the life of the settlement it became necessary for some individuals to hoard or cache metal wealth (Webb *et al*. 2006: 277). The association of non-ritual hoarding, especially of metal, with times of crisis is well documented (Knapp *et al*. 1988). The burial and the subsequent failure to retrieve the Vasilia hoards, if such they are, suggest that settlement may have ceased or retracted relatively abruptly here at the end of the Philia EC.

Karmi *Palealona* and *Lapatsa* were closely aligned with *Vounous* and may have been established as offshoots of this community (Webb *et al*. 2009: 248). The *Lapatsa* cemetery ceased to be used in early MC I, suggesting some retraction of settlement at this time. *Palealona* continued into MC II but had been abandoned by the end of this period. Thus both burial grounds were out of use well before the demise of Lapithos at the end of MC III, and may have been casualties of a gradual shift in authority from *Vounous* to Lapithos. There are, also, more specific indications of troubled times (Webb *et al*. 2009: 253). Chamber 9B, one of the latest in the cemetery at *Palealona*, was found empty. If awaiting new interments, it would appear that an expectation of continued use of the cemetery was interrupted. *Palealona* Tomb 8 and the main burial layer of Tomb 3A appear, furthermore, to have been broken into while the cemetery was still in use, suggesting that the *Palealona* community experienced serious disruption in MC II, involving the partial desecration of their ancestral burial ground.

The abandonment of the Karmi villages may be linked to settlement aggregation at Lapithos, Deneia and other sites in MC I–II. This led to a transformation of the earlier distribution of villages across much of the island. Some, like Marki and Alambra, were abandoned in favour of a more concentrated pattern and perhaps more tightly controlled regional networks. Evidence for the destruction by fire of some of the latest buildings at Alambra (Georgiou 2008) and perhaps also at Marki (Frankel & Webb 1996: 28–29) suggests that this was not entirely peaceful. The demise of Lapithos in late MC III and the retraction of settlement at Deneia in turn reflect a major shift in market focus toward Egypt and the Levant (see, most recently, Knapp 2013b: 32–35). The construction of 22 fortified sites in the north, centre and east of the island at this time, variously seen as a strategy for long-distance control of copper mining (Peltenburg 1996) or as part of a broader process of local elite behaviour (Peltenburg 2008), suggests that this phase of settlement restructuring also involved significant conflict over territory and resources.

Conclusion

Cyprus' potential role in an international maritime metals trade may have provided the impetus for events that led to the arrival of a fully-fledged metal industry in the mid-third millennium BC and in large measure determined the nature and extent of the settlement system established at that time. This involved an advanced set of metallurgical skills, almost certainly including the ability to smelt and roast sulphide ores and to produce tin and arsenical bronzes. This in turn suggests that some communities in Cyprus in the mid-third millennium BC were connected to external markets and engaged in establishing and promoting levels of integration between coastal outlets and hinterland and mining areas. While Stewart dismissed the Philia phase/culture as of no importance beyond its borders, we may also have underestimated the complexity of the copper industry that was introduced to Cyprus at this time and the role it played in creating a new island identity.

Mining settlements like that at Ambelikou probably had a long history on the island by MC I. Similar communities of skilled miners and smelters integrated into communication networks managed by regional centres or coastal outlets may be envisaged also for the Philia period. These may be viewed, following Raber (1987: 302), as 'mobilised, local industries', distinctive features of which include planned rather than opportunistic use of resources, a skilled labour force dependent on a local support base and a production and distribution network embedded into a larger system of demand and exchange. The latter feature—the linkage to a larger extra-regional entity or entities—may be the key to understanding the internal dynamics of the 'copper trade' in both the Philia EC and MC periods. While operating at a relatively small scale and dependent on local resources, miners and smelters at sites like Ambelikou and Katydhata were almost certainly producing metal for distribution beyond the site and probably beyond the region.

Copper ingots were also produced at Marki, some 10km from the nearest ore bodies, and small-scale crucible smelting and/or refining were carried out at Alambra in MC II. In the latter case, the ore is thought to have come from an exposure of pillow lavas 1.5km from the excavated area (Gale *et al*. 1996a: 367). At Pyrgos the nearest potential mine is only 600m distant from the site (Belgiorno *et al*. 2012: 27). Kalavasos *Laroumena*, Episkopi *Phaneromeni*, Paramali *Pharkonia* and Politiko *Troullia*, where casting and refining are also indicated, are also relatively close to ore bodies. This suggests considerable diversity in the organisation of copper production, perhaps in accordance with the location and size of ore bodies and fluctuations in demand. Specialised mining, smelting and casting villages like that at *Aletri* may only have been established in more remote regions. While these sites probably enjoyed considerable autonomy, relationships between metalworking and coastal communities engaged in the extra-island distribution of copper were clearly well developed by the MC period. These networks appear to have been mobilised primarily by Vasilia during the Philia EC and by Lapithos in MC I and II. After the demise of Lapithos toward the end of MC III, copper mined in the Skouriotissa region may have been shipped to a new regional centre around Morphou (Keswani & Knapp 2003: 215), while ores from sources in the northeast Troodos are likely to have been transported eastward to Enkomi (Peltenburg 1996: 30–35; Knapp 2013b: 33–34, 40).

In conclusion, it is clear that Stewart's views on the importance of copper production and trade in the prehistoric Bronze Age, particularly during the Philia horizon, have stood the test of time. His suggestion that shifts in settlement and authority on the north coast were highly contested may also be correct. The 'mantle of Vasilia' did not, however, pass directly to Lapithos, as he thought, because a downturn in external demand altered the internal dynamics of the island for some time and gave rise to a different kind of community at *Vounous* in EC I–II. When it did, however, we see the re-establishment of internal networks, a new round of prospecting, shifts in population to mining areas and regional centres, and a re-engagement with the outside world. While copper was not the only commodity of value in prehistoric Bronze Age Cyprus, this confirms Stewart's view of the centrality of the 'copper trade' and of the north coast for much of this period. While we now have a considerably more nuanced picture, however, questions of the scale and organisation of copper production, procurement and distribution still present a significant challenge.

Bibliography

Åström, P. 1989: *Katydhata. A Bronze Age Site in Cyprus* (*SIMA* 86), Partille: Paul Åströms Förlag

Bassiakos, Y. & T. Tselios 2012: On the cessation of local copper production in the Aegean in the 2nd millennium BC, in V. Kassianidou & G. Papasavvas (eds), *Eastern Mediterranean Metallurgy and Metalwork in the Second Millennium BC*, 151–161, Oxford: Oxbow

Belgiorno, M.R. 2009: Progetto Pyrame: Pyrgos ricerche archeologiche e archeometallurgiche, lo stato dell'arte a dicembre 2008, in M.R. Belgiorno (ed), *Cipro all'Inizio dell'Età del Bronzo. Realtà sconosciute della comunità industrial di Pyrgos/Mavroraki*, 14–105, Rome: Gangemi

Belgiorno, M.R., D. Ferro & D.R. Loepp 2012: Pyrgos-Mavrorachi in Cypriot metallurgy, in V. Kassianidou & G. Papasavvas (eds), *Eastern Mediterranean Metallurgy and Metalwork in the Second Millennium BC*, 26–34, Oxford: Oxbow

Bittel, K. 1940: Der Depotfund von Soloi-Pompeiopolis, *Zeitschrift fur Assyriologie und Vorderasiatische Archaologie* 12, 183–205

Carpenter, J.R. 1981: Excavations at Phaneromeni: 1975–1978, in J.C. Biers & D. Soren (eds), *Studies in Cypriote Archaeology* (*UCLA Institute of Archaeology, Monograph* 18), 59–78, Los Angeles: UCLA Institute of Archaeology

Constantinou, G. 2012: Late Bronze Age copper production in Cyprus from a mining geologist's perspective, in V. Kassianidou & G. Papasavvas (eds), *Eastern Mediterranean Metallurgy and Metalwork in the Second Millennium BC*, 4–13, Oxford: Oxbow

Dikaios, P. 1962: The Stone Age, in P. Dikaios & J.R. Stewart, *The Swedish Cyprus Expedition,* Volume IV, Part 1A, *The Stone Age and the Early Bronze Age in Cyprus,* 1–204, Lund: The Swedish Cyprus Expedition

Efe, T. 2002: The interaction between cultural/political entities and metalworking in western Anatolia during the Chalcolithic and Early Bronze Ages, in Ü. Yalçın (ed), *Anatolian Metal* II (*Der Anschnitt*, Beiheft 15), 49–65, Bochum: Deutsches Bergbau-Museum

Efe, T. 2007: The theories of the 'Great Caravan Route' between Cilicia and Troy: the Early Bronze Age III period in inland western Anatolia, *Anatolian Studies* 57, 47–64

Falconer, S.E. & P.L. Fall 2013: Household and community behavior at Bronze Age Politiko-Troullia, Cyprus, *Journal of Field Archaeology* 38, 101–119

Finné, M., K. Holmgren, H.S. Sundqvist, E. Weiberg & M. Lindblom 2011: Climate in the Eastern Mediterranean, and adjacent regions during the past 6000 years. A review, *Journal of Archaeological Science* 38, 3153–3173

Frankel, D. & J.M. Webb 1996: *Marki Alonia. An Early and Middle Bronze Age Town in Cyprus. Excavations 1990–1994* (*SIMA* 123.1), Jonsered: Paul Åströms Förlag

Frankel, D. & J.M. Webb 2004: An Early Bronze Age shell pendant from Cyprus, *Bulletin of the American Schools of Oriental Research* 336, 1–9

Frankel, D. & J.M. Webb 2006: *Marki Alonia. An Early and Middle Bronze Age Settlement in Cyprus. Excavations 1995–2000* (*SIMA* 123.2), Sävedalen: Paul Åströms Förlag

Frankel, D. & J.M. Webb 2007: *The Bronze Age Cemeteries at Deneia in Cyprus* (*SIMA* 135), Sävedalen: Paul Åströms Förlag

Gale, N.H., Z.A. Stos-Gale & W. Fasnacht 1996a: Copper and copper working at Alambra, in J.E. Coleman, J.A. Barlow, M.K. Mogelonsky & K.W. Schaar, *Alambra. A Middle Bronze Age Settlement in Cyprus. Archaeological Investigations by Cornell University 1974–1985* (*SIMA* 118), 359–426, Jonsered: Paul Åströms Förlag

Gale, N.H., Z.A. Stos-Gale & W. Fasnacht 1996b: Metal and metalworking, in J.E. Coleman, J.A. Barlow, M.K. Mogelonsky & K.W. Schaar, *Alambra. A Middle Bronze Age Settlement in Cyprus. Archaeological Investigations by Cornell University 1974–1985* (*SIMA* 118), 129–142, Jonsered: Paul Åströms Förlag

Georgiou, G. 2004: "Ο Πολιτισμός της Φιλιάς": Ανάπτυξη του προβλήματος και του προβληματισμού, *Report of the Department of Antiquities, Cyprus*, 73–84

Georgiou, G. 2008: The settlement at Alampra-*Mouttes* revisited, *Report of the Department of Antiquities, Cyprus*, 133–143

Georgiou, G., J.M. Webb & D. Frankel 2011: *Psematismenos-Trelloukkas. An Early Bronze Age Cemetery in Cyprus*, Nicosia: Department of Antiquities

Giardino, C. 2000: Prehistoric copper activity at Pyrgos, *Report of the Department of Antiquities, Cyprus*, 19–32

Giardino, C., G.E. Gigante & S. Ridolfi 2003: Archaeometallurgical studies, in S. Swiny, G. Rapp & E. Herscher (eds), *Sotira Kaminoudhia: An Early Bronze Age Site in Cyprus* (*American Schools of Oriental Research Archaeological Reports* 8, *Cyprus American Archaeological Research Institute Monograph Series* 4), 369–396, Boston: American Schools of Oriental Research

Given, M., A.B. Knapp, L. Sollars, J.S. Noller & V. Kassianidou (eds) 2013: *Landscape and Interaction: The Troodos Archaeological and Environmental Survey Project, Cyprus.* Volume 2: *The TAESP Landscape* (*Levant Supplementary Series* 15), London: Council for British Research in the Levant/Oxbow

Hennessy, J.B., K.O. Eriksson & I.C. Kehrberg 1988: *Ayia Paraskevi and Vasilia. Excavations by J.R.B. Stewart* (*SIMA* 82), Göteborg: Paul Åström's Förlag

Karageorghis, V. 1960: Chronique des fouilles et découvertes archéologiques à Chypre en 1959, *Bulletin de Correspondance Hellénique* 84, 242–299

Kassianidou, V. 2008: The formative years of the Cypriot copper industry, in I. Tzachili (ed), *Aegean Metallurgy in the Bronze Age*, 249–267, Athens: Ta Pragmata

Keswani, P.S. 2004: *Mortuary Ritual and Society in Bronze Age Cyprus* (*Monographs in Mediterranean Archaeology* 9), London: Equinox

Keswani, P.S. 2005: Death, prestige, and copper in Bronze Age Cyprus, *American Journal of Archaeology* 109, 341–401

Keswani, P.S. & A.B. Knapp 2003: Bronze Age boundaries and social exchange in north-west Cyprus, *Oxford Journal of Archaeology* 22, 213–223

Knapp, A.B. 1990: Production, location and integration in Bronze Age Cyprus, *Current Anthropology* 31, 147–176

Knapp, A.B. 2008: *Prehistoric and Protohistoric Cyprus: Identity, Insularity and Connectivity*, Oxford: Oxford University Press

Knapp, A.B. 2013a: *The Archaeology of Cyprus: From Earliest Prehistory Through the Bronze Age*, Cambridge: Cambridge University Press

Knapp, A.B. 2013b: Revolution within evolution: the emergence of a 'secondary state' on Protohistoric Bronze Age Cyprus, *Levant* 45, 19–44

Knapp, A.B., J.D. Muhly & P.M. Muhly 1988: To hoard is human: Late Bronze Age metal deposits in Cyprus and the Aegean, *Report of the Department of Antiquities, Cyprus*, 233–262

Mellink, M. 1991: Anatolian contacts with Chalcolithic Cyprus, *Bulletin of the American Schools of Oriental Research* 282/283, 167–175

Palmieri, A.M., M. Frangipane, A. Hauptmann & K. Hess 1999: Early metallurgy at Arslantepe during the Late Chalcolithic and the Early Bronze Age IA–IB periods, in A. Hauptmann, E. Pernicka, T. Rehren & Ü. Yalçın (eds), *The Beginnings of Metallurgy* (*Der Anschnitt*, Beiheft 9), 141–148, Bochum: Deutsches Bergbau-Museum

Panayiotou, A. 1980: Cu-Ni-Co-Fe sulphide mineralization, Limassol Forest, Cyprus, in A. Panayiotou (ed), *Ophiolites. Proceedings of the International Ophiolite Symposium (Nicosia, Cyprus, 1979)*, 102–116, Nicosia: Geological Survey Department

Peltenburg, E.J. 1996: From isolation to state formation in Cyprus, c. 3500–1500 B.C., in V. Karageorghis & D. Michaelides (eds), *The Development of the Cypriot Economy from the Prehistoric Period to the Present Day*, 17–44, Nicosia: University of Cyprus

Peltenburg, E.J. 2008: Nitovikla and Tell el-Burak: Cypriot mid-second millennium B.C. forts in a Levantine context, *Report of the Department of Antiquities, Cyprus*, 145–157

Peltenburg, E.J. 2013: Conclusions, in E. Peltenburg (ed), *Associated Regional Chronologies for the Ancient Near East and the Eastern Mediterranean.* Volume II. *Cyprus*, 39–127, Turnhout, Belgium: Brepols

Philip, G. 1991: Cypriot bronzework in the Levantine world: conservatism, innovation and social change, *Journal of Mediterranean Archaeology* 4, 59–107

Poursat, J.-C. & M. Loubet 2005: Métallurgie et contacts extérieurs à Malia (Crète) au Minoen Moyen II: remarques sur une série d'analyses isotopiques du plomb, in R. Laffineur & E. Greco (eds), *EMPORIA. Aegeans in the Eastern and Central Mediterranean. Proceedings of the 10th International Aegean Conference: Italian School of Archaeology, Athens, 14–18 April 2004* (*Aegaeum* 25), 117–121, Liège, Austin: Université de Liège, University of Texas at Austin

Raber, P. 1987: Early copper production in the Polis region, western Cyprus, *Journal of Field Archaeology* 14, 297–312

Sagona, A. & P. Zimansky 2009: *Ancient Turkey*, New York: Routledge

Şahoğlu, V. 2005: The Anatolian Trade Network and the Izmir region during the Early Bronze Age, *Oxford Journal of Archaeology* 24, 339–361

Stewart, J.R. 1962: The Early Cypriote Bronze Age, in P. Dikaios & J.R. Stewart, *The Swedish Cyprus*

Expedition Volume IV, Part IA, *The Stone Age and the Early Bronze Age in Cyprus*, 205–401, Lund: Swedish Cyprus Expedition

Stos-Gale, Z.A. 2001: Minoan foreign relations and copper metallurgy in Protopalatial and Neopalatial Crete, in A. Shortland (ed), *The Social Context of Technological Change in Egypt and the Near East, 1650–1550 BC*, 195–210, Oxford: Oxbow

Stos-Gale, Z.A. & C. Macdonald 1991: Sources of metal and trade in the Bronze Age Aegean, in N. Gale (ed), *Bronze Age Trade in the Mediterranean* (*SIMA* 90), 249–288, Jonsered: Paul Åströms Förlag

Swiny, S. 1986: T*he Kent State University Expedition to Episkopi Phaneromeni*, Part 2 (*SIMA* 74.2), Nicosia: Paul Åströms Förlag

Swiny, S. 2003: The metal, in S. Swiny, G. Rapp & E. Herscher (eds), *Sotira Kaminoudhia: An Early Bronze Age Site in Cyprus* (*American Schools of Oriental Research Archaeological Reports* 8, *Cyprus American Archaeological Research Institute Monograph Series* 4), 369–384, Boston: American Schools of Oriental Research

Todd, I.A. 1993: Kalavasos-*Laroumena*: test excavation of a Middle Bronze Age settlement, *Report of the Department of Antiquities, Cyprus*, 81–96

Webb, J.M. 2002: *Exploring the Bronze Age in Cyprus. Australian Perspectives* (*The Fifth Museum of Antiquities Maurice Kelly Lecture*), Armidale: University of New England

Webb, J.M. 2012: Kalopsidha: forty-six years after *SIMA* volume 2, in J.M. Webb & D. Frankel (eds), *Studies in Mediterranean Archaeology: Fifty Years On* (*SIMA* 137), Uppsala: Åströms Förlag

Webb, J.M. 2013: Changing technological and social environments in the second half of the third millennium BCE in Cyprus, in D. Frankel, J.M. Webb & S. Lawrence (eds), *Archaeology in Environment and Technology: Intersections and Transformations*, 135–148, New York: Routledge

Webb, J.M. & D. Frankel 1999: Characterizing the Philia facies: material culture, chronology and the origin of the Bronze Age in Cyprus, *American Journal of Archaeology* 103, 3–43

Webb, J.M. & D. Frankel 2010: Social strategies, ritual and cosmology in Early Bronze Age Cyprus: an investigation of burial data from the north coast, *Levant* 42, 185–209

Webb, J.M. & D. Frankel 2011: Hearth and home as identifiers of community in mid-third millennium Cyprus, in V. Karageorghis & O. Kouka (eds), *On Cooking Pots, Drinking Cups, Loomweights and Ethnicity in Bronze Age Cyprus and Neighbouring Regions: An International Archaeological Symposium Held in Nicosia, November 6th–7th 2010*, 29–42, Nicosia: A.G. Leventis Foundation

Webb, J.M. & D. Frankel (eds) 2012: *Corpus of Cypriot Artefacts of the Early Bronze Age Part 4 by James R. Stewart* (*SIMA* 3.4), Uppsala: Åströms Förlag

Webb, J.M. & D. Frankel 2013a: Cultural regionalism and divergent social trajectories in Early Bronze Age Cyprus, *American Journal of Archaeology* 117, 59–81

Webb, J.M. & D. Frankel 2013b: A*mbelikou Aletri. Metallurgy and Pottery Production in Middle Bronze Age Cyprus* (*SIMA* 138), Uppsala: Åströms Förlag

Webb, J.M., D. Frankel, K.O. Eriksson & J.B. Hennessy 2009: *The Bronze Age Cemeteries at Karmi Palealona and Lapatsa in Cyprus. Excavations by J.R.B. Stewart* (*SIMA* 136), Sävedalen: Paul Åströms Förlag

Webb, J.M., D. Frankel, Z.A. Stos & N. Gale 2006: Early Bronze Age metal trade in the eastern Mediterranean. New compositional and lead isotope evidence from Cyprus, *Oxford Journal of Archaeology* 25, 261–288

Weinstein Balthazar, J. 1990: *Copper and Bronze Working in Early Through Middle Bronze Age Cyprus* (*SIMA Pocket-book* 84), Jonsered: Paul Åströms Förlag

Yakar, J. 2002: East Anatolian metallurgy in the fourth and third millennia BC: some remarks, in Ü. Yalçın (ed), *Anatolian Metal* II (*Der Anschnitt*, Beiheft 15),15–25, Bochum: Deutsches Bergbau-Museum

Yener, K.A. 2000: *The Domestication of Metals: The Rise of Complex Metal Industries in Anatolia* (*Culture and History of the Ancient Near East* 4), Leiden: Brill