

Article

Shifting Centres: Site Location and Resource Procurement on the North Coast of Cyprus over the *Longue Durée* of the Prehistoric Bronze Age

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Abstract: This paper examines the relationship between site location, resource procurement, and political economy in the context of three localised centres of settlement—Vasilia, Vounous, and Lapithos—which succeeded each other in the narrow, naturally bounded north coastal strip of Cyprus during the approximately 750 years of the Early and Middle Bronze Age (ca. 2450–1700 BC). Cyprus is home to abundant copper sulphide ores and was linked to the international metal trade in the first phase of the Early Bronze Age and again in the Middle Bronze Age. In both cases, this was conducted largely, if not exclusively, via outlets on the north coast which lie close to the southern coast of Anatolia and contemporary shipping lanes but some 35–40 km distant from the nearest ore bodies in the foothills of the Troodos Mountains. Mechanisms which allowed north coast sites to overcome internal distance deterrents in order to exploit geostrategic advantages in relation to external trade include a favourable natural environment (rainfall, soils, and harbours), technological advantage, probably coercion (physical and ideological), and an ability to achieve high levels of centrality within communication and transport networks with fluctuating levels of integration and hierarchy.

Keywords: Cyprus; Bronze Age; site location; resource procurement; metals trade; political economy; connectivity; central places; central flow theory; nodal points

1. Introduction

This paper aims to examine the relationship between site location, resource procurement, and political economy in the context of three localised centres of settlement—Vasilia, Vounous, and Lapithos—in the narrow, naturally bounded north coastal strip of Cyprus during the approximately 750 years of the Early and Middle Bronze Age (ca. 2450–1700 BC) (Figure 1). Space enters into economic relationships through the usually uneven distribution of natural resources and the distance separating economic activities [1] (p. 1). Both are critical to understanding the north coast of Cyprus, especially in relation to the first and third of our settlements. The north coast played a major role in the development of Bronze Age society in Cyprus. What happened in this region, however, was as much a case of overcoming locational disadvantage, as of exploiting advantages to create central places in an uncentral landscape that achieved considerable success within and beyond their micro-region. This was not a straightforward process. It did not follow a unilineal pathway and it did not progress to urbanisation. The ultimate demise of this evolutionary trajectory appears to reflect shifts in market demand in the wider eastern Mediterranean, emphasising the critical importance of off-island and inter-regional connectivity to the economic success of these settlements.

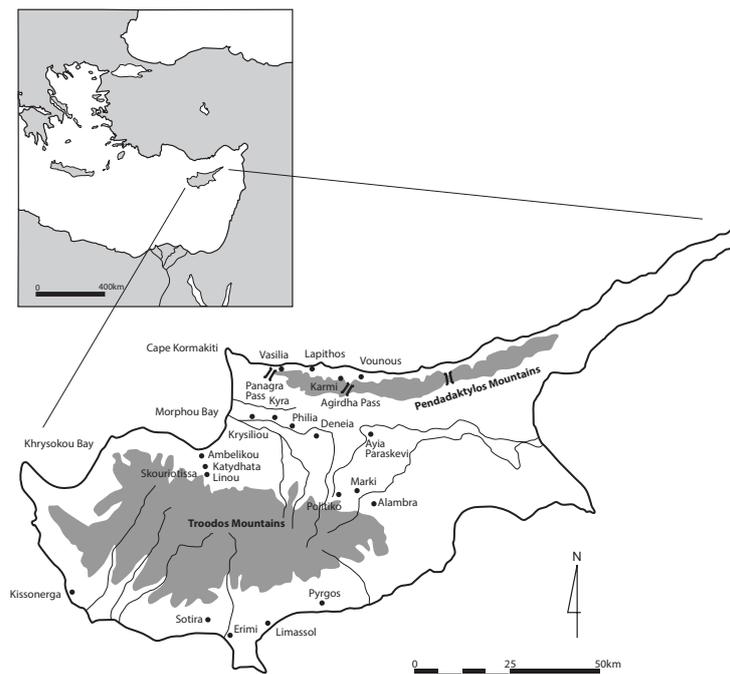


Figure 1. Map of Cyprus showing the location of the island within the Eastern Mediterranean and the main sites mentioned in the text.

The mining, processing, and movement of Cypriot copper will be a key focus of this paper. The sulphide ores, which are locally abundant in the pillow lavas that surround the Troodos Mountains in the central west of the island, were mined from at least the beginning of the Early Bronze Age (EBA). With several exceptions, the distance between ore bodies and potential coastal outlets is such that mechanisms for long-distance procurement must have been in place before an export trade in Cypriot copper could begin. Yet, several lines of evidence suggest that Cyprus was linked into the international metals trade in the first phase of the EBA, referred to as the Philia Early Cypriot period (Philia EC), and again in the Middle Bronze Age (MBA) or Middle Cypriot (MC) period (Table 1). In both cases, this external trade appears to have been conducted largely, if not exclusively, via outlets on the north coast which lie some 35–40 km from the nearest ore bodies.

Table 1. Approximate chronological schema for the Early and Middle Bronze Ages in Cyprus (for recent discussions see [2–4]).

	Approximate Dates Cal BC
Philia Early Cypriot (Philia EC)	2500/2450–2250/2200
Early Cypriot (EC) I–III	2250/2200–2000/1950
Middle Cypriot (MC) I–III	2000/1950–1680/1650

This gives rise to the questions that are the central concern of this paper. How were north coast communities articulated with those in the procurement zone (i.e., mining communities), along transportation and communication routes, and at trans-shipment points? Did these inter-regional economic transfers take place within a network or networks that were hierarchical, top-down, and coercive, or between mutually benefiting, self-interested individuals and groups? How much mobility, autonomy, and connectivity did they involve?

In attempting to answer these questions, the deficiencies of the archaeological record must be acknowledged. First and foremost, while there is a wealth of mortuary data, there are almost no excavated settlements in the regions of greatest interest; in addition, since the Turkish invasion of

Cyprus in 1974, the northern part of the island has not been under the control of the Republic of Cyprus, creating a four-decade hiatus in fieldwork in this area [5]. The recent publication of several pre-1974 excavations in the occupied area, however, including that of a mining settlement, have provided new data [6,7], and excavations since 1974 in other parts of the island continue to illuminate broader socio-economic trajectories [8,9]. Petrographic and chemical studies of ceramics [10–12] and compositional and lead isotope analyses of EBA and MBA metal assemblages from the north coast [13–15] are also adding significantly to our understanding of intra-island connections and the extent to which the north coast was involved in the metals trade.

2. The Physical Environment

Knitter et al. [16] (p. 4) identify five main factors that control the location of settlements: the availability of water, arable grazing land, and fuel and building materials (for the Cypriot context, see [17], [18] (pp. 80–81), [19] (pp. 264–294)). Nagle [20] (p. 6) adds freedom from flooding, level sites to build on, sunny south facing slopes, potential for trade, and commerce and defensibility to this list. On almost all counts, the environmental characteristics of the central north coast of Cyprus are likely to have been highly favourable to prehistoric (as to more recent) settlement (on the geology, environment, and natural resources of the north coast see [21] (pp. 199–201), [22], [23] (pp. 61–74, 248–256, 296). The narrow coastal plain (Kyrenia Lowlands), which stretches for about 80 km from Panagra in the west to east of Kantara, is flat or gently inclined, with light alluvial soils [21] (p. 43). The richest springs on the island rise on the middle and lower slopes of the ‘vertical wall-like’ Pendadaktylos Range [21] (p. 10), which forms a formidable barrier between the north coast and the hinterland. Three widely spaced passes lead south to the Central Lowlands: the Panagra Pass, near Vasilia; the Agirdha Pass, above Vounous; and further east to the north of Lefkoniko (on the importance of the Panagra and Agirdha Passes in the EBA and MBA, see [24] (pp. 120–122)). The north coast lies within 100 km sailing distance of the southern coast of Anatolia (Figure 1, inset). While much of the coastline is rocky, there are small sheltered coves which would have provided serviceable anchorages for ancient shipping, like those known or presumed from such EBA Levantine sites as Byblos, Ugarit, and Sidon [25].

Much of Cyprus is semi-arid to arid and subject to periodic drought [21] (p. 28), [26] (pp. 19–24). While this is likely to have imposed significant constraints on population density in some areas, the north coast is less effected by fluctuations in rainfall [27] (pp. 27–28, Figure 3) [28], and the towns in this region have long been among the largest and most prosperous on the island. Lapithos, in particular, is ‘an exceptionally favoured locality’ [29] (p. 74) with perennial flow irrigation allowing intensive land use and relatively high population density [21] (pp. 59, 63, 118, 199, Figures 41, 60, 62a, 87). The spring at Lapithos Vrysi tou Barba, which is one of the most copious on the island, outlets in a deep semicircular cove, potentially offering ancient shipping a source of freshwater as well as a safe anchorage. Lapithos is also known for the quality of its clays and building stone and offers several uniquely defensible plateaus at Kastros and Ayia Anastasia [30] (pp. 21–22, Figures 1.2–1.3, 1.17–1.18, and 1.22), one or both of which may have been a focus of settlement during the Bronze Age (Figure 2).

The north coastal strip is, however, nowhere wider than 5 km (Figure 3). This is likely to have inhibited the longer-term potential for population growth and systems elaboration in favour of sites with larger sustaining areas [31] (p. 32, n. 19). Other disadvantages of the north coast include its physical isolation behind the precipitous slopes of the Pendadaktylos Range, its distance from the island’s copper sources and the need to control the passes that are the only overland routes south to the Central Lowlands. It is clear, however, that the geostrategic importance of the north coast, i.e., its proximity to an inter-regional maritime trade network which stretched between the Levantine coast and the Aegean basin via the southern Anatolian coast in the third and early second millennia (see, most recently, [32] (pp. 78–79, Figure 14)), was of paramount importance; and that mechanisms were in place that enabled north coast communities to overcome these disadvantages at least during the Philia EC and MBA.

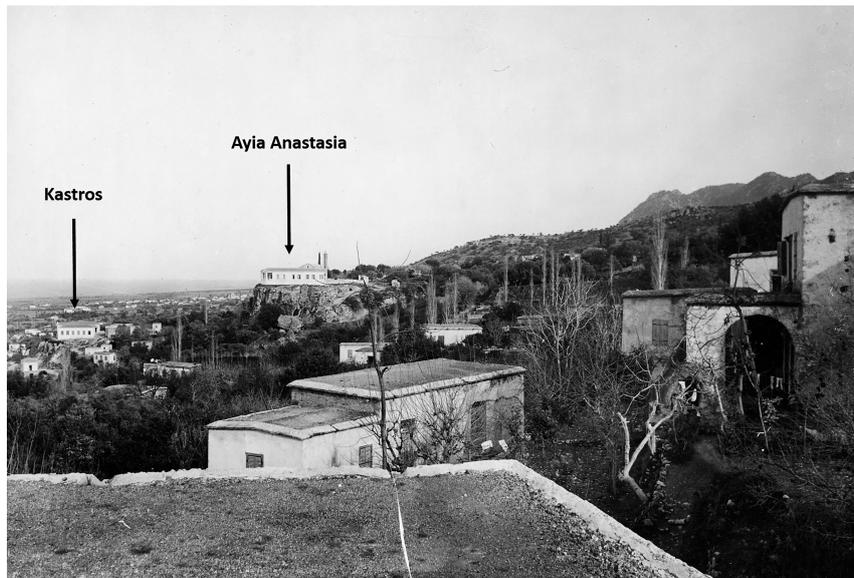


Figure 2. View of Lapithos village from the west, showing the plateaus of Kastros and Ayia Anastasia (© Medelhavsmuseet, Stockholm C06274). Photo taken in 1927.

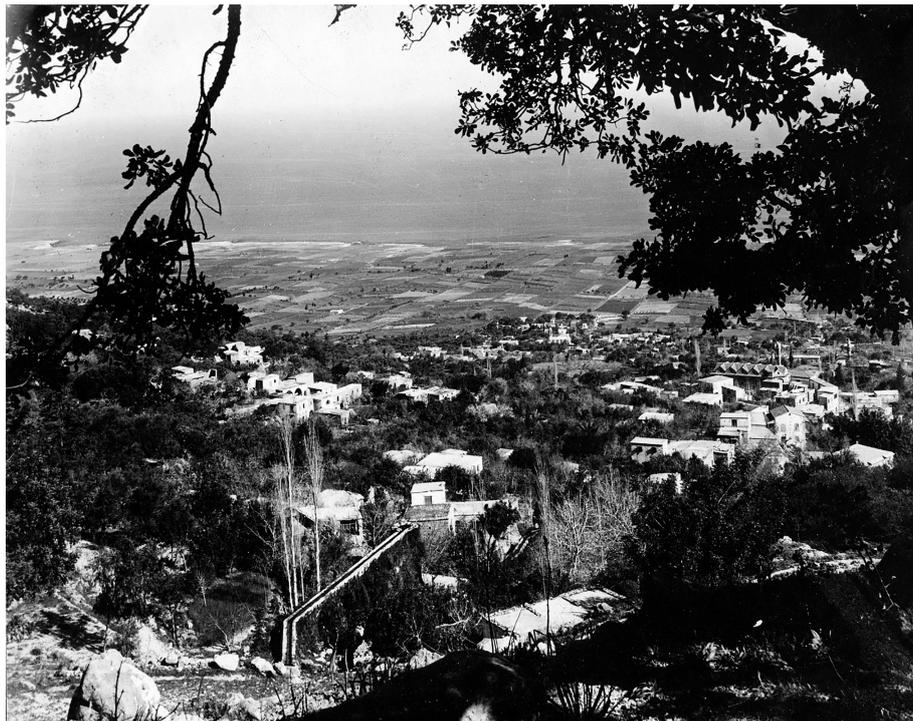


Figure 3. View of the north coastal strip from the south, with Lapithos village in the foreground (© Medelhavsmuseet, Stockholm C00936). Photo taken in 1927.

3. Vasilia, Vounous, and Lapithos

Three major sites on the north coast will be considered as possible examples of the development of economic and political centrality in prehistoric Bronze Age Cyprus—Vasilia, Vounous, and Lapithos (Figure 4). All are situated in favourable locations within their natural region and two are among the few coastal settlements known on the island at this time. Vasilia was occupied in the Philia EC, Vounous from the following EC I period to MC II and Lapithos from EC II until MC III (see Table 1).

All three appear to have been large settlements with significant political, economic, and ideological authority at both the local and inter-regional level, operating in succession or, in the case of Vounous and Lapithos, as rivals in the narrow coastal strip.

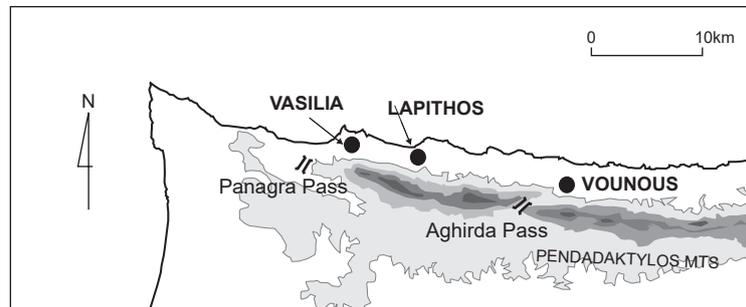


Figure 4. The central north coast of Cyprus showing the location of Vasilias, Lapithos, and Vounous.

3.1. Vasilias

It is now widely accepted that the Bronze Age in Cyprus was initiated by some population movement from Anatolia ca. 2450 BC, although the processes involved and the nature of interaction with local Chalcolithic communities continue to be matters of debate (see, most recently, [3], [27] (pp. 24–25), [33] (pp. 263–277), [34] (pp. 344–346), [35]). Copper is likely to have provided a major incentive for this movement, in particular a desire to find new sources of metal to feed into the prestige goods networks that linked southeast Anatolia to the northeast Aegean, the Cyclades, and mainland Greece in the early to mid-third millennium [32,36,37]. This move to Cyprus resulted in the first systematic exploitation of the island's copper resources. Metallurgical technologies introduced at this time include the smelting of sulphide and polymetallic ores and the use of arsenical copper alloys [33] (pp. 300–301), [38] (p. 7), [39] (pp. 232–233), [40] (p. 63).

The importance of the north coast in the first phase of the EBA, the Philia EC, is well-known and it is likely that it was the initial point of entry for incoming groups. Vasilias, located northeast of the Panagra Pass and in command of an 'excellent harbour for primitive craft' [41] (p. 297), was clearly a major settlement. While it remains unexplored, surface indications and the great extent of associated burial grounds suggest it was of considerable size [24] (pp. 116–117), [42] (p. 25), [43] (pp. 180–182), [44] (pp. 206–210, Table 10). Similarly, the elaborate construction of several chamber tombs contrasts sharply with the majority of small pit tombs, suggesting considerable socioeconomic inequality [40] (pp. 61–64), [42] (pp. 25–39).

Philia EC sites were founded across the island (Figure 5) near ore bodies and on communication and transport routes [45] (for a more circumscribed Philia network, see [46]). They shared a remarkably homogeneous material culture, and recent analyses of pottery clays suggest that most of the finer vessels were distributed from a production centre or centres in the north, perhaps in a reciprocal exchange with copper producing areas [10,11]. The recovery of a casting mould at Marki in the Central Lowlands [47] (pp. 216–217, Figure 6.7, pl. 57) leaves no doubt that one or more ore bodies in the northeast Troodos were being mined at this time and an arsenical copper dagger-ingot from Sotira suggests the exploitation of ore bodies in the Limassol area [48] (pp. 391–392). A Philia EC presence at Phlasou in the vicinity of the major ore bodies at Skouriotissa in the northwest Troodos is also possible [49] (pp. 70–78). Settlements in the Ovgos Valley, at Khrysiliou, Kyra, Philia, and Deneia, formed a major communication route linked with Vasilias via the passes at Panagra and Agirdha. Prominent individuals ('central persons') at Vasilias are likely to have played a key role in promoting these internal networks and to be the same individuals reflected in the remarkable funerary record that is currently unique to this site.

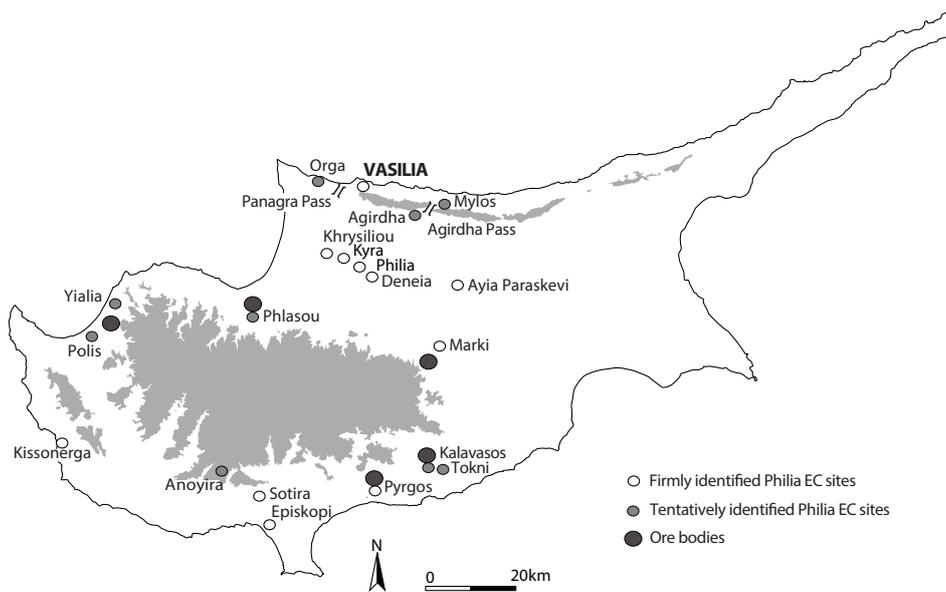


Figure 5. Map of Cyprus showing Philia EC sites.

3.2. Vounous

Settlement at Vasilia ceased, possibly abruptly, around 2250/2200 BC [44] (pp. 206–210, 443, Table 10.10), [50] (pp. 277–281). Its demise coincides with a major disruption to Cyprus' external connections. This is likely to have been brought about by the collapse of the eastern Mediterranean interaction system—perhaps as a result of environmental degradation associated with a severe drought (see, most recently, papers in [51]; for the Cypriot context see [3] (p. 1), [8] (pp. 62–63), [27] (p. 27)).

Following the demise of Vasilia, Vounous, 20 km to the east and 2.5 km inland, became the paramount centre on the north coast. Once again, the settlement remains unknown, but 164 tomb complexes have been excavated in two cemeteries (Sites A and B) [52–54]. The tomb assemblages, particularly those of EC I–II date at Site A, show a distinctive ceramic tradition, with high artefact diversity, a rich, diverse array of forms, and a complex iconography [8,55–57]. There is a focus on elaboration, visual symbolism, individualising vessels (drinking cups), and ritual forms, and evidence for ongoing ritual activity in some tombs. This suggests that pottery, tomb elaboration, and mortuary feasting were used in a fluid system of status negotiation and that ancestral relationships were particularly important in the formation and legitimation of authority at Vounous [58] (pp. 37–83), [59] (see also [57,60], [61] (pp. 159–160), [62] (pp. 139–142), [63] (pp. 84–87)). This may reflect a more-or-less direct evolution on the north coast from the earlier Philia EC system—which had been founded on economic centrality and the management of cross-island networks—to one in which status and authority were structured in ways which appealed instead to ritual legitimacy and the elaboration of a highly localised material culture.

North coast pottery occasionally moved south to settlements like Marki [47] (pp. 110–112, 119), where stone moulds indicate continued production of copper ingots in EC I–II, and west as far as Kissonerga [64]; and a few vessels from the south found their way to the north coast [65]. These cross-regional imports, along with hybrid ceramic forms at Katydhata [66] (p. 134), indicate a degree of interaction between the north coast, northwest Troodos, and Central Lowlands, perhaps involving a trade in ingots or metal artefacts. The sharp stylistic boundaries which are visible, however, in material culture, most obviously in the form of ceramic style-zones (Figure 6), suggest the existence of relatively circumscribed networks at this time with the Pendadaktylos serving as a significant physical boundary [8], [46] (pp. 461–463), [56], [67] (p. 219).

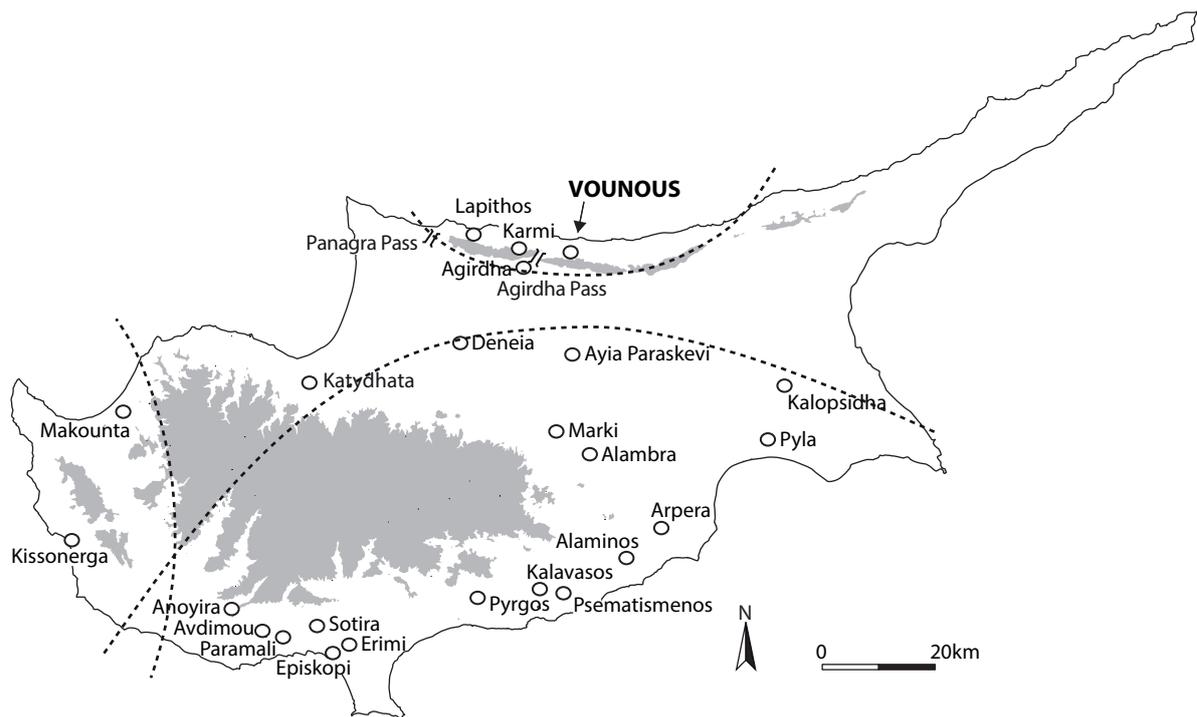


Figure 6. Map of Cyprus showing EC I–II sites and ceramic style zones (bordered by dotted lines).

3.3. Vounous and Lapithos

Lapithos lies on the coast midway between the Panagra and Agirdha Passes and ca. 17 km west of Vounous. Like Vounous, the settlement or settlements here remain unknown but 166 tombs have been excavated at the localities of Vrysi tou Barba and Sotira and in the modern town. While only 25 tombs (and one additional chamber) have been published [68] (pp. (32–162), [69], a comprehensive report on another 38 is available as an unpublished dissertation [70] (see also [71]), and preliminary reports, archival records, and my own ongoing research allow some discussion of the remainder [9], [29] (pp. 78–85), [72] (pp. 73–83), [73] (p. 521), [74] (pp. 469–472), [75].

The burial data and surface indications suggest a densely occupied landscape (Figure 7). Indeed, for the MC period, as many as 12 burial and settlement locales have been identified in the vicinity of the modern village [44] (pp. 215–219, nos 43–54, Table 10.1), [75] (p. 57). This may be the result of population aggregation early in the MBA, a phenomenon evident also at this time at Deneia, a major site with close ties to Lapithos in the Ovgos Valley south of the Agirdha Pass [76] (pp. 159–161). Additional sites were also established in EC III or MC I at Vounous, Vasilia, Karavas, and Motides on the central north coast [44] (pp. 224–225, Table 10.1). These cluster around Lapithos and Vounous, with an 8 km gap or ‘buffer zone’ between them [44] (Figure 11.21), [75] (Figure 1a) (Figure 8). While their chronology and function remain unclear, their number and distribution suggest that, by the MBA, the territory of Lapithos was significantly larger than that of Vounous, extending east to Karavas and west to Vasilia.

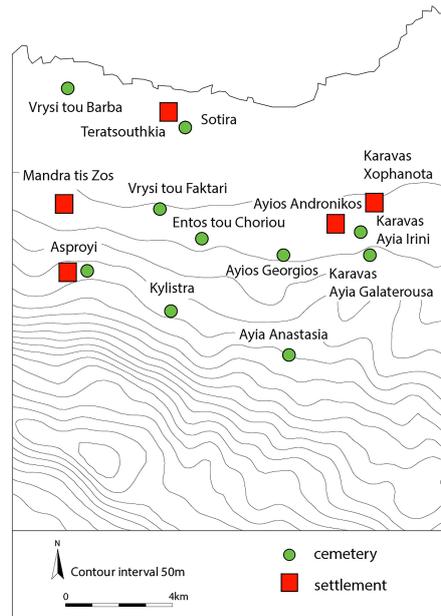


Figure 7. Settlement and cemetery sites in the vicinity of the modern village of Lapithos, as indicated by surface survey and limited excavations (after data collected by Georgiou [44]).

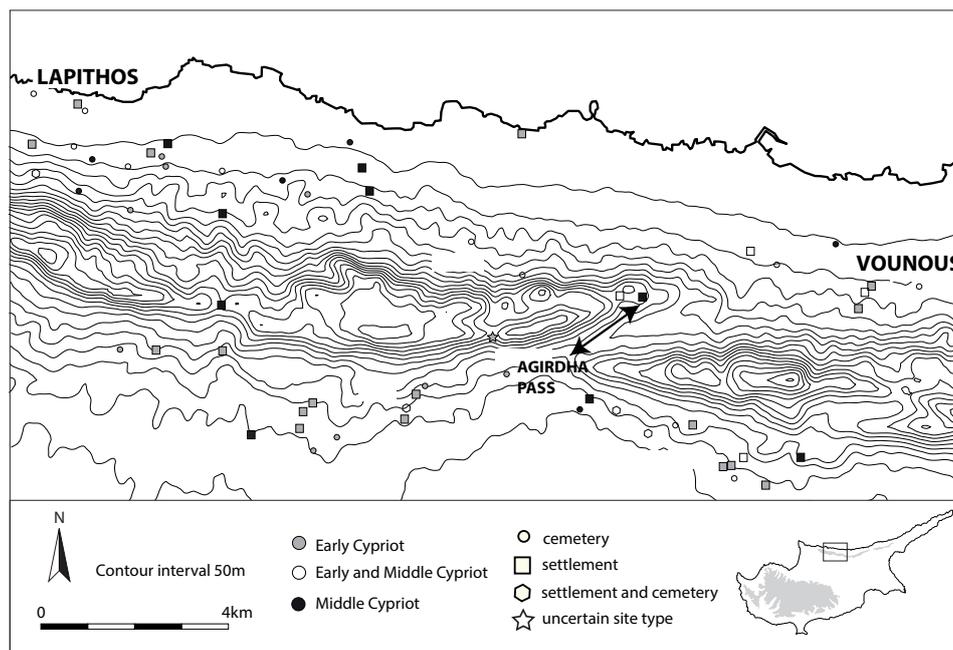


Figure 8. Settlement and cemetery sites in the vicinity of Lapithos and Vounous, as indicated by surface survey and limited excavations (after data collected by Georgiou [44]).

The earliest tombs at Lapithos date to EC II. The site, however, remained relatively small until EC III. At this point, Lapithos and Vounous are likely to have come into competition for land and other resources. The re-emergence of an external demand for Cypriot copper at the beginning of the MBA is also likely to have played a critical role, with Lapithos better placed to take advantage of this resurgence of seaborne trade. It appears to have become pre-eminent during MC I, by which time Vounous was in decline, with settlement ceasing here in late MC II. The shifting fortunes of these two sites are reflected in the relative quantity of metal deposited in the tombs (Figure 9). Metal is more common at Vounous in EC I–II (when it was the dominant site in the region), there is little difference

between the two sites in EC III–MC I (when they had reached a position of potential rivalry), metal grave goods then decrease significantly at Vounous and occur at Lapithos at remarkably high levels in MC I–II and MC II–III [58] (pp. 63–71, Tables 4.7a–c, 4.8, 4.9, 4.11a–c, 4.12, 4.15, Figures 4.4, 4.5), [59] (pp. 370–378, Figure 17, Table 12), [75] (Figure 1c).

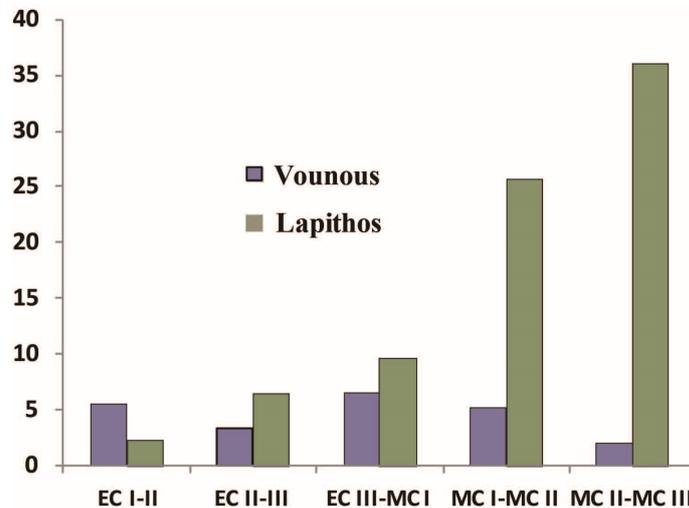


Figure 9. Metal objects as a percentage of the total burial assemblage at Vounous and Lapithos across five burial periods (numbers for Lapithos do not include objects excavated in 1913 and 1917).

The incidence of specific artefact types is also instructive. Spearheads occur in small numbers at Vounous and Lapithos prior to EC III, become far more common in EC III–MC I at both sites, and by MC II have disappeared almost entirely at Vounous but are increasingly common at Lapithos [75] (Figure 2a) (Figure 10 left, Figure 11). Similarly, knives are notably more common at Vounous up to and including EC III/MC I, their numbers then drop at Vounous, while at Lapithos they increase in frequency and size [75] (Figure 2b,e) (Figure 10 right). Both sets of data suggest that bladed weapons were plentiful on the north coast in EC III/MC I, a period of potential conflict between rival sites and territories. Indeed the concentration of weapons here is remarkable. Vounous and Lapithos account for 81.6% of all spearheads recovered from EC and MC tombs across the island [9] (p. 133, Figure 4), [77] (Table 9.1). Keswani [58] (p. 83) has argued that they were ceremonial objects used in mortuary display, but their presence coincides with the rise of Lapithos and the demise of Vounous, suggesting real conflict in this micro-region.

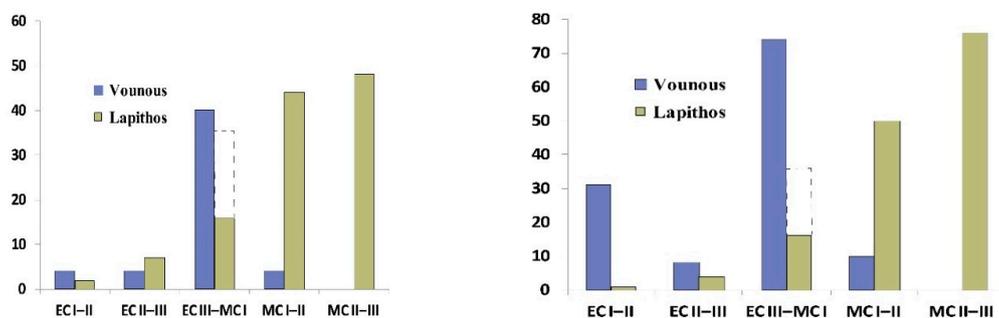


Figure 10. Number of spearheads (left) and daggers/knives (right) from Vounous and Lapithos recovered in tombs from EC I–II to MC III (the dotted line is an estimate of the number found in unpublished tombs at Lapithos Sotira).

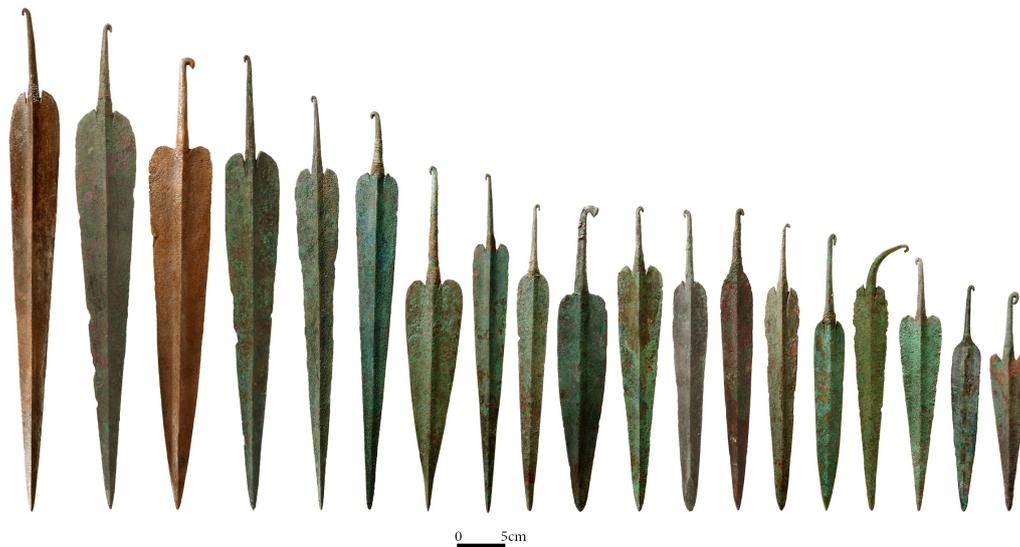


Figure 11. Copper-base spearheads from Lapithos. Photographs by Rudy Frank.

4. Beyond-Village Settlements

Views on the nature and significance of the settlements at Vasilias, Vounous, and Lapithos and the role, more broadly, of external trade and the copper industry in the emergence of complex social structures on Cyprus have fluctuated widely over the last half century. In the most recent discussion, Knapp [78] (also [79] (pp. 113–117)) has refined his own earlier arguments [80,81], which traced the ‘incipient’ stages in the emergence of sociopolitical complexity to the EBA and MBA. While accepting that there are some material indicators of intensifying external contacts between 2000 and 1750/1700 BC, and that an intensified level of copper production at this time may have set the stage for the transformations apparent at the onset of the Late Bronze Age (LBA), he is now of the view that the material correlates of a stratified society do not appear before ca. 1700 BC, and that all associated developments, including increased mobility and connectivity, ‘took place within an archaeological moment of change around 1700 BC’ [78] (p. 21) (see also Knapp [79] (p. 114)). Copper, he argues, remained a scarce resource throughout the EBA and MBA, and the number of imported goods suggests that the people of this era were only passively involved in long-distance exchange, which was ‘sporadic rather than intensive and systematic’ [78] (pp. 24, 39).

There are two related issues of importance here. 1. The number of imports in Cyprus in the EBA and MBA, in particular on the north coast. 2. The extent to which north coast settlements were engaged in metal production and trade. Current evidence for both extends well beyond that utilised in previous studies.

4.1. The Question of Imports

Knapp [78] (p. 24), citing Keswani [58] (Table 4.11b–c), [59] (pp. 388–389, Table 13), [50,82], refers to a total of some 40 imports from Crete, the Levant, Anatolia, and Egypt from the whole island for the period from the Philia EC to the end of MC II (see also [79] (p. 114), where the number of imports is reported as ‘about 25’). This is a crude measure, which assigns equal weight to objects of different size, material, and origin and fails to take into account the limited extent of excavated deposits, the concentration of imports on the north coast, and fluctuations in external contacts over the prehistoric Bronze Age. It is also a significant underestimate.

Imports from the Philia EC period include three spearheads, a sword, two knives, two ring ingots, and an axe/axe-shaped ingot, which are either of non-Cypriot types and/or of non-Cypriot copper [47] (Table 5, nos 3–5, 8–9, 14), [83] (p. 245, Figure 3), [84] (p. 212, Table 11, 1957.22, 1957.24), a gold earring [42] (p. 26), two bowls, one with a diameter of 58cm, and a jug of calcite [42] (pp. 29,

32, nos 3, 4, Figures 48, 62d–63), [82] and two earrings of electrum [48] (pp. 391–392, as gold), [85] (pp. 376–379, M6, M7). Thirteen of these 15 imports come, certainly or probably, from a handful of looted tombs at Vasilia. Sherds and a possible jug of Cypriot Philia EC wares from EB II Tarsus attest to reciprocal connections between the north coast and the Anatolian mainland [86] (pp. 112–113, 128, 130, Figure 263.371–378), [87] (pp. 170–172, Figures 2–7), [88] (pp. 31, 33, n. 5). The appearance of isolated linear signs on an axe and chisel from Vasilia [89] (p. 170, nos 1867–1870) and a knife from Soli-Pompeipolis on the Anatolian coast [90] (p. 187, Figure 4, pl. III) also suggests north coast participation in wider networks.

Six imported objects from 45 EC I–II tomb chambers at Vounous Site A—a Syro-Levantine jug, an object of sheet gold, and four pins [53] (pp. 237, 239, Tomb 164B.9, 40, pls XCIVa, CVIIIf), [91] (pp. 70, n. 1, 72, n. 3, Tombs 84 and 91)—are the only imports known on the island from this period. However, things changed radically toward the end of the EBA and in the MBA. Imports from Lapithos include 62 rings/earrings and two pins of lead, six rings/earrings, five pins, three bracelets, a diadem and a vessel of silver, 12 gold ornaments, at least 30 faience necklaces, comprising over 1170 beads, two faience pendants, three pottery vessels and five knives, three pins, two pairs of tweezers and a razor of copper/bronze [58] (Table 4.11b–c), [59] (Table 13), [68] (pp. 33–162), [69], [70] (pp. 802–804), [74] (pp. 471–472, CS 1693), [91] (pp. 62, 68, 69, 71), [92] (pp. 111–112, Figures 2, 3, pl. 25c–e), [93] (pp. 123, 125, ill. 1C), [94] (pp. 144, 153, 161, Figure 46). Further likely imports comprise a socketed hook, eight pins, and two spatulas of copper/bronze [91] (pp. 66, 71, Types 3a.3–5, 75, Figures 4.7, 5.11, pl. 2f), and an incised bone rod [70] (pp. 803–804). Other MBA imports on the north coast include two Syrian jars, a gold spiral, 13 faience beads, two knives, tweezers, and a pin from Vounous [52] (Figure 15, Tomb 15.75), [54] (pp. 61, 83, 116, 182, Tombs 59.9, 15, 64.106, 125, 68.1, 72.130), [91] (pp. 62, 69, 71, Tombs 12.74, 13.79, 19.89, 143.32), and a Middle Minoan II cup, and four faience beads from Karmi [6] (pp. 128, 155, 246–247, Figures 3.98, 3.105, 4.45).

While reducing this exercise to a numbers game is not without problems, and many of these objects are small personal items, it is nevertheless clear that there are many more imports from the north coast than previously reported: 13 from Vasilia, six from EC I–II Vounous, and some 150 certain and at least 12 likely imports from MBA tombs at Lapithos, Vounous, and Karmi. These figures do not include ‘hidden’ imports, which likely included horses [68] (p. 143) and possibly textiles. The evidence from Lapithos, in particular, suggests the import of weapons, jewellery, tools, and pins of copper/bronze, lead, and precious metals. The fact that these imports are matched by relatively limited evidence for Cypriot MBA pottery in the Aegean [95,96] and Anatolia [97] (pp. 314–315, Figure 228, nos 410–411) suggests, though it certainly does not confirm, that this was primarily a trade in metals which did not involve luxury ceramics or the movement of goods in ceramic containers.

This is not, however, the whole story. Lead isotope analyses (LIA) suggest that a significant amount of the copper found in locally produced objects from the north coast is of non-Cypriot origin. Indeed, eight of ten Philia EC copper-based artefacts from Vasilia which have been analysed to date have lead isotope signatures currently considered to be inconsistent with Cypriot ores [50] (Table 5, nos 3, 5, 9, 14), [84] (Table 11, 1957.21–24). They include a spearhead, knife, ring ingot, and axe apparently of Cycladic copper [50] (pp. 271–273, Table 5.3, 5, 14), [84] (Table 11, 1957.22), a knife with a lead isotope composition consistent with ores from Lavrion in Greece [15] (p. 112, Vasilia 1957.21), and a knife and two ring ingots with lead isotope compositions consistent with ore bodies in Anatolia [50] (p. 271, Table 5, no. 9), [84] (Table 11, 1957.23, 24) (but see [15] (p. 112) for a possible Cypriot origin for Vasilia 1957.23). While we need to keep in mind the caveats relating to LIA—notably the periodic overturning of attributions in the light of new data (see e.g., [98] and [99] (p. 10, Figure 10)—if supported by future analyses, this may require us to consider the possibility that the north coast was receiving the *majority* of its copper from external sources in the Philia EC period (and/or that incoming groups brought quantities of raw metal or/and artefacts with them).

The situation is not dissimilar in the MBA. Zofia Stos-Gale [100] has identified the lead isotope signature of the copper in 47 (52.81%) of 89 sampled objects from Lapithos as inconsistent with Cypriot

ores and likely coming from sources in Iran, Turkey, and the Aegean (see also [14] (pp. 388–392, Tables 2–4) and [15] (p. 116)) (Figure 12). Indeed, according to Stos-Gale [15] (p. 111), only 67% of all analysed copper-based artefacts from EBA–MBA Cypriot sites more generally are of copper of local origin. The Lapithos objects include spearheads, knives, axes, tweezers, a chisel, an awl, and pins of copper, arsenical copper, and tin bronze. They are, for the most part, of undoubted Cypriot types and include artefacts, for example mushroom-headed eyelet pins, which are almost exclusively found at Lapithos and likely to have been produced there. It would appear that significant quantities of copper from foreign sources may have been used alongside copper from local ore bodies to produce objects in MBA workshops at Lapithos.

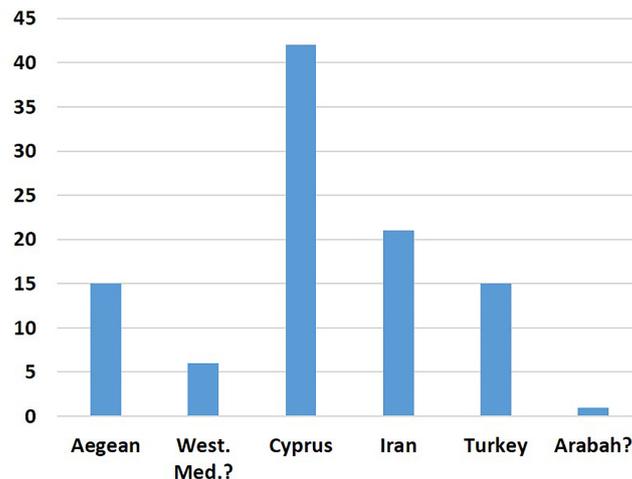


Figure 12. Possible origin of the copper in 89 artefacts from Lapithos, based on lead isotope analysis interpreted in accordance with the current data base for ores. Lead isotope data were provided and interpreted by Zofia Stos-Gale, April 2018.

We need also to consider the issue of tin. Tin does not occur in Cyprus and is not present in Cypriot copper ores [101], [102] (p. 277). While it was once believed that it did not appear on the island until the beginning of the MBA (ca. 2000 BC) [84] (p. 97), [94] (pp. 161–162), [103] (p. 69), it is now clear that imported tin bronzes (and tin metal) were reaching Cyprus and being produced locally almost half a millennium earlier. Compositional analyses have identified three Philia EC artefacts as tin bronzes [50] (pp. 266–267, Table 2: 2, 4, 8). Two (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. The third, an axe of Cypriot type, with a lead isotope ratio consistent with copper from the Limassol area, suggests that local metalsmiths were producing bronzes using local copper and imported tin. Additionally, six tin bronze earrings were recovered from a Philia EC tomb at Sotira in the south [48] (pp. 388–390), [85] (pp. 376–377).

The amount of tin entering Cyprus in the MBA has also been significantly under-reported. Balthazar, whose 1990 volume on EBA and MBA Cypriot metalwork included a study of all previous analytical work, concluded that tin bronze did not become common until the end of the MBA [94] (pp. 161–162). Similarly, Swiny [103] (p. 76) reported only 47% of alloyed metal in his MC sample, a far lower rate than in Anatolia or the Levant. Recent portable X-ray fluorescence (pXRF) analyses undertaken by Andreas Charalambous [13] of the University of Cyprus on 408 artefacts from MBA tombs at Lapithos have, however, identified 36% as arsenical copper (Cu–As), 29% as arsenical bronze (Cu–Au–Sn or Cu–Sn–As), and 20% as tin bronze (Cu–Sn) alloys, with only 14% of the assemblage of pure copper (Figure 13 left). While we need to take into account the limitations of pXRF, which examines only the surface of an object where some alloyed metals are more or less abundant than others [104] (p. 225), similar analyses elsewhere have proved successful in identifying the major

alloyed elements in prehistoric artefacts, while tending to overestimate the proportion of secondary metals [105] (p. 57). With due caution with regard to the latter, Charalambous' analyses show that 68% of analysed artefacts contain tin (Sn): 43% registered as between 0.1 and 4.9%, 8% between 5 and 10% and 17% over 10% (Figure 13 right). Thus, some 20% of the assemblage can be considered tin bronze (defined as greater than 2% tin, see [84] (p. 97)) or arsenical tin bronze (29%), and at least 17% as high tin bronze. It would appear that tin bronze, arsenical bronze, and arsenical copper were in widespread use at Lapithos in the MBA.

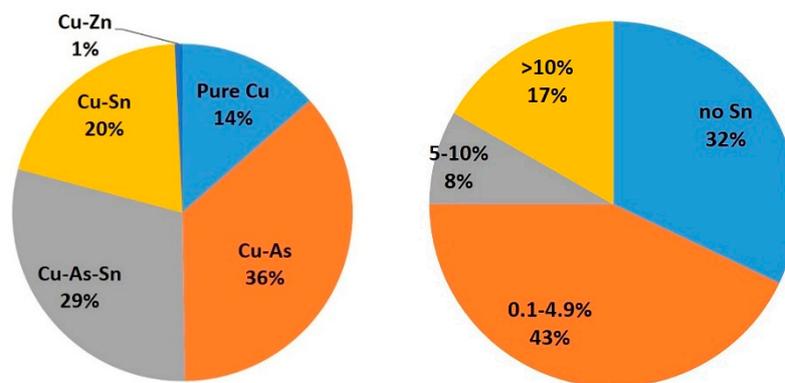


Figure 13. Results of compositional analysis by portable X-ray fluorescence (pXRF) of 408 copper-based artefacts from Lapithos. (Left): Percentage of pure copper, Cu-As, Cu-Zn, Cu-As-Sn and Cu-Sn. (Right): Percentage by weight of Sn. Data provided by Andreas Charalambous, University of Cyprus, Nicosia.

The tin in these artefacts was certainly imported, probably by the same north coast settlements that were exporting copper. While the minimum presence of arsenic required to distinguish an intentional alloy is a matter of debate (likely >2–3 wt %, see [105]) (p. 67)), the amount present in many of the objects from Lapithos indicates the addition of arsenic-rich minerals or exploitation of the high arsenic polymetallic ores of the Limassol Forest area [106] (Table 5) [107] (p. 392). In either case, the evidence suggests that local and imported copper, imported tin, and arsenic sulphide minerals or high arsenic copper ores were available on the north coast in the MBA.

4.2. North Coast Artefact Production and Trade

The quantity of metal at north coast sites is remarkable. Over 28.3% by number, and a much greater percentage by weight, of Philia EC metal comes, certainly or very probably, from a small number of looted tombs at Vasilia [40] (p. 63), [50] (pp. 279–280, Table 6). The richness of the Philia EC period, more generally, in metal is also clear. At the excavated settlement of Marki in the Central Lowlands, 46% by weight of metal artefacts recovered came from Philia EC deposits; even though these deposits were far less well preserved than those of the later EC and MC periods [47] (pp. 185, 190). Philia artefacts also represent the majority of metal objects found at Pyrgos in the south [108] (Figure 18).

The presence of 49 metal artefacts in 22 tombs at Vounous Site A [58] (pp. 197–198, Table 4.7a) shows that the north coast continued to have privileged access to metal in the EC I–II period. The quantity of metal at Lapithos in the following MBA, however, is truly astonishing. In total, 140 tombs have produced over 1,800 copper-base artefacts, five times the number recovered from 164 tombs at Vounous [9] (pp. 132–133), [75] (p. 59). The amount of metal at Lapithos also increased dramatically through the MC period [9] (p. 133, Figure 2), [58] (pp. 68–9, 208–214, Tables 4.11b–4.12), [75] (pp. 59–60, Figure 1c). In contrast, relatively few metal artefacts have been found in MC tombs elsewhere, even at sites near copper ore sources and/or with evidence of metalworking [42,66], [108] (p. 88), [109–111], [112] (pp. 137–141), [113], Fissore in [114] (pp. 245–248). More surprisingly, few metal

artefacts are reported from the vast burial grounds at Deneia and Ayia Paraskevi [76] (p. 128), [115,116]. Thus while Knapp's suggestion [78] (p. 39) that copper was a scarce resource in EBA and MBA Cyprus may be true of some regions of the island, in particular the west and south, it does not apply to the central north coast settlements which are the focus of this paper (as indeed noted by Knapp in [80] (p. 159)).

The quantity of metal on the north coast and the presence of tin bronze and other alloys also suggest that a high level of metallurgical expertise existed in this region, possibly linked with the presence of metalsmiths and metal workshops. This is certainly likely to have been the case in the Philia EC period. I have suggested elsewhere that 13 Philia EC metal items acquired in 1959 and a set of nine metal objects found beneath the floor of a tomb at Vasilia [42] (p. 26, Figure 60) were hoards [50] (pp. 277–279). Both groups contain ingots, worn and damaged objects, and finished, unused items, which likely belonged to metalsmiths or merchants [117] (pp. 236–238, Table 1), [118] (pp. 11–14, Table I). Their presence suggests that traders and merchants and/or craftsmen on the north coast were engaged in the accumulation, distribution, and recycling of metal, and that their stock-in-trade included, as indicated by the analyses discussed above, copper from both local and foreign sources and objects of unalloyed copper, arsenical copper, and tin bronze.

The presence of a blowpipe tip in a tomb at Vounous Site A suggests the continued production of metal artefacts on the north coast in the following EC I–II period [40] (p. 65, Figure 6a), [41] (p. 345, Figure CXLIX.25). At Lapithos, the MBA assemblage shows the targeted use of bronze for some artefacts—notably pins—with mushroom-headed eyelet pins perhaps exclusively made of high tin bronze (Figure 14). This correlation between the chemical composition of alloys, manufacturing techniques, and artefact types suggests that north coast metalsmiths knew the effects that metal quality and composition had on the properties of casting and the formation of alloys and consciously chose manufacturing techniques and alloy recipes for given artefact types. This, in turn, implies a high level of technological knowledge (see [98,119]). The superior workmanship of some artefacts, particularly engraved pins, may further indicate contacts between metalsmiths at Lapithos and on the surrounding mainland [70] (p. 809) (see [120,121]), and a degree of mobility, linked not just with metal, but also with metalworking and metalsmiths.



Figure 14. A selection of eyelet pins, including mushroom-headed pins, from Lapithos. Photographs by Rudy Frank.

Finally, the textual evidence is critical. It mirrors Lapithos' rise to prominence in the MBA and suggests a significant outward movement of copper from Cyprus. Cuneiform texts of the late C19th (or 'earlier to mid-C18th BC', see [27] (p. 29)) to C17th BC from Mari, Alalakh, and Babylon refer to the receipt of copper, and, in one instance, of bronze from Alashiya, the ancient name of Cyprus or part thereof [63] (pp. 307–308), [122] (pp. 18–19), [123,124]. Lead isotope analysis also suggests the use of Cypriot copper in Crete at Ayia Photia in EB II [125] (p. 92, Table 5) and Malia in the C19th BC [126], and an increase in the use of Cypriot copper in the Cyclades in Early Cycladic IIIA [127] (p. 389, Figure 37.4b). This leaves little doubt that Cyprus was a significant source of copper in the Levant and the Aegean prior to 1700 BC, while the selective use of 'clean' copper by MB I Levantine craftsmen [119] goes some way toward explaining why Cypriot copper, which has a low level of impurities [128] (p. 194), may have been in demand. Altogether, this poses a substantial challenge to the view that communities in Cyprus were only passively engaged in long-distance networks in the EBA and MBA [78] (p. 24) (see also [129] (p. 153), [130] (p. 40)).

On the contrary, it would appear that Vasilgia and Lapithos were significant nodes in an international maritime network, and actively involved in the internal procurement and export of Cypriot copper; and probably also in the manufacture of artefacts using local and imported copper and, certainly by the MBA, imported tin, lead, silver and gold. This requires us to ask how these north coast settlements were acquiring copper for manufacture and export from ore bodies located some 35–40 km distant on the other side of the Pendadaktylos Range. Without stretching the credibility of the available data, can we use the prism of central place theory to suggest how such a system may have worked and the degree of organisational complexity required to initiate and sustain it?

5. The Issue of Centrality

If the importance of an archaeological site is determined by its centrality— and centrality is a measure of the relative concentration of interaction [16], [131] (p. 219)—then our task is to assess the degree and type of interaction visible at our three settlements within an inter-regional political economy. It is important at this point, however, to distinguish between central places, as defined by Christaller [132] (for a recent critique and redefinition see [131]), and nodal points or hubs, as defined by Sindbæk [133]. While central places are served by local traffic and depend on maximum accessibility from a hinterland, 'the function of a nodal point is exercised through long-distance traffic and will therefore be stimulated in particular by topographical restrictions that guide traffic into corridors' [133] (p. 128). Most nodal points are situated in locations where a topographical barrier caused a break in traffic and demanded the trans-shipment and perhaps temporary storage of goods [133] (pp. 128–129). The geographical outcome is likely to be a network with a few sites in boundary-locations acting as hubs or nodal points for long-distance traffic within a widespread web of more localised contacts [133] (p. 129). These nodal points are distinguished by a high incidence of imports and tools of exchange, and frequently by craft production using imported raw materials. Importantly, nodal networks are primarily concerned with long distance exchange and do not necessarily reflect hierarchical relationships or political centrality.

The location of nodal points is influenced by the conditions topographic parameters create for exploitation, transportation, and exchange. Deneia, located in the Ovgos Valley midway between the Agirdha Pass and the northern foothills of the Troodos and possibly on a river crossing, is ideally suited to support strong flows of transit traffic and an obvious candidate for a nodal point (Figures 15 and 16). It was occupied already in the Philia EC period, but grew rapidly in the MBA when burial evidence suggests a massive upsurge in population that could not have been achieved by natural increase alone (estimates of the MBA mortuary population range from 9000 to 20,000, see [76]) (pp. 152–154). It is well-positioned to have served as a broker/trans-shipment point both on a north/south route through the Agirdha Pass and east/west along the Ovgos Valley, as well as an agricultural production centre and perhaps an organisational outpost. Ayia Paraskevi, occupied from the Philia EC and located in the Central Lowlands some 18 km to the east, may similarly owe its

importance at this time to its position on a route south to settlements near ore bodies in the northeast Troodos [24] (p. 122), [44] (pp. 447–454), [115] (on possible networks as envisaged through least-cost path analysis see [12] (pp. 97–99, Figure 2)).

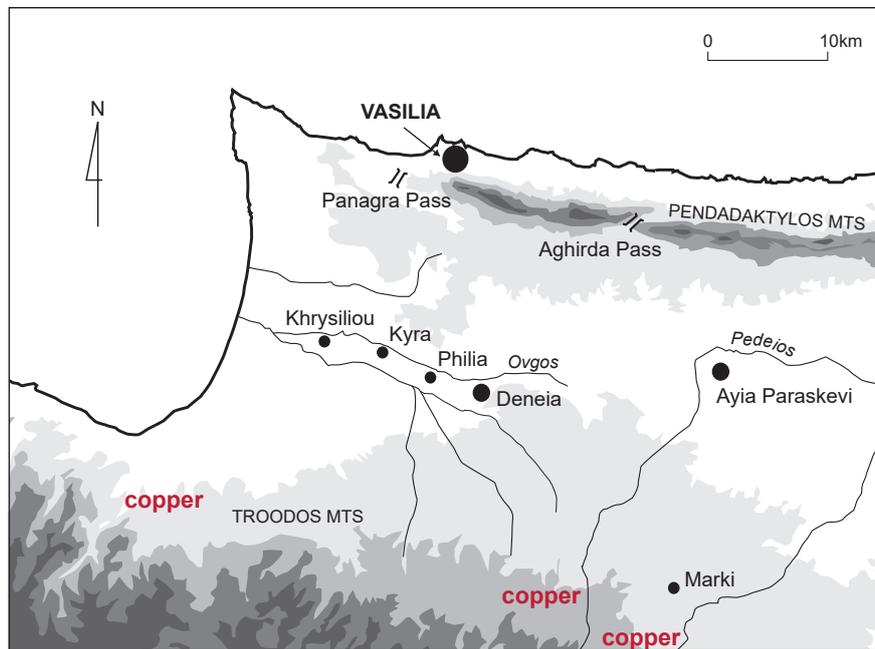


Figure 15. Map of northwestern Cyprus showing suggested nodal points in an internal copper procurement network mobilised by Vasilia during the Philia EC period.

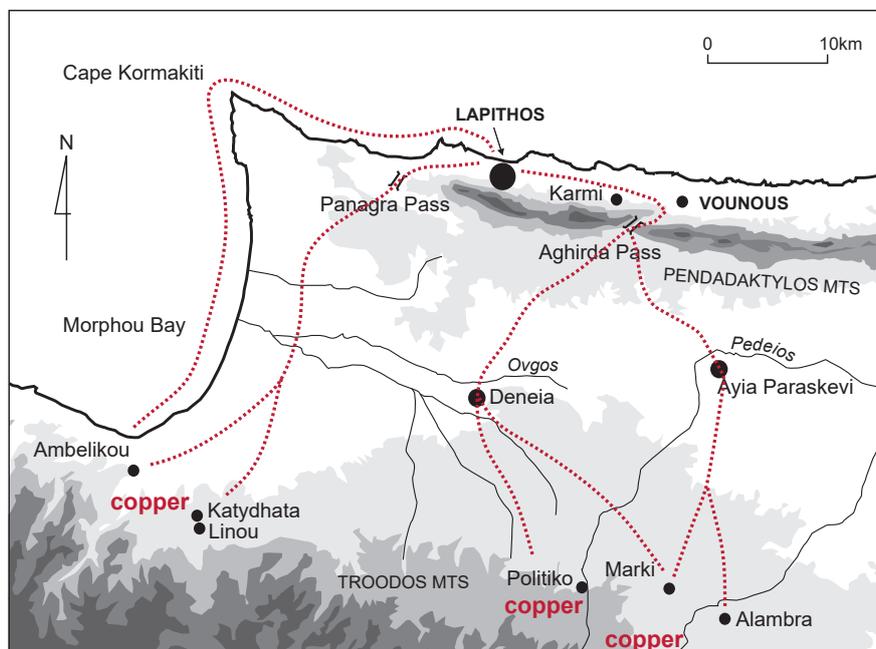


Figure 16. Map of northwestern Cyprus showing suggested nodal points and transportation routes (red dotted lines) in an internal copper procurement network mobilised by Lapithos in the MBA.

Vasilia and Lapithos may also be viewed as nodal points or junctions. Both were ‘end points’ within an internal network and points of off-island contact and exchange, engaged in

the trans-shipment and likely production and distribution of outgoing and incoming goods, and thus also nodes within a broader maritime interaction sphere. Their coastal location suggests that this external connectivity was prioritised from foundation over proximity and direct access to copper ore bodies. While the location of Vasilia was almost certainly linked with the arrival by sea of new groups on Cyprus at the beginning of the EBA, the foundation of Lapithos, on or near the coast, is likely to have been entirely 'market-driven'. At the same time, the success of both harbour towns as consumers and suppliers of metal indicates their ability to contest and secure access to copper supplies and transportation routes over considerable distances.

Access to long-distance exchange systems may have provided an opportunity for emerging elites in these nodal settlements to create bottlenecks or brokerage points, and ultimately, social debt, by controlling the movement of resources and through differential access to materials. While none were located in catchments which could meet all their economic needs, Lapithos, Deneia, and Ayia Paraskevi drew in large populations in the MBA (and likely Vasilia in the Philia EC), perhaps by offering a range of social, political, economic, and ideological opportunities. The nature and intensity of tomb construction at Deneia gives the appearance of considerable prosperity. Ayia Paraskevi has also produced several remarkable burial assemblages [24,115]. The co-presence of these large sites in a single network suggests multiple pathways to economic prosperity, with nodes differentially positioned near metal resources, on transportation routes, and at trans-shipment points.

Elsewhere in the Bronze Age world, the expansion of extractive industries and an increase in inter-regional exchange provided opportunities for emerging elites to exert influence over the flow and production of metals and led to increasingly centralised hierarchical socioeconomic institutions [134–136]. Complex urbanised regional polities with institutionalised inequality certainly developed in Cyprus in the LBA, but mining, specialised production, and external trade started well before the MBA/LBA transition. How hierarchical were these earlier networks? Were the transfer mechanisms that brought copper to the north coast dependent on autonomous relations within a network of localised contacts managed through nodal points or more actively manipulated by managerial elites in dominant north coast centres?

Despite the paucity of settlement data, I believe we can provide some answers to these questions. Much work in this area is based on the assumption that similarities and differences in material culture reflect the frequency and intensity of contacts between sites [137] (p. 13), [138]. If inter-regional patterns in material culture can be taken as indicators of the scale of connectivity, then the homogeneity of Philia EC ceramics and personal ornaments and the near island-wide distribution of pottery from northern workshops suggest multiple small-scale interactions between closely related communities and successful long-distance commodity networks. The latter were operating from the north coast or Ovgos Valley and are likely to have involved a reciprocal northward movement of copper. Beyond this, the level of functional differentiation in the use of land and resources during the Philia EC remains unclear, but metalworking is indicated at Marki and seasonal or permanent mining settlements must have existed in the immediate vicinity of ore bodies.

The situation is both clearer and more complex in the MBA. Here, the use of similarity coefficients as a proxy measure for connection strength tells us only part of the story. Rather, a combination of regional characteristics, local specifics, and the movement of pottery and other goods allows us to suggest something of how the north coast was procuring copper for production and export. Firstly, it is clear that Lapithos' greatest connectivity was with Deneia. Ceramic production at Deneia is highly distinctive. A number of vessel forms and clusters of stylistic attributes unique to this site belong to an emblematic local style, which may have been part of a conscious construction of community identity coincident with population aggregation [139]. Vessels from Deneia occur with some frequency and cluster in particular tombs at Lapithos (Figure 17), and, similarly, vessels from Lapithos are present in the cemeteries at Deneia (see e.g., [76] (pp. 70–71)). In both cases, they are fine tableware (jugs, juglets, and bowls) rather than storage or transport vessels (on primary (vessel) and secondary (container) wares in exchange contexts see [140] (p. 194)), which likely reflects the mobility of individuals and

thus a significant presence of people from Deneia at Lapithos and vice versa. At the same time, the distinctive ceramic tradition at Deneia, and differences in tomb architecture and burial practice between these two sites, suggest that this connectivity was primarily economic (rather than cultural or ancestral), and that proclaiming and maintaining local identity at nodal points was an important characteristic of the network.



Figure 17. Pots typical of Deneia found in tombs at Lapithos. Photographs by Rudy Frank.

The evidence from Ambelikou is also instructive. Here, a permanent settlement with workshops for smelting, casting, and the production of ingots, as well as pottery production, was located adjacent to a mine in the MBA [7]. While the site's closest ceramic relationships were with nearby communities at Katydhata and Linou in the Karkotis Valley [7] (p. 222), which were probably also engaged in mining and smelting, the strongest extra-regional connections were with Lapithos. The almost complete absence of ceramics from Deneia at Ambelikou and in the Karkotis Valley suggests, however, that copper was not shipped northward via the Agirdha Pass but by sea via Cape Kormakiti, or overland via a route running inland from Morphou Bay through the Panagra Pass [7] (pp. 220–221) (see Figure 16). The presence, similarly, at Ambelikou of some vessels from the west suggests connections with the Khrysochou Bay area [7] (pp. 78, 95–98, 223). The miners and smelters at Ambelikou were clearly producing metal for distribution beyond the site. While most ingots probably made their way to the north coast, the presence of western goods suggests that metal was also traded out to the west and thus that the community at Ambelikou enjoyed a degree of autonomy in the management and distribution of their products.

One class of object, likely to have been of significant symbolic value, appears to have been moving outward from Lapithos within a specific operational network. These are terracotta 'plank figures' which average 25 cm in height and depict flat, stylised figures wearing elaborate jewelry and decorated garments. Variants include figures holding infants and two- or three-necked figures. While the question of what or who they depict—deities, ancestral figures, or human agents—remains open, they were clearly associated with ritualised activity in mortuary contexts [141]. Some 40% of provenanced examples have been found at Lapithos, and only Lapithos has produced the full range of types (Figure 18). This suggests production at this site, at least initially. Elsewhere, they occur at Deneia and Ayia Paraskevi and at the smaller villages of Marki, Alambra, Politiko, and Ambelikou, where the presence of more crudely modelled figurines, which emulate imported plank figures (e.g., [47] (pp. 156–157, Figure 5.3)), suggests that they had a significant local impact. The down-the-line movement of these high value items implies greatest connectivity between Lapithos, Deneia, and

Ayia Paraskevi and sites between these nodes and the ore bodies. This highlights the role played by the north coast in the materialisation of symbolic ideas within this network.

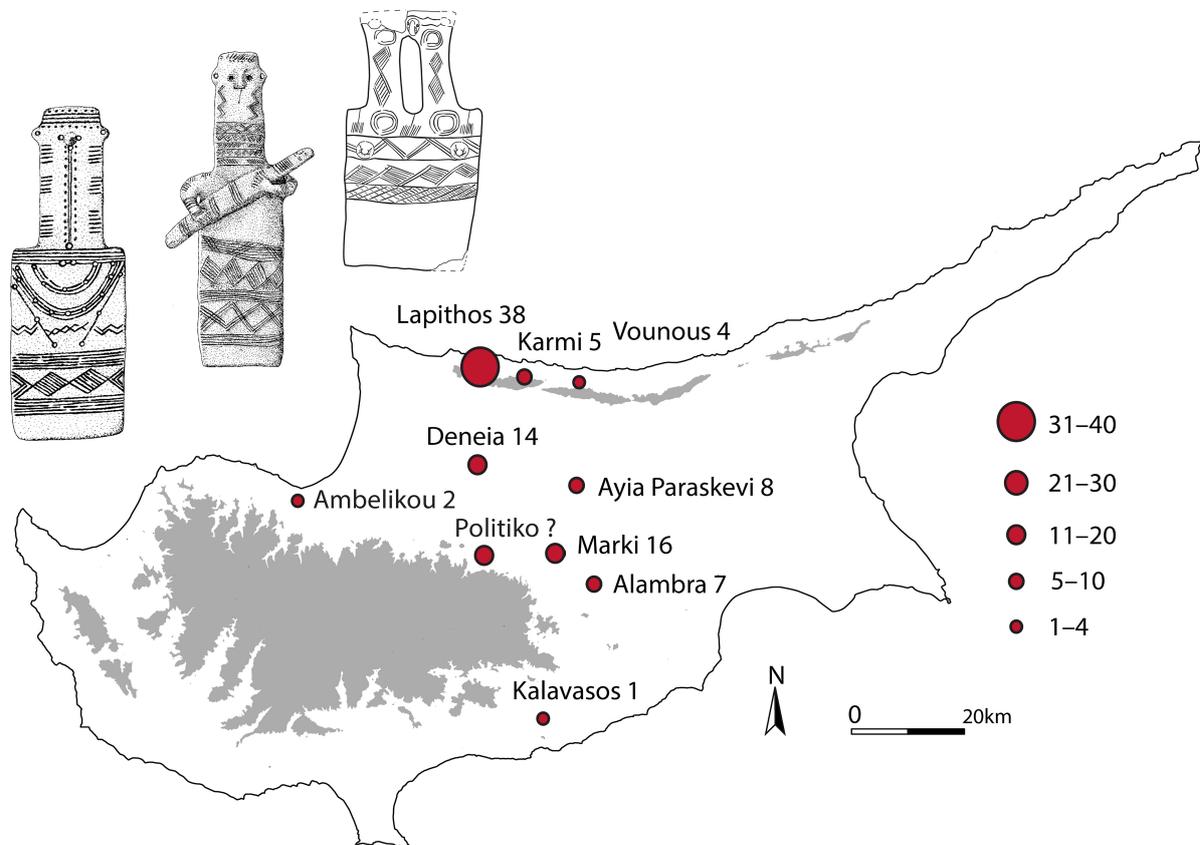


Figure 18. Map of Cyprus showing the distribution of plank figures.

This is not, then, a simple case of material culture similarities serving as a proxy measure of interregional connectivity. Rather, for much of the MBA, connectivity is visible in the movement of stylistically distinctive products between certain nodes in the network, the exception being the unidirectional distribution (and local imitation) of plank figures from an ideologically dominant Lapithos. A further complicating factor is the number of weapons on the north coast. While there has long been a tendency in Cypriot archaeology to romanticise the EBA and MBA as comprised of peaceful, agrarian, egalitarian settlements (most recently [142]), the number and concentration of bladed weapons at Lapithos in the MBA suggest a very different scenario. While initially likely to reflect competition between Lapithos and Vounous for dominance on the central north coast, they may also signal the emergence of a military group or class (as suggested for concentrations of weapons elsewhere, see [143] (p. 101)), and leave little doubt that some groups at Lapithos had the capacity to raid, trade, and protect their wealth. What appears to emerge from the evidence discussed so far is a complex relational mix of autonomy and connectivity, interdependence, complementarity and, potentially, coercion within a network of economic transactions linking functionally specialised settlements over considerable distances.

The dominant role of Lapithos with respect to the use and disposal of metal, however, is clear. The sheer quantity of metal, the use of imported copper and high tin bronze and the presence of unique artefact types suggest that it served as more than just a conduit for finished goods and raw materials originating in the hinterland, and likely as a production centre receiving and converting raw materials from both within Cyprus and without. This, in turn, is likely to have involved a significant degree of craft specialisation. While at present we have no direct evidence for this, the scale of production,

the number of persons involved, and the expertise gained from the repetition of procedures argue for the presence of skilled craftsmen at Lapithos (see [99] (p. 2), [144]). Metalworking (and weaponry) is also indicated at Vasilia in the Philia EC in the form of the hoards, and possibly also at Vounous in EC I–II, as noted above. Thus, metalworking may have been a long-standing technological tradition on the central north coast, setting the political economy of these settlements even further apart from those located elsewhere in the network.

Also visible, over time, at Lapithos are significant changes in social structure and in the function and value of metal. Some MBA tombs stand apart from the rest in terms of their size and architectural complexity and are characterised by an oversupply of metal and pottery. Some also show evidence for the manipulation of burial space and likely ritual activity, and for the caching, hoarding or accumulation of metal [57], [75] (p. 63), [77] (pp. 134–136), [145] (Figure 19). By the end of MC II, metal artefacts appear to have ceased to be valued as personal possessions in the burial domain. Together with the likely manipulation of exotic goods for political purposes and a degree of ‘industrialisation’, this accumulation of symbolic capital suggests the management of metal wealth at a corporate level and the emergence of inheritable categories of wealth and status. Lapithos may, at this time, have been moving towards an increasingly exclusionary political economy, dependent on network strategies by which leaders controlled bottlenecks in the production, exchange, transport, and defence of prestige goods, weapons, and other highly valued objects [146] (pp. 31–32, 36–38), setting them apart also in patterns of consumption and deposition.

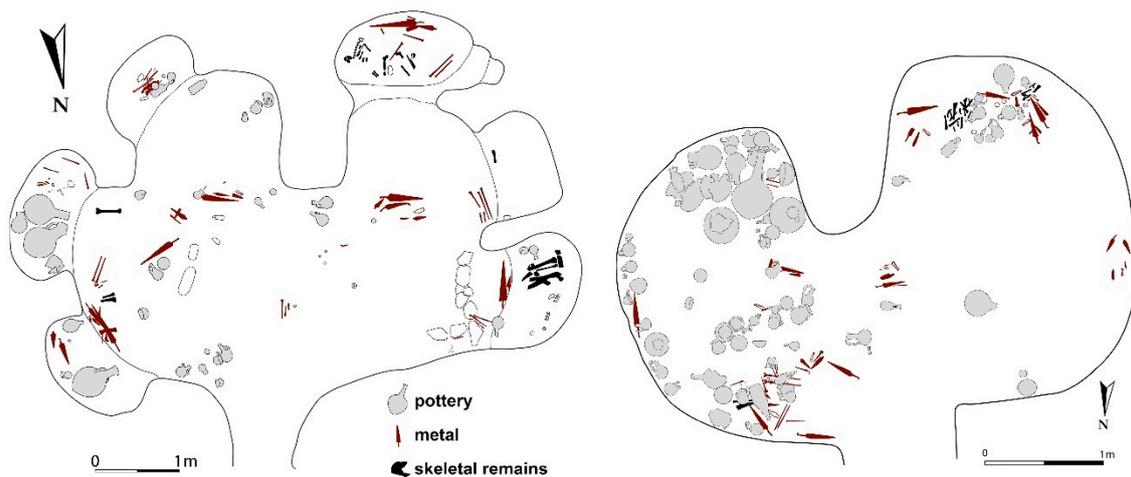


Figure 19. Two tomb chambers at Lapithos with evidence for the caching or hoarding of metal (after [68] (Figures 43.1, 50.6)).

6. Central Places and Central Flows

Central flow theory, introduced elsewhere to complement central place theory in relation to urban structures [147], may be a useful tool for understanding the prehistoric Cypriot context. While central places are hierarchical vertical spatial structures linking local scales of interactions (hinterlands), networks are primarily horizontal and link non-local interactions [147] (p. 2804). The latter involve central flows and centrality but are not dependent on dominant or central places. Similarly, Meijers [148] (p. 248), although also discussing urban structures, identifies complementarity as a main feature of the network model with two-way flows between different and similar-sized settlements leading to significant horizontal accessibility. While the location of settlements is fixed, their relative importance is prone to change. Individual agents also form parts of network-like structures, with partners and subordinates at various nodes, and considerable movement is likely to take place between settlements to profit from resources and opportunities available at specific nodal

points [147] (p. 2806). In central flow theory, it is ‘flows that come to centre stage as the building-block generating a network’, not centrality of location [147] (p. 2814).

The physical affordances of the central north coast of Cyprus, which included access to small but suitable harbours and territorial control of one or both passes, offered particular infrastructural possibilities. Lapithos was especially well-positioned to control the Agirdha and Panagra Passes, located, respectively, some 12 km to the east and 9 km to the west, and, with shipments of copper from the northwest Troodos possibly also arriving by sea, had the capacity to act as ‘a supply area’ or point of convergence for commodity flows without being dependent on a single source or access route (see Figure 16). This must have been among the locational advantages of Lapithos over Vounous and likely allowed Lapithos to exercise significant control over network structure and flow with less vulnerability to localised disruptions. This combination of advantages may have permitted Lapithos to achieve a high degree of network centrality during the MBA. This is not to suggest that other actors and nodes were not autonomous, pro-active, and self-interested. A degree of interdependence and cooperation would appear to be necessary if we are to explain how such an extensive network could have worked at all. The concentration of weaponry in some tombs at Lapithos suggests, however, that relationships on either side of the Pendaktylos Range became increasingly asymmetrical over time. This may also help to explain why, when external market access conditions were no longer favourable for north coast agents, the settlement at Lapithos lost its centrality and swiftly declined.

Centrality assessment measures discussed by Knitter et al. [16] (pp. 4–8, Figures 4 and 5) for several EBA and LBA settlements in Anatolia are based on evidence for five central functions: namely, administration, craft/industry, trade, cult, and security. While direct evidence for administration remains elusive for all three of our sites, trade and the production of metal artefacts are indicated for Vasilia, Lapithos and perhaps also Vounous, and Lapithos, Vounous and possibly Vasilia were centres of ceramic production. Vounous appears to have been of significant local and possibly inter-regional ritual/ideological authority, and the distribution of plank figures suggests that Lapithos also had considerable ideological reach. In the case of Lapithos, we may add the provision of security, at least within its own territory. While the political element remains elusive, rivalry between Vounous and Lapithos must have involved a struggle for authority (centrality) within this region, and likely the control of communication routes, information flows, knowledge, and external contacts.

7. Conclusions

The focus here has been on two primary topological (structural) properties of distribution/connectivity networks—integration and hierarchy. In an extremely hierarchical network, a handful of nodes will have far higher levels of centrality than other nodes, resulting in high centralisation indices [138] (p. 215). This was probably the case during the Philia EC, when fine ware pottery was distributed from one or several northern production centres, and high material culture similarity indices are visible across much of the island. The loss of an external market led to the demise of this network and the emergence in the EBA of Vounous as a singular settlement with a highly idiosyncratic material culture, few traces of which are evident elsewhere even within its micro-region. Connections with the Central Lowlands, however, remained in place and the north coast continued to receive metal and possibly to produce artefacts for its own needs.

In the MBA the re-engagement of the north coast in external trade led to the re-establishment of a political economy, this time at Lapithos, which depended on a secure supply of local copper, but now within a significantly smaller procurement network, largely confined to the northern Troodos and Central Lowlands. While this network appears to have been less hierarchical, some nodes certainly had higher levels of centrality than others and Lapithos was able to establish economic, cultural, and ideological pre-eminence. This pre-eminence, however, must always have been fragile. If the law of decreasing interaction with distance applies to all forms of communication [1] (p. 1), [149], connectivity mechanisms would always have been critical. These may have been enhanced by ‘intervening opportunities’ [150] offered by nodal points, like Deneia and Ayia Paraskevi, and a high degree of

mobility, autonomy, and collaboration, possibly underpinned by the coercive monitoring of key routes. Whatever the case, it is unambiguously evident that for several centuries distance deterrents (the cost of transportation, loss of information, and security of persons and goods) were successfully overcome.

Given the (dis)location of ore deposits, agricultural soils, population centres, and natural harbours in Cyprus, the spatial (distance) dimension involved in off-island commodity flows was always critical. If Lapithos was receiving copper from extraction points in both the northeast and northwest Troodos as well as through maritime trade (along with tin and precious metals), such a convergence of supply surely qualifies it as a centre with considerable linear outreach. While not a 'central place' in Christaller's terms, it was clearly a central node within a complex communication and transport network, and likely a centre of metal production and distribution. The presence and number of weapons suggest a community conscious of its economically privileged position and the need to defend it, and a degree of 'militarisation' may have been one of many ways in which this site developed different values and identity. The earlier dominance of Vasilia, and this site's engagement with international trade, may have led to the early development in this region of both seafaring and external contacts. Thus, in addition to the geostrategic importance of the north coast, communities here *could* have developed a strong comparative advantage over the *longue durée* in seafaring, metallurgy, organisational expertise, and possibly also in military prowess.

The central north coast was, for some 750 years, a major focus not just of settlement and trade, but also of cultural and ideological authority on Cyprus. Changing circumstances gave our three sites a high potential for centrality at some times and dramatically reduced it at others. This was a product of locational advantage, long-term historical process, and the combined effects of three key factors: the generating capacity of the origin, the attraction of the destination, and the 'resistance' incurred through distance (the so-called 'gravity law', see [1] (p. 5)). Distance measures become economically relevant when interaction is channelled through the links of a given network ([1] (p. 2)). While we still have much to learn, it is clear, given the topography, that they were not straight-line distances and that monitoring of communication and transport routes and the availability of alternative sources of metal must always have been critical. While the external demand for Cypriot copper remained in place and the shipping lanes continued to favour north coast outlets, the north coast sites had a structural advantage as network actors that they were able to convert into long-term socioeconomic success. This must have involved a significant degree of managerial expertise, possibly initially introduced by groups who arrived in Cyprus at the start of the EBA and maintained through social relationships embedded in individuals, groups, and institutional structures. Thus, it is possible to suggest that these north coast settlements combined both *natural centrality*, based on their location within the local environment, and a *politically controlled centrality*, brought about by human efforts to assemble central functions and achieve economic and ideological authority at a supra-regional level (see [16]).

The focus here has been on the north of the island. Elsewhere, there is increasing evidence for workshop production of metal, pottery, textiles, perfume, oils, and perhaps beer [67] (p. 217), [108,151–154], suggesting a similar targeted use of the landscape and its resources and a significant degree of mobility in the volume and flow of goods and information within regional and perhaps inter-regional networks. While we may not be able to trace in detail the transformation from egalitarian villages to communities with surplus accumulation (see [155,156]), we can argue for the interdependence of settlements within networks maintained through regular contacts and the movement of people and goods. This implies off-site distribution and local control of production with multiple site-to-site exchanges suggesting 'collaborative and strategic action' [155] (p. 34). While it would be naïve to think that this was all smooth sailing (note the existence of a circuit wall and complex locking mechanisms in the workshop at Erimi, see [153]) (pp. 350, 357, Figure 16.2)), only at Lapithos is a degree of physical coercion visible. This is one of many respects in which this settlement stands apart.

The scenario proposed here is necessarily speculative. The dots could no doubt be joined in other ways and there is much that remains beyond our ken, including the extent to which seafaring may have been part of the north coast 'phenomenon', and the role which language, ancestral bonds, and

other aspects of cultural affiliation may have played in creating directed ties between individuals and communities. At best, it may provide a partial explanation of the processes which contributed to settlement location and the organisation of economic activities that operated to produce the data that we have. While we should be wary of attempting to aggrandise our own area of interest (see [157] (p. 180)), the singularity of the north coast in the EBA and MBA is undeniable, and excavated settlements elsewhere on the island cannot be taken as proxies for those we currently lack in this region. What happened on Cyprus ca. 1700 BC was a major shift that ultimately led to the rise of complex urban polities at Enkomi and elsewhere in the LBA. It may, however, be best understood as a relocation, reorganisation, and further development of systems and structures (coastal outlet/specialised production/distance procurement network), together with accumulated social and institutional knowledge, which existed on the north coast in the MBA and likely already in the EBA.

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