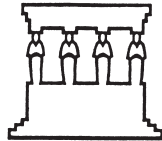


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The Mycenaeans and Europe: Long-distance networks and cross-cultural communication

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In the 2nd millennium BC cultural, social and political entities of a new kind and scale came into existence and transformed Europe into a distinct cultural zone, where intense and dynamic interactions between local, regional and ‘global’ processes of change intersected with increased social connectivity and mobility. The presence of artefacts made of non-local raw materials in archaeological contexts indicates that mechanisms for the import of essential goods and other forms of cross-cultural exchange have existed throughout prehistory. Therefore the archaeological evidence provides an excellent proxy for studying questions related to socio-political organisation, cultural boundaries, communication networks and mobility of people, goods, technologies, and ideas. This contribution discusses relations between the Mycenaeans and the societies of temperate Europe in the mid 2nd millennium BC. Although long-distance interactions may have often been indirect, societies across Europe, from the Mediterranean all the way to Scandinavia, were incorporated into vast communication networks that linked them together.

An introduction to chronological and theoretical frameworks

Cross-cultural communication, trade and exchange in its various manifestations (local, interregional and long-distance) are fundamental and ubiquitous forms of social organisation and interaction. The main reason for this may be seen in the unequal geographic distribution of desirable raw materials like obsidian, flint or metal. Securing access to such goods by creating social networks via interpersonal relations and diplomatic alliances, which are in turn maintained through the exchange of gifts, has always been a fundamental motivation for forming social ties. Investigating how these relations and their material manifestations changed in time and space offers tremendous opportunities for the study of human interaction across cultural boundaries. Several scholars have previously investigated contacts between the Mycenaean world and temperate Europe.¹ However, new evidence

1. Harding 1984; Bouzek 1985; Lewartowski 1989.

has recently been unearthed. The following discussion will concentrate on direct archaeological evidence. Aspects touching the religious and ceremonial or symbolic spheres – which may contain as much ambiguity and interpretational doubt as potential information – are not explored in depth.

The chronological framework for the phenomenon under study encompasses the Mycenaean period, i.e. the 17th to 11th centuries BC (see Table 1). Cross-cultural contacts and long-distance communication between Greece and temperate Europe already existed in the early Mycenaean period, as is evidenced by the Baltic amber and the Carpathian and eastern European horse harnesses that appeared in the Shaft Graves of Mycenae.² There are also many examples of Mycenaean rapiers and swords that have been found in the Balkans and in the Carpathian Basin.³ Most of them date to the Early Mycenaean period. Some Mycenaean influences might also be visible in several swords from northern and Central Europe, generally dating from the 14th to 11th century BC.⁴ Nevertheless, communication between Mycenaean Greece and temperate Europe was particularly intense at the end of the 13th and throughout the 12th century BC, when numerous artefacts of so-called ‘northern origin’ appeared in the South. Among them were different types of weaponry, dress fasteners, jewellery and ornaments, as well as Handmade Burnished Ware.⁵ At that time, significant political, social and economic transformations occurred on the European continent, generally attributed to large scale migrations and changes in warfare.⁶

The problem that immediately becomes apparent when trying to understand European and Mycenaean relations is the complexity that would result from trying to examine every archaeological source on its own. The main danger here lies in over-interpreting the meaning of individual items and neglecting the bigger picture. To overcome this issue, different scales of analysis need to be chosen and carefully linked with each other. For the purposes of this study, a suitable approach is to investigate the evidence on an interregional (‘global’) scale to reveal general patterns and processes, complemented by regional scale case studies to verify local effects (it is generally thought that communication networks exhibit interesting properties on many scales).⁷

2. Karo 1930, 1933; Harding and Hughes-Brock 1974; Harding 2005; Hughes-Brock 2005.

3. Alexandrescu 1966; Panayotov 1980; Bouzek 1985; Kilian-Dirlmeier 1993; Wardle 1993.

4. Randsborg 1967; Bouzek 1985, 120, 221; Thrane 1990.

5. Harding 1984; Bouzek 1985; Lewartowski 1989.

6. Drews 1993.

7. Barabasi 2003 or Christakis and Fowler 2009 for a general introduction to social network theory.

Table 1. *The chronology of the Bronze Age Aegean and Central Europe.*

Central Europe		Greece	
Period	Date	Period	Date
Br A1	2400/2300-2000	EH III	2400/2300-2100
		MH IA	2100-2000
Br A2	2000-1600	MH IB	2000-1900
		MH II	1900-1800
		MH III	1800-1700
		LH I	1700-1600
Br B	1600-1500	LH IIA	1600-1490
Br C1	1500-1400	LH IIB	1490-1430
		LH III A1	1430-1390
Br C2	1400-1300	LH III A2	1390-1300
Br D	1300-1200	LH III B	1300-1200
Ha A1	1200-1100	LH III C	1200-1100
Ha A2	1100-1000	Submycenaean	1100-1050/1020

This study assumes that cross-cultural communication between the Mycenaeans and the societies of temperate Europe occurred within different types of established networks. In some cases, contacts were indirect, as systems of connected ‘networks of networks’ allowed objects and ideas to travel via middlemen. In other cases, they were direct and occurred within smaller networks that provided particularly efficient links. Once established, these connections inevitably became catalysts of cultural exchange in many forms that eventually led to profound social change throughout the European continent.⁸ In the Bronze Age, networks for the supply of raw materials, and later more refined commodities, created incentives for individuals to move across the mainland, taking on many different roles, such as those of travelling craftsmen and traders, warriors and mercenaries, emissaries and perhaps explorers. It is at this point that we can truly speak of ‘travelling cultures’⁹ and connected societies.

The idea that no society can exist in isolation and that even remote ‘neighbours’ depend on each other as part of a connected system is expressed by Wallerstein’s classic World System Theory.¹⁰ A recent review of both World System Theory and network analysis by Harding suggests that the two represent

8. Kristiansen and Larsson 2005; Vandkilde 2007.

9. Kristiansen and Larsson 2005; Vandkilde 2007.

10. Wallerstein 1974.

opposed perspectives on social processes.¹¹ However, the concepts of network analysis transcend scales and are fully compatible with the systemic approach of World Systems Theory, both in regards to their general focus on interactions and in specific notions such as ‘cores’ and ‘peripheries’.¹² This is because even though the reconstruction of networks is usually performed in a bottom-up manner (by establishing links between individuals of interest) the tools of network analysis are capable of finding relationships on a higher (group) level. Indeed, one may state that Wallerstein’s theory can give sociological meaning to the properties revealed by network analysis, that both models complement each other, and that they both support a top-down and bottom-up perspective. Hall, Kardulias and Chase-Dunn provide profound insight into these theoretical issues while also giving an overview of archaeological case studies that employ a systemic world view approach.¹³

The Mycenaeans and Europe: the evidence

The evidence for Mycenaean contacts with temperate Europe in the mid 2nd millennium BC is rich and diverse. Of the items that speak of cross-cultural communication, one may find amber, bone and antler horse harnesses, dress fasteners, personal ornaments and jewellery, weaponry and tools, as well as Handmade Burnished Ware made of local clay. Most of the artefacts, and the sites where they were found, are well covered in the available literature.¹⁴ The published data clearly indicates that long-distance communication between the societies of Central Europe, northern Italy and the Aegean had already taken shape at the beginning of the Mycenaean Culture, dated to 1700 BC. Nonetheless, it was the transition from the 13th to the 12th century BC when these relations became particularly intense. According to Bouzek, at that time one might speak of a *koine* (common market) in material culture between the Aegean, the Balkans, northern Italy and Central Europe.¹⁵ This discussion will focus on a selection of types of artefacts which are clearly recognisable as foreign in the places where they occurred: amber, horse harnesses, dress fasteners and weaponry.

11. Harding 2013, 14.

12. Kristiansen and Larsson 2005, 20-25.

13. Hall, Kardulias and Chase-Dunn 2010.

14. Harding 1984; Bouzek 1985; Lewartowski 1989; Sherratt 2000 with further references.

15. Bouzek 1985, 241.

One of the most recognisable items of so-called ‘northern origin’, found in the Aegean, is Baltic amber. The earliest known fragments appeared in mainland Greece in MM III B.¹⁶ In the Aegean, amber is mostly known from wealthy graves, where it occurs with gold and electron. Most amber fragments date to MM III B/LH I-LH II and were found in the graves of Mycenae, Pylos, Peristeria, Kakovatos, Thebes and Orchomenos.¹⁷ However, amber was also found in later periods – in LH III on the Peloponnese, in Thessaly, on Crete and Euboea and during the Submycenaean period in Elis and on Salamis. In total, nearly 4000 amber fragments have been found in the Aegean; in shaft grave no. IV of Mycenae alone, 1290 beads were recorded.¹⁸ One needs to keep in mind that amber is an organic substance that disintegrates when exposed to oxygen, and that most of the rich Mycenaean burials have been plundered; thus the number of known objects certainly falls short of the original amount.

Another important class of artefacts are horse harnesses made of bone and antler. The specimens found in the Shaft Graves at Mycenae bear morphological similarities to cheek pieces from the Carpathian Basin and Eastern Europe.¹⁹ In relation to horse harness, it is important to consider the so-called ‘running spiral’ and ‘wave band’ ornaments that were very popular in the Aegean and in Central Europe, mainly in the Carpathian Basin, as well as in Scandinavia.²⁰ Around the 17th-16th centuries BC, in the North and in the South, many items, including bone cheek pieces, discs, cylinders, bronze axes, swords, daggers, jewellery and pottery, were decorated with these motifs. Although in these regions the running spiral and wave band ornaments had already been applied since the Neolithic, some researchers claim that ‘there are too many resemblances between the Carpathian Basin and the Aegean to consider them as merely accidental’.²¹ Moreover, as David notes, ‘ornamental and morphological characteristics of some Danubian objects and Mycenaean or Anatolian examples are so closely related that they would not be imaginable without the existence of direct contacts between these regions’.²²

Dress fasteners (pins and fibulae) are a group of artefacts that testifies to a different aspect of relations between the Mycenaean Culture and the societies of temperate Europe. They appeared in the Aegean at the end of LH III B and

16. Dietz 1991, 263.

17. Harding and Hughes-Brock 1974; Hughes-Brock 2005.

18. Harding and Hughes-Brock 1974, 147.

19. Hüttel 1981; Penner 1998; Harding 2005.

20. Randsborg 1967; Thrane 1990; David 1997.

21. Bouzek 1985, 60.

22. David 2007, 414.

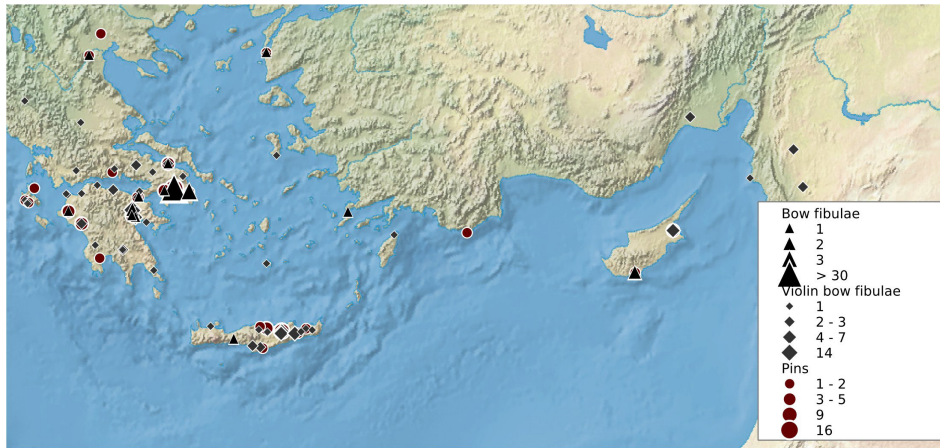


Fig. 1 *Distribution of pins and fibulae.*

throughout LH III C (Fig. 1). Because they are personal items, some authors associate their occurrence in Mycenaean Greece with the arrival of new groups of people, presumably members of the Protovillanova, Tumulus and Urnfield Culture groups.²³ Three main pin types have been recorded in the Aegean: (A) with elongated swelling and a series of ring-mouldings or with shallow incised rings and flatter swelling; (B) with a disc at the head and a globular swelling a little way down the shaft; and (C) with spatulate tip or roll-topped pin.²⁴ The majority of them was found in Attica, Argolid, Elis, on Crete and Euboea.²⁵ These long pins were very popular in Central Europe, Italy and in the Balkans during the 14th and 13th centuries BC, and also in the Near East and in Anatolia.

Unlike pins, fibulae were not known in the Aegean before the 13th century BC. Of this type of dress fasteners two main forms were found: (A) violin-bow and (B) arc fibulae.²⁶ Violin-bow fibulae appeared in LH III B, mostly in the Argolid and on Crete, as well as in Achaia, Attica, Beotia, Laconia and Corinthia.²⁷ Around LH III C they were gradually replaced by arc fibulae, most of which are known from the Kerameikos cemetery in Attica.²⁸

Another significant group of objects to be considered here are weapons of both Mycenaean and European origin. For instance, at least 23 rapiers and 42 swords of Mycenaean type have been found in the Balkans and in the Carpathian

23. Bouzek 1985, 159, 167.

24. Kilian-Dirlmeier 1984.

25. Bouzek 1985.

26. Kilian 1975, 1985.

27. Bouzek 1985, 159.

28. Harding 1984, 179, n. 81.

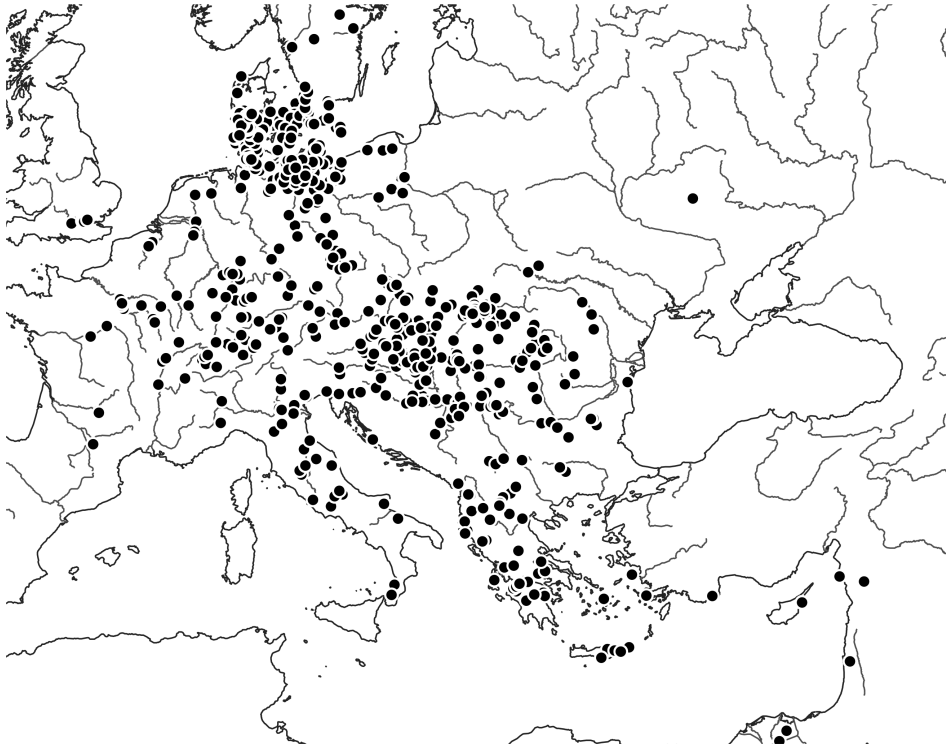


Fig. 2 *Distribution of Naue II type swords.*

Basin, mostly dated to the Early Mycenaean period.²⁹ There are also some (disputed) examples which possibly indicate analogies with Mycenaean forms and technologies from Central, Northern and Western Europe.³⁰ These include the finds from Nürnberg-Hammer (Germany), Ajak (Hungary), Dollerup and Ørskovhede (Denmark), Adliswill (Switzerland), Saône (France), Surbo (Italy), Pelynt (Britain) and Spišský Štvrtok (Slovakia), most of which date from the 14th (Br C2) to 11th (Ha A1) century BC.³¹

A different group of weapons is represented by the Central European cut-and-thrust flange-hilted swords of the Naue II type that appeared in the Aegean at the end of LH III B and throughout LH III C (Fig. 2). The earliest specimen come from Mycenae,³² Langada on Kos³³ and Enkomi on Cyprus.³⁴ In

29. Alexandrescu 1966; Panayotov 1980; Kilian-Dirlmeier 1993; Warlde 1993.

30. Randsborg 1967; Mozsolics 1973, 29-3; Bouzek 1985, 120, 221; Thrane 1990.

31. Bouzek 1985.

32. Krzyszkowska 1997, 147.

33. Morricone 1966, 137-139.

34. Schaeffer 1952, 337-338.

the beginning, Naue II swords occurred with Mycenaean counterpart swords. However, since Central European swords were more efficient in combat, they quickly replaced the Mycenaean types.³⁵ Aegean craftsmen rapidly adopted Central European types of swords and began manufacturing them locally in modified forms.³⁶ Naue II turned out to be so versatile that in the 12th and 11th centuries BC it became the only type of sword used in temperate Europe, the Aegean and the Near East. In total at least 50 swords of Naue II type have been found in the Aegean and around 29 in the Near East.

During the 13th and 12th centuries BC, several flange-hilted Peschiera type daggers appeared in Mycenaean Greece as well, mostly on Crete. They originated in northern Italy and it seems that they were imitations of Mycenaean models.³⁷ Peschiera daggers spread all over Europe, from the Carpathians to France and from Italy and the Balkans to Denmark.³⁸ Their distribution can therefore be interpreted as an indication of a wider bronze working tradition embracing Central Europe, northern Italy and the Aegean. While none of the Aegean Peschiera daggers are datable by context, their European parallels belong to the 13th (Br D) and 12th (early Ha A1) centuries BC.

Alongside swords and daggers, new spearheads of so-called ‘northern origin’ appeared in the Aegean during the 13th and 12th centuries BC. They were mostly found in the Argolid, Achaea, Attica, Epirus, on Crete, Kephallonia and Ithaca as well as in Beotia, Corinthia, Phocis and Elis³⁹. In terms of shape, three main types of spearheads can be distinguished: (A) lanceolate (*geflamnte*), (B) with a midrib (being a hybrid between lanceolate and leaf-shaped forms), and (C) small leaf-shaped variants.⁴⁰ Many of these spearheads came from burials and were associated with Naue II swords as well as with Mycenaean spears, which suggests that they belonged to the standardized equipment of the Late Bronze Age warriors.

Another intriguing example of cross-cultural contacts is the Handmade Burnished Ware, which is handmade pottery that is coarse with large grits, and that is of a fabric that can be both micaceous and sandy. The ware’s surface treatment is very uniform and the burnish colour always dark. A characteristic feature is the plastic decoration that includes finger-impressed ornaments, ledges and rims. Handmade Burnished Ware appeared in LH III B and was produced

35. Kristiansen 2002.

36. Catling 1961, 118-121.

37. Daniel and Evans 1975, 719.

38. Sherratt 2000, 96-98.

39. Bouzek 1985.

40. Snodgrass 1964, 116-119, 134-136.

well into the Submycenaean and Protogeometric periods.⁴¹ Pottery of this type has been recorded on many Mycenaean sites and there is no doubt that it was foreign to Mycenaean ware manufacturing. Originally, the number of sites with Handmade Burnished Ware was probably much higher than the published examples suggest. However, its resemblance in terms of technology and fabric to Greek Neolithic or Middle Bronze Age products caused a general lack of scholarly interest in it. Handmade Burnished Ware found in the Aegean shows parallels to the pottery traditions of Troy, Italy, the Balkans and also Central Europe. Therefore, one possible explanation of its appearance in the Aegean may be sought in the arrival of new groups of people that might have originated in temperate Europe.⁴² Integration of these newcomers into Mycenaean society is suggested by the coexistence of Handmade Burnished Ware and Late Helladic pottery as well as handmade vessels imitating Aegean shapes.⁴³

The Development of cross-cultural communication in the European Bronze Age
Examination of the archaeological data makes it possible to distinguish four principal development phases of cross-cultural communication between the Eastern Mediterranean, the Aegean and temperate Europe in the Bronze Age. The beginning of these contacts actually pre-dates the Mycenaean Culture, as they occurred as far back as the end of the 3rd millennium BC. Therefore, it makes sense to broaden the scale of the analysis to include some earlier aspects of connectivity between the regions. This allows for a better understanding of the background of Mycenaean and European relations. The first distinguishable phase is dated from 2400/2300 BC to 2000 BC and its end marks the complete establishment of tin bronzes in Central Europe. The second phase, dated from 2000 BC to 1700/1600 BC, falls into the classical stage of the Central European Unetice Culture's development and the pinnacle of the Minoan Culture on Crete. The third phase is critical for the perspectives discussed here, because it encompasses the early and middle stages of the Mycenaean Culture. It spanned the period between 1700/1600 BC and 1300/1200 BC. In Central Europe, societies of the Carpathian Basin underwent a period of revival between 1700/1600 and 1500 BC, and the Tumulus Culture emerged. The fourth and last phase of interest here occurred after 1200 BC. It coincided with the late Mycenaean Culture in Greece and the Urnfield Culture in Central Europe.

41. Pilides 1994, 107.

42. Deger-Jalkotzy 1977, 64-80; Rutter 1990; Bankoff et al. 1996, 199-200.

43. Rutter 1975, 32; Jacob-Felsch 1987, 31; Kilian et al. 1981, 180-181.

The existence of cross-cultural communication between the Mediterranean, the Balkans and temperate Europe in the first phase is evidenced by the common occurrence of artefacts such as wound-wire pins (*Schleifennadeln*), riveted daggers, rings (*Lockenringe*), and ring ingots (*Ösenhalsringbarren*), such as recorded in Moravia and the Levant.⁴⁴ Furthermore, ceramic vessels resembling the iconic Aegean *kantharoi* have been recorded in the Carpathian Basin; a striking example of a cut-off rim vessel akin to MM I-II ceramic types was found in Hungary in a context dated to 2000 BC.⁴⁵ According to Kadrow, a Mediterranean influence is also visible in pottery (mostly bowls) with diagonally cut rims, recorded for example in southeastern Poland.⁴⁶ This type of ceramic has its closest analogy with specimens known from the southeastern Balkans and Anatolia.⁴⁷ In this case, however, the evidence suggests more indirect connections, because of the selective character of the elements being imitated.

According to Gerloff, the period between 2400/2300 BC and 2000 BC represents the opening of Near Eastern societies towards more systematic exchange and communication with Central Europe. Maran sees the roots of these events in the Balkans, demonstrating the existence of trade networks linking Early Helladic societies in Greece, the Adriatic and the Carpathian regions as early as the middle of the 3rd millennium BC.⁴⁸ This is evidenced in pottery forms and some prestige goods, the exchange of which was most likely linked to early metal trade. Moreover, large fortified settlements that appeared in the Balkans and in the Carpathian region show similarities to Anatolian and Aegean architecture, such as a division into *acropolis* and *suburbium* and the use of stone walls.⁴⁹

In the second phase, dated to 2000-1700/1600 BC, cross-cultural communication intensified and encompassed the entire area under discussion.⁵⁰ The goods that were exchanged within this long-distance network included tin, copper, gold, amber and other perishable products. During this period, social stratification intensified in the Aegean and in temperate Europe. In both regions, rich burials appeared (e.g. in Mycenae, Pylos and on Aegina as well as in Leubingen, Helmsdorf, Łęki Małe, Tiszafüred and Thun-Renzenbühl), in

44. Gerloff 1993; Maran 2007.

45. Bouzek 1996, 180.

46. Kadrow 2007, 324-325.

47. Némeková-Pavúková 1999.

48. Maran 2007.

49. Gogâltan 2008.

50. Sherratt 1993, 24-29.

which large numbers of imports were found.⁵¹ At the same time, metallurgical production intensified in Central and Western Europe as a result of the widespread use of tin bronze.⁵² The development of new metallurgical technology led to the rise of powerful centres on the continent, where bronze and precious metals were worked. To secure access to new raw material deposits, it was often necessary to establish and maintain further cultural and trade contacts.

Between 1700/1600 BC and 1300/1200 BC, societies in the north and south of Europe entered a third phase in the development of cross-cultural communication; the most intense one yet. During this phase the Mycenaean Culture (LH III A-B) underwent great cultural and economic expansion after taking over long-distance trade routes in the Mediterranean Basin from the collapsing Minoan civilisation. Temperate Europe was characterized by the consolidation of regular cross-cultural communication and exchange. The opening of new Transylvanian copper deposits and access to Czech tin led to a revival of the Carpathian metallurgical centres, which in turn resulted in intense development in that region around 1700/1600 BC -1500 BC.⁵³ In other parts of Central Europe, the Tumulus Culture emerged and evolved.⁵⁴

There is no doubt that during the third phase an extensive European communications and exchange network existed. At that time, the Balkans, on the periphery of the Aegean world, became a destination for political and economic expansion of the Mycenaean.⁵⁵ Connections were also established with the highly developed Terramare Culture of northern Italy,⁵⁶ as well as first contacts between the Carpathian and the Mycenaean societies.⁵⁷ In addition, prestige chain exchange between rulers of individual groups allowed for, albeit indirect, communication with southern Scandinavia, especially Jutland.⁵⁸ It seems that it was predominantly the cultures of the Carpathian Basin that linked the Aegean and Eastern Mediterranean with eastern and northern European societies. Initially, these contacts were rather indirect and are evidenced by Carpathian (oblong) and Caucasian (round) horse harnesses as well as Baltic

51. Karo 1930, 1933; Kowiańska-Piaszykowska 1957, 1968; Strahm 1966; Iakovidis 1981; Zich 2004.

52. Krause 1998.

53. Sherratt 1993, 29.

54. Jockenhövel 1991.

55. Wardle 1993.

56. Jung 2006.

57. Gancarski, eds., 2002; Palincas 2007.

58. Kristiansen 1987.

amber that appeared in mainland Greece.⁵⁹ In temperate Europe on the other hand, several metal vessels with analogies to Mediterranean specimens⁶⁰ and Cypriot daggers have been found,⁶¹ as well as a number of rapiers and bronzes decorated with running spiral motifs, considered by some scholars to be either Mycenaean imports or their local imitations.⁶² The relations between the north and the south of Europe at the end of the third phase, i.e. 1300/1200 BC, were direct and can be linked to migrations, during which numerous items of so-called ‘northern origin’ appeared in Mycenaean Greece, such as: weapons, dress fasteners, personal ornaments and jewellery.⁶³

The fourth and final phase in the development of cross-cultural communication is dated to the period after 1200 BC. In the Aegean, this overlaps with the final period of the Mycenaean civilisation and its later decline. In temperate Europe, it coincides with the emergence of the Urnfield Culture, known for its expansionism that resulted in significant cultural unification of an area stretching from modern day Hungary to France and from the Alps to the North Sea.⁶⁴

In the 12th century BC, significant political, social and economic changes occurred in the Mediterranean which are generally attributed to the migrations of the Sea Peoples.⁶⁵ These events had serious consequences, causing a partial collapse of exchange and communication networks and a decline of political and economic entities like the Mycenaean Culture, the Hittite Empire and cities of the Levant (e.g. Ugarit). Even Egypt and Mesopotamia were significantly affected. In the following period of the Post-palatial economy, a majority of cultural and trade contacts of the Mycenaean societies weakened; however, connections to southern and northern Italy were maintained.⁶⁶ European bronze items, as well as decorations and symbols (such as birds *protomae* and solar discs) continued to appear in Mycenaean Greece as a result of the expansion of the Urnfield Culture.⁶⁷

59. Harding and Hughes-Brock 1974; Harding 2005; Hughes-Brock 2005.

60. Sherratt and Taylor 1989.

61. Catling 1964.

62. David 1997.

63. Harding 1984; Bouzek 1985; Lewartowski 1989; Sherratt 2000.

64. Plesl and Hrala 1987.

65. Popham 1994.

66. Jung 2006.

67. Harding 1984; Bouzek 1985; Lewartowski 1989.

Conclusion

Cross-cultural communication as a form of human interaction is a universal and fundamental driver of any society's development. Its study, through the proxy of material archaeological evidence, sheds light on a large variety of social processes and historical epochs. The European Bronze Age is an illustrative example of this. Increased connectivity, driven by migrations and exchange, led to the growth of diversity and dissemination of technological skills, innovation and wealth. But it also resulted in a more unequal distribution of goods, as only some people controlled important resources or critical parts of the networks. This caused stronger social stratification and the emergence of new hierarchies. In turn, the need to control resources created more potential for aggression and hostilities. The wide dissemination of different types of weaponry, presented in this article, reflects the highly interactive nature of warfare.⁶⁸ Weapons and methods of combat are shaped by constant competition between warring factions and any successful novelty is very likely to be rapidly adopted and spread over vast regions by 'warriors on the move'. At the same time, raising, organising and training armies to be proficient within a fighting system is an expensive effort in terms of resources, which leads to the arranged and standardized nature of weapons and fighting techniques. All of this is reflected in a booming weapons technology, the rise of warrior aristocracies and the luxurious lifestyles of Bronze Age elites – Europe's 'first Golden Age'.

The archaeological evidence for socio-political organisation, cultural boundaries, communication networks and the mobility of people, goods, technologies, and ideas provides a material base for rich interpretational frameworks. The following are some suggested hypotheses. (A) The artefact distribution patterns can best be explained by different spheres of interaction (trade and exchange, warfare, migrations, individual travelling, etc.), with different scales and different intensities. (B) The evidence indicates that flow from temperate Europe to Mycenaean Greece was stronger than the other way around. This suggests a significant socio-economic gradient. (C) The nature of the relations changed over time. Exchange and communication networks eventually allowed individual travels and direct contact. There seems no doubt that the motivations for travelling diversified, as did the strongly connected societies themselves.

68. Carman and Harding, eds., 1999; Otto et al., eds., 2000.

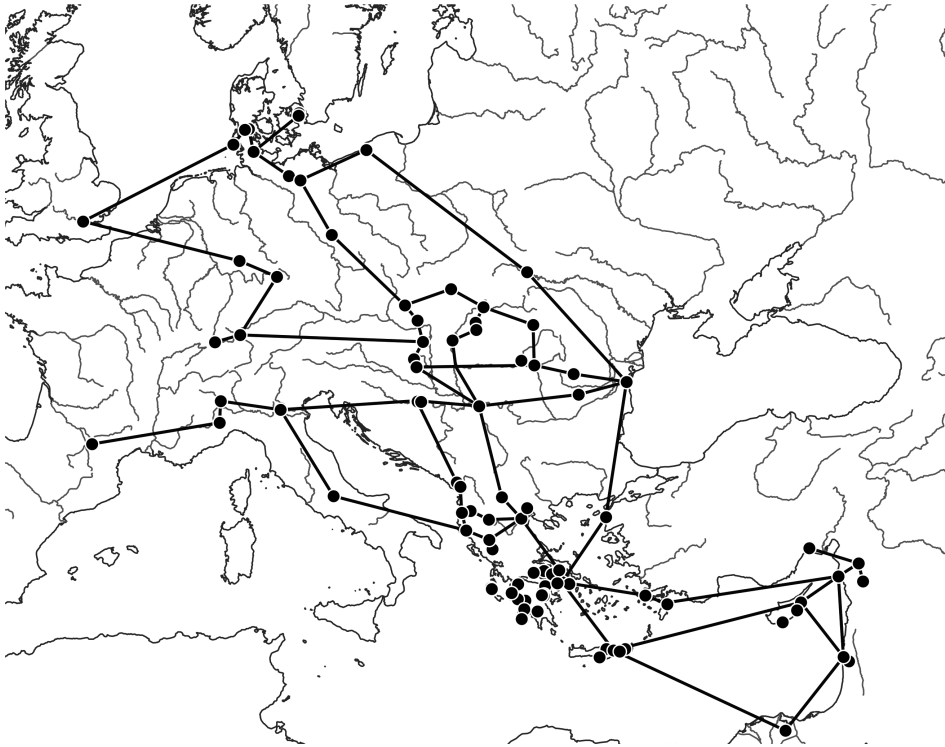


Fig. 3: Reconstruction of approximate communication networks, based on occurrences of Naue II type swords.

Fig. 3 presents a generalized and approximate reconstruction of the communication networks as supported by the distribution of the European swords of type Naue II, but also by finds of other metal weaponry, dress fasteners and jewellery. This reconstruction does not include all possible sites and connections; it shows only the most important routes between those centres with archaeological evidence of cross-cultural communication dated generally to 1300-1100 BC. It should be noted that geographical networks, such as road networks, have specific properties. They are physical networks that existed in the landscape and consisted of sites such as villages, towns and settlements, and the connections between them, such as roads, pathways or shipping routes. Objects, ideas and people moved (“flowed”) through these networks.

In contrast to social networks *sensu stricto*, the nodes (places) in such a topographically constrained network (i.e. its “configuration”) are largely stationary and their flow capacity (e.g. the number of travellers that can use a single road at the same time) fixed. This means that the role and importance of any place within such a network is determined (at least to a significant degree) by its geographic potential. Although the connectivity of places can be modified

(e.g. by constructing new roads), such changes require considerable investment of resources and with the ultimate limitation that a bad geographic location cannot be turned into a good one. It is important to keep this in mind when applying methods and perspectives of social network analysis that often assume “soft”, immaterial links between actors that are easily reconfigured.

In this respect, the structure of the network in Fig. 3 is largely determined by natural pathways such as rivers and navigable coasts, as well as barriers like mountain ranges and rugged coastlines. It appears that the flow of communication between temperate Europe and the Aegean went primarily via Italy and the western Adriatic or the Carpathian Basin and Black Sea region. Within mainland Europe, the river network favours North-South connections, but the Danube and its tributaries form the single most dominant link that crosses large parts of Europe from east to west.

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