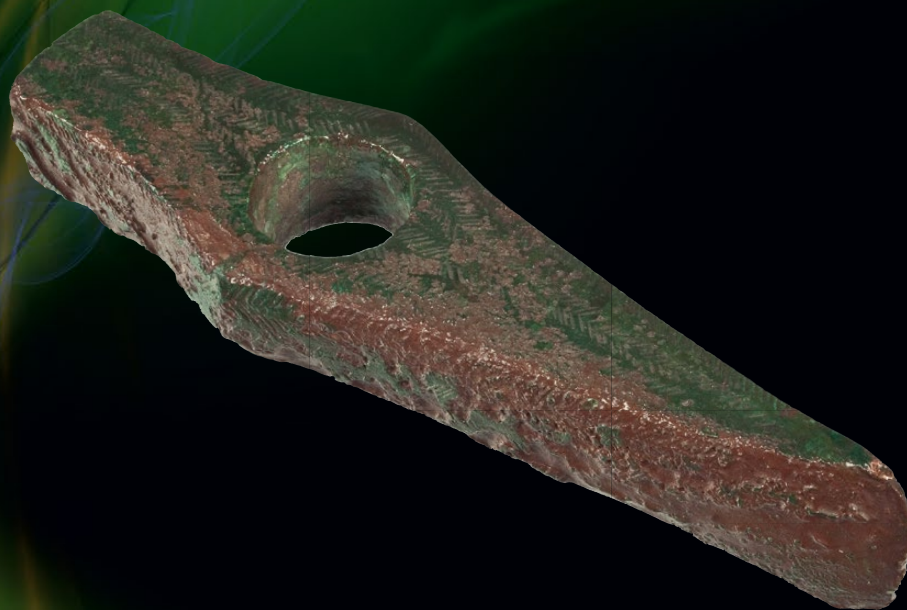




# The Rise of Metallurgy in Eurasia

Evolution, Organisation and Consumption  
of Early Metal in the Balkans



Edited by

Miljana Radivojević, Benjamin W. Roberts,  
Miroslav Marić, Julka Kuzmanović Cvetković  
and Thilo Rehren



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Inner back cover: Reconstruction of the world's earliest copper smelting. Green flames come from the extraction of metal from malachite. Experiments at Pločnik, Serbia (2013) - Marko Djurica

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*To the memory of Borislav Jovanović, our colleague, friend and inspiration*

*(1930 - 2015)*



# Contents

List of Authors .....	v
Foreword by Evgeniy N. Chernykh .....	xi
Foreword by Barbara S. Ottaway.....	xiii
Foreword by Stephen J. Shennan.....	xiv
Acknowledgements .....	xvii
<b>Part 1 Introduction .....</b>	<b>1</b>
<b>Chapter 1 The birth of archaeometallurgy in Serbia: a reflection.....</b>	<b>3</b>
Julka Kuzmanović Cvetković	
<b>Chapter 2 The Rise of Metallurgy in Eurasia: Evolution, organisation and consumption of early metal in the Balkans: an introduction to the project.....</b>	<b>7</b>
Thilo Rehren, Miljana Radivojević and Benjamin W. Roberts	
<b>Chapter 3 Balkan metallurgy and society, 6200–3700 BC .....</b>	<b>11</b>
Miljana Radivojević and Benjamin W. Roberts	
<b>Chapter 4 The Vinča culture: an overview.....</b>	<b>38</b>
Benjamin W. Roberts, Miljana Radivojević and Miroslav Marić	
<b>Chapter 5 Introduction to Belovode and results of archaeometallurgical research 1993–2012.....</b>	<b>47</b>
Miljana Radivojević	
<b>Chapter 6 Introduction to Pločnik and the results of archaeometallurgical research 1996–2011.....</b>	<b>60</b>
Miljana Radivojević	
<b>Chapter 7 Excavation methodology for the sites of Belovode and Pločnik .....</b>	<b>77</b>
Miroslav Marić, Benjamin W. Roberts and Jugoslav Pendić	
<b>Part 2 Belovode.....</b>	<b>81</b>
<b>Chapter 8 Belovode: landscape and settlement perspectives .....</b>	<b>83</b>
Miroslav Marić	
<b>Chapter 9 Belovode: geomagnetic data as a proxy for the reconstruction of house numbers, population size and the internal spatial structure .....</b>	<b>94</b>
Knut Rassmann, Roman Scholz, Patrick Mertl, Kai Radloff, Jugoslav Pendić and Aleksandar Jablanović	
<b>Chapter 10 Belovode: excavation results .....</b>	<b>108</b>
Miroslav Marić, Benjamin W. Roberts and Miljana Radivojević	
<b>Chapter 11 Belovode: technology of metal production.....</b>	<b>123</b>
Miljana Radivojević and Thilo Rehren	
<b>Chapter 12 Pottery from Trench 18 at Belovode.....</b>	<b>152</b>
Neda Mirković-Marić, Marija Savić and Milica Rajičić	

<b>Chapter 13 Chronological attribution of pottery from Trench 18 at Belovode based on correspondence analysis .....</b>	<b>170</b>
Miroslav Marić and Neda Mirković-Marić	
<b>Chapter 14 Belovode: technology of pottery production .....</b>	<b>186</b>
Silvia Amicone	
<b>Chapter 15 Figurines from Belovode .....</b>	<b>199</b>
Julka Kuzmanović Cvetković	
<b>Chapter 16 Ground and abrasive stone tools from Belovode .....</b>	<b>205</b>
Vidan Dimić and Dragana Antonović	
<b>Chapter 17 Bone industry from Belovode .....</b>	<b>215</b>
Selena Vitezović	
<b>Chapter 18 Chipped stone industry at Belovode .....</b>	<b>221</b>
Elmira Ibragimova	
<b>Chapter 19 Chemical and technological analyses of obsidian from Belovode .....</b>	<b>233</b>
Marina Milić	
<b>Chapter 20 Archaeobotanical evidence of plant use at the site of Belovode.....</b>	<b>236</b>
Dragana Filipović	
<b>Chapter 21 Animal remains from Belovode .....</b>	<b>249</b>
Ivana Dimitrijević and David Orton	
<b>Chapter 22 Belovode: past, present and future.....</b>	<b>259</b>
Benjamin W. Roberts and Miljana Radivojević	
<b>Part 3 Pločnik .....</b>	<b>263</b>
<b>Chapter 23 Pločnik: landscape and settlement perspectives .....</b>	<b>265</b>
Miroslav Marić	
<b>Chapter 24 Pločnik: geomagnetic prospection data as a proxy for the reconstruction of house numbers, population size and the internal spatial structure .....</b>	<b>271</b>
Knut Rassmann, Roman Scholz, Patrick Mertl, Jugoslav Pendić and Aleksandar Jablanović	
<b>Chapter 25 Pločnik: excavation results .....</b>	<b>281</b>
Miroslav Marić, Jugoslav Pendić, Benjamin W. Roberts and Miljana Radivojević	
<b>Chapter 26 Pločnik: technology of metal production.....</b>	<b>301</b>
Miljana Radivojević and Thilo Rehren	
<b>Chapter 27 Pottery from Trench 24 at Pločnik .....</b>	<b>317</b>
Neda Mirković-Marić, Marija Savić and Milica Rajčić	
<b>Chapter 28 Chronological attribution of pottery from Trench 24 at Pločnik based on correspondence analysis .....</b>	<b>345</b>
Neda Mirković-Marić and Miroslav Marić	
<b>Chapter 29 Pločnik: technology of pottery production .....</b>	<b>362</b>
Silvia Amicone	



<b>Chapter 30 Figurines from Pločnik</b> .....	375
Julka Kuzmanović Cvetković	
<b>Chapter 31 Ground and abrasive stone tools from Pločnik</b> .....	382
Vidan Dimić and Dragana Antonović	
<b>Chapter 32 Bone industry from Pločnik</b> .....	393
Selena Vitezović	
<b>Chapter 33 Chipped stone industry at Pločnik</b> .....	397
Elmira Ibragimova	
<b>Chapter 34 Plant use at Pločnik</b> .....	408
Dragana Filipović	
<b>Chapter 35 Animal remains from Pločnik</b> .....	422
Jelena Bulatović and David Orton	
<b>Chapter 36 Pločnik: past, present and future</b> .....	433
Benjamin W. Roberts and Miljana Radivojević	
<b>Part 4 The Rise of Metallurgy in Eurasia: a view from the Balkans</b> .....	437
<b>Chapter 37 Relative and absolute chronology of Belovode and Pločnik</b> .....	439
Miroslav Marić, Miljana Radivojević, Benjamin W. Roberts and David C. Orton	
<b>Chapter 38 The social organisation of the Vinča culture settlements. New evidence from magnetic and archaeological excavation data</b> .....	455
Knut Rassmann, Martin Furholt, Nils Müller-Scheeßel and Johannes Müller	
<b>Chapter 39 Belovode and Pločnik: site visibility and remotely sensed data</b> .....	460
Jugoslav Pendić	
<b>Chapter 40 Population size and dynamics at Belovode and Pločnik</b> .....	477
Marko Porčić and Mladen Nikolić	
<b>Chapter 41 Metallurgical knowledge and networks of supply in the 5th millennium BC Balkans: Belovode and Pločnik in their regional context</b> .....	484
Miljana Radivojević, Thilo Rehren and Ernst Pernicka	
<b>Chapter 42 The pottery typology and relative chronology of Belovode and Pločnik: concluding remarks</b> ..	528
Neda Mirković-Marić and Miroslav Marić	
<b>Chapter 43 Pottery technology at the dawn of metallurgy in the Vinča culture</b> .....	538
Silvia Amicone, Miljana Radivojević, Patrick Quinn and Thilo Rehren	
<b>Chapter 44 Belovode and Pločnik figurines in their wider context</b> .....	552
Julka Kuzmanović Cvetković	
<b>Chapter 45 Ground and abrasive stone tools from Belovode and Pločnik: concluding remarks</b> .....	556
Vidan Dimić and Dragana Antonović	
<b>Chapter 46 Bone tool technology at Belovode and Pločnik</b> .....	560
Selena Vitezović	

<b>Chapter 47 Chipped stone industries in the Vinča culture</b> .....	<b>564</b>
Elmira Ibragimova	
<b>Chapter 48 Geochemical characterisation of chipped stones from Belovode and Pločnik</b> .....	<b>566</b>
Enrica Bonato, Martin Rittner and Silvia Amicone	
<b>Chapter 49 Belovode obsidian in a regional context</b> .....	<b>570</b>
Marina Milić	
<b>Chapter 50 Plant consumption at Belovode and Pločnik: a comparison</b> .....	<b>574</b>
Dragana Filipović	
<b>Chapter 51 Evidence for animal use in the central Balkan Neolithic across the early metallurgical horizon: the animal remains from Belovode and Pločnik in context</b> .....	<b>585</b>
David Orton, Jelena Bulatović and Ivana Dimitrijević	
<b>Part 5 The Rise of Metallurgy in Eurasia and Beyond</b> .....	<b>599</b>
<b>Chapter 52 Balkan metallurgy in a Eurasian context</b> .....	<b>601</b>
Miljana Radivojević and Benjamin W. Roberts	
<b>Chapter 53 Where do we take global early metallurgy studies next?</b> .....	<b>619</b>
Benjamin W. Roberts, Miljana Radivojević and Thilo Rehren	
<b>Appendices</b> .....	<b>624</b>
<b>Bibliography</b> .....	<b>627</b>

## Chapter 4

# The Vinča culture: an overview

Benjamin W. Roberts, Miljana Radivojević and Miroslav Marić

This chapter reviews the archaeological evidence for the Vinča culture, the broader archaeological context for the majority of the metal production and metal artefacts extensively explored in Chapter 3, as well as for the sites of Belovode and Pločnik, whose investigation forms the core of *The Rise of Metallurgy in Eurasia* project. The chapter will provide a lengthy introduction to the current data and interpretations of the Vinča culture that are subsequently developed in far greater detail in the thematic overviews by many of the leading specialists in later chapters (Chapters 39–52). This monograph seeks to address, at least in part, the absence of a dedicated synthesis of the Vinča culture since Chapman's (1981) monograph (see Chapman 2020b for a critical reflection).

The concept of archaeological cultures remains problematic in European prehistory in terms of definition and interpretation, yet extremely resilient in the absence of comparable empirically orientated alternatives (Roberts and Vander Linden 2011). Due to competing national traditions of scholarship, the culture history groupings and terminologies are strikingly complex in the later prehistoric Balkans (Gori and Ivanova 2017; Tsirtsoni 2016a). As such, the chapter explores the historiography and complex debates that surround the archaeological and temporal definitions of the Vinča culture. The importance of the Vinča culture lies not only in the evidence of early metallurgy but also in the evidence for the expansion of material culture production and circulation, the intensification of agriculture and increase in sedentism and settlement growth, which are all subsequently reviewed. The chapter concludes by examining past and present interpretations of the communities who lived and died within what we now term the Vinča culture.

### Defining the Vinča culture

The Vinča culture is a Late Neolithic/Early Chalcolithic phenomenon, which lasted from c. 5350/5300 BC to c. 4500 BC across the northern and central Balkans and is fundamentally defined by ceramic types (Porčić 2020; Whittle *et al.* 2016). It occurs across a large area of the Balkans (Figure 1), which includes all of present-day Serbia, the Romanian Banat, Transylvania and parts of Oltenia, western Bulgaria, eastern Macedonia, eastern parts of Slavonia and Bosnia and the southern

Hungarian region of Baranya. Much of the general information about this culture is known from research by several national and international teams, starting with the seminal work of Vasić (1932–1936), but also Childe (1929), and many others (e.g. Borojević 2006; Chapman 1981; Fewkes 1936; Garašanin 1951, 1979; Gimbutas 1976a; Holste 1939; Jovanović 1971; Markotić 1984; McPherron and Srejović 1988; Orton 2008; Porčić 2009b; Renfrew 1970; Srejović 1963, 1984a; Srejović and Tasić 1990; Tringham and Krstić 1990a). Regarding the cultural historical surroundings, this phenomenon shows strong links with the contemporaneous Karanovo (phases III to Kodžadermen–Gumelnița–Karanovo VI) in Bulgaria, Precucuteni–Tripolye A in Moldavia and Ukraine, Dimini in Greece, and the late manifestations of the Starčevo culture and early Sopot culture in eastern Croatia.

The origins of the Vinča culture are still elusive; opinions on this issue have traditionally been divided between advocates of colonisation from Anatolia, based on typological parallels with the black burnished ware from this area (Childe 1929; Garašanin 1973; Jovanović 1962; Milošević 1949; Schachermeyr 1955) and proponents of local development (Chapman 1981; Kaiser and Voytek 1983; Leković 1990; Makkay 1990; Markotić 1984; Renfrew 1969, 1970; Srejović 1988; Todorova 1978; Tringham 1971). While the diffusionists' argument favours an external influence in explaining the origins of the Vinča culture, the 'autochthons' rely on the fact that the Vinča culture territory was culturally preceded by the Starčevo–Körös–Criș complex, and that there is strong evidence for local development of settlements, ceramic typology and stratigraphy. Whilst a major review of the existing radiocarbon dates highlights the rapid spread of the indicative biconical and black burnished ceramics throughout the Central Balkans, it takes neither side, and indeed seeks to move beyond these traditional and binary debates (Whittle *et al.* 2016). Furthermore, neither the north nor the south of the Vinča culture 'potscape' exhibit notably earlier dates (Whittle *et al.* 2016). More recently, Porčić (2020) reviewed the 'origins' evidence across the Balkans, with a particular emphasis on radiocarbon dates. He highlighted the earlier Western Anatolian evidence for black-burnished ware (Çevik 2018; Özdoğan 2011) and its presence in the eastern Balkans several centuries prior to c. 5300 BC. He also stressed the



Figure 1. The distribution of the Vinča culture (shaded) with Vinča sites (red dots) and later settlements (green dots) (Middle Chalcolithic). Prepared by J. Pendić and M. Marić.

significant increase in the settlement type and size from the flat (pit-) settlements, typically across 1–2 ha at Starčevo culture sites (though larger sites exist) to the rectangular wattle and daub settlement structures typically across 5–10 ha at Vinča culture sites. There are exceptions to this broader trend, with several Starčevo culture sites such as Nosa (Garašanin 1961) and Ludaš Budžak (Sekereš 1967) near Subotica and Zlatara near Ruma (Leković 1988) in Serbia and Szentgyörgyvölgy-Pityerdomb (Bánffy and Sumegi 2011) in Hungary also yielding evidence of wattle and daub structures. However, the radiocarbon dating evidence at least partially undermines evidence of settlement or ceramic continuities whilst the modelled radiocarbon dates indicate a demographic decline in the centuries prior to the emergence of the Vinča culture (Porčić 2020), albeit one that is not evident until several centuries later in the eastern Balkans. Whether this can, indeed, be related to any incoming population—as aDNA studies on small samples could suggest (e.g. Hervella *et al.* 2015; Mathieson *et al.* 2018)—remains to be seen.

The terminology of the Vinča culture is yet another matter of dispute, closely related to the acknowledgement of the scope of metallurgical activities within this archaeological culture. The majority of ex-Yugoslav archaeologists refer to the

Vinča culture as a Late Neolithic manifestation, while Bulgarian archaeologists acknowledge it as partly an Early Chalcolithic occurrence (e.g. Todorova 1978). However, Miložić (1949: 108) argued that the Vinča phenomenon was Chalcolithic (or Eneolithic) starting from the Gradac Phase, a view supported by Čović (1961: 127–128), and later by Garašanin (1994/1995: 17). On the other hand, Jovanović and Ottaway (Jovanović 1971; Jovanović and Ottaway 1976) shared the opinion that the entire culture was already a Chalcolithic phenomenon. The term ‘Late Neolithic’ for the Vinča culture nevertheless remained firmly established in the ex-Yugoslav literature, despite the fact that knowledge of the Vinča culture metallurgy has advanced since the last century (cf. Radivojević, *et al.* 2010 and literature therein). Whilst the authors would advocate for the use of the term ‘Early Chalcolithic’ for the entire Vinča culture, it is used throughout this monograph in conjunction with the Late Neolithic where necessary, with an intention to facilitate interconnections across various regional publications and excavation reports.

### Vinča culture chronologies

The chronology of the Vinča culture was initially established on the basis of ceramic typology (see detailed review and re-dating in Whittle *et al.* 2016) and

the stratigraphic sequence of the type-site Vinča-Belo Brdo which has recently been re-dated (Tasić *et al.* 2015, 2016a, 2016b). Of the abundant typological schemata (Berciu 1961; Chapman 1981; Garašanin 1951, 1979; Holste 1939; Lazarovici 1979, 1981; Lenneis and Stadler 1995; Menghin 1931; Milojević 1949; Parzinger 1993; Schier 1991, 1996, 2000), the most popular are those of Garašanin (1951) and Milojević (1949). Garašanin (1951) divided the Vinča culture into an early phase, Vinča-Tordoš (I and II) and a late one, Vinča-Pločnik (I, IIa, IIb), with an intermediate phase called 'Gradac' (Table 1) added later, in the mid-1970s (Garašanin 1979). The other major periodisation, introduced by Holste (1939) and further developed by Milojević (1949), was based on the use of alphabetical letters rather than sites (Vinča A-D with subdivisions). Milojević's periodisation is the preferred choice in this monograph, however sparingly used in agreement with the Garašanin's proposal. The spatial division of the Vinča culture has also been the subject of debate with several regional and local groups defined across its extent. Of these, the most widely used conventional division is that of Garašanin (1951) who identified seven regions with different lifetimes (classical, South-Moravian, Kosovian, East-Bosnian, Transylvanian, Oltenian and Srem-Slavonian).

Early Vinča pottery reflects a combination of three distinct ceramic traditions: northern with incised band

decoration (LBK and Moldavian-Ukrainian complex), southern (Anatolian- Balkan) with dark burnished ware, and a local background of impressed and barbotine of the Starčevo culture (Chapman 1981: 53; Garašanin 1951: 63; Milojević 1949: 106; Schachermeyr 1955). This is also reflected in the appearance of ceramic types with no immediate predecessors from the previous period. However, some ceramic styles, such as coarse ware (with impressed, incised or barbotine decoration) and painted ware, are well grounded in the preceding Starčevo culture, and continue to be used throughout the early sequences of the Vinča culture (Chapman 1981; Schier 1996). The early Vinča culture (Vinča A-B1) also saw the emergence of the black burnished ware style, typical throughout its sequences in black-topped (Figure 2a), black-burnished and black-polished varieties (Figure 2b) (Chapman 1981; Garašanin 1951).

Vessel shapes in the early Vinča phases (Vinča A-B1) are characterised by biconical bowls, some of which are pedestal, and carinated bowls with longer detached rims, usually decorated with shallow channelling technique and incised decoration-ribbons often filled with round points made using a sharp tool (Figure 3a) (Schier 1996). The most dramatic change in vessel shape and decoration is observed at the beginning of the Gradac Phase (Vinča B2-C1): among the many new forms are tri- or four-partite vessels with cone-

Table 1. Overview of alternative typological schemes for Vinča ceramics (after Schier 1996; Whittle *et al.* 2016; Figure 2).

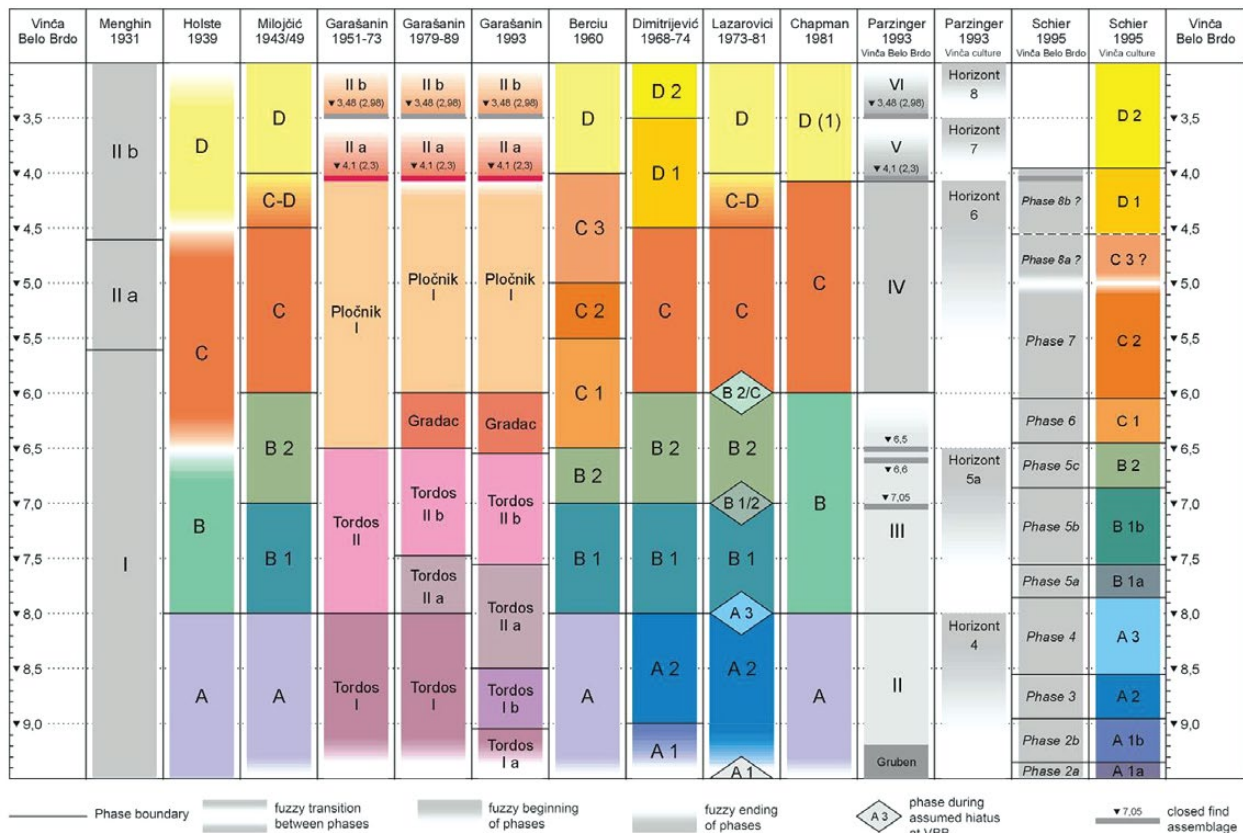




Figure 2. Vinča culture pottery: a) a black-topped 'fruit stand' (early Vinča); b) a black polished three-legged bowl (late Vinča C-D); after Nikolić 2008: Cat. 166, 176).

Figure 3. Vinča culture pottery: a) an amphora decorated with incised ribbon; b) a shallow channelled amphora (after Nikolić 2008: 261, 264).

shaped necks and protruding shoulders, and the so-called Gradac dishes: conical bowls with thickened rims channelled on the interior (Schier 1996). These shapes also occur throughout the later Vinča phases (Vinča C–D). Beside vessel shapes, this change is also visible in the decoration methods and motifs, with a decline in incised ribbons filled in with points made with a sharp tool, sporadically replaced by stamped, rounded dents. Bi-chromatic, rainbow and black topped vessels disappear from assemblages, and the dominant decoration technique gradually becomes channelling, polishing and burnishing (Figure 3b).

From the late 1970s, more radiocarbon dates became available (Breunig 1987; Ehrich and Bankoff 1992; Lenneis and Stadler 1995; Obelić *et al.* 2004; Renfrew 1969; Schier 1996, 1997, 2000; Srdoč *et al.* 1975, 1977, 1987) which, in recent years, have culminated in a major critical review and modelling of existing radiocarbon dates for Vinča ceramics (Whittle *et al.* 2016) supported by the extensive sampling, radiocarbon dating and Bayesian modelling of the type site sequence at Vinča-Belo Brdo (Tasić *et al.* 2015, 2016a, 2016b) and Uivar, Romania (Draşovean *et al.* 2017). This significantly expanded database of radiocarbon dates has

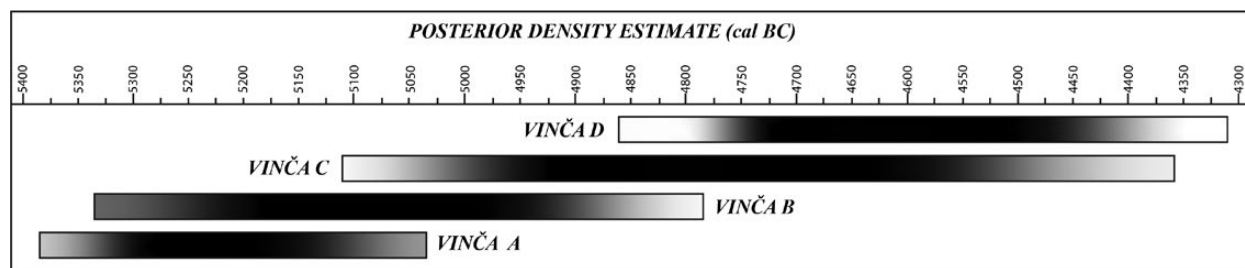


Figure 4. Schematic diagram showing the currency of the different phases of Vinča ceramics proposed by Miložić (1949). The darker the shading the more probable that a ceramic phase was present in a particular 25-year period. (Derived from Model 1). (Whittle *et al.* 2016; Figure 37)

subsequently enabled demographic modelling (Porčić 2020). Whittle *et al.* (2016) place the start of the Vinča A phase (as exemplified with the type site of Vinča-Belo Brdo at c. 5400/5300 BC, while Vinča B starts around 5200 BC. The highest probability end date for Vinča B1 is c. 5000/4950 BC, which marks the beginning of the Gradac Phase. The Gradac Phase was an episode between Vinča B and C, probably lasting for 50–100 years, at least at the site of Vinča-Belo Brdo. Vinča C ended in c. 4850/4800 BC, while the end of the Vinča culture falls around 4500 BC (Figure 4). The re-dating of the entire sequence at Belovode and Pločnik—which, as sites, span the entire Vinča culture—by *The Rise of Metallurgy in Eurasia* project enables further refinements to the overall Vinča culture chronology as presented in Chapter 37.

Traditional theories on the disappearance of the Vinča culture relate to violent encounters with communities related to the Bubanj-Saluța-Krivodol (BSK) cultural complex from Oltenia, or the bearers of the Baden culture (Garašanin 1979: 204–205) as evidenced by the widespread burning and apparent abandonment of major settlement sites. This transition to Middle Chalcolithic (or mid-5th millennium BC), marked in culture-historical terms by the Bubanj-Sălcuța-Krivodol (BSK) group in southern and central Serbia and Tiszapolgár and Bodrogkeresztúr group finds on the edge of the Pannonian plain and in the river valleys of Sava and Danube tributaries, appears to be a highly dynamic process. However, the period remains relatively poorly understood and the core debate over changes or continuities in settlement practices needs to be addressed in more detail.

The first point to consider is what settlement activity can be identified. As Ristić-Opačić (Ристић-Опачић 2005) demonstrated in her analysis of Vinča settlement topography and chronology, the Vinča D phase has the lowest number of newly formed settlements identified. Yet rather than representing a straightforward decline in past settlement activity, this trend is largely the product of archaeological excavations concentrating overwhelmingly upon earlier, established settlement sites that have a prolonged existence. Those settlements dating to the second half of the 5th millennium BC have

been less extensively excavated and dated compared to earlier settlement sites. Given that, on current evidence, the mid-5th millennium BC onwards in the central Balkans frequently sees the construction of new, single phased settlements primarily being founded away from existing Vinča culture sites, as demonstrated in the area of Mačva in western Serbia (Tripković and Penezić 2017), it is easy to see how the shift towards a less archaeologically visible settlement activity could be incorrectly interpreted as abandonment or collapse.

The Late Vinča D site of Crkvine, near Mali Borak provides a potentially instructive case study. It consists of a series of spaced wattle and daub structures on a hillock with steep sides above a local stream, a tributary of Kolubara River in western Serbia (Marić 2011), representing a broader shift from river terraces to more elevated terrains which are far less visible in the landscape to archaeologists, creating the false impression of little or no settlement activity. Neither should it be assumed that this period comprised only small-scale settlements with sites such as Stubline near Obrenovac (Crnobrnja 2014) and Drenovac near Paraćin (Perić *et al.* 2016) showing clear evidence of the aggregation of inhabitants with several hundred wattle and daub structures visible in geomagnetic surveys, albeit in a rather different spatial organisation.

The second point to consider is evidence of settlement continuity. Given the underlying culture-historical framework of the settlement debate, an important starting point is the mid- 5th millennium BC settlement of Kalenić Livade in western Serbia which comprises a single wattle and daub rectangular structure with a mixed ceramic assemblage that ranges from BSK to Tiszapolgár and Bodrogkeresztúr and evidence of a settled farming economy (Blagojević 2005; Trbojević 2005). This highlights not only the intensive contacts between various communities of the region (Parkinson *et al.* 2004) but also the problematic issues with defining them by their pottery. In terms of settlement activity, Vinča continuities can be seen at sites such as Bubanj-Humska Čuka (Bulatović and Milanović 2020; Bulatović *et al.* 2018) and potential continuities at Bodnjik-

Družetić (Živanović 2013). Even at the site of Vinča-Belo Brdo, Bodrogkeresztúr graves have been recovered succeeding the Vinča settlement activity (Jevtić 1986). When considered from a broader Balkan perspective and beyond, settlement continuities throughout the second half of the 5th millennium BC at multi-layered sites in Bulgaria and the Pannonian Plain are well documented (Porčić 2019a) as are settlements in caves and other naturally and otherwise protected locations across eastern Serbia and western Bulgaria (e.g. Borić *et al.* 2018, Merkyte 2005; Nikolov 1975; Nikolov 1984). It is clear that a more detailed evaluation of the settlement evidence undermines the traditional explanations of Vinča collapse and/or conquest during the mid-5th millennium BC, thus reflecting the broader trends in Neolithic-Chalcolithic Balkan scholarship (Porčić 2019a; Tsirtsoni 2016b), but far more research is required to explain the transformations that occurred.

### *The Gradac Phase*

The Gradac Phase (Vinča B2–C1) is of particular interest in defining the Vinča culture, as it marks the change in material culture, settlement activity and, most importantly here, pyrometallurgical activities. Garašanin (1990: 12–15, 1973: 103, 1979: 152) inserted this phase between Vinča- Tordoš IIb (B2) and Vinča- Pločnik I (C1) (▼6.5 m–▼6.1 m) in the type-site, admitting, however, that it did not separate as well in the classical Vinča culture as in its southern variants. The appearance of the Gradac Phase, although not immediate across the whole Vinča culture, is marked with the house destruction horizon in several sites, an increased number of settlements erected at more dominant positions, intensification of elaborated monumental figurine production as well as introduction of new pottery forms (Garašanin 1991). Jovanović's (1994) subsequent periodisation of the later Vinča culture phases is noteworthy as it builds on the significance of the Gradac Phase, dividing it into three sub-phases confined to the Morava valley, namely Gradac I–III. Gradac I is synchronised with Vinča B2/C1, as exemplified by Rudna Glava and associated pottery hoards (Vinča B2/C1). Gradac II relates to the disappearance of the Vinča culture further in the Danube basin and the final settlement horizon in Divostin (Vinča C2, D1–2). Gradac III is associated with the longer-surviving southernmost areas of the Vinča culture and its Kosovian variant in southern Serbia.

The most distinctive traits of the Gradac Phase material culture are ceramic plates with a thickened rim, single-handled carinated jugs, so-called Vidovdanka figurines (Figure 5), voluminously modelled and with a polygonal face, triangular ceramic altars with deer or ram heads (Figure 6) and the introduction of graphite-painted pottery (Garašanin 1979: 174). Todorova (1978: 30) related metallurgy in Thracian Bulgaria to the expansion of

the graphite painting of black burnished pottery. This technique created a silver-like surface brilliance, thus potentially resembling the lustre of metal objects (Chapman 1981: 138; Chokhadzhiev 2000: 97; Schachermeyr 1955: 133). Graphite painting, as well as the crafting of the black burnished ware long thought to be connected to early metallurgy (Gimbutas 1976a; Renfrew 1969), required mastery in controlling firing conditions, in which Vinča potters were exceptionally skilful. The darker fabric pottery was fired in a reducing atmosphere between 700° and 900° C, while both reducing and oxidising atmospheres were combined to attain a multicoloured effect (such as black-topped pottery) (Goleanu *et al.* 2005: 945; Varvara *et al.* 2008: 10). The ceramic pyrotechnologies of the Vinča culture are addressed in detail in Chapters 14, 29 and 43 whilst the inter-dependence of metal and ceramic technologies is explored in Chapters 43 and 52. The discovery of the early mining site of Rudna Glava along with new forms of Vinča pottery (Jovanović 1982) convinced Garašanin to acknowledge the Gradac Phase as the beginning of mining activities and hence the Early Chalcolithic within the Vinča culture (Garašanin 1994/1995: 17) (see also Chapter 1).

The nature and extent of the cultural change that marked the beginning of the Gradac Phase has not been studied thoroughly, let alone the reasons for its varying magnitude across the Vinča culture. The most intensive changes in material and settlement activity during this phase were exhibited in the southern variants of the Vinča culture, the south-Moravian and Kosovian (Jovanović 2006: 222; cf. Vasić 1911), which led some scholars to believe that the Gradac Phase was a short-lived phenomenon of a merely typological character. However, as noted above, Jovanović identified three distinctive stages of the Gradac Phase, based on the longer lifetime of Vinča culture sites south of the Danube and along the Morava Valley (Jovanović 1994). Gradac Phases I–III also follow the development of the Vinča culture metallurgy, starting with the mining activities in Rudna Glava and intensifying with the settlement production of massive copper implements, as seen in Divostin and Pločnik.

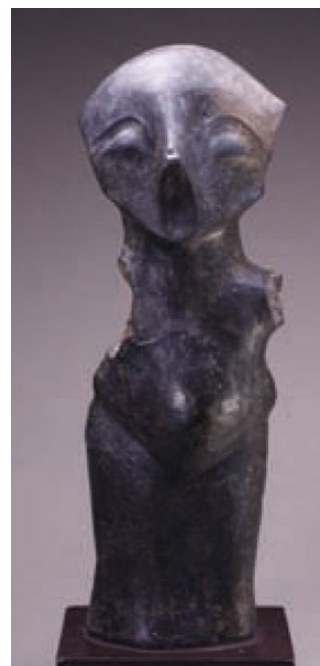


Figure 5. The Vidovdanka, discovered at Vinča-Belo Brdo (after Nikolić 2008: 222).





Figure 6. A triangular ceramic 'altar' with deer or ram head (after Nikolić 2008: 172, Figure 68).

In the wider region, in terms of relative chronology, the Gradac Phase is contemporary with the following cultures: Maliq Ia, Gradeshnitsa III A-B, Poljanica, Sava, Vidra (Boian III), Pre-Cucuteni I, Hamangia III, Maritsa V, Dikili Tash II, Paradimi IV, classic (late) Dimini, Sitagroi II, Szakalhat, Tisza (transition), Sopot B and Źeleziowce (Garařanin 1994/1995: 15–16). In terms of broader interconnections beyond metallurgy, the typical Gradac one-handed jugs are found as far as east Bulgaria (Durankulak) or the Turkish Thracian coast (Toptepe) (Jovanović 2006: 223–224; cf. Özdoğan and Dede 1989: 22–23) whilst the triangular altars (?) with ram heads also occur in central Bulgaria and the lower Danube (Gimbutas 1976b: 88–89). Jovanović (2006), unlike Garařanin (1994/1995), thought that the metallurgy was the driving force behind the Gradac Phase and accompanying cultural changes in the region; however, both agreed that its origins should be sought in the 5th millennium BC cultures of the north Balkans. This debate over the relationship between early metallurgy and the Gradac ceramic phase is addressed in Chapter 52.

### Vinča settlement and subsistence

The evidence for settlement in the Vinča culture comprises the pit structures (Bogdanović 1988; Marić and Mirković-Marić 2011) and wooden framed, wattle and daub houses above the ground in larger settlement sites with longer durations of occupation. Whilst the

shape and size of pit structure can vary significantly, at both the Vinča tells and flat settlements, the houses are rectangular or squarish in shape with visible internal organisation (Tripković 2009a). The structures were usually up to c. 10 m<sup>2</sup>, with occasional ancillary structures (>10 m<sup>2</sup>) (Chapman 1981: 60; cf. Cook 1972). Inside the settlements, a food preparation area is usually located around thermal structure and silos (Borojević *et al.* 2020), while spaces for practicing crafts are commonly found both inside houses and in the outer yards (Chapman 1981: 63–68). The evolution in size is noticeable over time, with houses evolving into 100 m<sup>2</sup> multi-roomed constructions at the sites of Gomolava and Divostin (cf. Brukner 1980; McPherron and Srejović 1988; Porčić 2009a, 2019b).

The usual settling location for the Vinča culture groups were river terraces or plateaux, hillocks in waterlogged landscapes, or hill slopes near streams; dominant

hillfort settlements are rare as they are mostly associated with the later phase of the period and less traversable terrains (Garařanin 1979). The Vinča culture communities inhabited a wide variety of soil types, from highly arable locations to seasonally flooded ones (Chapman 1981: 84–116). The overlapping of buildings resulted in tell-type sites, as seen at Vinča-Belo Brdo (Tasić 2005; Vasić 1932–1936) or Gomolava (Brukner 1980; 1988). However, these are rare, as most multi-layered Vinča period sites do not show the typical traits of tells, i.e. a prominent mound-like central area surrounded by thinner archaeological layers. Rather, Vinča culture sites tend to be horizontally dispersed settlements, as is the case with the 'open' flat type of Selevac (Tringham and Krstić 1990a) or Pločnik (Grbić 1929; Šljivar and Kuzmanović Cvetković 1998a).

There has been considerable debate concerning the spatial scale of settlements with the seminal analysis by Chapman (1981) identifying three groupings: 1.0–1.9 ha; 4.0–4.9 ha and 20–29 ha with accompanying estimations of populations of 50–300, 200–500 and 1200–2500 people respectively. The conclusion was that Vinča culture settlement sites were agricultural villages whose expansion was limited by their food production capabilities. As highlighted in the magisterial survey across southeast Europe by Lichter (1993), excavations and surveys had revealed relatively little about the spatial organisation of settlements in the region which naturally limited the critical evaluation of Chapman's

(1981) conclusions. In the decades since, these debates have been re-invigorated by extensive geophysical surveys of the frequently burnt houses at Vinča culture settlement sites, notably at Crkvine-Stubline (Crnobrnja *et al.* 2009), Drenovac (Perić *et al.* 2016) and Bordjoš (Medović *et al.* 2014); by geophysical surveys at contemporary and comparable settlements sites across southeast Europe (see review in Chapter 38); and by more sophisticated methodological approaches (e.g. Porčić 2012a, 2019a, 2019b) (see Chapter 40) with the conclusion that larger settlements such as Divostin, Belovode, Pločnik, and probably Vinča-Belo Brdo, may have had populations of c. 1000 people but probably fewer than c. 2000 people (Porčić 2019a).

Scholarly understanding of the subsistence strategies of the communities of the Vinča culture have traditionally been limited by the rarity of excavation recovery strategies, such as sieving, that would enable archaeobotanical and zooarchaeological remains to be identified and interpreted (see Chapters 20–21, 34–35, and 50–51). Even with the more widespread adoption of improved fieldwork methods, there are still relatively few sites from which to extrapolate broader food production trends (Borojević 2006; Filipović and Tasić 2012). Vinča communities grew domesticated crops such as einkorn, emmer, barley, lentil, pea and flax/linseed (see Chapters 20, 34, 50) and reared domesticated animals such as cattle, pig, sheep and goats (see Chapters 21, 35, 51). The higher proportion of cattle in settlements, particularly males, suggests the importance of cattle possession in terms of wealth, while their symbolic role is indicated by the so-called ‘bucrania shrines’ (Orton 2008; Tripković 2007).

Wild plants such as edible fruits and nuts were gathered and wild animals such as red and roe deer were hunted. Crops were stored in ceramics, storage pits and potentially organic bags at settlement sites (Filipović *et al.* 2018). The main evidence for salt production comes from Gornja Tuzla in east Bosnia, located a few kilometres away from a rich rock-salt mine. Here, conical coarse ware with elongated feet appeared only in the Vinča culture sequence and were presumably related to the salt production (Benac 1961: 50 ff.; Čović 1961: 90, 115–116). Whilst the evidence for subsistence practices varies slightly in terms of proportions and occasionally species across different sites, the overwhelming trend in food production and consumption is one of continuity throughout the duration of the Vinča culture.

### **Vinča craft production**

Craft production in the Vinča culture has frequently been debated in terms of an increase in standardisation and specialisation, an increased diversity in the forms and materials involved, and an increase in quantity (Earle 2018; Tringham and Krstić 1990a; Vuković 2011; Vuković 2020). Scholarship has traditionally

concentrated on widely discovered inorganic materials such as ceramics (Amicone *et al.* 2019, 2020; Spataro 2018), polished stone, obsidian, flint (Antonović *et al.* 2005; Antonović 2003; Milić 2015; Šarić 2015), and metal (Radivojević *et al.* 2013 and literature therein; Radivojević *et al.* 2010a) (see Chapters 11, 14, 16, 18, 19, 26, 29, 31, 33, 41, 43, 45, 47–49). Recent research has also transformed understandings of organic materials such as bone (Vitezović 2013b, 2018; Vitezović and Antonović 2020) (see Chapters 17, 32, 46) and shell (Windler 2018). Yet despite the emphasis on craft specialists and specialisation, many scholars have concluded, after fairly exhaustive research, that the majority of the forms and technologies associated with their particular material were likely to have been widely known and practiced and were therefore not made by highly specialised craftspeople (Amicone *et al.* 2020; Kaiser and Voytek 1983). Experimental archaeological reconstructions have enabled a clearer understanding of the processes involved, with a firing experiment showing that the entire range of pottery found at Vinča sites could be produced without using a proper kiln (Svoboda *et al.* 2004/2005; Vuković 2018a). The identification of a specialised craft ‘workshop’ in any material is, perhaps unsurprisingly, a rarity.

The importance of colour in Vinča craft production and material culture has been consistently highlighted over the last two decades (Chapman 2011). Whether evidenced in the selection and extensive continued use of white coloured materials for tools and ornaments in stones such as quartz and magnesite or bones and shells (Antonović 2003; Vitezović *et al.* 2017) (see Chapters 16, 17, 31, 32, 45, 46), or the consistent selection of green and black copper-rich ores for both copper and tin bronze metallurgy (e.g. Radivojević and Rehren 2016; Radivojević *et al.* 2013) (see Chapters 11, 26, 41), or the pale yellow, grey or black shades of ceramics created through different firing conditions (Amicone *et al.* 2020; Chapman 2006) (see Chapters 14, 29, 43), the colourful aesthetics in craft materials were evidently important. This is certainly not unique to the Vinča culture. The pre-existing networks of long-distance circulation via rivers in the central Balkans of *Spondylus/Glycymeris* shells from the Aegean (Bajnóczi *et al.* 2013; Dimitrijević and Tripković 2002; Windler 2018, 2019) and obsidian from the Carpathian Basin (Milić 2015; Tripković and Milić 2008) (see Chapter 19, 49) are also strongly evident in the earlier phases of the Vinča culture. The subsequent identification of similar networks in copper across the central Balkans and beyond (Radivojević and Grujić 2018) (see Chapter 2) implies at least a partial continuity in these inter-connections.

### **Interpreting Vinča culture communities**

The communities who comprised what archaeologists now term the Vinča culture were farmers living in settlements that, at certain sites, had a population of

more than 500 but fewer than 2000 (Porčić 2019a) (see Chapter 40). There is no evidence for any proto-urbanism (Gaydarska *et al.* 2020) nor specialised military, religious or administrative centres, thus reflecting the broader Balkan area during the Neolithic-Chalcolithic Age (Chapman 2010; 2020a; Lichter 2014; Porčić 2019b; Reingruber 2014). The existence of larger buildings at settlements has generated considerable debate concerning their potential as the residence of elites (Chapman 2010; Lichter 2014).

It is difficult to evaluate any interpretations of social hierarchies against the evidence for the funerary record as there are only two known cemeteries for the entire Vinča culture, one at the early Vinča site of Botoš (Marinković 2010) and burials at the late Vinča settlement at Gomolava (Stefanović 2008a). Both exhibit indications of differentiation among buried individuals, in terms of grave goods and sex respectively (Grbić 1934; Milleker 1938; Stefanović 2008b). Single skeleton or cremation burials, including also partial findings of human skulls or a mandible, have been found at Vinča, Potporanj (Garašanin 1979), Parța (Lazarovici *et al.* 2001), Pločnik (Bogosavljević *et al.* 2019) and Belovode (Šljivar *et al.* 2006). Recent analysis of the Gomolava individuals indicated the possibility of a kin relationship among buried individuals (Čuljković *et al.* 2002; Stefanović 2008b: 97). The social interpretation of these burials is potentially important with differences between individuals indicated by the grave goods. The placing of a malachite bead necklace as a grave good in a child's burial indicates a social position designated by birth rather than age. Similar patterns have also been identified, albeit with far more extensive funerary evidence, in contemporary cemeteries in northeast Bulgaria (Lichardus 1988: 93–100). This interpretation, although based on a limited number of analyses, could be significant for our understanding of the Vinča culture society.

Human representation is far more extensively evidenced than human burial in the Vinča culture. The evolution of figurines can be followed in relations to face shaping: from triangular in the early periods, polygonal in the Gradac Phase, to ornitomorphic in the later phases (Garašanin 1979; Gimbutas 1982; Hansen 2007). Figurine production reached its culmination, and hence the greatest variety, during the Gradac Phase, and then slowly decreased in quality in the later Vinča periods (Garašanin 1979; Tasić 2008a). In terms of function, figurines are described as votive offerings for deities (Gimbutas 1982) or fertility symbols (Letica 1964), although the concept of an 'Earth Mother' is disputed by some authors (Tasić 1973; Ucko 1969).

The evidence for weaponry and human conflict in the Vinča culture remains ambiguous (Chapman 1999a), partially as a result of the very limited evidence of funerary practices. The majority of excavated Vinča culture settlements do have evidence for extensive burning and many had large ditches constructed at their boundaries. However, this does not necessarily support interpretations of inter-group tensions (cf. Müller 2012). Experimental replications indicate that house burning could not have occurred without a significant investment in labour, which indicates a deliberate and potentially ritual act (Chapman 1999b, 2020b; Lichter 2016; Stevanović 1997).

The extensive scholarly and political debates over the existence of a Vinča culture script based on incised markings on ceramic sherds has been analysed in considerable depth by many authors such as Winn (1981), Starović (2004, 2005) and Merlini (2005). Yet, the evidence and logic of interpretations has recently been argued to be questionable (Porčić 2019a). This does not, however, diminish the importance of the repetitive appearance of a designated set of incisions in clay (on pots or figurines) throughout Vinča culture settlements, which remains a subject of continuing interest.

Over the last 40 years, the interpretation of Vinča culture communities has been re-evaluated from their culture-historical origins as a representation of a people by a wide range of scholars, primarily from the Balkans, Germany, America and Britain, who span many theoretical approaches (Chapman 2020b; Chapman and Souvatzi 2020; Porčić 2019a). There are recurring themes across the different approaches, such as identity, inequality, (subsistence) economics, (long distance) exchange and social complexity. The intellectual breadth of scholarship encompassing the Vinča culture communities means that the social agency of fragmentation and circulation patterns in artefacts, as innovatively and influentially proposed and evaluated by Chapman (2000; 2020a) and Chapman and Gaydarska (2007), co-exists with the evaluation of inequalities with the nuanced and highly stimulating application of the Gini coefficient model (Porčić 2019a). The modelling of settlement location selection in the landscape by individual Vinča farming communities (Marić 2017) can be complemented by the modelling of potentially related house orientations across the Vinča and Linearbandkeramik culture areas, which together almost span the breadth of continental Europe (Hofmann and Müller-Scheeßel 2020). This diversity of approaches and perspectives means that there is no single vision for what the Vinča culture represents in terms of the communities who lived and died in the central Balkans for the duration of this phenomenon.

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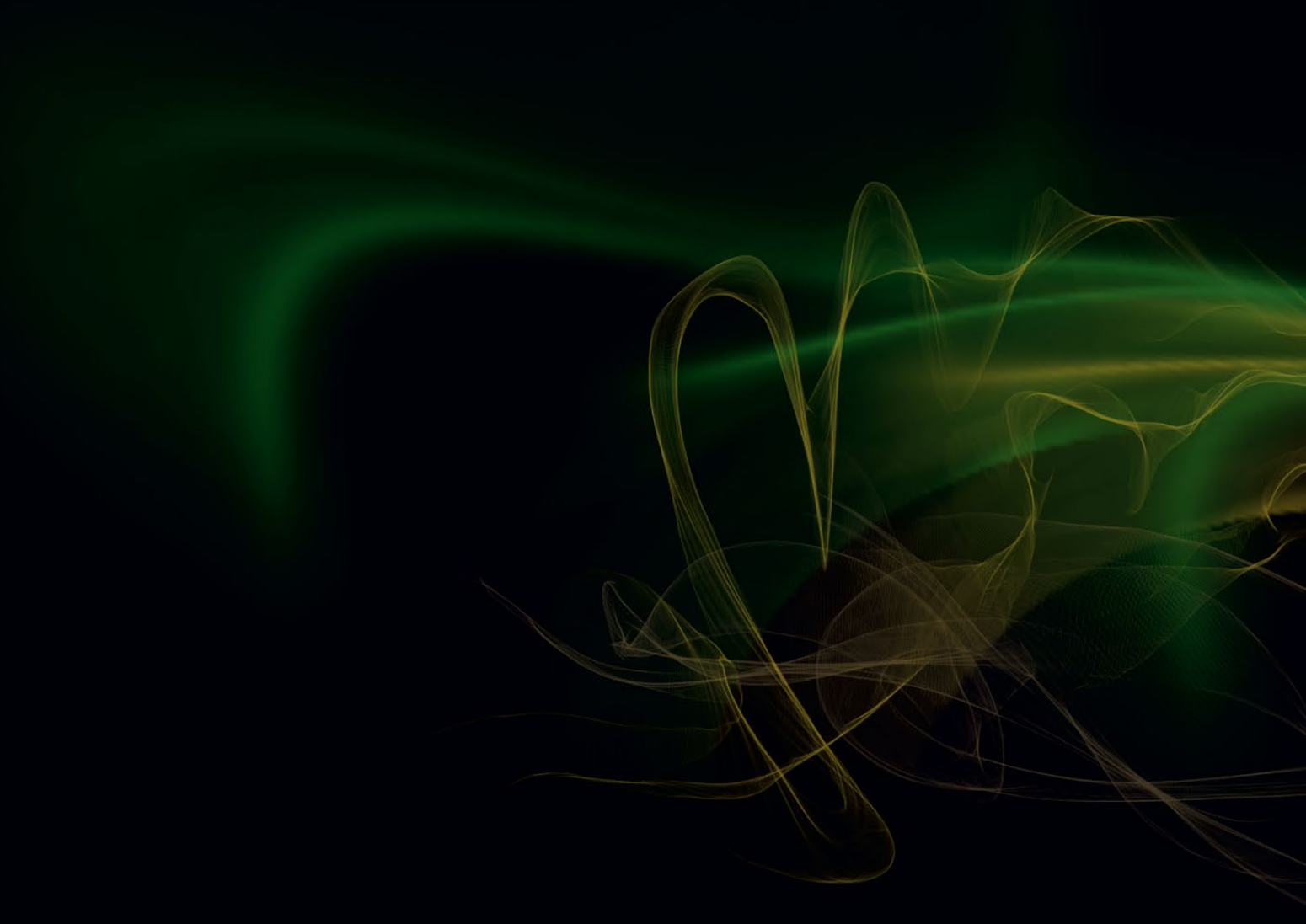
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*The Rise of Metallurgy in Eurasia* is a landmark study in the origins of metallurgy. The project aimed to trace the invention and innovation of metallurgy in the Balkans. It combined targeted excavations and surveys with extensive scientific analyses at two Neolithic-Chalcolithic copper production and consumption sites, Belovode and Pločnik, in Serbia. At Belovode, the project revealed chronologically and contextually secure evidence for copper smelting in the 49th century BC. This confirms the earlier interpretation of c. 7000-year-old metallurgy at the site, making it the earliest record of fully developed metallurgical activity in the world. However, far from being a rare and elite practice, metallurgy at both Belovode and Pločnik is demonstrated to have been a common and communal craft activity.

This monograph reviews the pre-existing scholarship on early metallurgy in the Balkans. It subsequently presents detailed results from the excavations, surveys and scientific analyses conducted at Belovode and Pločnik. These are followed by new and up-to-date regional syntheses by leading specialists on the Neolithic-Chalcolithic material culture, technologies, settlement and subsistence practices in the Central Balkans. Finally, the monograph places the project results in the context of major debates surrounding early metallurgy in Eurasia before proposing a new agenda for global early metallurgy studies.