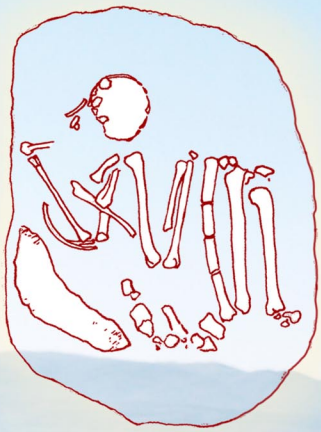
Darko Stojanovski

GRNČARICA



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A CONTRIBUTION TO THE EARLY NEOLITHIC PUZZLE OF THE BALKANS

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CONTENTS

PREFACE AND ACKNOWLEDGMENTS

The following text summarizes the analyses carried out mainly in late 2011 and early 2012, in the frameworks of the Erasmus Mundus International Master in Quaternary and Prehistory research project. Even though in its original English language, the publication of the thesis in Macedonia is long overdue. For this, I am sincerely grateful to Goce Naumov and the team at CPR. Since 2012 we have witnessed advances in many aspects of the Neolithic archaeology of the Balkans. As far as Grnčarica is concerned, however, my assessment of the pottery was the last advance in the study of this important Neolithic settlement. For this reason, I have decided to publish these results in their original form from 2012, without significant modifications.

Several people and institutions made significant contribution in the process. Before and above all, I would like to thank my mentors Marta Arzarello and Trajče Nacev for sharing their experience and knowledge and for having the patience to go through the project. The Master thesis was financially supported by a scholarship awarded by the EACEA through the Erasmus Mundus program. Gratitude is also due to Zoran Čitkušev (then director of the Museum in Štip) and his team for providing some field documentation and making the material available for study. I have benefitted, personally and professionally, from the companionship of countless friends and colleagues encountered during my two-year archaeological journey through Italy, Portugal and the Philippines. I thank them all.

Finally, I extend my greatest gratitude to Stefanija, Stole, Svetlana and Mite for their help, support and trust.

CHAPTER 1: INTRODUCTION

1.1 The Neolithic: what, when, where and why?

Neolithic (meaning *new stone*) is a rather simple term standing for an incredibly complex and dynamic process which incorporates all segments of human life. The term itself was introduced in the north European archaeology to distinguish the polished stone collections from the more ancient chipped stone (or Palaeolithic) assemblages (Renfrew 2006). Today we know that the Neolithic is much more than a change in stone tool technology. The Neolithic is probably one of the most important transformations in human socio-economic and cultural development, expressed through changes in social organisation (sedentism), food production (agriculture) and technology (pottery production). But the most important transformation was the change in the human mind; their perception of what surrounded them and their interaction with nature, shifting from passive to pro-active (even interfering) agents. It is one of the last true milestones on the cognitive road towards today. Neolithisation was the prelude to urbanisation, civilisation and the modern globalisation. Today, the way in which we perceive the Neolithic is as dynamic as it was the process itself. Even though the basic concepts of the Neolithisation were established a long time ago, with V. Gordon Childe (1956) and the ’Neolithic revolution‘ concept, there are still more questions than answers. With the modern interdisciplinary approach in archaeology, some bold and challenging advances are undertaken, which makes this discipline even more interesting (Banning 2011; Dietrich and Schmidt; Finlayson et

al. 2011; Price and Bar-Yosef 2011; Maher et al. 2012). Nevertheless, concerning some key questions, there is a general agreement among scientists.

Towards the end of the Pleistocene, about 14 000 years ago, Mesolithic mobile hunter-gatherer groups gradually shifted to sedentism. Simple circle stone-based structures appeared in settlements in Southwest Asia, in the context of what is today known as the Natufian culture. Although these early settlers were probably manipulating wild cereals, this is still considered pre-agricultural phase. What caused sedentism is largely debated (O. Bar-Yosef and Belfer-Cohen 1992; Ofer Bar-Yosef 1998a, 1998b; Belfer-Cohen and Bar-Yosef 2002), but probably sedentism was the trigger to both, farming and population growth. Being based in one place meant that the group had to support itself from the local resources of the relatively limited area they inhabited. Advanced wild species manipulation became part of the hunting/fishing/gathering trade. The increasing role of certain species in the subsistence strategy would lead to specialisation, technological and know-how improvements, and almost unintentionally to farming. This process was at the same time both caused and supported by the population increase and settlement enlargement. Besides being tamed, the wild species also suffered morphological and genetic modifications throughout the relatively slow process of domestication, until the point in which they could no longer survive on their own in the wild. This is the stage of Pre-Pottery Neolithic (PPN). This is the time when small bands budding off from these settlements started a journey, on land and sea, to search for new resources. They carried with them their culture, the new Neolithic life philosophy. Shortly after the first dispersals, those who stayed behind came to a new technological achievement – pottery. This new item took the next wave out and became one of the most valuable archaeological artefacts for the following of the Neolithic dispersal and the definition of the various manifestations.

This is a rather simplistic representation of what was going on in Southwest Asia (the Levant, the flanks of Zagros and Taurus Mountains and parts of Anatolia) roughly between 12,000 and 7,000 BP (O. Bar-Yosef and Belfer-Cohen 1992), which is the most researched area and the region from where the Neolithic came to Europe. But new discoveries show that the Neolithisation process was a global phenomenon. Now, we know that there are at least ten areas in the world that are considered as ’hearts of domestication‘ (Fig. 1.1). Those are areas in which people independently started to show interest in controlling other species for personal benefit. The

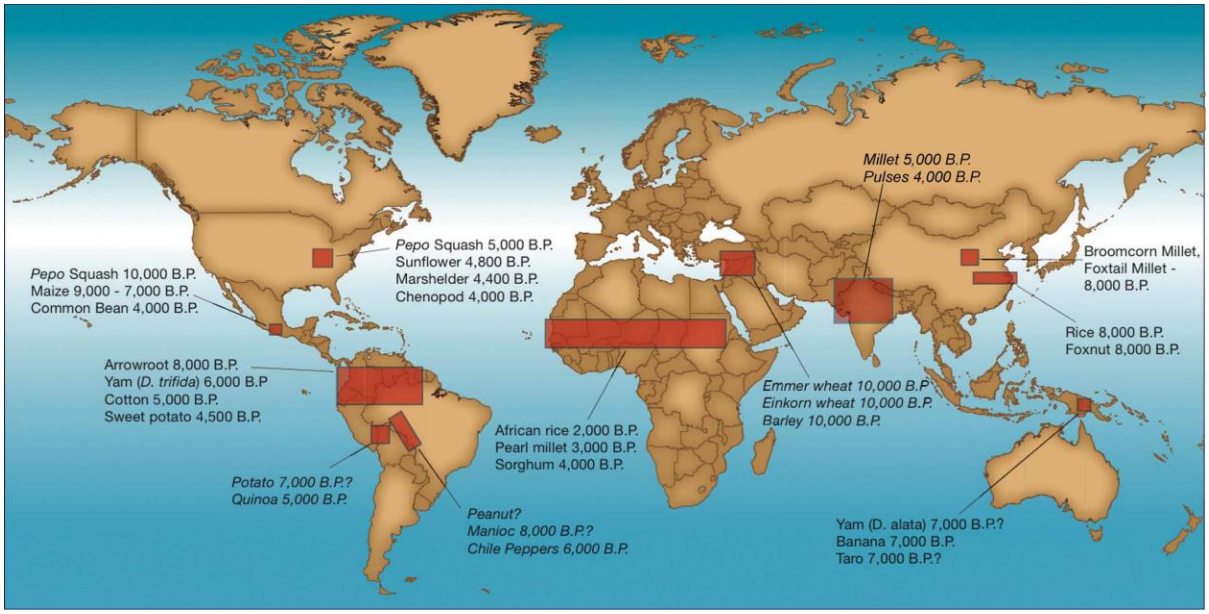


Figure 1.1 Domestication areas, domesticated cultures and chronology (after Price and Bar-Yosef 2011).

domesticated species and the timing might be different, but there is no doubt that there was a common driving force behind the process (Price and Bar-Yosef 2011). Many of these areas were acknowledged just in the last few years and exiting news are expected from ongoing archaeological, anthropological, zooarchaeological, archaeobotanical, genetic, ethnographic and other lines of research.

One of the earliest attempts to explain the reasons for the transition towards farming societies was the ’oasis theory‘, V. Gordon Childe (1956) being one of the main proponents (Gebauer and Price 1992; Price and Bar-Yosef 2011). Starting from a simple premise of a climatic amelioration at the end of the Pleistocene and the beginning of the Holocene, this theory sees the Middle East of that period as a dry area, punctuated by small water sources (oasis), which attracted all living species. This way, humans, animals and plants were driven together in a small area, competing for the same limited resources. The only way for positive outcome for humankind (supposing its superiority) from this situation would be to establish control over the rest of the competitors and domesticate them. In other words, ’domestication emerged as a symbiotic relationship for the purpose of human survival‘ (Price and Bar-Yosef 2011)

This theory was challenged as early as the 1940s and the 1950s, when new research disputed its starting point (Gebauer and Price 1992; Price and Bar-Yosef

2011). The new evidence suggested that there was no great climatic event at this time in Southwest Asia, so the climatic change as main suspect for the initiation of the Neolithic was rejected. The scholars redirected their attention. Braidwood (1960) considered that by the end of the Pleistocene the technology and culture were ripe and the people were familiar enough with the nature of the wild species. He focused the search for the first agriculture signs in the natural habitat area of the wild progenitors of the earliest domesticated species. Working in Southwest Asia, he found evidence of early agriculture in the hilly areas of the Fertile Crescent.

Lewis Binford (1986) changed the whole perspective by introducing the argument: was agriculture people's choice or 'last resort' for surviving. In his view, agriculture was much more 'backbreaking, time consuming and labour intensive' than hunting and gathering, and therefore human groups must have been forced to agriculture. As support he offered ethnographic studies of modern hunting-gathering groups from the Kalahari Desert in Africa. These emphasize the question 'why agriculture?' even more. The answer he offers is: population pressure. This assumes population increase in the period prior to the first domestication. More people require more food, and to sustain this population growth, people turned to agriculture. But to maintain intensive farming successfully, these progressive groups needed more people for labour and major changes in their social life (level of sedentism, social reorganization…). So, which was first and what followed?

Mark Cohen took Binford's line even further by proposing 'population pressure' as the main cause for almost all major population movement events in human history: going out of Africa, populating Asia and Europe and by 10,000 BC all inhabitable areas on the planet. The next logical step in Cohen's view would have been cultivating the land (Cohen 1977, 2009).

In the last few decades this theory was also challenged. Brian Hayden introduced his 'competitive feasting' model and opposed it directly to the 'population pressure' (Hayden 1992). He claims that hunter-gatherers in general tend to maintain 'population level in dynamic equilibrium with available resources'. Population increase would be inseparably connected to resource abundance, instead of crises. He sees food production as competitive surplus accumulation by 'ambitious individuals', who are part of a relatively complex social group, inhabiting resource rich areas. The quandary of this model however is the same as the opposite one: what comes first? Are stratified societies precondition for agriculture, or they result from it?

Latest researches from the Levant also put into question the ’population pressure‘ model. There are strongly supported data that actually there was population decrease prior to the shift to agriculture (Goring-Morris and Belfer-Cohen 2011). Dealing with the difficult task of past societies demography research further, Bocquet-Appel (2011) finds that the actual population growth begins later in societies that are already agricultural.

Observing the summary of some of the main theories regarding the reasons behind the shift to agriculture, one understands the complexity of the problem and the necessity of new studies. It is important however that new research is conducted, implementing modern scientific approach, methods and collaborations with variety of archaeological disciplines.

1.2 Neolithisation of Europe

Whenever we talk about the history of Neolithic study, it is difficult not to encounter the name of V. Gordon Childe. In the early twentieth century, he coined the *ex oriente lux* model (’the light from the Near East‘). According to Childe, the Neolithic was introduced in Europe as a package, brought by farmers from the Near East. The package included domesticated plants and animals, polished stone technology and pottery. These migrants ’paddled or sailed on the alluring waters of the Mediterranean to the next landfall-and the next‘ (V.G.Childe 1956, cited in Barker 2009).

The Late Pleistocene/Early Holocene seafarers were familiar with the Mediterranean waterways long before the Neolithic. Obsidian from the Melos Island in the Aegean and deep-sea fish remains were discovered in the pre-Neolithic layers of Franchthi cave in Peloponnese (Thorpe 1996; Perlès 2001). Mainland Asia foragers were making hunting journeys to Cyprus since the ninth millennium BC (Simmons 1988). European hunter-gatherers were also visiting Corsica and Sardinia to hunt (J. D. Vigne 1987). So, when the first farmers from the Levant went out to search for new lands, at least they started on a familiar track.

Cyprus was permanently inhabited during the second half of the eighth millennium BC (Fig. 1.2:2). The sites Mylouthkia and Shillourokambos, with their circular stone-based structures and early impressed pottery, share similar material. culture with the PPNB and the Earliest Pottery Neolithic of the Levant (Özdoğan

2011; Perlès 2001; J.-D. Vigne et al. 2011)These settlements, together with occasional journeys to some smaller Aegean islands (Phoca-Cosmetatou 2011) represent the initial wave of the Neolithic advance.

Until recently inland Anatolia was mainly avoided by the mainstream Neolithisation discussions. Research was mainly focused on the sea route and Greece. According to Mehmet Özdoğan, based on his work in the past few decades, there was another land bound migration, contemporary to the maritime. These groups passed the north-western border of the primary core-area of Neolithisation (the Taurus Mountain) and settled inland Anatolia (Fig. 1.2:2). This route, compared to the maritime, was understandably slower, following the high plateaus and mountains. These initial movements of the Levantine Neolithic population can be traced until the middle of the seventh millennium BC (Özdoğan 2011).

The next generations to leave the home country were looking for a bit different environment. By then agriculture was almost exclusive subsistence strategy, so the Aegean islands and high mountains were probably not exactly preferred. This phase was also dual: by sea and by land. Now, the ’core area‘ was bigger by the areas settled during the initial phase. The new areas to be settled by these more advanced farmers were: Crete (under the well-known Knossos) (Perlès 2001; Barker 2009), littoral Greece (with movements towards the hinterland) and littoral Asia Minor (Fig 1.2:3). During the second half of the seventh millennium BC, the Thessalian plain became rapidly and densely populated by *tell* settlements. This type of settlement was a result of continuous rebuilding phases on the same spot over a period of many generations. The material culture resembled their ancestral tradition, but at the same time a lot of new innovations or adaptations appeared. And it seemed that very soon after, when Thessaly became new core area for further Neolithisation, each newly formed entity had its own identity traits. Some authors give special credit to these and other Early Neolithic features and emphasize the role of the local Mesolithic groups in the forming of a common Balkan Neolithic (Donahue 1992; Kotsakis 2001). The mainstream theory however, although not excluding the local hunter-gatherers completely, limits their role in the culture formation. Whichever stand we take, the facts are the same. Before 6100 cal BC this Early Neolithic cultural complex, following the bigger fluvial routes, spread north all the way to the Danube. Starting from the Aegean coast, through Macedonia and Bulgaria to Serbia and Romania, there

are an increasing number of sites with remains from the first farmers in the central and northern Balkan Peninsula, sharing the same cultural traits that point back to Southwest Asia. This large body of artefacts, seemingly uniform and yet very diverse, is the structure of the synthetic term ’Balkan-Anatolian cultural complex‘ (Garašanin 1979).

It seems as if the 8200 BP climatic event (cooling climatic event between 6340 and 6010 cal BC) delayed the spread of the Neolithic further north. This is one of the most important climatic shifts of the Holocene, which in crucial time, through chain of climatic events brought huge flooding in the river valleys of the Balkan. These events also affected the Neolithic people, who were forced to adapt to the changing environment around Danube and its tributaries (Bonsall et al. 2002; M. Budja 2007).

In a process parallel to the Neolithisation of the Balkan Peninsula, back in Asia Minor, other groups (probably from the Çatalhöyük area) inhabited western and northern Anatolia, reaching both shores of Marmara and carrying the Fikirtepe culture. According to Özdoğan (2011), this migration impulse was caused by social disturbances in the core area, possibly connected to the same ’8200 BP‘ climatic cooling event. When they reached the Balkans, their distant relatives that took the maritime route, were already there. The temporal gap and the different experiences accumulated by then resulted in slightly different material cultures in terms of architecture, pottery production, burial practice and subsistence. But the similarities were still enough to complement and further ’complicate‘ the picture of the Balkan-Anatolian cultural complex.

At the end of the seventh millennium BC another migratory event began. This time the system was already established, there was an existing network of settlements, so this expansion was more massive and more rapid than any of the previous (Fig 1.2:4). The novelty of this phase was the painted decoration on the pottery (from basic red-slipped bands to elaborated white-on-red complex motifs). There was also a significant and sudden increase of the number of settlements from Anatolia to the Balkan (Özdoğan 2011). This is the time of large villages, densely populated valleys, highly developed trading networks and spiritual or religious systems. This was the time of Sesklo complex in Greece (Perlès 2001), Anzabegovo-Vršnik and Velušina-Porodin groups in Macedonia (Naumov et al. 2009; Санев 2009), Starčevo in Serbia, West Bulgarian Painted Pottery group (Чохаджиев 2007) and Karanovo group in

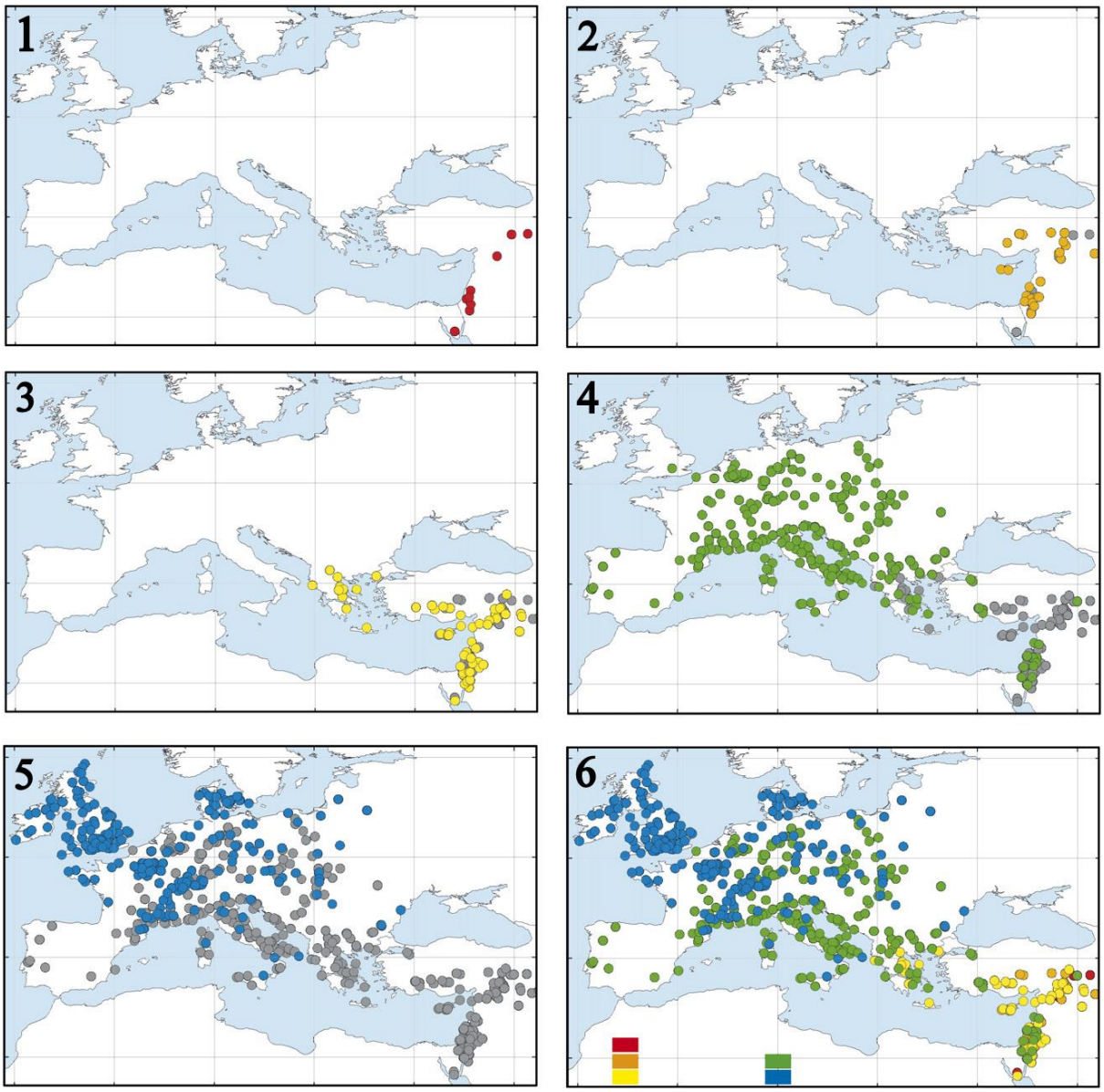


Figure 1.2 Neolithisation of Europe: 1) 13-11,5 cal. ka BP; 2) 11,5-10 cal. ka BP; 3) 10-8,4 cal. ka BP; 4) 8,4-7 cal. ka BP; 5) 7-5,5 cal. ka BP (after Turney and Brown 2007).

Bulgaria (Hiller and Nikolov 1997). They are all representatives of the fully developed Balkan-Anatolian cultural complex.

The transition of the rest of Europe to agriculture is complex and differs from one region to the other (Zilhão 1993, 2011; Oosterbeek 2001, 2004; Allard 2007; Bocquet-Appel et al. 2009; Cristiani et al. 2009; Collard et al. 2010). Marek Zvelebil (2001) has developed a detailed system of seven different mechanisms and they are all relevant for one or more regions of Europe. They are a refreshing contribution against

the old migration/acculturation/autochthonous discussions. However, the vast theoretical and empirical system regarding the Neolithisation process of the rest of Europe is beyond our scope.

1.3 Neolithic chronology of Macedonia

The Neolithic research in Macedonia is going on for more than a century. Many adventurers and scientists, with different interests and political background, left their mark in the history of the discipline. Today, in the official archaeological map of Macedonia there are 200 registered Neolithic sites. Grnčarica is the 201st.

On the other hand, with the exception of some 19th and early 20th century artefact reports (Кузман 1993), the archaeological research of Palaeolithic and Mesolithic in certain parts of the country are still in the survey or beginning-of-excavation phase (Шаламанов-Коробар 2010). Records from the neighbouring countries (Perlès 2001; Krauß 2011b) show that the peninsula was populated during these times. But in order to find out what was the exact role of the Early Holocene population in the agricultural transition in Macedonia we need to start from the basics – problem-oriented field research.

The Neolithic of Macedonia at present is regarded as a complete package, brought by immigrants from the Middle East. The existing literature does not give any information about a transitional phase. The Anzabegovo-Vršnik culture stands at the beginning of the Neolithic sequence, Anzabegovo Ia being the earliest phase. It is a fully agricultural society, with the full range of domesticates. The domestic animal species compose 96.5% of the faunal assemblage (Bökönyi 1976; Ivkovska 2009). There is one peculiarity about the cattle remains. Bökönyi recognizes transitional species. This supports the argument about the Balkan origin of the domestic cattle.

Another discussion is focused on the corridors of Neolithisation and the origin of the first agricultural groups. Did Neolithic groups come to Macedonia following the Vardar valley, or the Struma-Strumešnica-Lakavica corridor to reach Bregalnica basin (the core area of the Anzabegovo-Vršnik group)? Are there other possible corridors? Were those groups from Anatolia or Thessaly? Some authors emphasize the similarity of pottery decoration patterns and clay stamp incisions with Anatolian examples (Budja 2003; Naumov et al. 2009). Others see the same and more features in the

cultures of Thessaly and what is today North Greece. There are close parallels between all Neolithic cultures from the Middle East to Danube. They are all part of the Balkan-Anatolian complex after all. In the Balkans, almost every topographic enclosure has its own cultural peculiarities. Maybe the Mesolithic population was not so insignificant after all. These questions are very important, but instead of looking too far and reach a general conclusion we already know, Neolithic research should concentrate on a higher resolution scan of the cultural movements and influences inside the peninsula, which are not always progressive and unidirectional.

The Neolithic period on the territory of Republic of Macedonia is divided into three phases: Early, Middle and Late. The chronology was established over the past five or six decades through detail studies of the material culture (especially pottery decoration styles, typology and, to a lesser extent, technology), supported by absolute dates.

The Early Neolithic is manifested regionally in three different cultures. The earliest, as already mentioned, is **Anzabegovo-Vršnik I**. It spreads roughly in Central, North and East Macedonia (Fig. 1.3). According to the stratigraphy at the eponymous site Anzabegovo the earliest phase was subdivided into three sub-phases: a-c (Санев 2009). Other authors, who excavated different areas of the same site, recognized only two sub-phases: a-b (Gimbutas 1976). Technical differences aside, they agree over the main attribute of the Early Neolithic in Macedonia – white-painted pottery. The absolute dates of the phase cluster between 6100-5800 cal BC. Chronology and material culture show closest connection of this phase with Nea Nikomedeia, a settlement not far to the south in the Thessaloniki plain.

Another group of people that settled in the Pelagonia plain (Southwest Macedonia) not long after the foundation of Anzabegovo painted their pottery in a similar way. They used the same colours, but the ornaments and the shapes of the pottery were slightly different. Another difference was the type of settlements they constructed. Unlike the flat, riverbank villages in Northeast Macedonia, in Pelagonia the settlements were mounds. This society, relatively isolated in the mountain-surrounded valley, were the carriers of the **Velušina-Porodin** culture (Garašanin 1979; Симоска et al. 1979). The valley itself and the way it was inhabited, as well as parts of the material culture, resemble Thessaly.

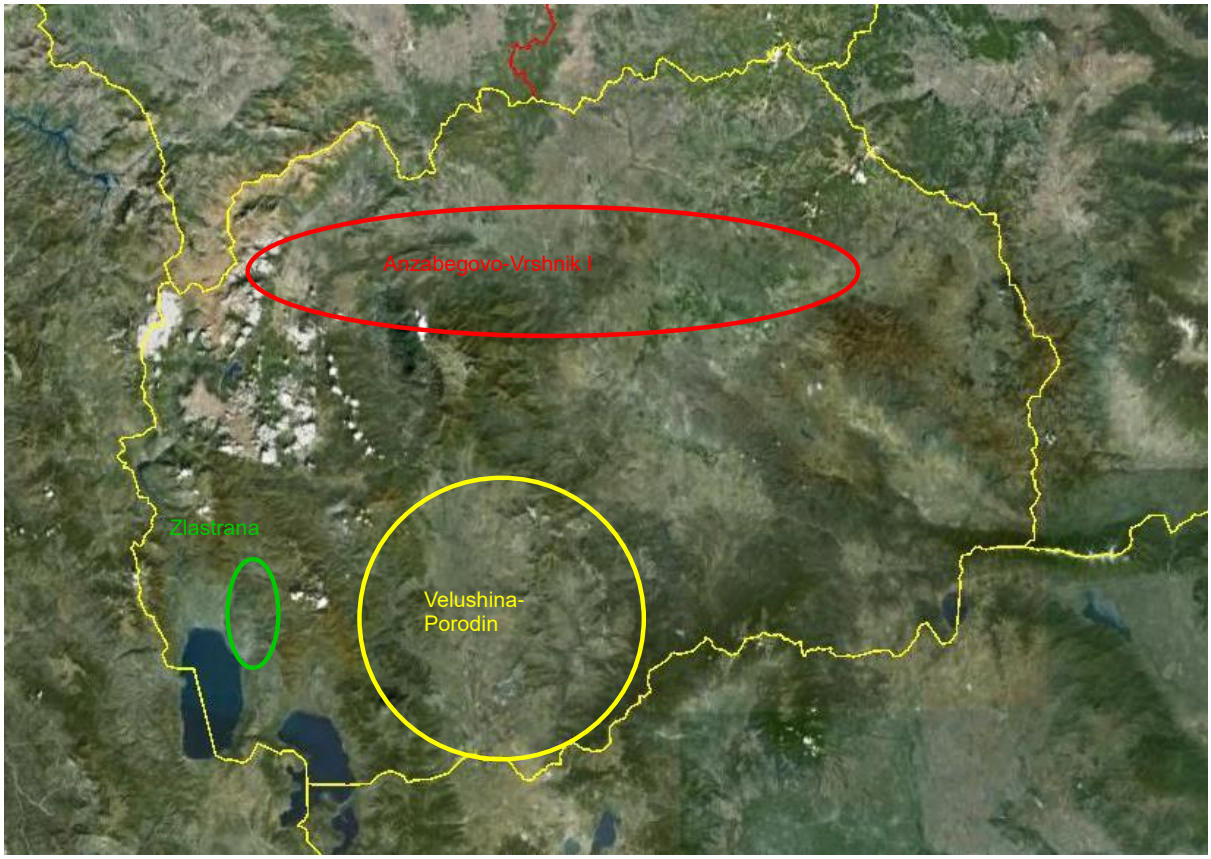


Figure 1.3 Early Neolithic cultures in Macedonia.

Another Early Neolithic culture is **Zlastrana** in the Ohrid Lake area. It is poorly known (only two settlements excavated so far: Zlastrana and Dolno Trnovo), so the chronological determination was made by parallels with the Eastern Adriatic impressed pottery groups (from Croatia, Herzegovina and Albania) (Кузман 1990).

The presence of three different cultures in a not so big area shows that Macedonia was not inhabited at once. Beyond the general similarity, there are subtle differences in the material culture, the result of a different chronology, genealogy, geography or a combination of factors.

During the Middle Neolithic, we can see tendency towards uniformity of the material culture on the entire territory of the country. It is a natural development from the Early Neolithic cultures through intensive contacts between regions. Even the contact zones were detected: the Polog region and probably the Tikveš region. We can recognize some features from all Early Neolithic cultures, but uniting feature for all of them is the dark-painted pottery. That is why the whole territory is unified in a single

culture: **Anzabegovo-Vršnik II-IV** (Fidanoski 2009; Санев 2009). The absolute dates group between 5800 and 5200 cal BC. This was a time of prosperity for the Neolithic communities in Macedonia. In these settlements, we can see the strongest socio-cultural manifestations.

The big changes in material culture that determine the Late Neolithic in Macedonia relate to foreign influences and probably population intrusion. There are three Late Neolithic groups, differentiated mainly based on surface treatment and decoration of the pottery. The dominant technological approach is different from the Early and Middle Neolithic. Now the assemblage is dominated by dark, burnished pottery. Vessels on high pedestal are very common. Complex handles, channelling and incised decoration with paste incrustation are typical. **Angelci-Zelenikovo II** group is considered as the culture that inherited Anzabegovo-Vršnik. It is strongly influenced by the north Balkan cultures. **Trn** is a limited cultural manifestation with individual features in Central Macedonia. **Ustie na Drim** is another Late Neolithic culture developed on the north shore of Lake Ohrid (Fidanoski 2009). The last two groups show some north-western Balkan influences. This turbulent stage at the end of the Neolithic did not last long: 5200-5000 cal BC.

If Late Neolithic was a foreign influence, the Chalcolithic was a violent intrusion of northern warrior-tribes. It brought obvious cultural shifts, not only in material culture, but also in settling strategy and spiritual life. Some of these changes can be sensed in the Late Neolithic. The Neolithic/Chalcolithic transition in the Balkans is another interesting field for a future research.

CHAPTER 2:
GRNČARICA, THE NEOLITHIC SETTLEMENT

2.1 Excavation and dating

Republic of Macedonia is in the centre of the Balkan Peninsula (Fig. 2.1). This geographic position has predetermined its role in many important events throughout prehistory and history, among which the gradual arrival of agriculture and pottery in Europe. For the Neolithic people coming from Asia it was one of the first steps on European ground, before advancing further to the north-west.

One of the locations which the first farmers found suitable for settling was Grnčarica in Eastern Macedonia. Today it is an agricultural field, some 12 kilometres north from Štip, in the territory of Krupište village (Fig. 2.2). It is 7 kilometres north from Vršnik, and 20 kilometres north-east from Anzabegovo – two eponymous sites for the Early Neolithic culture in the region (c.f. Ch. 1).

The location was not recognized for its archaeological potential until 2007, when for the purposes of a hydro-system construction, a big survey in Northeast Macedonia was made. Thirty-three new archaeological sites were recognized (Fig. 2.3). Even though only partially and often under time limit pressure, all of them were excavated. The results were presented in an exhibition at the end of 2009 (Нацев 2009).

Figure 2.1 Macedonia in European frames.

Figure 2.2 The location of Grnčarica and the nearest Early Neolithic sites on the territory of Macedonia; rectangle enlarged in Fig. 2.3 (GoogleEarth).

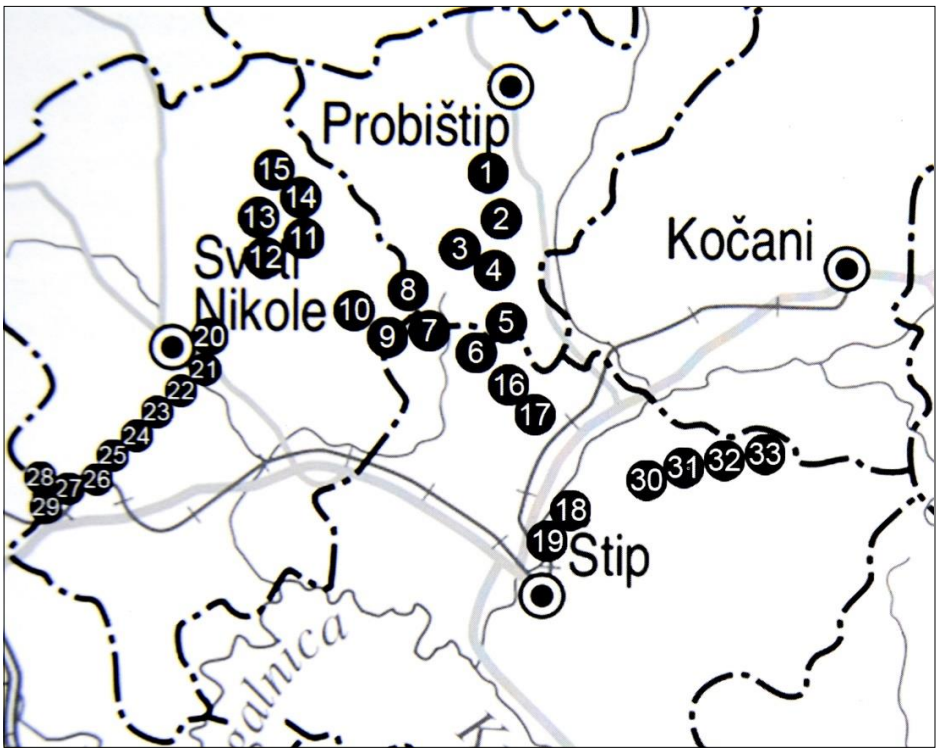


Figure 2.3 The hydro-system 'Zletovica' sites in Northeast Macedonia; Grnčarica is number 2 (Nacev 2009).

Grnčarica is the only Neolithic site among these. It is positioned on a flat hillside at the northern periphery of the valley of Bregalnica, right next to a small torrent which today is dry. The torrent limits the settlement from the North. From the West, there is a steep hill. To the South and East, the terrain gradually descends into an open valley. The area was initially prospected for a Roman *villa rustica*, which turned out to be less than 100 metres to the East. The villa was out of the excavation permit area, so until today it remains unexcavated. But the test trenches that were intended to outline the periphery of the Roman villa, turned out to be the centre of an Early Neolithic settlement (Fig. 2.4).

The site was excavated between 26.09.2007 and 28.03.2008, with many interruptions in-between. The weather conditions caused methodological difficulties during the excavation, which had an impact on the interpretation and might have minor effects on the field work results.

During the mentioned period, around 580 m² have been excavated. The exact limits of the settlement were not established, but observing the topography of the terrain, we assume the bigger part of it remains unexcavated. Because of the

Figure 2.4 Grnčarica; the circle encloses the Neolithic settlement; the arrow points to the unexcavated Roman period remains (GoogleEarth).

development-led character of the excavation, the position of the trenches was predetermined by the axis of the hydro-system canal direction. Most of the twenty-six trenches are with dimensions 3x6 m, but few of them had to be adapted to the situation and are significantly bigger (Fig. 2.5). The reached depths vary (from 0.25 m in the central trenches, to 1.30 m in the north-western), but in all of them (except trench 22) the natural green bedrock was reached (Fig. 2.6) on which almost directly the Neolithic people founded their huts.

The trenches can be divided in four groups: northern (trench number 1, 2, 7, 8 and 10), central (trench number 3, 3a, 3b, 3c, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 23), eastern (trench number 19-22) and southern (trench 4 alone, marking the southern limit of the settlement).

The first area is characterized by the bigger depth of the sediment, bigger clusters of fragmented pottery, small stones and animal bones in the lower Neolithic layer. The upper layers, which were disturbed by intensive agriculture, contained mixed Roman and Neolithic fragmented pottery. No postholes or other traces of architecture were discovered. This area was interpreted as the margins of the settlement where waste material was discarded. Trenches 2 and 8 contained two round and very regular deep holes, with diameters up to 2 metres. They were dug well inside

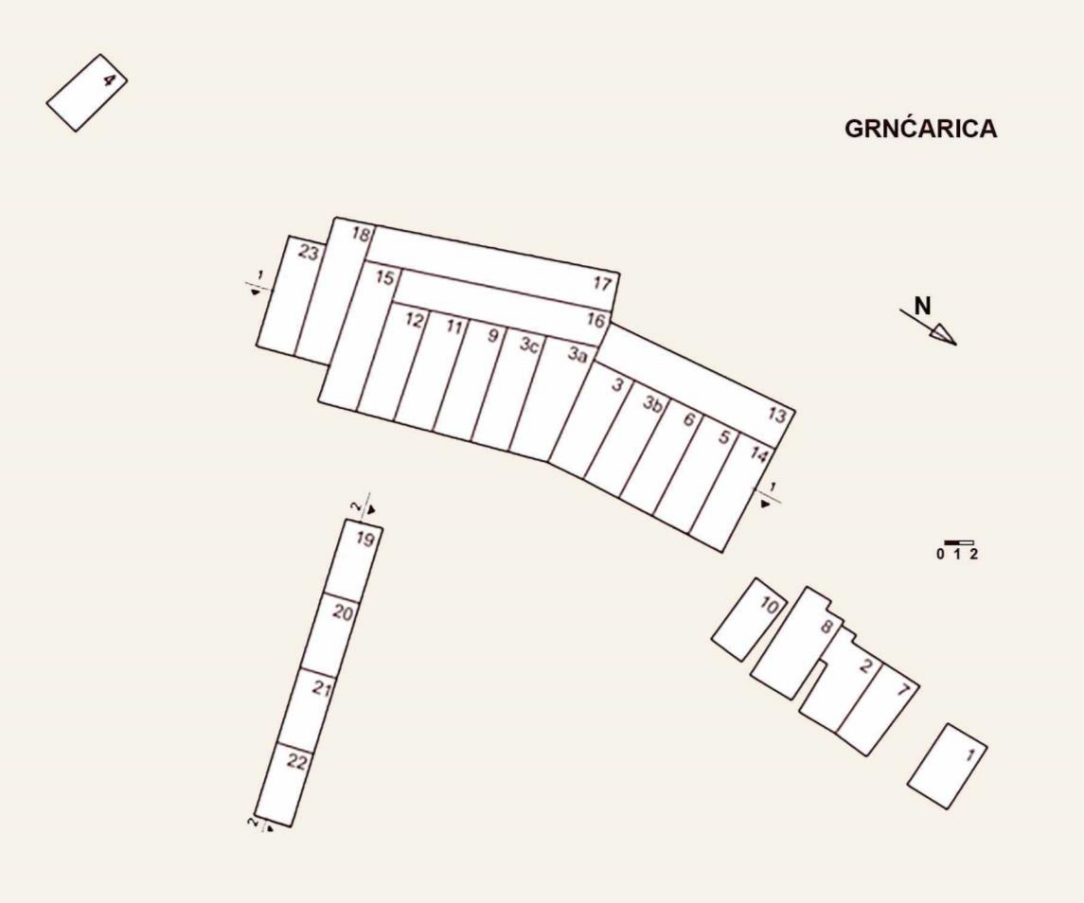


Figure 2.5 Excavations plan: position of the trenches and total excavated area (plan by Lj. Kljonkova).

the bedrock, but mixed Roman and Neolithic content was reported from both (Нацев 2008). They are probably underground storage silos from a later period.

The second group uncovers the central area of the settlement. Even though the cultural deposit here is the thinnest (0.25-0.65 metres in the centre), it reveals artefacts that testify of intensive everyday activities. The area is full of channels and post-holes carved in the natural bedrock. A pottery kiln was also carved in the bedrock. Around the kiln there were flattened areas and small round depressions, which were probably used for working the clay. There were many pottery fragments, chipped stone tools, stone hand-mills, parts of anthropomorphic figurines and destroyed hearths. Unfortunately, the shallowness of the deposit made the main part of the settlement vulnerable to the agricultural activities that were going on for centuries and left us with fragmented material and traces in the bedrock. But not all contexts were lost. At the end of the excavations, trench 18 presented remains of beaten clay; a human burial was discovered beneath.

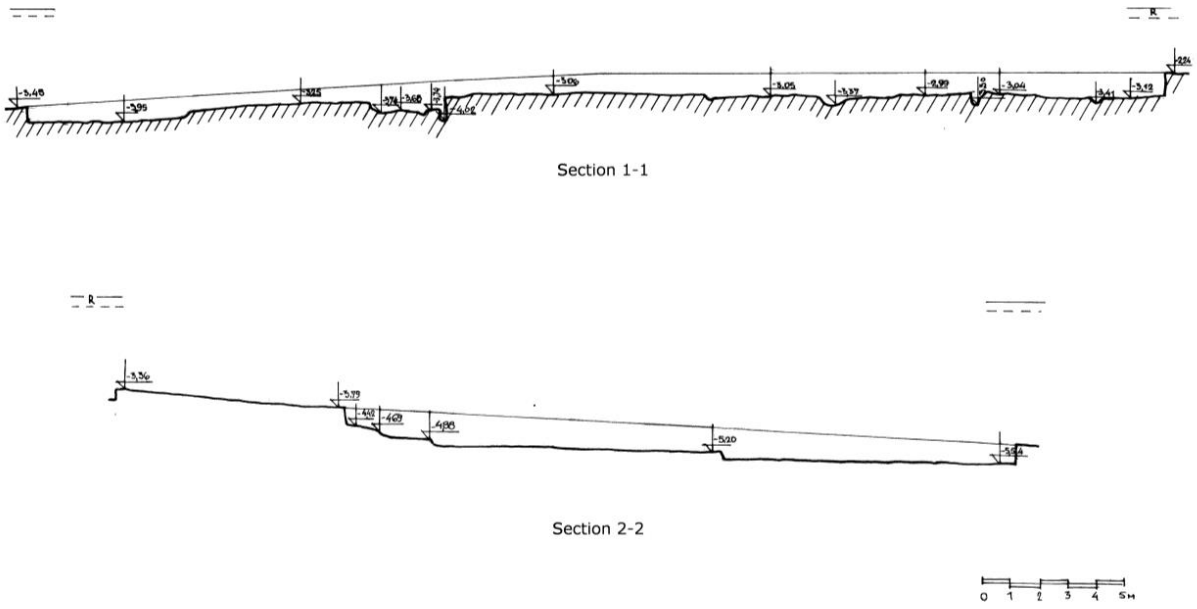


Figure 2.6 Cross-sections of the central and eastern area (ref. Fig. 2.5; after Lj. Kljonkova).

Four trenches in the north-eastern periphery of the settlement confirmed what the topography was suggesting. The settlement spreads to the end of the upper terrace, then the terrain sharply declines few metres and further to the east forms another lower terrace where the supposed Roman villa is. The number of Neolithic remains in these trenches is insignificant, even though some architectural remains can be claimed in trench 19. The furthest trench 22 was almost empty of Neolithic artefacts. Here the natural bedrock already starts to decline. This trench was not fully excavated.

Trench 4 did not give any Neolithic material. The bedrock sharply declines from south-west towards north-east. Although it is not so far from the central area, it is probably out of the village perimeter.

There was only one fragment with white-painted decoration and it is difficult to affiliate the entire assemblage to the Anzabegovo-Vršnik Ia phase. Most of the pottery fragments are ’primitive‘ and half of them are entirely or partially red-slipped. The technological traits and decoration styles are similar to the Balkan ’monochrome phase‘, as presented in Krajnici (Tchohadjiev and Bakamska 1990), Grivac I, Divostin I (Bogdanovich 2007). The significant presence of barbotine decoration shows some similarities with the Proto-Starčevo phase. So, the technological traits of the pottery and the decoration style are in favour of determining Grnčarica in a monochrome pottery phase in Macedonia, as part of the still ambiguous pool of Balkan settlements,

manifestations of an early wave of Neolithic farmers (Perlès 2001). This would also include the understudied Pešterica assemblage from south-central Macedonia, acknowledged few decades ago (Китаноски et al. 1980).

The absolute dating results however disagree. Two different samples were taken (both from the only human burial) and they were sent to two different laboratories. The first was a bone sample, sent to the Scottish Universities Environmental Research Centre (SUERC) AMS Facility. The AMS radiocarbon dating measured 6745±35 BP radiocarbon years, which after calibration with OxCal3 gave the results shown in Table 2.1 and Figure 2.7. This is an age at least 600 years younger than what was expected.

The second sample was taken from a human tooth. It was processed in CEDAD (Centro di Datazione e Diagnostica dell'Università Del Salento) in Italy[1]. This gave even younger dates. The radiocarbon age 6555±40 was calibrated with OxCal3.10 and the calibrated range is presented in Table 2.1 and Figure 2.8.

Sample/material	Radiocarbon age	Calibration range	Laboratory
Suerc-22529/human bone	6745 ± 35	5720bc (95.4%) 5610 calBC	SUERC
Ltl8510a/human tooth	6555 ± 40	5570bc (87.1%) 5470 calBC	CEDAD

Table 2.1: Radiocarbon dating results for Grnčarica samples.

According to the accepted chronology in the Balkans, these dates position Grnčarica in the Middle Neolithic. From a typological view, this means high-footed vessels, at least some occurrence of carinated shaped vessels, but most importantly dark-painted pottery. None of this is present in Grnčarica. Furthermore, few decades ago, typical Middle Neolithic layers from Vršnik and especially Anzabegovo II, gave almost identical dates as Grnčarica (Gimbutas 1976; Linick 1977; Naumov et al. 2009). This means that the people living in Grnčarica were in an everyday visual contact and probably sharing some arable land with the people from Vršnik, had

[1] For making this dating possible, I am sincerely grateful to Prof. Marta Arzarello and Prof. Carlo Perreto from the University of Ferrara.

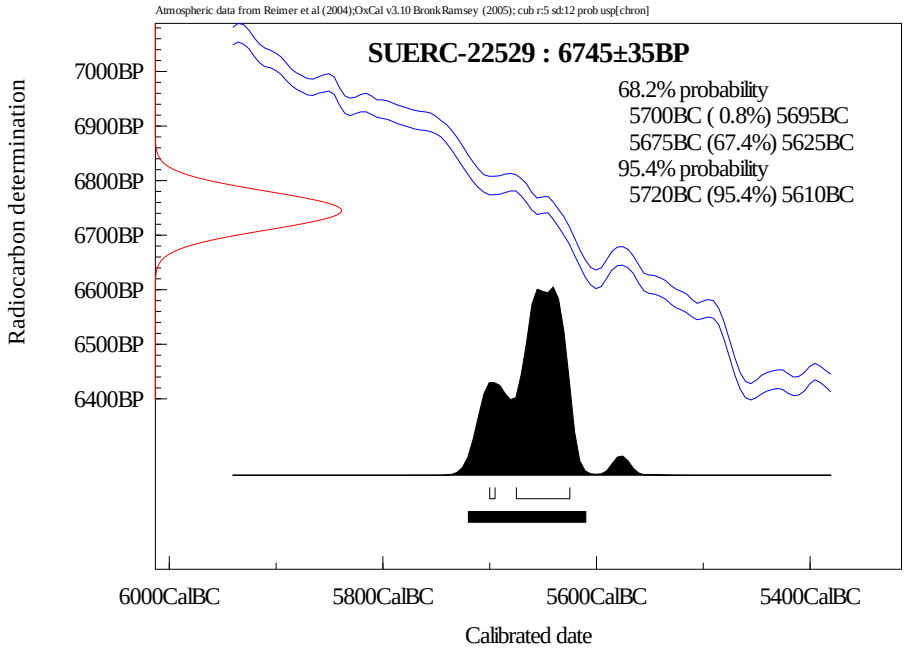


Figure 2.7 Calibration plot for human bone radiocarbon dating from Grnčarica.

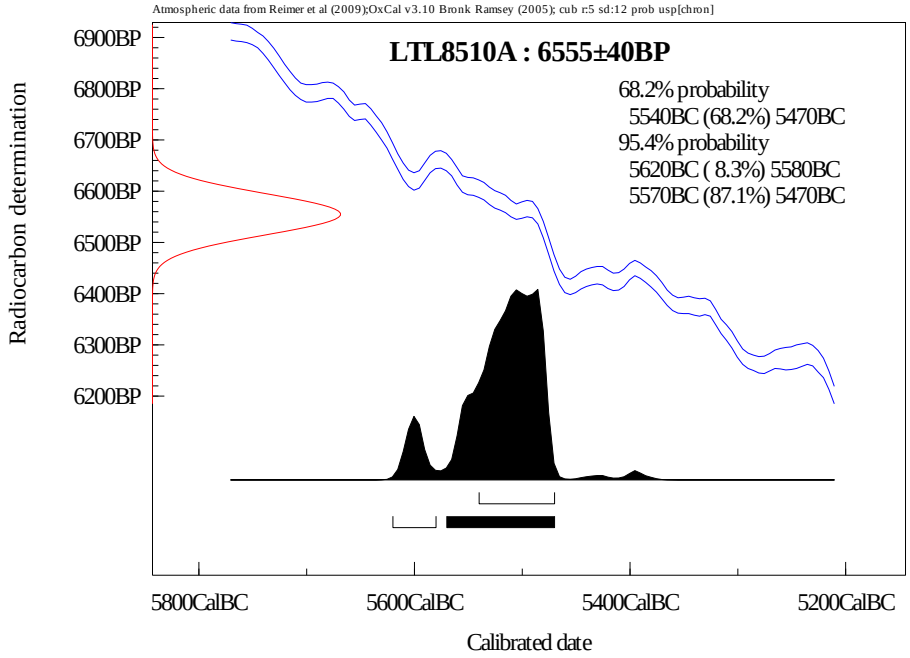


Figure 2.8 Calibration plot for human tooth radiocarbon dating from Grnčarica.

trading or other type of contacts with Anzabegovo, but their material culture was different (while Vršnik and Anzabegovo share more similarities). Obviously, many questions arise. This pottery assessment is one effort for answering them.

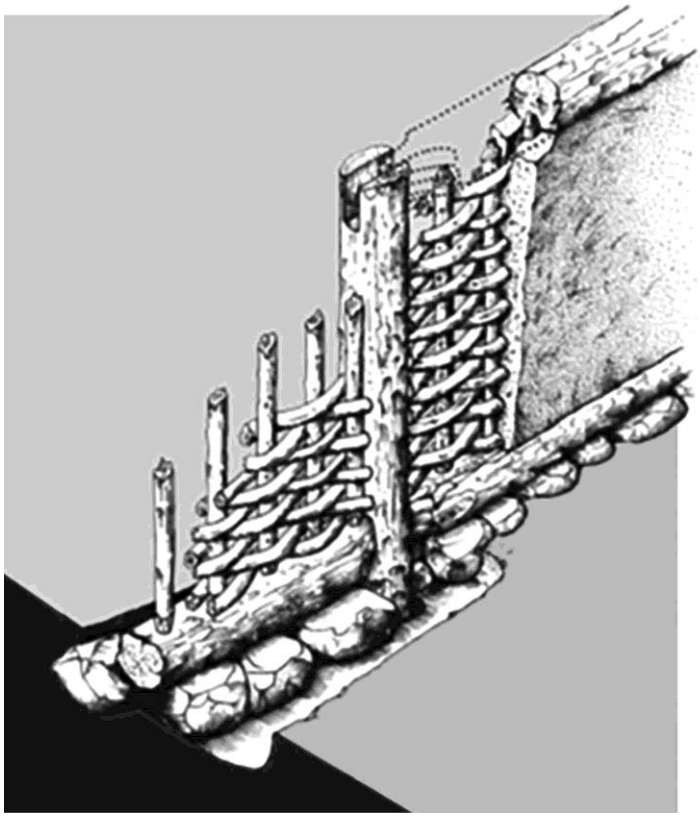


Fig. 2.9 Wattle and daub wall reconstruction (Perlès 2001).

2.2 Architecture

Houses in Grnčarica were probably constructed with the materials and techniques typical of the Early Neolithic (Tolevski 2009, Нацев и Стојановски 2013). Unfortunately, building materials were not preserved, but their absence is also a valuable information. The mass material was organic: wood, clay, grass and a lot of reed which was easily available from the surrounding area.

The huts were placed on the natural soft and green bedrock. Beaten clay was used to level the floors, small irregular patches of which were detected in trenches 23, 18 and 7. Those in 23 and 18 were part of the floor of the building which contained the human burial. The area was not fully excavated, but at the periphery of the excavated part there were aligned post-holes, which support these claims (Fig. 2.10). This is the most southern partially excavated house. Further to the north there are traces from at least two more huts. One is west of the pottery kiln. Only a small part was uncovered: few bigger post-holes and a small patch of ’white chalky soil‘ were reported (Jovčevska, pers. communication; Нацев 2008).

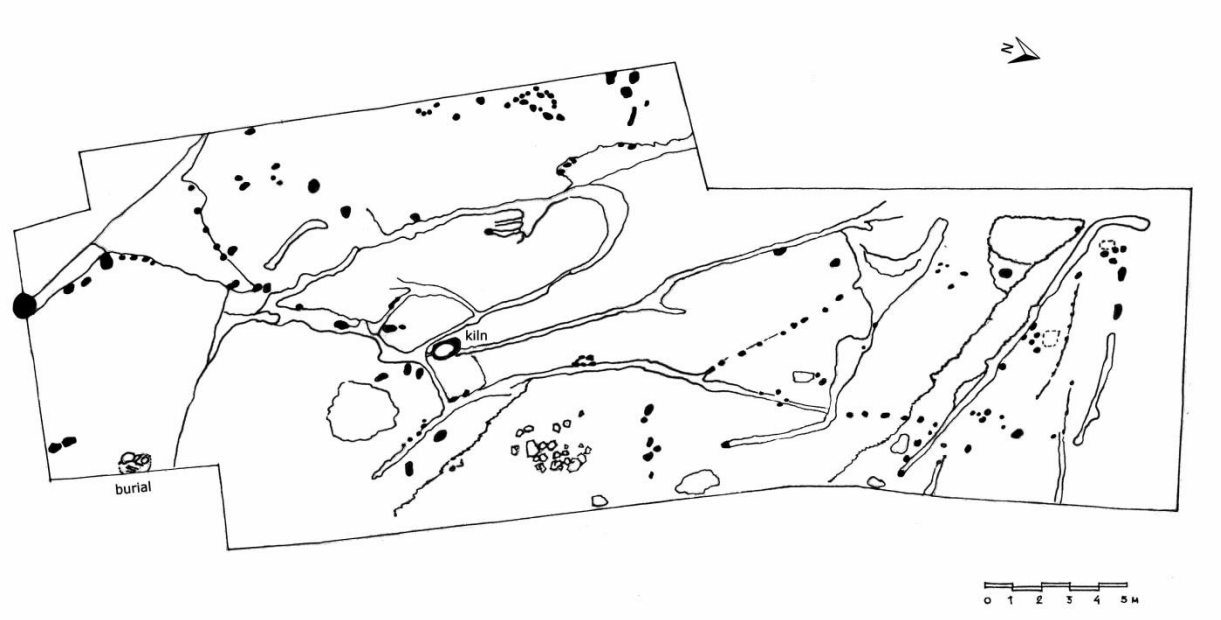


Figure 2.10 Central excavation area with post-holes, channels, burial and pottery kiln presented (plan by Lj. Kljonkova).

The third hut is next to the northern profile and is completely uncovered. Here we see combination of post-holes and shallow channels, carved in the natural bedrock. Probably the channels were used as sockets, which supported the vertical wattle and daub construction of the main walls. The ground plan of the house is elongated trapezoid or triangular with curved apex, with 13x7 metres maximum dimensions.

The upper parts of the walls were probably constructed in the wattle and daub technique. Once the vertical posts were positioned and strengthened, thinner branches or reed were intertwined among them (Fig. 2.9), and once the whole construction had been stabilized, it was covered from both sides with clay and straw mixture. At the end, a finer clay layer was applied which might have been decorated or painted (Корошец and Корошец 1973; Симоска et al. 1979).

The roofs must have been made of light materials: thin branches, straw, leaves, reed and clay. Generally, the roofs are flat or gable (double sloping). For now, either of the kind can be proposed for the Grnčarica houses.

Few features interpreted as hearths must have been associated with houses. They were discovered in fragments, already destroyed by the agricultural activities.

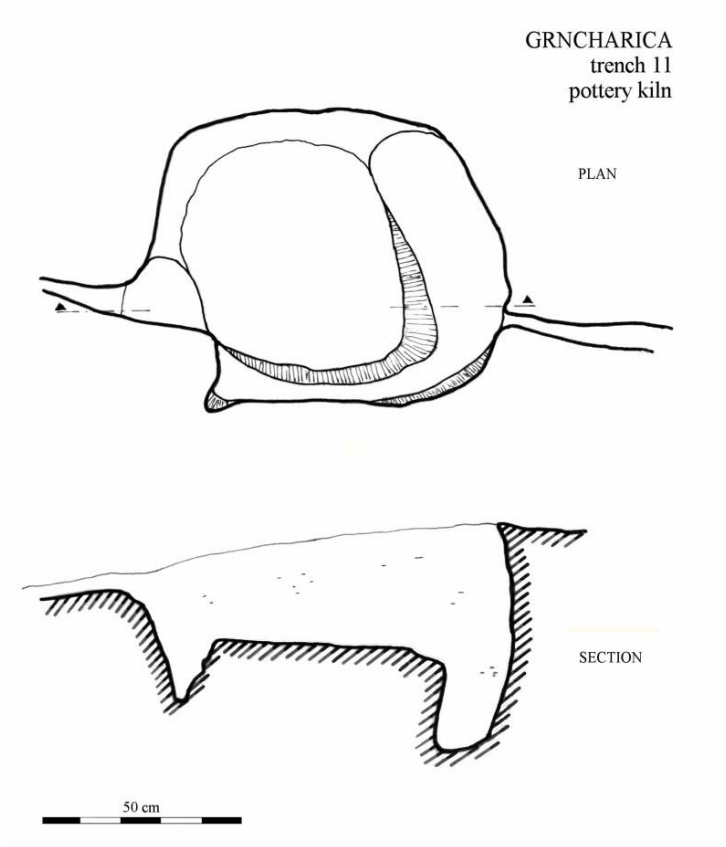


Figure 2.11 Pottery kiln (M. Videska).

2.3 Pottery kiln

The mentioned architectural elements in Grnčarica seem to be positioned around one central area, where the pottery kiln was discovered. This is the first structure of this kind for the Neolithic, at least in the central and southern part of the Balkan Peninsula. The usual interpretation for pottery firing in the Neolithic is bonfire, either on the ground or in a shallow hole in the ground, reaching temperatures between 650°C and 900°C.

The kiln in Grnčarica is simple, just one step further in the craft development. Simplified, it is a hole in the ground where pottery was being fired. But in fact, it is a not so simple system of a cavity with a platform in the middle, supplemented with channel network for oxygen and temperature regulation (Fig. 2.10; 2.11). The kiln is a round hole, carefully cut into the bedrock, around 0.60 metres deep, with diameter of about 1 m. In the middle of the hole, the Neolithic people constructed a platform out of small stones and clay, elevated 0.25 metres from the bottom. This platform is also round with diameter of 0.55 m. This way a cavity was formed, surrounding the platform. This cavity was where the fuel was burned. During excavation, large

quantity of ash and charcoal was found here. Even though no pottery was discovered *in situ*, the interpretation is that the vessels were positioned on the platform. Before burning, the kiln together with the pottery was probably covered with organic material that eventually acted as additional fuel. Two main channels enter (or exit) the kiln on two opposite sides. These channels continue into a long and complex network around the kiln. They acted as heat and oxygen regulation system (Нацев 2008). Judging from most of the pottery assemblage, the temperature was low and frequently changing. Unless this was done intentionally for a desired effect, we can assume that this structure was still in the experimental phase for the Grnčarica potters.

2.4 Burial

The burial from Grnčarica was mentioned on few occasions so far. It is the only burial discovered in the excavated area. Further excavations, especially to the East and West, may reveal more, so we can speak of a common ritual or practice. From the information available, whatever conclusion we bring, it will be relevant only for burial no. 1.

It was discovered during the last days of the excavation, partially entering the eastern profile of trench 18 (Fig. 2.10). The human skeleton was inside a clayey sediment, which was at the same level with the bedrock in the western part of the trench, where several post-holes were uncovered. They were both supra-positioned by the usual dark soil. The skeleton itself was positioned in a very shallow, but obviously intentionally prepared elliptical cavity in the bedrock, with dimensions 0.80 x 0.70 metres. In terms of a relative depth, it was between 0.44 and 0.57 metres from the modern surface.

The orientation of the body was NW-SE, deposited on the left side in a flexed position, the face looking NE. The burial was discovered in its primary position. The anatomical order is preserved, but the bones are in a very fragile state. Together with the bones, few stone flakes were collected from the mud, but all of them are probably incidental inclusions inside the grave. No other artefacts were discovered.

In her report, dr. Fanica Veljanovska from the Museum of Macedonia determined the skeleton as gracile Mediterranean type. The deceased was an adult male who died at the age of about 45. The cause of death was probably natural, but during his lifetime he suffered from arthritis and anaemia. The severe wear on the

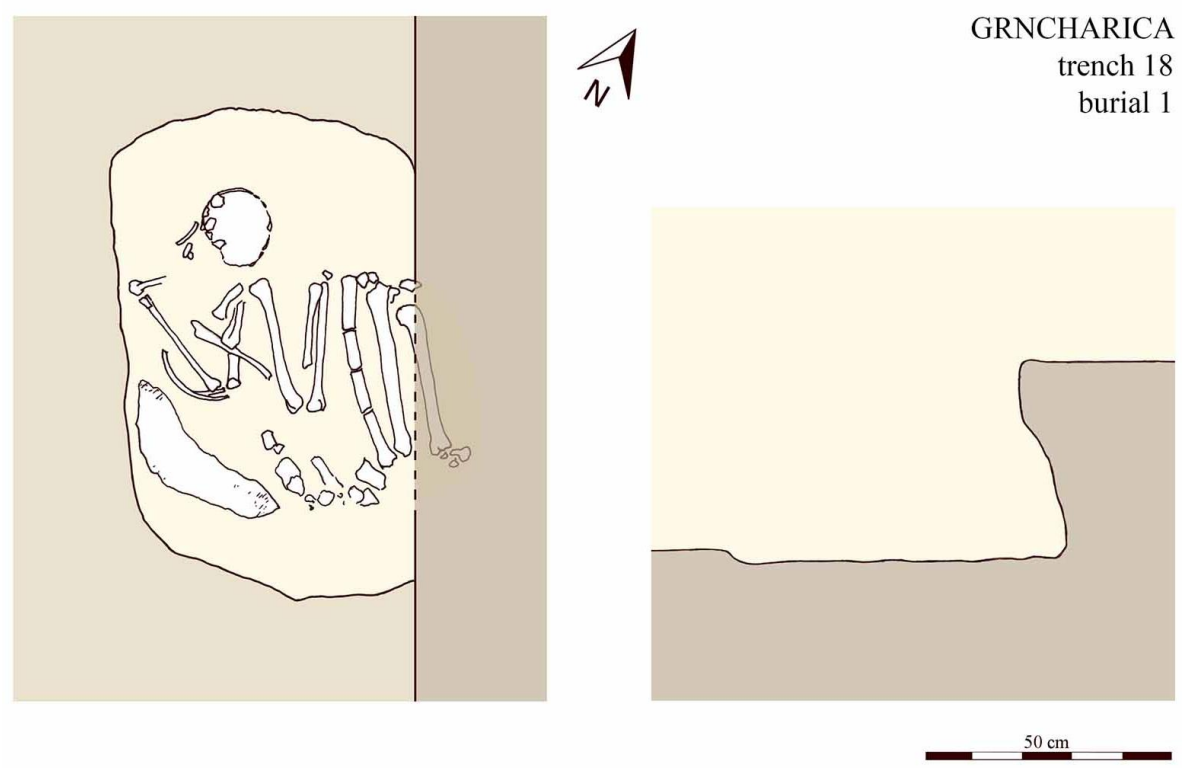


Figure 2.12 Burial 1 (M. Videska).

holding or tightening something). Radiocarbon dating results of the skeleton were presented earlier in this chapter.

The practice of burying the deceased in a flexed position on one of the sides is typical of the Neolithic in a wide area, from Asia to Europe (Perlès 2001; Чохаджиев 2001; Marijanović 2003; Beauclair 2008). In Macedonia, the best studied examples are the burials from Anzabegovo (Nemeskeri and Lengyel 1976; Санев 2009). According to reports, the skeletons belong to the same Mediterranean gracile anthropological class. They identified thirty-four individuals, mostly female, of different age (Nemeskeri and Lengyel 1976). The burials are from the Early and Middle Neolithic layers (Ib to III-IV). Almost all of them are in flexed position, either on the left or the right side or on their backs. The orientation seems not important. What differentiates them from Grnčarica is that none of them is under the floor of a house. Instead, they were reported as found between the houses. Another difference is that some of them were found together with occasional burial gifts (beads, bone tools, pottery) (Санев 2009). Nevertheless, these two sites from Macedonia, together with Nea Nikomedeia in Northern Greece (Theocharis 1973; Perlès 2001), share many similarities in the burial practice.

2.5 Neolithic artefact assemblage

Neolithic pottery artefacts, the main aspect of this work, are discussed in Chapter 4. Beside the pottery vessels (or their fragments), artefacts made of various materials were discovered in Grnčarica, and their short presentation is due. The assemblage is differentiated by the raw material: clay, bone and stone.

2.5.1 Clay

Most of the items used by the Neolithic people were probably made of organic material and therefore they are not preserved. We can only imagine the variety of objects: from basketry (of which we find prints on the pottery) to the house construction materials. Of what remained until today, objects made of clay are among the most frequent archaeological finds. Besides the pottery, there are also: six ceramic discs, two parts of anthropomorphic figures, one loom weight and one bracelet fragment.

The range of proposed purposes of the **ceramic discs** is wide: loom weights, pot lids, potters turntable, pot scrapers and even ’tokens‘ or game pieces (Perlès 2001). They are cut-outs from discarded potsherds (usually from vessels with thicker walls). Some of them still have a red slip and barbotine decoration (Fig. 2.15a, f). In Macedonia, there are varieties with or without a hole in the middle. For those with a hole, the ’loom weight‘ theory is plausible. The Grnčarica samples are without a hole, and this type seems not very practical for a loom weight or a spindle whorl (Fig. 2.15; 2.16). They might be lids, but most of the pots have much bigger openings. They are also too small to be turntables (Perlès 2001). Following Perlès, our samples neither show polish nor use-wear, to be considered as potter’s tools. The diameter varies between 6 and 10 centimetres and their thickness between 1.2 and 2.1 centimetres. One of them has ’V‘-shaped carvings on both sides, which might somehow support the theory of their non-utilitarian use (Fig. 2.15d; 2.16a). As far as Balkan Neolithic is concerned, this is a unique case of Neolithic clay disc with decoration or ’writings‘ on them.

Anthropomorphic and zoomorphic figures are common items in prehistoric assemblages. Since the Upper Palaeolithic they acted as material manifestation of the cultural memory of a human group, or ’mnemonic devices‘ for re-enacting the past

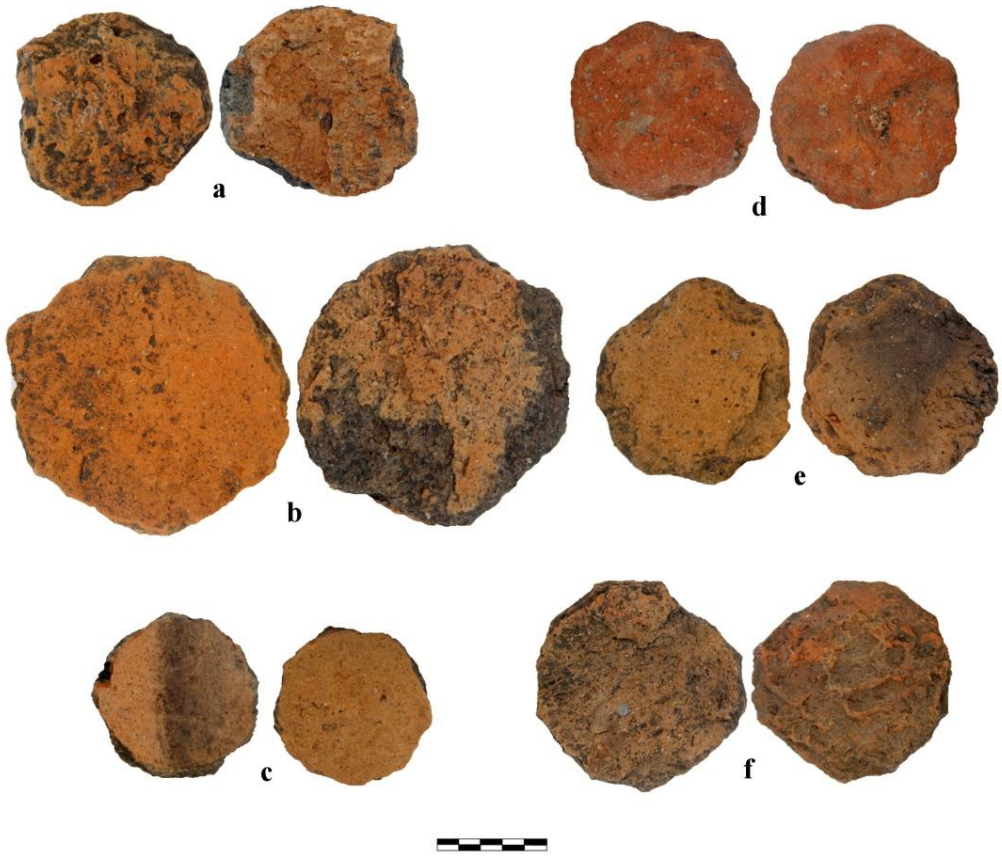


Figure 2.15: Clay discs.

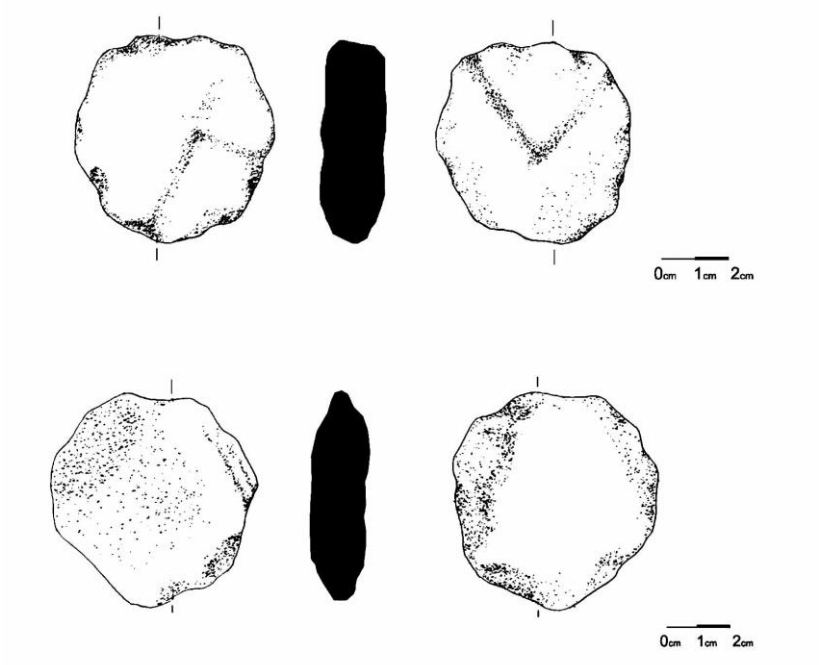


Figure 2.16: Carved and plain clay discs (S. Stojanovska)

Figure 2.17 Anthropomorphic figure parts.

and preserving the tradition (Assmann and Czaplicka 1995; Porr 2010). By the time of the Neolithic, producing and using these figures was already well-established practice.

This form of proto-religion shares the same general traits throughout the whole Balkan-Anatolian territory and further into Europe. Considering the large collection of figures, many authors have studied and written on this subject (Bailey 2000; Nanoglou 2010; Perlès 2001). Our examples are only two and difficult to determine (Fig. 2.17).

They are both made of clay containing various inclusions; their surface is roughly smoothed, and they were fired under badly controlled conditions and received uneven reddish colour; their shape is highly stylized. The first one might be a foot, but also a highly stylized body of a seated figure (Fig. 2.17a). The second can also be lower part of a leg, but it is more likely it represents a stylized human head. Even though no features (eyes, nose…) are present, the basic shape resembles the Middle

Fig. 2.18: Loom weight.

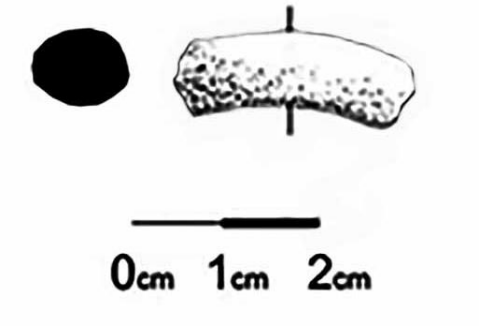


Figure 2.19: Bracelet fragment.

Neolithic anthropomorphic cylinders and altars from Skopje region, especially from Tumba Madžari which are far more elaborated (Санев 2009).

The loom weight was found on the surface (Fig. 2.18). Its Neolithic provenance is not questionable when compared to the Roman loom weights and loom weights from other Neolithic sites. It is made of clay with larger mineral inclusions; it has a trapezoid shape and perforation in the upper part. After the firing, it received light-brown to greyish colour. Secondary fire traces are visible. These artefacts are not particularly sensitive to changes through time, but still its presence in the assemblage should be noted.

One small fragment of a **clay ring,** possibly a bracelet, was discovered in trench 2 (Fig. 2.19). It was made of clay containing some middle-sized mineral and organic temper. Probably it had a thin coating of more liquid clay with red colour. It was discovered in the waste area. The bracelet has a round cross-section with d = 1 cm. These artefacts are not very frequent in the Macedonian Neolithic (Fidanoski 2009).

2.5.2 Bone

Grnčarica has surprisingly poor bone collection. Only three objects will be discussed here. The first one is a broken tip of a **bone chisel**. It was made of a long bone diaphysis by longitudinal splitting. The working edge is arch-shaped. Further zooarchaeological observations should reveal whether it was of human or of animal origin and of which animal in the latter case (Чохаджиев 2001).

The other two objects are animal **knucklebones** (Fig. 2.21). One is much bigger than the other (possibly from *Bos primigenius*). It is difficult to speculate if these objects had a higher purpose than a food waste. It is also not clear if the obvious alteration of the surface colour was intentional (paint) or a result of taphonomy.

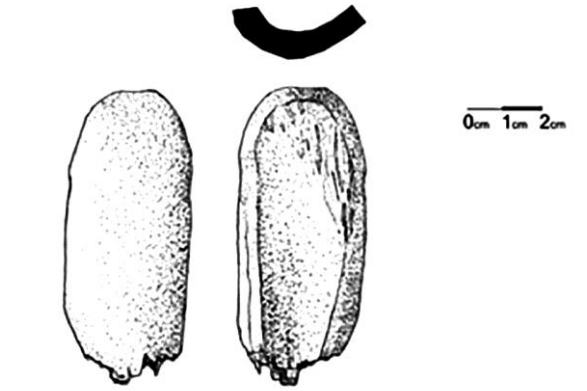


Figure 2.20: Bone chisel (S. Stojanovska).

Figure 2.21: Animal knucklebones.

2.5.3 Stone

There are seventy-four stone objects from Grnčarica: fifty-eight chipped stone implements, seven hand-mill parts, three polished stone-tools and six tools with ambiguous definition.

The **chipped stone** industry deserves a separate study. Grnčarica was probably a regional centre for stone tools. There is a flint outcrop on the nearest hill, just 300 metres south of the settlement. Next to the outcrop, there was a large stone with couple of shallow holes on its surface. The marks clearly show that those holes were created by recurring abrasive movements with other objects. Once a hole became too deep, a new location on the stone surface was started. According to Jovčevska (personal communication, 2008) this was a 'working table' used in the initial on-site flaking stage and the stone was there at least since the Neolithic. Later the stone was taken to the Museum in Štip and its current location is unknown. Nevertheless, the

Figure 2.22 Assortment of chipped stone products.

abundance of flaking debris around the location and all over the hill slope confirms that this source was exploited for a long time.

The surprising element about the lithic technology and typology is the low presence of laminar products (Fig. 2.22). Tools made of blades are only 17% of the chipped-stone assemblage, including trapezoid microliths. The predominant elements in the stone tool-kit are the scrapers and points made of flakes. Another peculiar fact is the variety of raw material. Besides the mentioned outcrop, the stone tools were obviously produced of whatever material available, some of which with very bad quality. It is also not excluded that some of the higher quality rocks were brought from distant locations. A detailed techno-typological approach in the study of the lithics gathered from the area around Grnčarica might reveal pre-Neolithic phases of exploitation.

Polished stone-tools are poorly represented in Grnčarica. Only one chisel is a typical, fine grained, polished stone tool (Fig. 2.24 e). In addition, two other questionable axes are added to this group. They were made of atypical, coarse grained stone and only their shape determines their attribution.

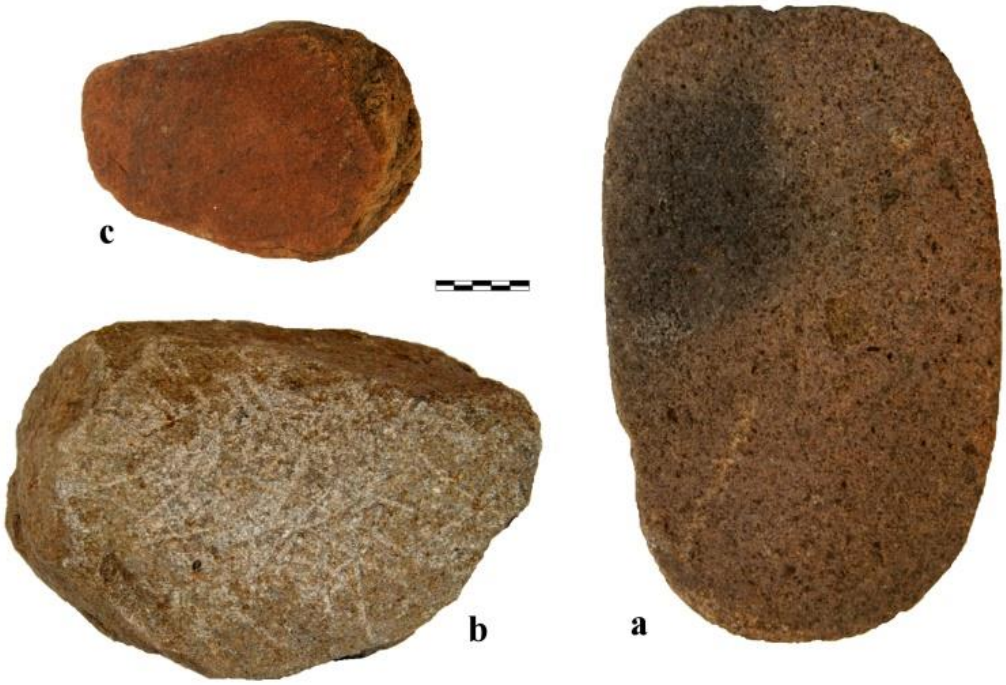


Figure 2.23 Hand-mills.

Ground stone hand-mills (quern stones) are composed of two parts: static (which is bigger and has flat upper surface) and mobile (smaller and flat lower surface). Their place is usually inside the house, near the fireplace. Even though they are very frequent finds in Neolithic sites, usually they are paidinsufficient attention (Perlès 2001). (Fore more information about Levant see Dubreuil 2004; Wright 1994). The usual raw material is coarse-grained volcanic rocks.

Five static (two shown in Fig. 2.23a, b) and one mobile part (Fig. 2.23c) have been found in Grnčarica. They bear traces of strong and prolonged firing, so they must have had indeed close connection with fire, but their context was disturbed during agricultural activities. Nevertheless, their concentration in one area is hardly a coincidence. Four of them were found in trench 12, one in trench 16 (but right next to its border with trench 12) and only the mobile part was found a bit further, in trench 10. This position coincides with the pottery kiln location, a central area of the settlement around which all the huts were built and where most of the daily activities took place. One of the static parts has many incisions on its flat surface, but their Neolithic origin is not certain.

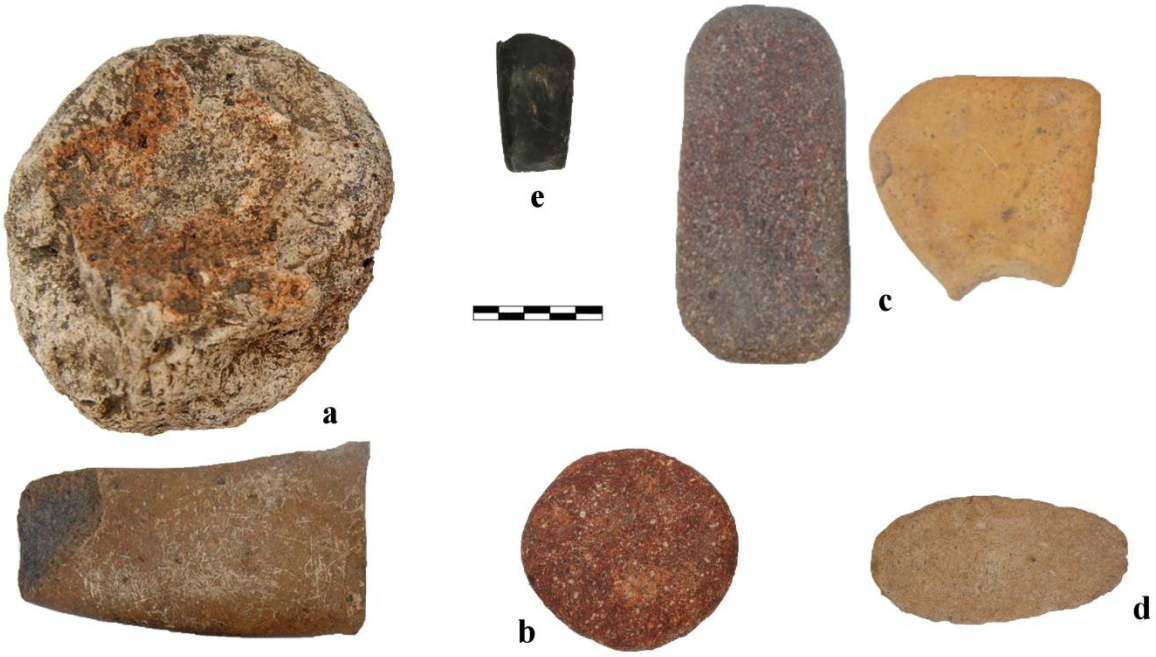


Figure 2.24 Ground stone tools.

Other stone tools (Fig. 2.24) include the discovered stones that are obviously tools, but their interpretation is speculative. Two tools in Fig. 2.24a were found together in trench 5. One is ball-shaped and has a small depression with red powder traces in it. It could be a small mortar for crushing ochre, as well as a pounder. The other has elongated shape and it is obviously broken. It bares many use wear traces. Probably it was used as a whetstone. In their proximity, in trench 6, two stones were found that are best interpreted as pottery polishers (Fig. 2.24c). They are both flat, thin and trapeze-shaped. One is yellowish-brown and its shortest side is concave. The other is grey, almost rectangular and has traces of red ochre. The tool in Fig. 2.24b is disc-shaped. Both its sides are very smooth. Found in trench 10, it was used as a polisher or a whetstone. The tool in Fig. 2.24d is made of sandstone and it is the most probable whetstone in the group. It is oval and has a flat working surface. It was found in trench 15.

CHAPTER 3:
MATERIAL AND METHODS

3.1 Provenance of the material

Subject of this study are the ceramic artefacts collected during the excavations in Grnčarica in 2007/2008. The fieldwork was led by Trajanka Jovčevska, and the entire 'Zletovica' project was coordinated and directed by Trajče Nacev. The complete Neolithic ceramic material is studied as a single group of artefacts, coming from a relatively small settlement which lived for a rather short time, contained entirely into one Neolithic phase (Нацев 2008).

The only artefact position recording during fieldwork was marking the trench number and sometimes the spit number. As previously noted, the material comes from a single cultural layer. The spits were only numbered, without giving at least the relative depth, and therefore not very informative. What remains is the trench number. Fig. 3.1 shows the excavation plan with the ceramic artefact density by trench for the Neolithic layer. The spatial distribution of the material can give us some information about the life intensity and different activity areas inside the settlements. When looking at this representation, one should have in mind that artefact selection was carried out by the archaeologists immediately after the excavation. This probably has certain influence on the result in Fig. 3.1. For example, the extremely high density of

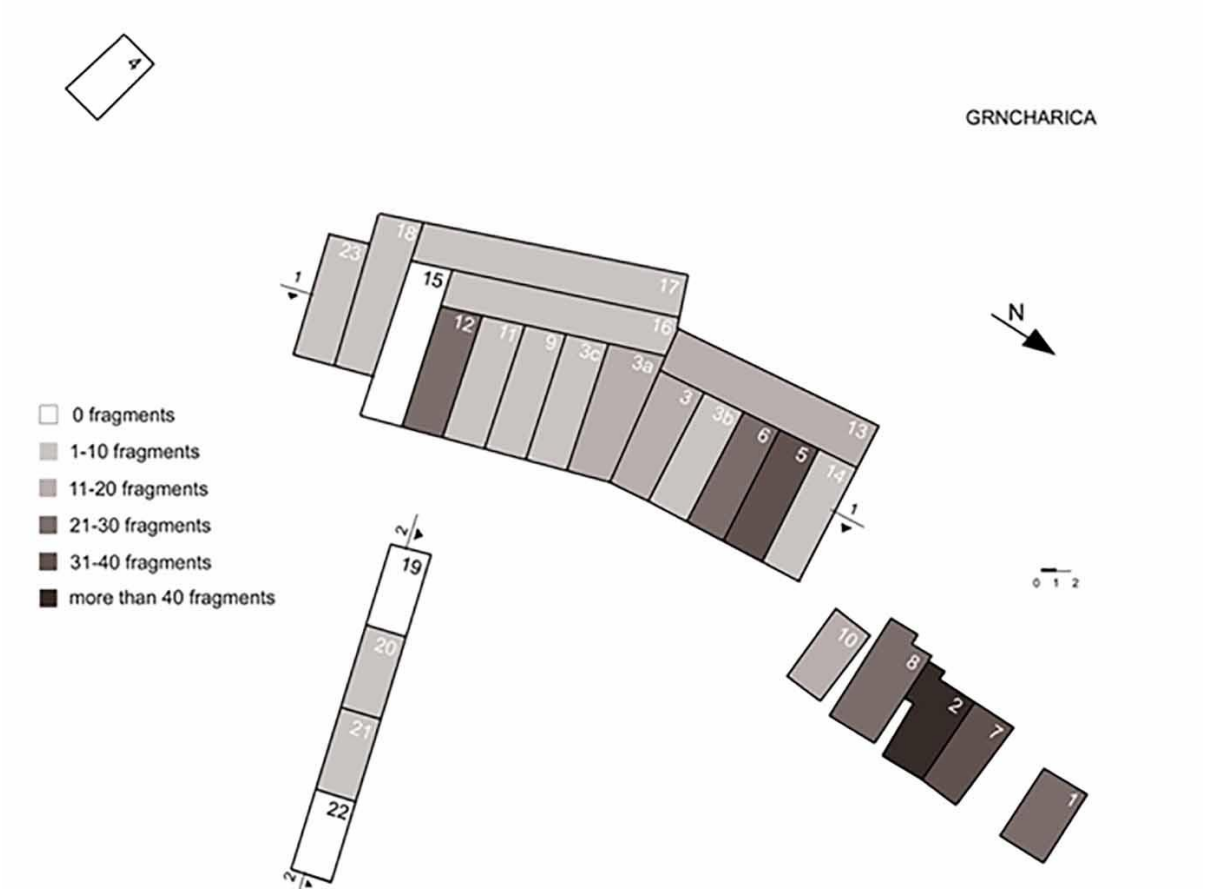


Figure 3.1 Trench numbers and pottery density in the excavated area (plan after Lj. Kljonkova).

potsherds in trench 2 may represent broken pottery disposal area. But the enormous difference with the central area of the settlement is probably because of the extremely fragmented state of the trench 2 material, further amplified by the post-excavation selection criteria. Nevertheless, the standpoint here is that Fig.3.1 reflects an existing general difference in spatial artefact distribution which points to different activity areas (households, pottery workshops, waste areas etc.).

There are a total number of 342 Neolithic ceramic artefacts. Ten of them (two figurine parts, one loom weight, one bracelet fragment and six circular objects) will not be included in the typological analysis. The assemblage of 332 pottery fragments is divided into 16 groups, determined by the body part (or combination of body parts) they represent (Table 3.1). Not all the groups give information for all the typology categories, but they all contribute to at least one of them.

Groups	no. of pieces	%
reconstructed vessels	13	3,9
handles	6	1,8
rim fragments	45	13,5
bottom fragments	5	1,5
wall fragments	40	12
rim/neck fragments	30	9
rim/wall fragments	78	23,5
wall/handle fragments	48	14,5
bottom/wall fragments	54	16,2
neck fragment	1	0,3
wall/neck fragment	1	0,3
leg/wall fragments	3	0,9
wall/neck/handle fragment	1	0,3
rim/neck/wall fragments	4	1,2
highly fragmented vessels	2	0,6
rim/wall/handle fragment	1	0,3
Total	**332**	**100**

Table 3.1 Groups and quantity of considered ceramic artefacts.

3.2 Techno-typological approach

From technological perspective, conclusions about the pottery production process Grnčarica are drawn. Number of elements of the settlement, such as the pottery kiln, some specific artefacts and some features on the human remains (see Section 2.4) speak about the local production of the pottery. The main accent in this work is on the shape typology of the assemblage, so no specific methods were applied for detailed technological analyses. Nevertheless, even if only through simple macroscopic observations and basic archaeometry, an attempt has been made to comment the production process (raw material provenance, use of temper, shaping and modelling of the vessel, surface treatment, decoration techniques and the firing process), and to cluster the artefacts based on their technological traits.

The first 'highest level' classification is dividing the material into one of the two **technological types**: coarse and fine. My criterion here is the thickness of the wall, 1 cm being the border line. The artefacts thinner than 1 cm are considered as fine, and those thicker than – or equal to – 1 cm as coarse. This classification has

nothing to do with the surface treatment of the vessels (which is subject to separate typology). Except for the bottoms and handles, all the other artefact groups participate in this typological classification.

Another technical feature which can be observed is the use of **temper** in the clay. No microscopic, petrographic, chemical or other methods have been applied. This prevents more precise identification of the mineral inclusions for example, but at least the macroscopic observation permits the differentiation between organic and mineral temper, or recognizing differences in size and quantities of temper. Thus, it is interesting to observe the relationship between certain temper type and pottery shape, technological group, surface treatment or any other typological group (Fidanoski 2009; Shepard 1985; Чохаджиев 2007).

The next typology category is the **surface treatment** of the pottery (following Fidanoski 2009 with some modifications). The pottery is clustered in four groups or four levels of surface treatment: rough, roughly smoothed, smooth and polished. The first level is where no attempt for at least minimal effort for smoothing is visible. What is sometimes visible are modelling traces (finger or tool marks) or coil borders. But above all, this category includes the intentionally roughened or barbotine decorated pottery. The second level of smoothness means that minimal effort for smoothing was made, probably using only the fingers. In many cases this effort was not applied equally on the entire surface. The third level is smooth, in places burnished surface. There is no doubt that smoothing tool was used, since there are occasional fine parallel lines testifying of the smoothing process. Still, there are some bigger vessels with unevenly treated surface. The fourth level is the extremely polished, evenly treated surface, which under certain angle reflects the light. These last two techniques were reserved for the vessels intended for slip application or painting. Comparing the inner and outer vessel surface treatment of the fragments can give some further information about the shape and the function of the vessel. Observations are also made on the connection between surface treatment and the choice of decoration technique. All artefact groups participate in this classification.

The next observations are made on the **use of slip**. Exactly 50% of the pottery is slipped, but the type of slip and the position where it is applied vary. Therefore, a bit more complex classification is produced and presented in a table in the next chapter. In the first group the denominators are: red slip, thin red slip, dark red slip, light red slip, orange red slip, brown red slip and brown slip. The slip in the Grnčarica assemblage is applied on the external surface of the vessel, on the internal, on both

surfaces, on the external and horizontal band below the rim on the internal surface, on the internal and thin horizontal band below the rim on the external surface, on the internal surface and the very tip of the lip, on the external surface and the very tip of the lip, or the potter simply slipped only the lip. The different combinations and their relationship with some of the other technological features will be explored in the next chapter. All artefact groups are included.

The firing stage (together with the choice of clay) is reflected on the original **surface colour** and the type of **profile-section** (visible on the fragmented pottery). The Neolithic potter understood surprisingly well (no doubt through trial and error and collective memory) the chemical and physical features of the different clays and their reaction when exposed to high temperatures. To avoid deformation or other unwanted appearances, but also to achieve the right colour, they were manipulating the clay, the temperature, the oxygen flow and they were consciously choosing the right type of temper. In this part of the next chapter, the pottery will be grouped by their surface colour, the profile-section type and the reasons and meaning of each will be discussed. All artefact groups are included in these analyses.

3.3 Shape and decoration typology

Due to the extremely fragmented state of the pottery, only 13 vessels could be reconstructed and they are representing the category of reconstructed vessels. This is the category that unambiguously gives us full information about the **vessel shape** and allows their typological classification. Many of the members of the fragment groups have enough preserved elements and they also contribute to this typology. From the variety of the Neolithic pottery shapes from Macedonia and the Balkan, there are only five types found in Grnčarica: plate, bowl, jar, lid and pan. In the next chapter all these types, their sub-types and their technological features will be reviewed separately.

The Grnčarica assemblage, being fragmented as it is, gives an opportunity to analyse the different body parts. Therefore, additional analysis of the different **base and handle types will be made.**

Finally, the **decoration techniques** used in Grnčarica are also assessed. Even though it is purely technological stage in the pottery production sequence, because of

the chronological sensitivity and importance of the decoration types for cultural identification of one assemblage, it deserves a separate analysis. Still, no pottery trait is isolated, so the information will only be complete if we identify the relationship between different traits.

The typology categories and sub-categories that result from these analyses are interconnected and not necessarily in hierarchical interposition. Their purpose is to detect in detail the shape and decoration traits of the Grnčarica pottery and the statistics that will result from that. Archaeological cultures change in time, people's perception and taste evolve and that is reflected on their material culture. These typological observations, being nothing else but direct analyses of the material culture of Grnčarica, find their justification and importance in further clarification of the Neolithic in the Balkan, or at least re-opening or provoking some new questions.

CHAPTER 4:
POTTERY TECHNOLOGY AND SHAPE AND DECORATION TYPOLOGY

4.1 Ceramic technology

Even though experimentation with clay is an autochthonous activity for the early farmers in Southwest Asia, they were not the first to invent ceramic objects. The Venus of Dolní Věstonice is an Upper Palaeolithic figurine from Central Europe, recognized as the earliest ceramic in the world. It is dated around 30ka ago and it was not alone. In the Far East, pottery was invented as early as 18 000 years ago in The Yangzi River valley (Boaretto et al. 2009), 15 000 years ago in Japan (Tsutsumi 2000), 13 300 in the Russian East (Kuzmin 2006), and 12 000 years ago in South China (Lu 2010). These occurrences are associated with egalitarian forager groups with developed subsistence strategies (Lu 2010). One of the early pottery invention centres is the wider region of Southwest Asia its whole Neolithisation process and the transmission to Europe being already elaborated (Chapter 1).

The pottery production in Macedonia is a continuation of Anatolian and Near Eastern tradition. It arrived already developed, together with the rest of the elements of the 'Neolithic package'. The further development of the pottery production in the 'new lands' goes in separate ways and that is what discriminates one culture from another or one chronological phase from another.

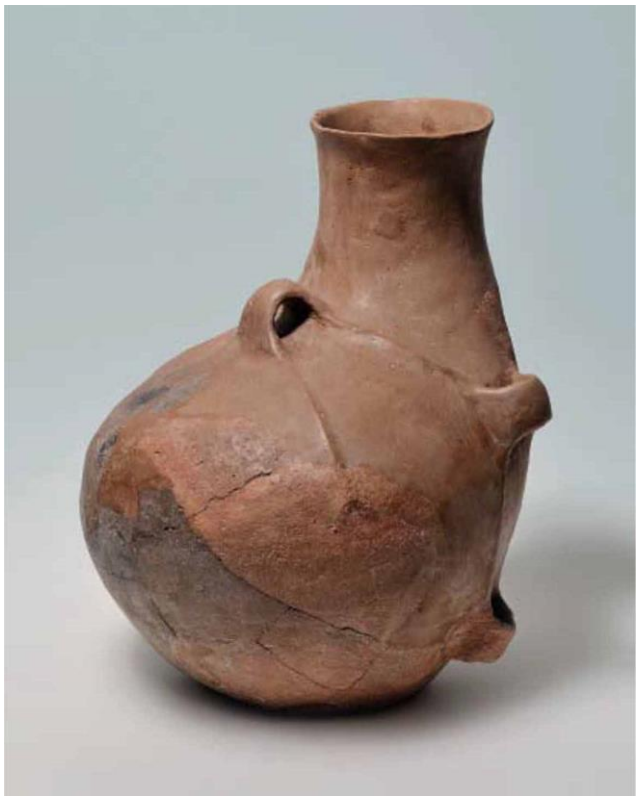


Fig. 4.1 Askos (Šemrov and Turk, 2009)

So far, not much attention has been paid to the provenance of the clay or pottery trade patterns among Neolithic communities in Macedonia. Clay is a relatively common material, so it is most probable to assume local raw material procurement. Further pottery analyses, especially on petrography, may give interesting results on trade and population movement patterns.

Fidanoski (2009) recognizes four different techniques of vessel shaping from Neolithic sites in Macedonia: 1) simple shaping of a vessel from a lump of clay, by thumbing a hole and shaping it with the fingers (used for small and simple vessels); 2) coil construction – building a vessel by placing clay coil rings or spiral in horizontal rows, one on top of the other; the first row was placed at the edge of already prepared clay disc, which would serve as bottom of the vessel; the coils were connected by vertical movements of the thumb or a tool, until relatively flat surface was achieved; this is the most common Neolithic technique in an area much wider than Macedonia and the Balkans; 3) slab construction – technique more common for the Middle East, but also present in the Balkans; the vessels were built of clay slabs, starting from the bottom towards the upper parts; the slabs were simultaneously connected with wet clay; 4) there is a group of vessels, called *askoi*, which are unique for the Anzabegovo-Vršnik culture (especially for the Middle Neolithic from the region of

Skopje); they are asymmetrical vessels with ex-centric necks and usually five handles (Fig. 4.1); no precise technique is proposed, but obviously a model or mould is necessary for their shaping.

All these techniques, except for the latter, were used in Grnčarica. So far, no *askoi* have been found. There are some very small vessels, which could have been shaped using the first technique. The pans were also constructed in this manner. Most of the vessels were produced using the coil technique though. Some of the fragments had broken off at the spot where two coils were connected and many of them have straight edges. On some of the fragments, especially the coarser ones, a layering can be seen on the cross section (different than the firing effect), which can be a sign of slab building. In the following headings, the rest of the technological features of the pottery assemblage will be observed in more details.

4.1.1 Wall thickness

As pointed in chapter 3, depending on the wall thickness, the pottery will be grouped in two groups: fine and coarse. The diagram produced in Chart 4.1 represents the number of pottery fragments by wall thickness. All the values smaller than 1 cm are considered fine. The pottery with wall thickness of 1 cm or more (in our case up to 2.5 cm) is considered coarse. As a result, two almost identical groups are established. The fine category consists of 163 pieces (or 50% of the pottery assemblage), and the second group counts 158 pieces (49.3%).

In the group of fine pottery, concerning the surface treatment (see Section 4.1.3), predominance of the third (smooth) level can be observed (40%), followed closely by the second (roughly smoothed) level (37%). The fourth (polished) level with 13% is better rated than the first (rough) level, which represents only 10% of the fine pottery group.

Hundred-and-six of the fine pottery pieces (65%) have slip. If compared to the total pottery assemblage (see Section 4.1.4), we can conclude that the percentage of the slipped pieces among the fine pottery is above average.

The use of temper was a usual practice in Grnčarica (see Section 4.1.2). While the organic temper was used without exceptions, the size of the mineral inclusions varies. When observed in the group of fine pottery, the conclusion is that there is no interdependence between wall thickness and mineral temper size. Namely, the small and the coarse particle categories are equally represented in the fine pottery group (37% each). There are even some very thin fragments with surprisingly large mineral

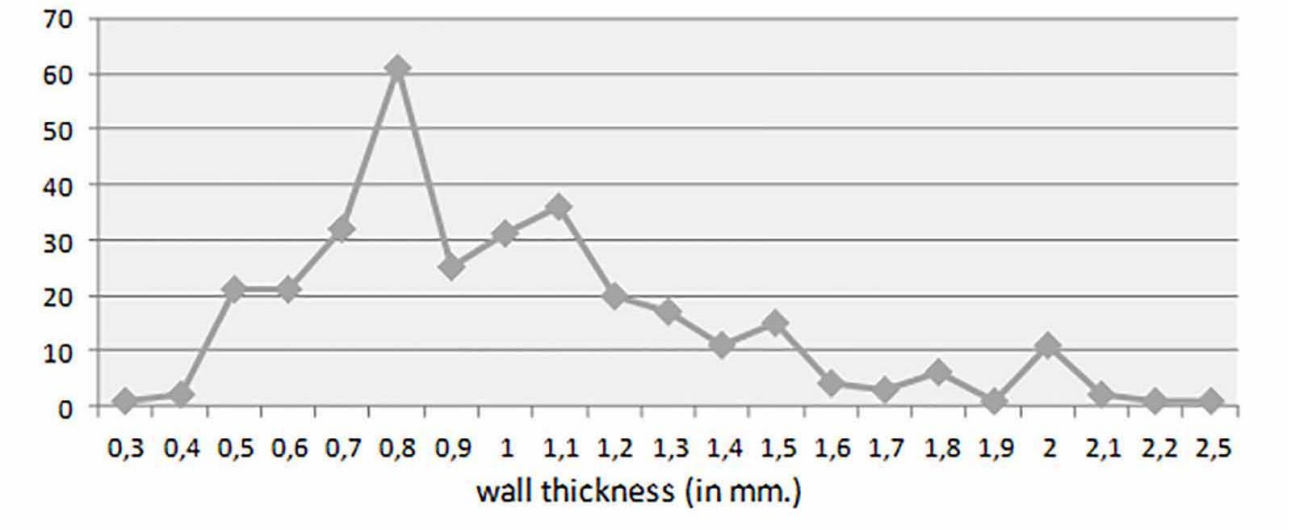


Chart 4.1 Piece count by wall thickness (values in mm.)

inclusions (Fig. 4.2). The middle size mineral temper category is represented in 26% of the fine pottery assemblage.

The group of coarse pottery differs from the fine pottery in some ways. For example, the predominant surface treatment level is the first (rough), represented by 45% of the coarse pottery assemblage. The second level follows with 30% while 20% are smooth. Only five pieces are polished. In addition, there are four pieces with rough lower part of the belly, but their upper part (below the rim) was smoothed in different level.

Only 33% of the coarse pottery assemblage have traces of slip. That is below the average for as much as the fine pottery is above.

As expected, the majority (56%) of the coarse pottery fragments have coarse-grained mineral temper. The medium-sized follow with 27% and the small-grained mineral temper is present in 17% of the fragments. Absolutely all of them have organic inclusions.

Figure 4.2 Large size mineral inclusions in pottery.

4.1.2 Temper

Neolithic potters understood the properties of the raw material very well. Depending on their needs and projections they purified the clay when necessary or added different temper when needed. The temper used in the clay in Grnčarica (as observed by the means explained in Section 3.2) can be divided into organic and mineral. The organic inclusions might be chaff, plant residues, seeds and even animal excrements (Fidanoski 2009; Чохаджиев 2007). In Grnčarica we find it in almost all the potsherds. There are only around twenty fragments requiring additional microscopic observation for confirmation. The mineral temper is usually a grinded limestone or siliceous sand and it is further grouped by the size of the particles into: small (≤ 1 mm), medium (1-3 mm) and coarse-grained (> 3 mm).

Considering the complete pottery assemblage, the small sized mineral inclusions are present in 26.5% of the potsherds, the medium-sized in 27% and the coarse dominate with 46.5%.

4.1.3 Surface treatment

Depending on the surface treatment, the pottery is grouped into four categories (see Section 3.2). Each of the categories represents different level of smoothness of the outer surface of the vessel: category I (rough), category II (roughly smoothed), category III (smooth) and category IV (polished).

Category I represents 26.5% of the assemblage, category II with 33.8% is the most dominant, category III comes second with 28.7% and only 9.6% of the pottery is polished. There are four potsherds that show different surface treatments of the same vessel. All of them have rough lower half, but two have category II upper half, one is smooth and one is polished. This is a purely statistical information which, in a fragmented assemblage like this, should be taken with precaution.

Further observations on the connection between surface treatment and slip use gave the following result: only three potsherds (3,5 %) of the category I group have slip; category II is the largest group in the assemblage, but only 33% have slip; eighty-six out of the ninety-five fragments that belong to category III are slipped (90.5%); only one out of the thirty-two polished fragments are without slip. Thus, it is clear that one of the main intentions behind surface smoothing was the slip application. But something else must be pointed out. The state of preservation of the

slip is directly connected with the surface treatment and varies from poorly preserved and barely visible in the rough pieces, to perfectly preserved in the polished ones. This probably influences the statistical results.

4.1.4 Use of slip

Slip is a liquid clay solution which was applied on the surface of an already shaped vessel, before firing. We can only speculate any function of the slip, other than aesthetic,. But the temporal frames of the use of slip in Macedonian Neolithic are somewhat better defined. Even though many hues were present (red, orange brown, grey), the Early Neolithic is characterized by the domination of the red varieties of

	Location 1	**Location 2**	**Location 3**	**Location 4**	**Location 5**	**Location 6**	**Location 7**	**Location 8**	**Total**	**%**
Red	25	27	55	1	3	1	1	3	**116**	**70**
Thin red	4	3	9						**16**	**10**
Light-red	6		2						**8**	**4.8**
Dark-red	3		8		1			2	**14**	**8.4**
Orange-red	4	2	4						**10**	**6**
Brown-red	1								**1**	**0.6**
Brown			1						**1**	**0.6**
Total	**43**	**32**	**79**	**1**	**4**	**1**	**1**	**5**	**166**	**100**
%	**26**	**19**	**47.5**	**0.6**	**2.4**	**0.6**	**0.6**	**3**	**100**	

Table 4.1 Slip types and distribution on the Neolithic pottery from Grnčarica.

slip. The red-slipped vessels with smooth or polished surface were the precondition for the appearance of the white-painted ornaments, which is the trademark of the Early Neolithic in Macedonia. The same hues were present throughout the whole Neolithic, but the Middle phase is dominated by the brown and grey hues and the Late Neolithic by the dark-grey and black slip (Fidanoski 2009).

One half of the Neolithic pottery assemblage of Grnčarica is slipped. The colour is almost exclusively red (there is only one piece with brown slip). The different tones of red and the position where the slip was applied vary. The slip on the vessel can be on: the external surface (location 1); the internal surface (location 2); both surfaces (location 3); the external and horizontal band below the rim on the internal surface (location 4); the internal and thin horizontal band below the rim on the external surface (location 5); the internal surface and the very tip of the lip (location 6); the external surface and the very tip of the lip (location 7); tip of the lip only (location 8). The generated results are presented in Table 4.1.

4.1.5 Surface colour

The vessels that were not slipped carry the natural colour of the clay after firing. Different clays have different mineral structure which means different reaction to fire and different colour. It seems that the Neolithic potters understood this well and had some control over the production of the desired products. Moreover, they understood that other factors, like oxygen influx and temperature level, also influence the properties of the ceramic and the discovered pottery kiln system proves that they were trying to control them too. For achieving lighter hues higher temperatures and oxygen level are required, and for darker hues (grey to black) the oxygen flow must be reduced. Another thing is when and whether these effects were intentional or they were achieved accidentally.

Observing the pottery assemblage from Grnčarica, we can conclude that intermediate to light hues were required. The statistics are the following: light-brown pottery dominates with 31% and it is equally present in both fine and coarse pottery groups; the brown pottery follows with 21% and it is also equally distributed; red-brown coloured pottery is present with 15. 7% and it is slightly more present in the coarse pottery; the darker hues come in fourth starting with greyish-brown, represented in 11.5%, equally distributed; the pottery with yellowish-red colour is present in 6.5%, equally distributed among the groups; a very dark version of brown follows with 5.7% and is also equally distributed; brownish-red pottery comes in 4%; the plain red pottery is only 2.5% of the assemblage and it is more affiliated with the fine pottery group; there are three pieces of dark-grey pottery which are probably parts of the same vessel and their obvious difference with the rest of the assemblage suggests that they might have been imported.

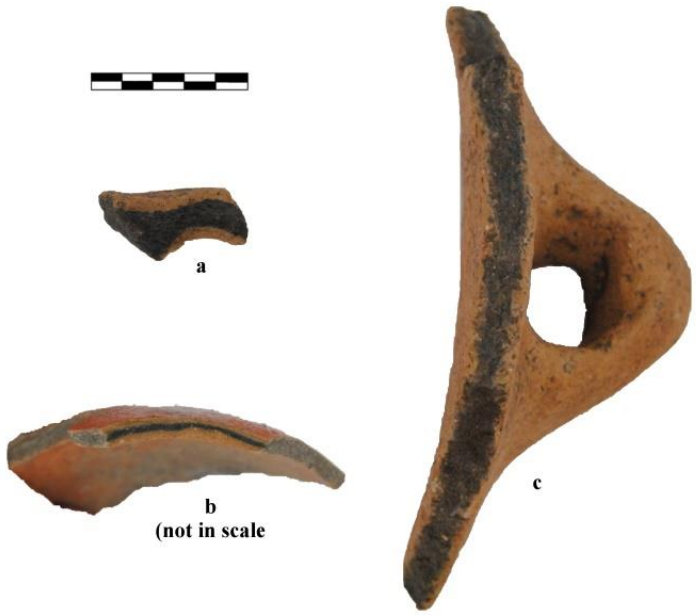


Fig. 4.3 Typical layered section of the Grnčarica pottery.

4.1.6 Section

The colours in the section of the broken potsherds can also give information about the conditions in which the pottery was fired. In general, there are two types of sections in the Neolithic: section with the same colour as the surface of the pottery, and the layered (biscuit) type (Fidanoski 2009; Чохаджиев 2007). The first type is present when the pottery is fired on constant and continuous temperature and oxygen flow. This type of section is completely absent in the Neolithic pottery from Grnčarica. The second type is when a grey or black layer is visible between two layers with the surface colour of the pottery (Fig. 4.3). This type suggests that the pottery was not exposed to fire long enough for the oxygen to reach through the entire clay wall. This was the case for the Grnčarica assemblage. The fuel department in the discovered kiln is not too large. Even though we don't know the covering structure, the height of the internal space of the kiln was not too big either. Whatever fuel had been used, it burnt relatively quickly, together with the cover, which led to a sudden oxygen increase and temperature decrease. This could explain the variety of dark tone layers, which are abundant in the section of the pottery from Grnčarica, even in the finest potsherds (Fig. 4.3 b). This could also explain the different hues of a single vessel, depending on its position inside the kiln during firing. Nevertheless, this hypothesis should be tested with archaeological experimentation.

4.2 Shape analysis

There is no unified criteria system and nomenclature for the typological analyses of Balkan Neolithic pottery. The current state is rather confusing and it is difficult to make comparisons. Literature has names for the same type of vessels in the same level, coming from different assemblages (Angeleski 2011; Fidanoski 2009; Garašanin 1979; Gardner 1976; Mock 1976; Ганецовски 2009; Гарашанин and Гарашанин 2009; Китаноски et al. 1978, 1980, 1987; Симоска et al. 1979; Чохаджиев 2007). Trying to fit an assemblage precisely in the jigsaw requires previous careful comparative analyses to the existing works. As mentioned in chapter 3, here the synthetic work of Fidanoski (2009) is followed, with personal modifications and adjustments to the Grnčarica assemblage.

4.2.1 Vessel shape

From the total of 332 potsherds in the Neolithic layer in Grnčarica, only 189 gave information about their vessel shape. The first level of classification divides the detected pottery shapes into five groups: plates, bowls, jars, lids and pans.

Plates are defined as open vessels whose largest diameter is the rim diameter (Appendix – Fig.6.1). In Grnčarica there is only a couple of reconstructed examples, but, from analyses of other assemblages, it is generally considered that the vessel height should be equal or smaller than one half of the rim diameter, and the foot diameter is less than ⅔ of the rim diameter (Fidanoski 2009).

Plates represent 47.6% (90 examples) of the 189 potsherds. Comprising almost half of the assemblage, they are the dominant pottery shape. Further observations bring out some internal differences among the plate samples. The wide range of their practical use defines the wide variety of profile, wall thickness, surface treatment or decoration. 56.6% (or 51 examples) belong to the group of coarse pottery. The remaining 43.3% (or 39 pieces) are fine pottery. Observing the surface treatment and presence/absence of slip shows no regulations within the plate group. All levels of surface treatment and all variations of slip application are present. Presenting the percentage would be statistical numbers without meaning. But the variations of the profile could give interesting and useful information, which can be used for further comparison and synchronization with other assemblages. Based on the profile variations, the following types can be recognized:

- hemispherical plates – the line of the wall in the profile section is curved (Appendix – Fig. 6.1: *a, b, d, e, f, g, j, k, l, m, n, o, q, s, u, w, y*); this type of plates slightly outnumbers the second type; examples *a* and *b* are so shallow that even their attribution to the plate group is questionable; they could easily represent lids; unfortunately the size of the fragments does not permit certainty, so some determinations must be taken conditionally; examples *d* and *g* (especially *d*) differ from the rest of the group for the gradual thinning of the wall from the belly of the vessel towards the lip; example *o* is unique, for its rim is decorated with small concavities (or pits), but there are also fine, short, horizontal lines on its exterior upper surface; these might be traces of the surface treatment process, but it is more likely to be intentionally applied; example *m* is the only pottery fragment in the whole assemblage that has stabbed decoration; there was an unsuccessful attempt to make a hole on example *s*, the purpose and time of which remain unknown.

- truncoconal plates – the line of the wall in the profile section is straight (Appendix – Fig. 6.1: *c, h, i, p, r, t, v, x*); example *i* is interesting for its 'V' shaped cut-offs on the rim, but also for its fingernail impression decoration on the external lower part of the body; example *r* has a peculiar inwardly curved rim.

Bowls are considered as open vessels. The rim diameter is smaller than their biggest diameter, but never less than ⅔. This criterion is especially useful when determining the shape of a vessel that is borderline between a bowl and a jar. In Grnčarica 46 bowls (24.3%) were found. Seven of them are reconstructed vessels and the others were recognized mostly by their rim fragments. Half of them are shown in Fig. 6.2.

Bowls are considered as the finest pottery in an assemblage, 'the highest achievement of the Neolithic potters in Macedonia' (Fidanoski 2009). This is generally confirmed by the Grnčarica assemblage: only 10 examples (21.7%) belong to the coarse pottery group; the fine dominates with 36 examples (78.3%); there are 15 examples with smooth surface, followed by thirteen polished pieces, then twelve roughly smoothed and six rough; thirty-one of this pottery type pieces (67.4%) are slipped; there are only two decorated examples: the first is the only white-painted potsherd in the whole assemblage (Fig. 6.8*k*) and the second has some very fine barbotine-like intentional roughing of the external surface below the rim (Fig. 6.2*e*); this type of vessels have mostly flat bases, but there are also examples with convex bases (Fig. 6.2*n, p*) or they stand on small (usually four) ellipsoid legs (Fig. 6.6*r, s;*

Figure 4.4 Miniature hemispherical bowl (see also Fig. 6.2h).

Fig. 6.8*k*); there are examples with small, medium and very large mineral temper in the clay and the inevitable organic inclusions; based on the bowl body form the following typological subdivision can be made :

- hemispherical bowls – this type of bowls represent part of a sphere; some are more flattened than others, but the common denominator is the curved line of their walls when looked at cross-section (Appendix – Fig. 6.2 *a-c*, *e-m*); in most of the cases the lip of this type of bowls is even, but there are examples with slight thinning (*k*) or widening (*g*) of the lip; the same example with widened lip also has a 'U' shaped notch on the rim; the size of the fragment is too small to say whether there were others as part a decoration, or it was only this one serving as a pouring stout; the example in Fig. 6.2*h* is specific for its size; it is very small and is one of the two almost entirely preserved vessels (Fig. 4.4);

- bowls with hemispherical lower and truncoconal upper part – the name of the type is descriptive enough; it can only be added that there is no carination dividing the two halves (Appendix – Fig. 6.2*n, o, p, q, w*); the last example stands out for its internally widened lip and almost cylindrical form; nevertheless, the walls are still tilted enough to be included in this type;

- bowls with outwardly drawn lip (Appendix – Fig. 6.2 *r, s, t, u, v*) **–** handles are rare in bowls in general, but here we have one example (which is completely

reconstructed) that has four tunnel-like handles (*t*) and is entirely slipped on the external surface;

- cylindrical bowls (Appendix – Fig. 6.2*d*) – there is only one example in this group, whose walls are vertical; it belongs to the fine pottery group, but its walls are not even; the fragment is small and we do not know the shape of the lower half, but from analogies with other assemblages, it was probably hemispherical;

Jars have constricted recipients (closed vessels). The usual body shape is spherical (the term *globular* is especially frequent), and very often they have relatively tall neck. The total height of the jars and their rim diameter never exceed ⅔ of the vessels' biggest diameter. The transformation of the jars characterizing the passage of the Early towards the Late Neolithic is in the height decrease and width increase (Fidanoski 2009).

In Grnčarica jars are slightly more frequent in assemblages than bowls. The number of examples is forty-nine, which makes 25.9%. Twenty-five of them (51%) are coarse, and 24 (49%) are fine. All temper types are present. Twenty-six (53%) are slipped. The majority has roughly smoothed surface (twenty examples, i.e. 40.8%). Seventeen pieces (34.7%) are smooth, ten (20.4%) are rough and only two pieces (4%) have polished surfaces. Like the bowls, most of the examples were determined according to the rim/wall potsherds. Nevertheless, of what has survived, the following profile typology can be determined:

- jars with constricted opening (Appendix – Fig. 6.3*q, r*) – the neck or the rim are not emphasised; the wall line continues from the belly towards closing the vessel, and ends without direction or thickness modification; these are the examples difficult to distinguish from the bowls, without applying metrical criteria; the example under *r* is the second of the two (besides the bowl in Appendix – Fig. 6.2*h*) almost completely preserved miniature vessels; besides their apparent similarity, for the sake of consistency in the metric criteria application, they belong to different vessel types; nevertheless, from a technological point of view, both of them can be considered examples of the first shaping technique (Section 4.1);

- jars with vertically drawn rim (Appendix – Fig. 6.3*e, f, m-p*) – the rim stems directly from the belly, it is drawn vertically and is relatively short; no other morphological element can be detected between the rim and the belly; the rim of the

example under *p* is far from being vertical, but the shift of the direction of the wall is obvious; instead of taking the name literally, this type should be considered more as a tendency, or as transitional type; another interesting feature about the mentioned example is the oblique incision on its rim, the nature of which is not clear; the examples *m* and *n* are reconstructed shapes; the first has four symmetrically positioned, vertically perforated nipple-like handles; the second has also four symmetrically positioned, vertically perforated, tunnel-like handles; the example under *e* has vertical, but widened and irregular rim (seen in cross-section).

- jars with short neck and outward rim (Appendix – Fig. 6.3*a-d, g, i, k, l*) – according to the potsherd examples, the neck in this category can be defined only as the breaking point between the inward wall of the belly and the outward rim; the example *c* is different from the rest of the group for its colour, as well as for its decoration; it has unique dark-grey colour and the decoration consists of cord-wrapped tool impressions on the neck exterior, which is not seen in the surrounding Neolithic cultures of the peninsula; it was already proposed as an import or as intrusions from later periods; the example *g* should also be mentioned for its unique irregular rim.

- jars with long neck and outward rim (Appendix – Fig. 6.3*h, j*) – this group is similar to the previous, but here the neck is an elongated parabolic transition from the belly to the rim; they are relatively large storage vessels, probably among the largest utilities in the household; unfortunately, the lower part of the vessel was not preserved.

Lids are expected to be common element in the Neolithic household activities. But their similarity with the plates makes them difficult to distinguish and surely diminishes their real number. In Grnčarica, only one fragment could be determined as part of a lid with certainty, and that is because of the minimal remains of an incised decoration it had on the external surface (Appendix – Fig. 6.4). Only few parallel lines from the supposed incised ornament are visible, nevertheless it was enough to logically conclude it used to be a conical lid. The potsherd belongs to the group of coarse pottery. There are organic and some middle-sized mineral inclusions in the clay. The surface is roughly smoothed and has the natural post-firing colour of the clay, which in this case is brown.

Figure 4.5 Pan base fragment with a basketry imprint.

Pans are lumps of clay, spread and roughly shaped into a flat platform with low irregular walls. Not much attention was paid to the other technological stages (clay structure, surface treatment or firing). No slipped or decorated examples are known from Macedonia. In fact, there are published examples only from the Late Neolithic Anzabegovo-Vršnik culture (Fidanoski 2009).

In Grnčarica three different pans were discovered. The first had enough elements to be reconstructed (Appendix – Fig. 6.5). It is a shallow vessel with irregular shape and a lot of inclusions in the clay, both organic and mineral in all sizes. The bottom is flat and thick, the wall thickness varies, and the rim is slimmed and drawn inwards. The post-firing colour of the clay varies, which means it was fired under unstable conditions. There are also traces of secondary firing. It stood probably very near to the fire place and had kitchen functions.

The second example is a grey-coloured bottom fragment from a vessel that apparently had a rectangular shape. On its lower side basketry imprints are visible (Fig. 4.5).

The third example is a rim fragment from a vessel which was also rectangular and obviously shallow. It has a similar colour and appearance as the first one.

4.2.2 Base types

Bases are the thickest and the strongest part of the vessel. Thus, they are usually the morphological element that is best preserved. Unfortunately, very often it is the only preserved part, making it difficult to associate certain base type with vessels. This is the case with the Grnčarica assemblage. There are seventy-six unearthed bases and base parts, isolated from the rest of the vessel. The best that can be concluded is the following base typology:

- flat base (Appendix – Fig. 6.6*a-h*) – this is the most common type in the assemblage; it is represented by thirty-four out of the seventy-six examples (44.7%); the belly of the vessel starts directly from the edge of the base;

- flat cylinder foot (Appendix – Fig. 6.6*i-l, n-q*) – here the belly starts from a slightly higher point, which gives the impression that the vessel is standing on a flat cylinder with a varying height; this type comes in a close second place with 43.4% (33 examples);

- legs (Appendix – Fig. 6.6*r, s*) **–** there are four cases in which the vessels stand on several (usually four) small legs; the examples from Grnčarica have ellipse horizontal cross-section;

- concave base (Appendix – Fig. 6.6*m*) – there are two examples with concave base in Grnčarica;

- convex base (Fig. 6.2*n, p*) – this type is known only from two reconstructed bowls;

- ring foot – even though this type is reported as dominant in sites not so far (chronologically and geographically) from Grnčarica (Чохаджиев 2007), here there is only one example of a ring foot (unavailable for demonstration).

4.2.3 Handle types

Handles (like bases) are strong (thick) parts of the vessel and very often, especially in cases of strong fragmentation of the pottery, are found out of morphological context. In Grnčarica fifty-eight handle examples are identified (reconstructed vessels, where four handles of the same type found together, are

considered as single example). Similar as in other Early Neolithic context (Krauß 2011a), the typology is very simple:

- lugs with perforation (Appendix – Fig. 6.7*a-g*) – this type of handles are represented by thirty-one pieces (53.4%); they can be found in either jars or bowls; usually there are four in one vessel, positioned symmetrically on its four sides; the perforation can be horizontal (*a, b*) or more frequently vertical (*c-g*), but very often the vertical lugs are slightly tilted to the left or right from the vertical axis; this tilting is probably related to the practical use and the direction of the ropes that were strung through them;

- vertically perforated tunnel-shaped handles (Appendix – Fig. 6.7*h-j*) – besides the lugs, this is the most frequent Early Neolithic type in the wider area; in Grnčarica they are represented by twenty-six examples (44.8%); they can also be found both in jars and bowls and their position on the vessel is the same as the lugs; the difference is that the tunnel-shaped handles are more elongated and the perforation is always vertical; their function is also related with cords or ropes for easier transportation and handling of the vessel;

- knob (Appendix – Fig. 6.7*k*) – there is only one ellipse-shaped knob handle in Grnčarica; it was positioned on the neck area of a large jar, which was also decorated with finger imprints on the body.

4.2.4 Decoration techniques

Neolithic potters in Macedonia decorated their products using eight different techniques: barbotine, application, painting, impression, stabbing, incision, incrustation, and channelling (Fidanoski 2009; Garašanin 1979; Гарашанин and Гарашанин 2009; Темелкоски and Миткоски 2005). Their significance in different cultural groups and chronological phases varies.

In Grnčarica, only 50 of the 332 Neolithic pottery artefacts are decorated. That means that undecorated monochrome (slipped or not) pieces dominate the assemblage with 85%. In the remaining 15% (50 examples), not all decoration techniques are represented. The different modes of impression and the barbotine technique are the most frequent, leaving far behind the different applications and the incised, stabbed and painted techniques, which are represented only by few examples:

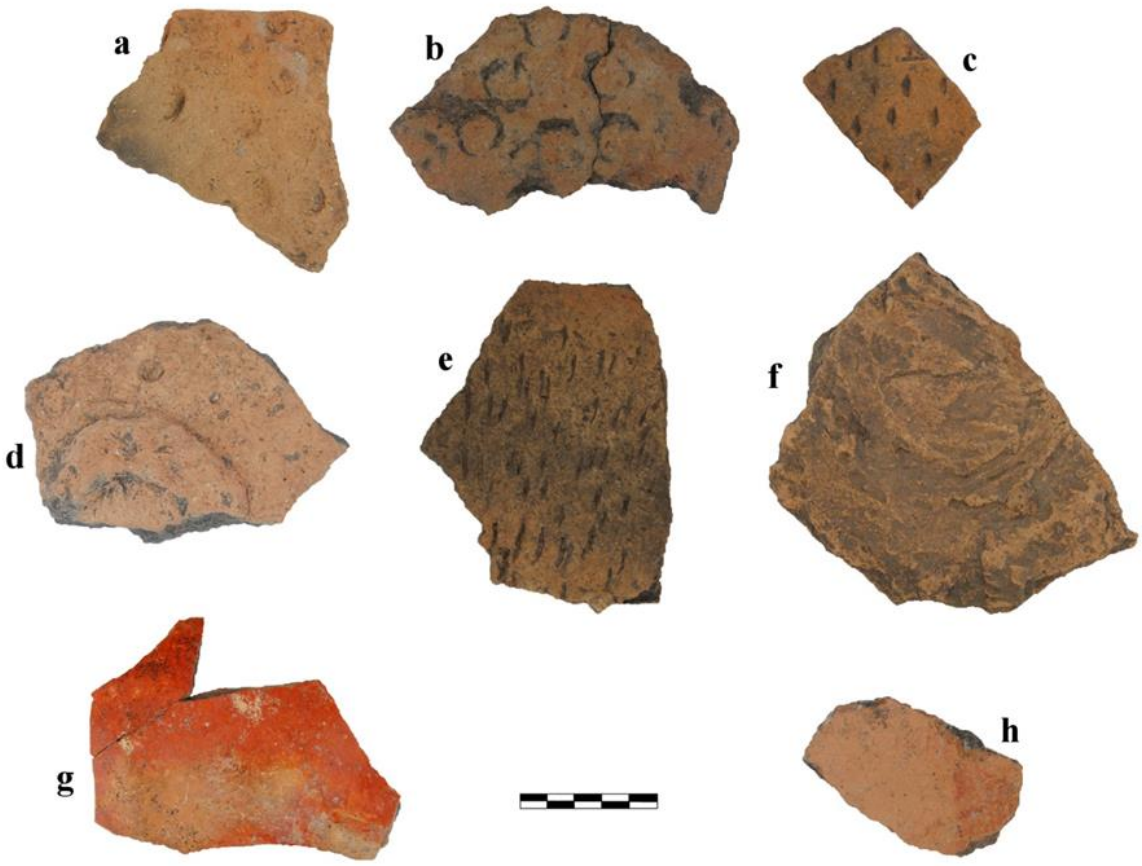


Figure 4.6 Pottery decoration varieties.

- impression –technique performed with a tool or by using the hands only; the goal is to leave marks on the vessel surface prior to firing; unfortunately, although it is the most frequent technique in the assemblage (18 examples, 36%), it is not chronologically sensitive; it is found in all the Neolithic phases; there are five different ways in which this technique can be performed: finger impressions, fingernail impressions, 'o' impressions, cord impressions and 'grain' impressions;

- **fingertips** leave relatively regular circle marks on the vessel surface; with ten examples, forming rows of circles with the fingers was one of the most common ways to decorate a vessel in Grnčarica (Fig. 4.6: a; Appendix – Fig. 6.8 *i*);
- another way of decorating a vessel without a tool was using the **fingernails** (Fig. 4.6*e*; Appendix – Fig. 6.8 *j*); they are represented with five examples; one of the reconstructed plates has its lower part of the exterior entirely decorated in this manner (Appendix – Fig. 6.1 *i*);

- one example shows **circular** impressions that are obviously made with tool (Fig. 4.6: *b*); Čohadžiev (2009) proposed that these impressions were made with a hollow bone instrument;
- another common impression pattern for the Balkan Neolithic is the '**grain**' impression (Fig. 4.6*c*); in Grnčarica, however, there is only one such example;
- the last example is the 'imported' jar in Fig. 6.3*c* of the appendix; the small ellipse impressions were made with a **cord-wrapped** tool on the exterior of the neck; as mentioned, this example is considered an import or intrusion into the Neolithic;

- barbotine – this is one of the positive decoration techniques; once the vessel was shaped (prior to firing) an uneven layer of clay was applied on its surface (usually on the lower exterior part); depending on whether it was modified or left unchanged after the application, there are two different types: organized and unorganized; this type of decoration was also used in all Neolithic phases in the Balkans; there are seventeen examples (34%) in the Grnčarica assemblage:

- **unorganized barbotine** – the additional layer of clay was applied freely, maybe even by sprinkling the mushy clay with a brush; a minimal 'spreading' intervention is possible in some cases; once the desired appearance had been achieved, the pot was fired without further modification (Fig. 4.6*f*); twelve examples were found in Grnčarica; one has a much finer appearance than the others (Appendix – Fig. 6.2*e*), but the technological process was the same;
- **organized barbotine** – after the additional clay mass was applied, using the fingers, vertical grooves were made from the bottom to the neck, giving a wavy appearance of the external surface (Appendix – Fig. 6.8*a, b*); depending on how the grooves finished at the neck area, a subdivision was named 'arched barbotine'; in Grnčarica, there are too few (only five) samples which are too small for such observations;

- application – another positive decoration technique, where previously shaped clay masses were applied on the vessel surface, prior to firing; although only five

examples have this kind of decoration, four different types are determined; they differ in the shape and the context of the application:

- **small spheres in tight rows** – the applied spheres have a 1.2 cm diameter and they are grouped in regular rows, tightly one next to the other (Appendix – Fig. 6.8*g, h*); from the two fragments that were discovered in Grnčarica, the rows are all there is, so there is no way of knowing on which part of the vessel or which type of vessel they were applied on;
- **nipple-shaped protrusions** – this is a unique fragment with two protrusions positioned vertically next to each other (Appendix – Fig. 6.8*e*); the example is greyish-brown coarse potsherd, probably from a bowl;
- **horizontal relief rib** – as the name describes, a clay band was horizontally attached to the body of the vessel; the preserved example is only one and very small (Appendix – Fig. 6.8*d*);
- **arched relief band** – another unique small fragment from the assemblage has an arched clay band applied on it, with couple of finger impressions (Fig. 4.6*d*; Appendix – Fig. 6.8*f*); apparently, this arch was part of a bigger ornament, but this small potsherd is the only puzzle piece that was discovered;

- incision – a decoration technique performed with a sharp tool; it is extremely rare in Macedonia and yet associated with all Neolithic phases; there are only two incised potsherds in the assemblage: one is the mentioned lid (Appendix – Fig. 6.4) and the other is the plate fragment shown in Fig. 6.1*o***,** Appendix;

- stabbing – there is only one plate fragment decorated with stabbings of a pointed instrument (Appendix – Fig. 6.1*m*); the decoration is performed on the lower part of the exterior surface;

- paint – the only white painted bowl fragment should be mentioned; obviously the ornament was more complex than what is preserved, and it was performed with white colour on a polished red-slipped background (Fig. 4.6*g*; Appendix – Fig. 6.8*k*); this is the characteristic type of a decoration for the 'post-monochrome' Early Neolithic of the Balkan Peninsula; having only one fragment, a confident chronological determination of the whole assemblage is not possible;

another body fragment, although questionable, should be mentioned; it seems that the normal red slip in this case was applied in order to create an ornament (Fig. 4.6*h*; Appendix – Fig. 6.8*l*); this is not the usual way how paint was applied, even for the later 'dark paint' phase; it is possible it was a result of a post-depositional alteration and uneven slip preservation.

4.3 General consideration regarding Grnčarica pottery (analogies)

The highly fragmented state of the pottery undermines the already difficult task of finding comparable assemblages in the wider region. Even though many fragments gave some information about the vessel shape, most of the information is limited to only one morphological part. In addition, the lack of previous interdisciplinary analyses of the clay fabric does not allow some very important technological characteristics to be observed. However, from the presented observations some general conclusions about the Neolithic pottery assemblage from Grnčarica can be summarized:

- There is an equal distribution of coarse and fine pottery;
- The organic and mineral inclusions in the clay are present in almost all potsherds; this is the case with almost all sites from the earliest phases of the Neolithic in the Balkans (the monochrome phase); the abundance of organic inclusions differs from the Anzabegovo-Vršnik Ia phase (where it is not so frequent) and the closest analogies in Ohoden (Bulgaria), not far from Grnčarica (Ганецовски 2009) and Krajnici I, which is even closer (Чохаджиев *et al.* 2007; Чохаджиев 2007);
- The surface of the vessel was only roughly smoothed in most of the examples, and together with those with smooth surface, they dominate the assemblage, leaving far behind the two extreme levels: rough and polished; there is not much information about this kind from other settlements, but it seems the assemblage fits well in the general Neolithic picture of the area;
- The use of slip was fashionable as half of the assemblage is slipped; the range of variety (as presented in Table 4.1) is wide; on one hand, the variety of colours of the slip can be accidental, resulting from mixture modification, different firing conditions or post-depositional alterations; on the other hand, the choice of which area of the body of the vessel to be

slipped is intentional and according to the potters or customers aesthetic perceptions; 'monochrome' pottery is common in Anzabegovo-Vršnik Ia, such as the white-painted pottery with floral elements (Garašanin 1979); at the same time, red slipped pottery is the 'trademark' of the mentioned sites from the monochrome phase from the peninsula, and the lack of white painted decoration in Grnčarica (taking the unique example as exception) confirms even further the common attribution of those sites;

- The post-firing surface colour of the non-slipped pottery is hardly a criterion for cultural or chronological determination of an assemblage (especially Neolithic); it can give information about the firing conditions and temperature, but the intra-site variations are so many that (on the basis on the colour only) sometimes no relation can be seen even from two fragments from the same vessel (especially when determinations of the colour are subjective descriptions); the cross-section type is somewhat more reliable, but the possible variations are too little and therefore not much informative; if a type of cross-section is typical for two assemblages, that does not necessarily make them culturally and chronologically connected; firing conditions are not something that gradually and irreversibly transforms in time from one setting to another; again, the biggest contribution of this kind of information would be only to understand the life inside that particular settlement better; in any case, the external appearance and the cross section appearance of the Grnčarica assemblage is comparable to the 'monochrome' group, Ohoden and Krajnici I being the nearest (Ганецовски 2009; Чохаджиев 2007), as well as to sites from Anzabegovo-Vršnik and the other 'developed Neolithic' cultural entities in the Balkan.
- The shape and decoration typology is the best indicator for making inter-site analogies and it has been used intensively (see Section 4.2); the shapes of the pottery in Grnčarica fit well in the wide Balkan-Anatolian Early Neolithic complex; the bi-cone shapes that begin to appear in the Middle Neolithic phases were not found at Grnčarica; also the general tendency of the jar to decrease in height and increase in width towards the Middle Neolithic cannot be seen; most of the shapes, especially the jars with four tunnel-like handles and the bowls on small legs find their exact analogies in

the the Anzabegovo-Vršnik complex; but the jars can also be found at sites in Anatolia even before the Neolithisation of Macedonia (Krauß 2011a) and together with the bowls and the different types of plates they are present in most of the Early Neolithic Balkan cultures; some exact analogies of the bowls and plates can be seen again in the Krajnici and Ohoden assemblages, as well as other sites from the monochrome Neolithic phase (Чохаджиев 2007 , Обр. 5; Ганецовски 2009, Обр. XVII-XXIII; Еленски 2002, 2006, 2007, 2008); it is also not surprising to find parallels with the base and handle types in the same sites (Чохаджиев 2007, Обр. 6; Ганецовски 2009, Обр. XIV, XXV); the established relative chronology in Macedonia and the region is based on the painted decoration, white-painted being Early Neolithic, and dark painted Middle and Late Neolithic; the attention on this type of decoration left the rest of the traits slightly under-investigated; the 'rough' modes of decoration are usually connected with later influences from the Balkan-Carpathian complex, or from the Adriatic coast cultures (Angeleski 2011; Batovič 1979; Brukner 1979; Garašanin 1979; Гарашанин 2009); however, later works had shown that this decoration styles are present at earlier sites in Western Anatolia and the Marmara region (Krauß, 2011a); the presented decoration styles in Grnčarica are contained by the existing cultural concepts in Macedonia; but as already said, these styles in those concepts are secondary, and in Grnčarica the 'primary' Neolithic pottery decoration, the paint, is minimized to one potsherd; on the other hand, obvious analogies are recognizable in the two mentioned assemblages from Bulgaria (Чохаджиев 2007, Обр. 43; Ганецовски 2009, Обр. XXVII), especially the impressions and some of the relief applications.

The comparison between two pottery assemblages is a powerful tool in determining relative chronology of a certain period in a geographical context. The longer the distance – the more caution should be applied. The Grnčarica assemblage has been intentionally compared only to the nearest sites, to determine the micro-regional disposition of synchronous settlements. The next chapter gives possible interpretations of the data presented so far.

CHAPTER 5: CONCLUSION

The debate about the pottery-based relative chronology of the Neolithic period in the Balkan Peninsula has been going on since the first attempts to establish it, and today there are more than ever open issues (Garašanin 1979; Gardner 1976; Heurtley 1939; Mock 1976; Tchohadjiev and Bakamska 1990; Гарашанин and Гарашанин 2009; Китаноски et al. 1978, 1980, 1987; Тодорова and Вайсов 1993; Чохаджиев 2007); This debate is inevitably correlated with the Neolithisation discussions (Bonsall et al. 2002; Kotsakis 2001; Krauß 2011b; Nikolova 2007; Özdoğan 2011; Perlès 2001). The main questions are about the exact time when the Neolithic started in the peninsula, the mode and directions of Neolithisation and the appearance and distribution of the earliest pottery. Relevant to all of them is the Balkan 'monochrome pottery' issue and the associated 'Proto-Starčevo' phase (Srejović 1971). One group of researchers see the monochrome phase as initial phase in the Neolithic development, preceding the 'developed' Neolithic with white-painted pottery (Nikolova 2007). The opposing group usually doubts the methodology during the excavations of the sites reported to contain 'monochrome' phase and add that 'pottery first arrived in south-eastern Europe at a time when the phase of monochrome pottery in the south-western Anatolian Lake District had already ended' (Krauß 2011a). Nevertheless, since the introduction of the phase by Srejović in 1971, many sites all over the Balkan were considered: Krajnici, Koprivec and Poljanica-platoto in

Bulgaria (Tchohadjiev and Bakamska 1990; Попов 1996; Тодорова and Вайсов 1993) and Divostin, Donja Branjevina and Grivac in Serbia (Bogdanovich 2007; Karmanski 1979; Богданович 1987). In Macedonia (even if it was not dubbed 'monochrome'), an assemblage lacking painted pottery was reported in Pešterica (Китаноски et al. 1980). Its material culture strongly resembles the architectural and outdoor activity traits of Divostin and Ohoden. This report has not received the proper attention and since then the established Neolithic system of Macedonia was not seriously challenged.

Grnčarica and Pešterica share many similarities. They are both flat settlements laying on slopes in peripheries of valleys. Compared to the tells, the life of these settlements was short. The buildings were not renewed after their first (and last) destruction. The architectural concepts were completely different, but it is more likely that they had been local adjustments and environmentally conditioned, than a chronological or cultural trait. In addition, given the great similarity of the pottery, especially from a technological aspect, the affiliation of these two sites from Macedonia seems straightforward. In the excavation report Kitanoski interpreted the site as an eponym of a 'new Neolithic group from the earliest phases of the Neolithic, settled in the wet Atlantic phases when the nearby Pelagonia valley was under water' (Китаноски et al. 1980).

It is already clear that all material culture characteristics point towards determining Grnčarica to the still amorphous chronological group of sites with monochrome pottery (Initial Neolithic). But the radiocarbon results presented in Section 2.1 disagree (5720BC (95.4%) 5610 cal BC and 5570BC (87.1%) 5470BC). For Neolithic standards the results do not match, but both are far from the proposed chronology for the Balkan Neolithic monochrome phase (before 6100 cal BC). No matter how problematic and questionable radiocarbon results sometimes can be, in this case they cannot be ignored. Especially because they come from two different samples from the same burial (which undoubtedly is a secure context), and they were measured in two different laboratories.

In Krajnici (Western Bulgaria) the monochrome layer I (which shares many pottery traits with Grnčarica) is at the bottom of the stratigraphy, superimposed by two layers (II and III) containing pottery with white-painted decoration (Чохаджиев et al. 2007). Thus, the stratigraphic and therefore the chronological order here seem clear. Radiocarbon dated samples from future excavations would be of great significance in completing the regional picture.

Ohoden is another settlement from Bulgaria which, besides some differences, finds many analogies with Grnčarica. This site was dated at 5710±40 cal BC (Ганецовски 2009). The dates roughly match the ones from Grnčarica, which gives further support to the credibility of the radiocarbon results.

On a more local scale, typological pottery analyses, as well as the rest of the assemblage, confirm the proposed hypothesis since the excavations (Нацев 2008), and position Grnčarica in a phase preceding the Anzabegovo-Vršnik Ia. As previously said, this contradicts the radiocarbon results, so the problem of chronological determination of Grnčarica still exists. At this point of research, it is not possible to give definite straightforward answer. Nevertheless, detecting and presenting the possible solutions is always one step forward.

If we accept that Grnčarica represents the prototype of agricultural societies in the region (to which the material culture points), then we need to explain the absolute dating results. Since there is no vertical stratigraphy detected during the excavations, future systematic campaigns might search for a horizontally stratified settlement complex. The difference in the thickness of the cultural layers in the northern and the central part of the excavation area and the sedimentation processes on the slope should be explored in more details.

If we accept the dates, then we have a lot of explanation to do. The radiocarbon dates of the different stages of the established Anzabegovo-Vršnik culture largely overlap (Linick 1977). According to the proposed chronology, Grnčarica would belong to Anzabegovo-Vršnik II or III, both determined as Middle Neolithic. As already pointed out, the most characteristic features of the Middle Neolithic (dark-painted ornaments on pottery, channelling, shapes with carination and vessels with a high hollow foot) completely lack in Grnčarica. In fact, there is no single element in the entire assemblage that would suggest Middle Neolithic. Even if we rely on a single white-painted fragment (0.03% of the pottery assemblage), we would still expect earlier dates. White paint is still present in Middle Neolithic pottery, but compared to the above-mentioned characteristics, it is a mere exception. So, finding the exception in the assemblage and not finding even one piece of the prevailing group is quite a coincidence.

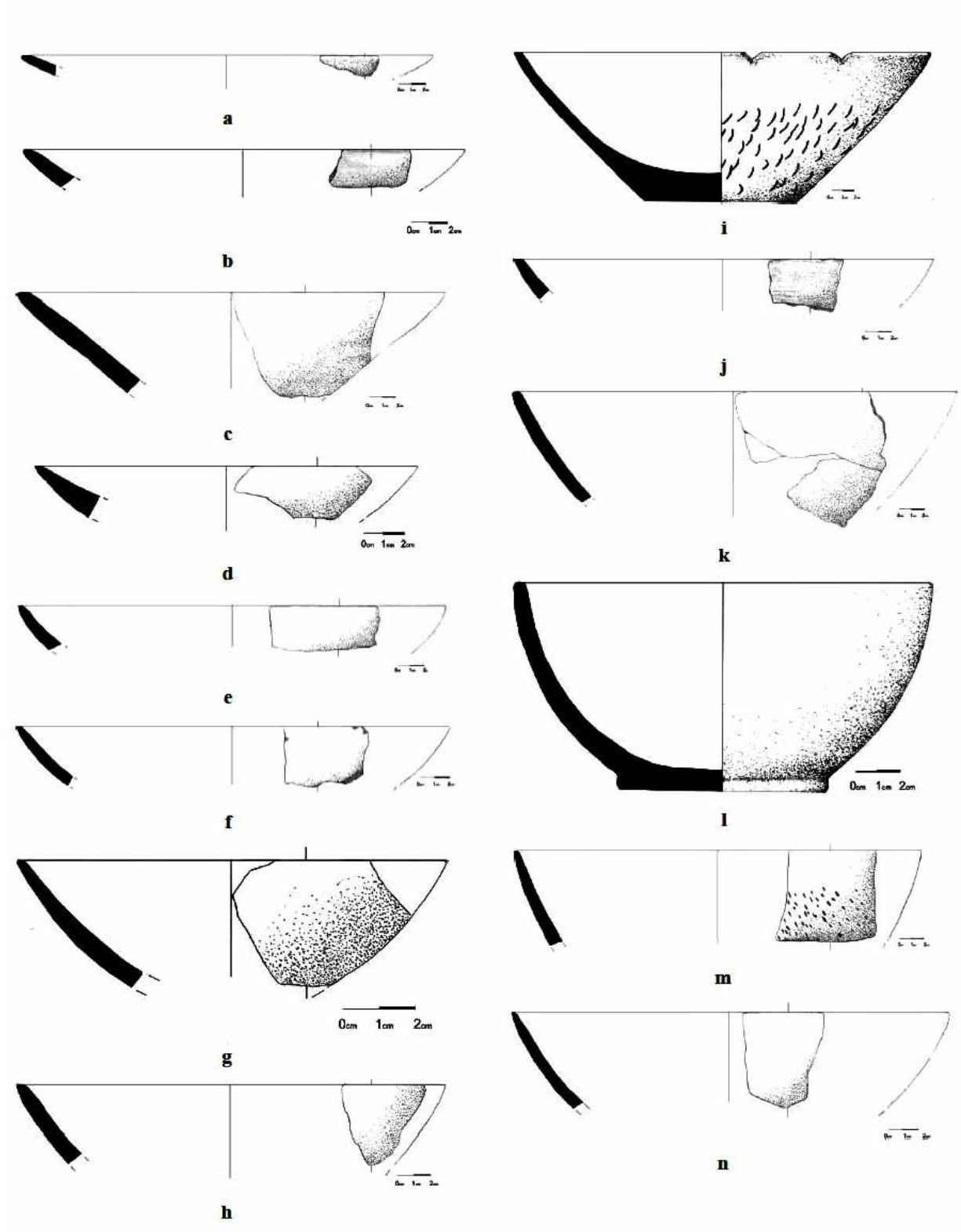
The generalized representation of facts prevents a more subtle detection of individual traits and differences. Some of them had already been discussed. When talking about Rug Bair I (another site from Eastern Macedonia), Garašanin (2009) attributes it to the Anzabegovo-Vršnik II phase, but notes that the predominant pottery

is the coarse ware and the barbotine decoration. In Vršnik I (which is one of the eponym sites) the assemblage is distinguished by the abundance of coarse ware and impressed decoration (Гарашанин 2009). In the Skopje region the Anzabegovo-Vršnik II-III Middle Neolithic sites also display strong individual characteristics. It seems that the general picture of the culture is exactly that – general picture of a region with prevailing common cultural features, but a region in which individual small communities also tend to maintain their cultural differences. This should not be a reason for dividing the culture, but to enrich and unite even more the archaeological record of the small tribes, scattered around the plains and hill-sides of Central, Eastern and Northern Macedonia into a single Neolithic culture. Somewhere in that puzzle Grnčarica fits very well. Our task is to find the exact empty space.

CHAPTER 6: APPENDIX

(Drawings by Stefanija Stojanovska)

Figure 6.1 Plate shapes:



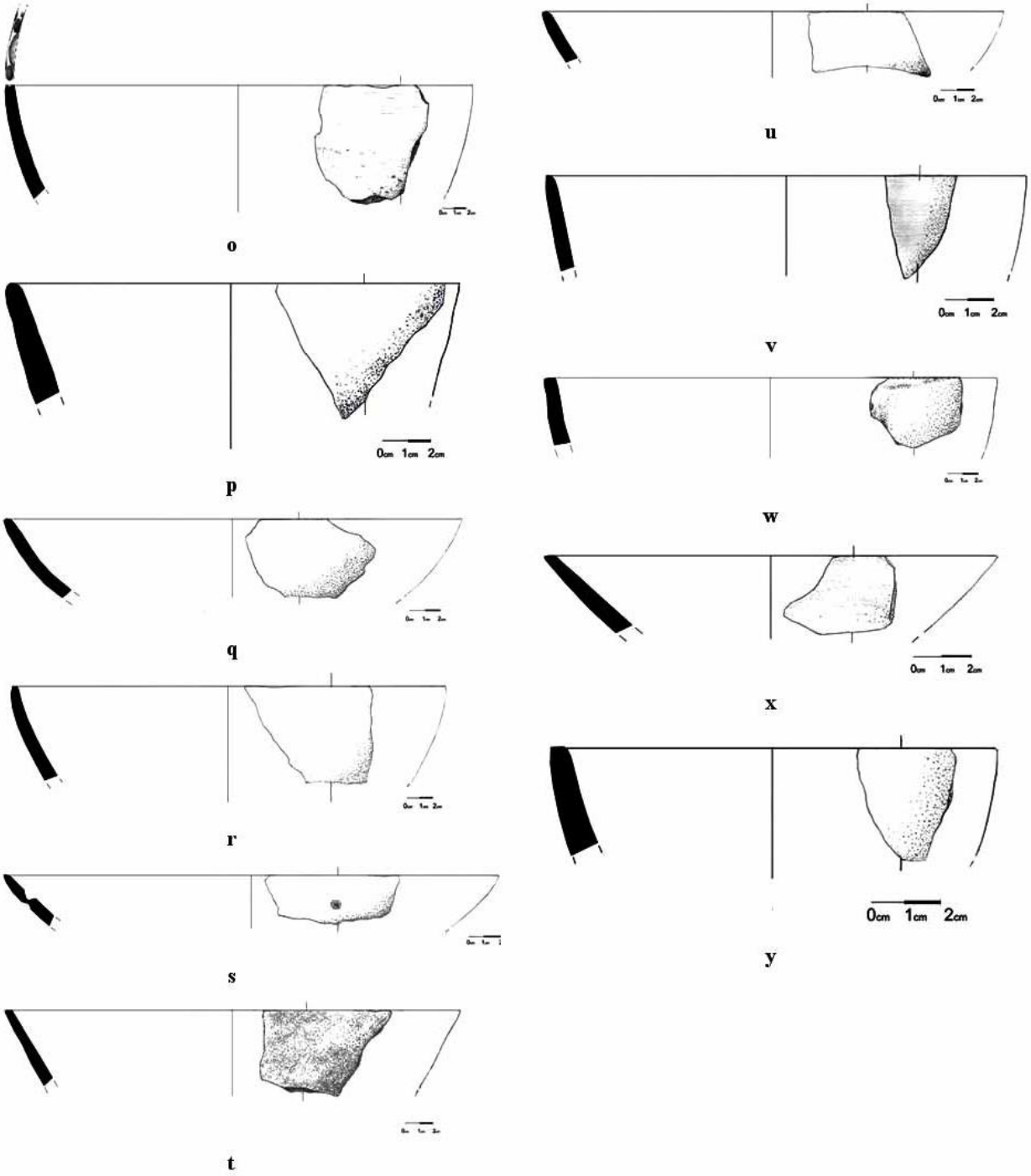

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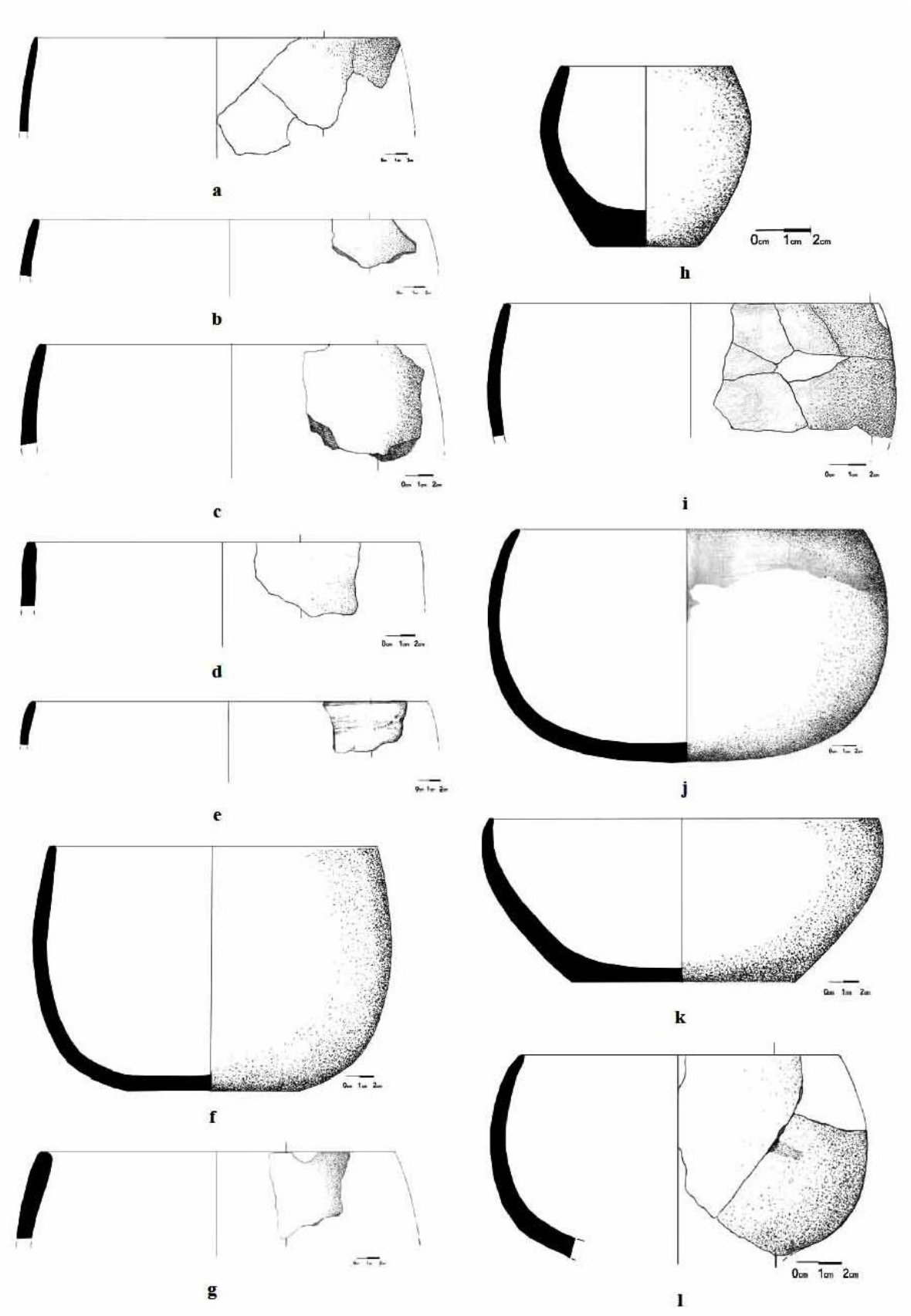
Figure 6.2 Bowl shapes:



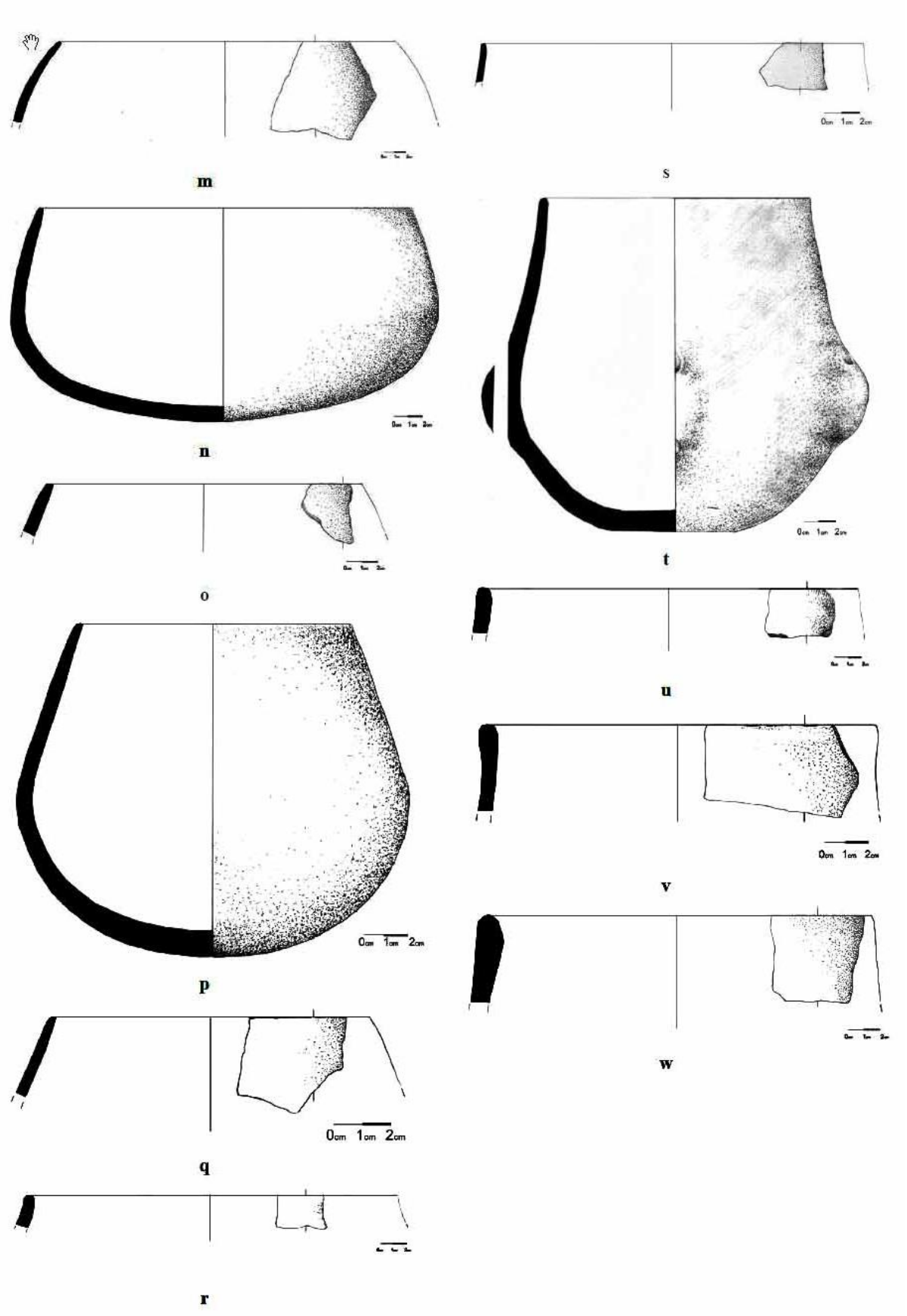

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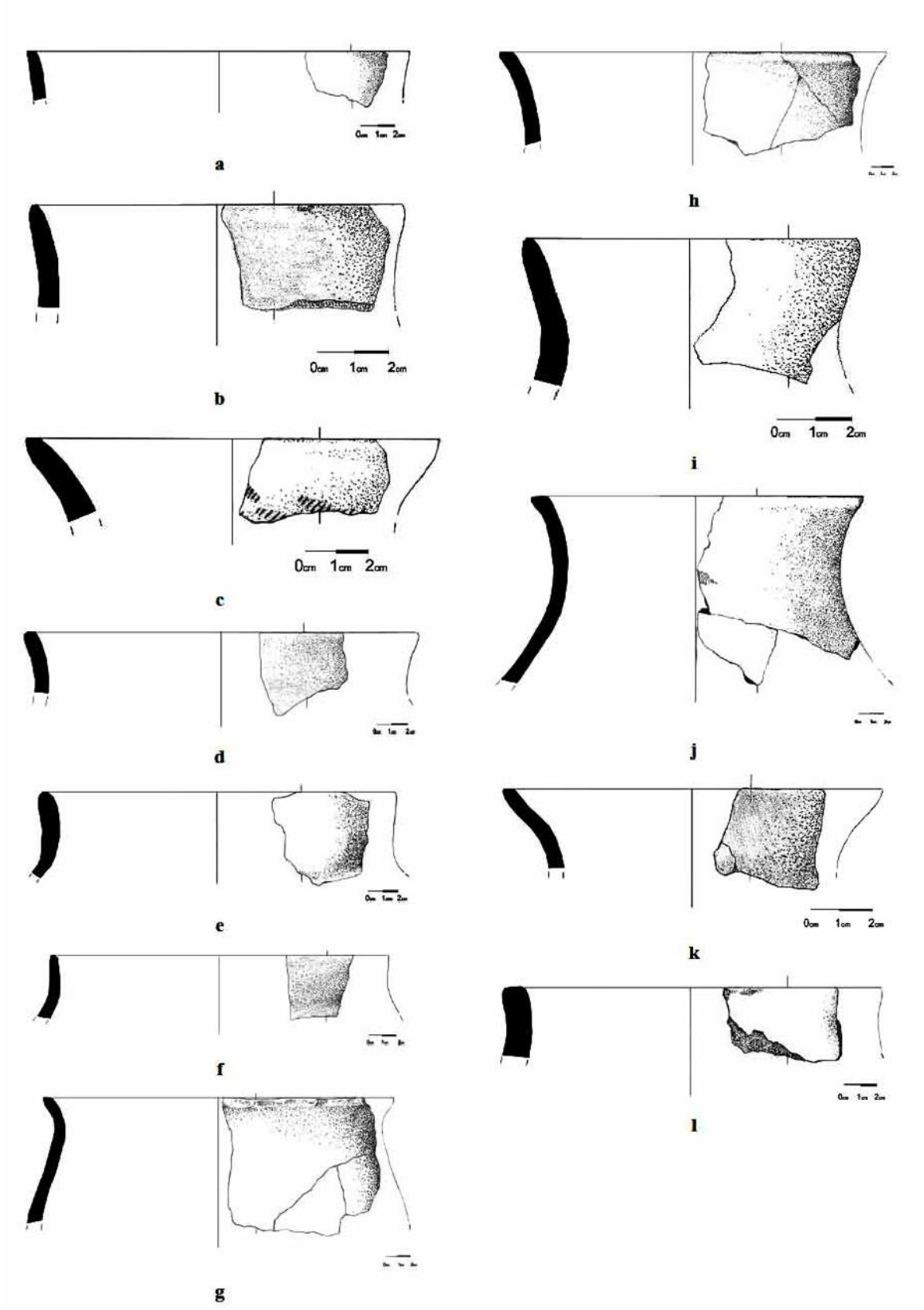
Figure 6.3 Jar shapes:



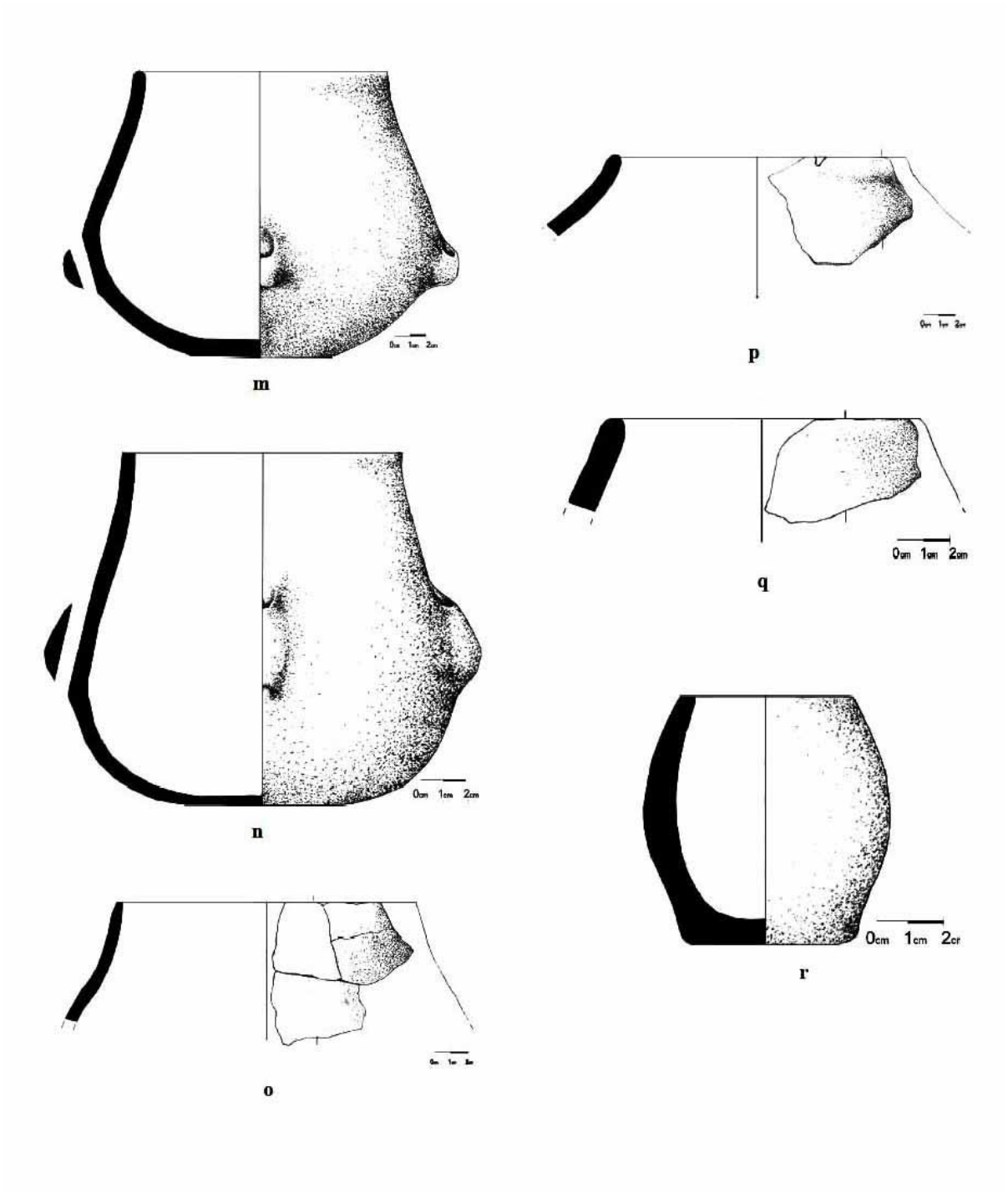

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Figure 6.4 Lid fragment:

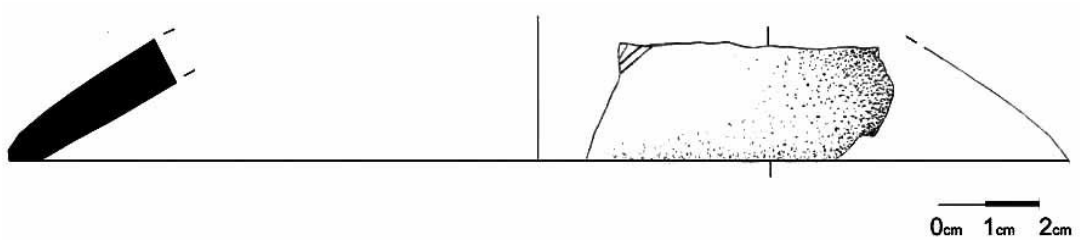


Figure 6.5 Pan (a reconstruction):

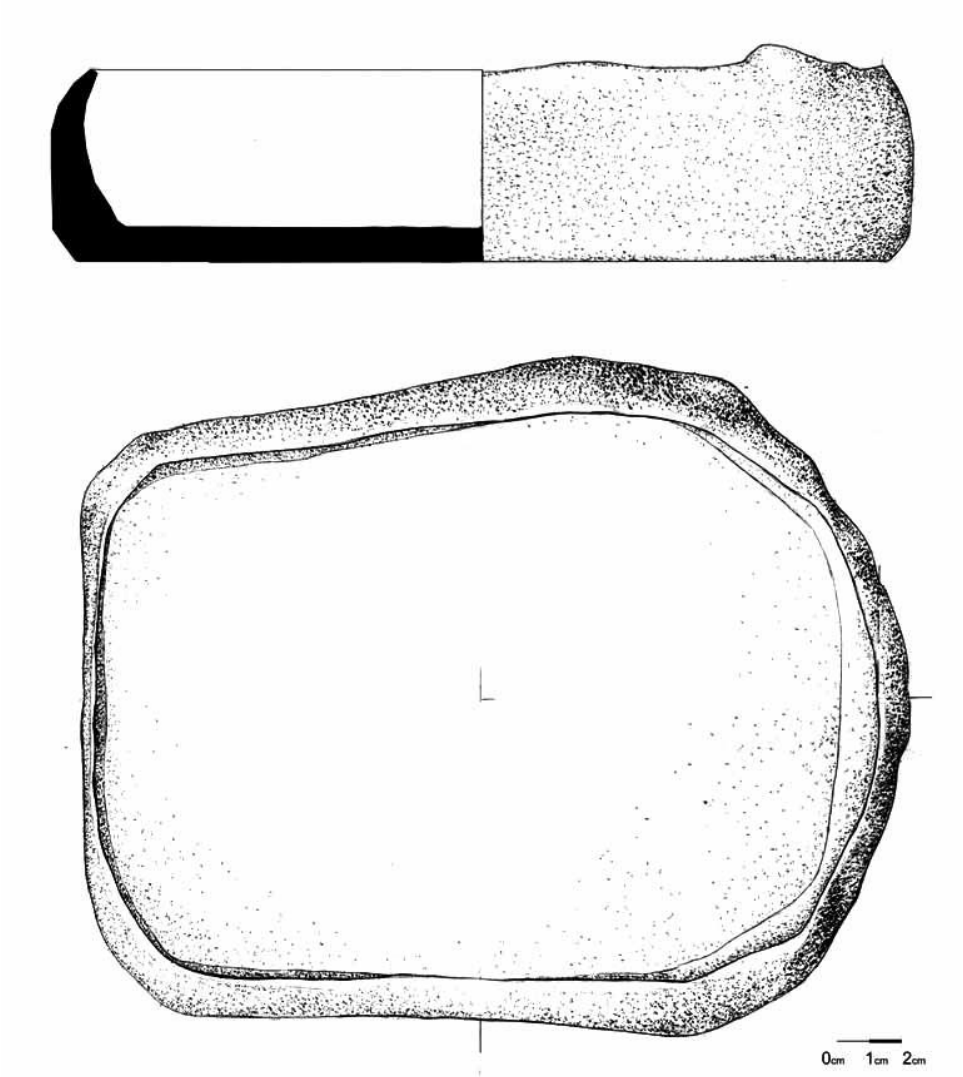


Figure 6.6 Base types:

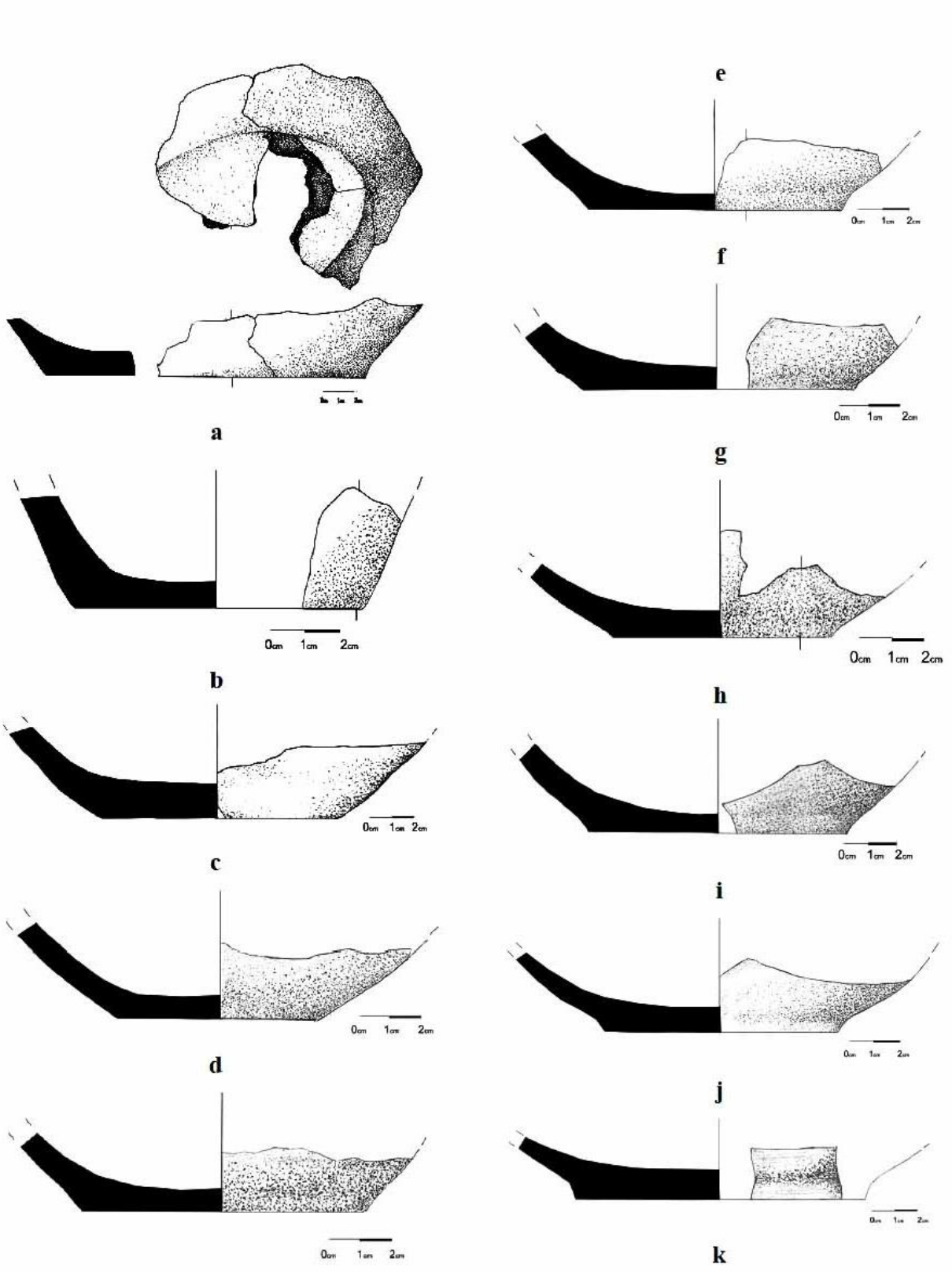


Figure 6.7 Handle types:

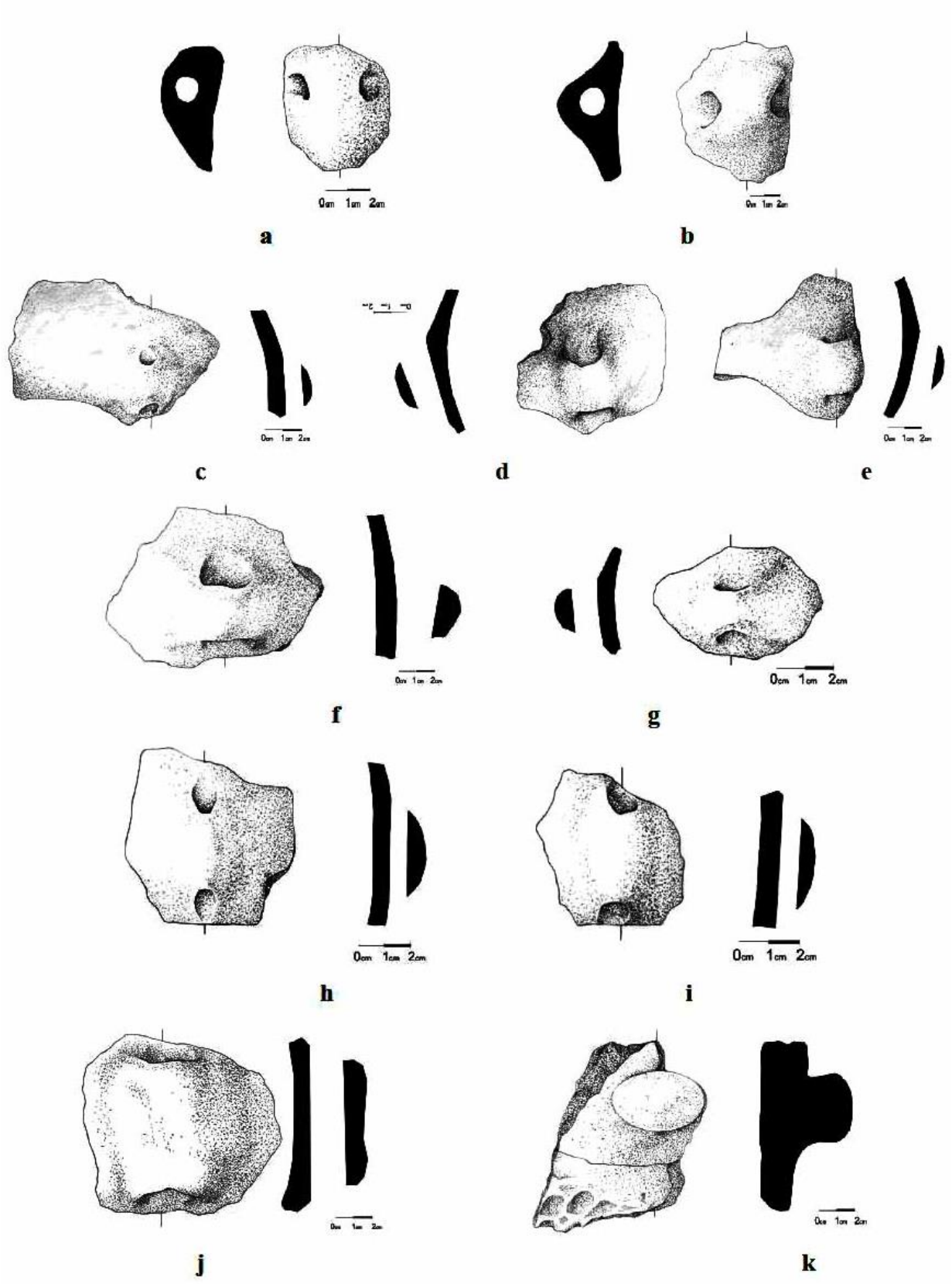
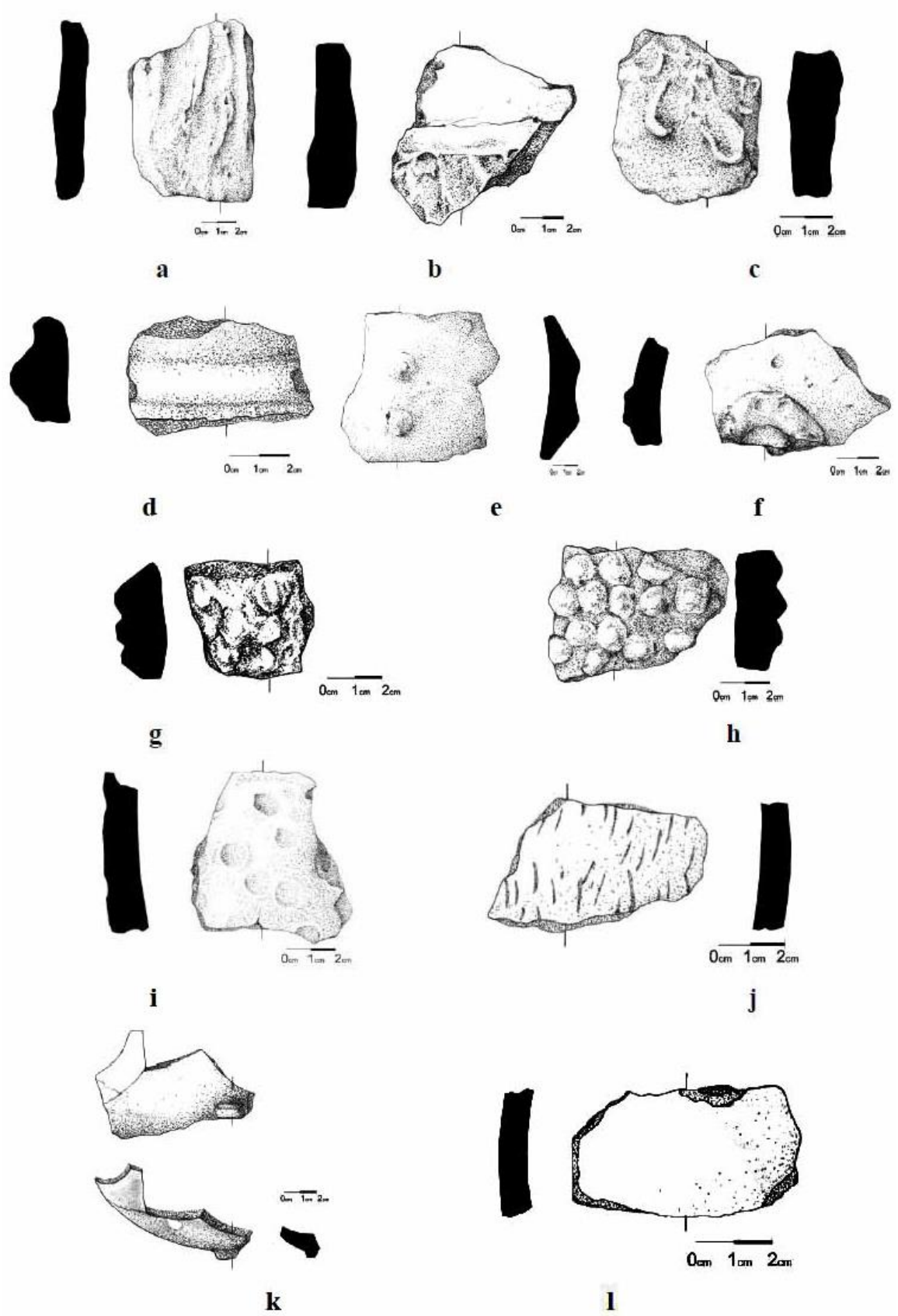


Figure 6.8 Decoration techniques:



BIBLIOGRAPHY

Allard, P. (2007), 'The mesolithic-neolithic transition in the Paris basin: a review', in A. Whittle and V. Cummings (eds.), *Going over: The Mesolithic-Neolithic Transition in North-west Europe* (London: British Academy).

Angeleski, Sote (2011), 'Analythical review of the Macedonian Neolithic', *Macedonia Acta Archaeologica,* 20, 91-125.

Assmann, Jan and Czaplicka, John (1995), 'Collective Memory and Cultural Identity', *New German Critique,* (65), 125-33.

Bailey, Douglass W. (2000), *Balkan prehistory: exclusion, incorporation and identity* (London, New York: Routledge).

Banning, E. B. (2011), 'So Fair a House: Göbekli Tepe and the Identification of Temples in the Pre-Pottery Neolithic of the Near East', *Current Anthropology,* 52 (5), 619-60.

Bar-Yosef, O. and Belfer-Cohen, A. (1992), 'From foraging to farming in the Mediterranean Levant', in A. B. Gebauer and T. Douglas Price (eds.), *Transition to agriculture in Prehistory* (Monographs in World Archaeology, 4: Prehistory Press).

Bar-Yosef, Ofer (1998a), 'The Natufian culture in the Levant, threshold to the origins of agriculture', *Evolutionary Anthropology: Issues, News, and Reviews,* 6 (5), 159-77.

--- (1998b), 'On the Nature of Transitions: the Middle to Upper Palaeolithic and the Neolithic Revolution', *Cambridge Archaeological Journal,* 8 (02), 141-63.

Barker, Graeme (2009), *The agricultural revolution in Prehistory: Why did foragers became farmers?* (Oxford: Oxford University Press).

Batovič, Šime (1979), 'Jadranska zona', in Alojz Benac (ed.), *Praistorija Jugoslavenskih Zemalja II, Neolitsko doba* (Sarajevo: Akademija nauka i umjetnosti Bosne i Hercegovine), 473-635.

Beauclair, Roland de (2008), 'Funerary rites in a Neolithic nomad community in Southeastern Arabia: the case of al-Buhais 18', *Documenta Praehistorica,* 35.

Belfer-Cohen, Anna and Bar-Yosef, Ofer (2002), 'Early Sedentism in the Near East

Life in Neolithic Farming Communities', in Ian Kuijt (ed.), (Fundamental Issues in Archaeology: Springer US), 19-38.

Binford, Lewis R. (1986), 'Post-Pleistocene adaptations', in L. R. Binford and S. R. Binford (ed.), *New perspectives in archaeology.* (Chicago: Aldine).

Boaretto, Elisabetta, et al. (2009), 'Radiocarbon dating of charcoal and bone collagen associated with early pottery at Yuchanyan Cave, Hunan Province, China', *Proceedings of the National Academy of Sciences*, 106 (24), 9595-600.

Bocquet-Appel, Jean-Pierre (2011), 'The Agricultural Demographic Transition During and After the Agriculture Inventions', *Current Anthropology,* 52 (S4), S497-S510.

Bocquet-Appel, Jean-Pierre, et al. (2009), 'Detection of diffusion and contact zones of early farming in Europe from the space-time distribution of 14C dates', *Journal of Archaeological Science,* 36 (3), 807-20.

Bogdanovich, M. (2007), 'Proto-Starchevo Culture and Early Neolithic in the Struma Valley', in Mark Stefanovich and Georgi Ivanov Henrieta Todorova (ed.), *Strymon Praehistoricus* (Kjustendil, Blagoevgrad, Serres, Amphipolis: Gerda Henkel Stiftung).

Bökönyi, S. (1976), 'The Vertebrate Fauna from Anza', in Maria Gimbutas (ed.), *Anza, Neolithic Macedonia, As Reflected by Excavations at Anza, Southeast Yugoslavia* (Los Angeles: The Regents of The University of California).

Bonsall, C. , et al. (2002), 'Climate, floods and river gods: environmental change and the Meso-Neolithic transition in southeast Europe', *Before Farming,* 3 (4).

Braidwood, R.J. (1960), 'Levels in prehistory: a model for the consideration of the evidence', *Evolution after Darwin,* 2, 143--51.

Brukner, Bogdan (1979), 'Koros - grupa', in Alojz Benac (ed.), *Praistorija Jugoslavenskih Zemalja II, Neolitsko doba* (Sarajevo: Akademija nauka i umjetnosti Bosna i Hercegovina), 213-29.

Budja, M. (2007), 'The 8200 calBP" climate event" and the process of neolithisation in south-eastern Europe', *Documenta Praehistorica,* 34, 191--201.

Budja, Mihael (2003), 'Seals, contracts and tokens in the Balkans Early Neolithic: where in the puzzle', *Documenta Praehistorica,* 30, 115-30.

Cohen, Mark (1977), *The food crisis in prehistory: overpopulation and the origins of agriculture* (New Haven: CT: Yale University Press).

--- (2009), 'Introduction: rethinking the origins of agriculture', *Current Anthropology*, 50, 591–95.

Collard, Mark, et al. (2010), 'Radiocarbon evidence indicates that migrants introduced farming to Britain', *Journal of Archaeological Science,* 37 (4), 866-70.

Cristiani, Emanuela, Pedrotti, Annaluisa, and Gialanella, Stefano (2009), 'Tradition and innovation between the Mesolithic and Early Neolithic in the Adige Valley (Northeast Italy). New data from a functional and residues analyses of trapezes from Gaban rockshelter', *Documenta Praehistorica,* 36.

Dietrich, Oliver and Schmidt, Klaus 'A Radiocarbon Date from the Wall Plaster of Enclosure D of Göbekli Tepe', *NEO-LITHICS,* 2 (10).

Donahue, R.E. (1992), 'Desperately seeking Ceres: A critical examination of current models for the transition to agriculture in Mediterranean Europe', in A. B. Gebauer and T. Douglas Price (eds.), *Transitions to Agriculture in Prehistory* (4; Madison: Prehistory Press).

Dubreuil, Laure (2004), 'Long-term trends in Natufian subsistence: a use-wear analysis of ground stone tools', *Journal of Archaeological Science,* 31 (11), 1613-29.

Fidanoski, Ljubo (2009), 'Pottery production', in Ljubo Fidanoski Goce Naumov, Igor Tolevski, Aneta Ivkovska (ed.), *Neolithic Comunities in the Republic of Macedonia* (Skopje: Dante).

Finlayson, Bill, et al. (2011), 'Architecture, sedentism, and social complexity at Pre-Pottery Neolithic A WF16, Southern Jordan', *Proceedings of the National Academy of Sciences,* 108 (20), 8183-88.

Garašanin, Milutin (1979), 'Centralnobalkanska zona', in Alojz Benac (ed.), *Praistorija Jugoslavenskih Zemalja II, Neolitsko doba* (Sarajevo: Akademija nauke i umetnosti Bosne i Hercegovine), 79-212.

Gardner, E. (1976), 'The technology of the ceramics', in Maria Gimbutas (ed.), *Anza, Neolithic Macedonia, As reflected by excavation at Anza, Southeast Yugoslavia* (Los Angeles: The Regents of the University of California), 159-76.

Gebauer, A.B. and Price, T.D. (1992), *Transitions to agriculture in prehistory* (4: Prehistory Press).

Gimbutas, Maria (ed.), (1976), *Anza, Neolithic Macedonia, As Reflected by Excavation at Anza, Southeast Yugoslavia* (Los Angeles: The Regents of The University of California).

Goring-Morris, A. Nigel and Belfer-Cohen, Anna (2011), 'Neolithization Processes in the Levant: The Outer Envelope', *Current Anthropology*, 52 (S4), S195-S208.

Hayden, Brian (1992), 'Models of domestication', in A. B. Gebauer and T. D. Price (ed.), *Transitions to agriculture in prehistory* (4; Madison: Prehistory Press).

Heurtley, W. A. (1939), *Prehistoric Macedonia* (Cambridge: Cambridge University Press).

Hiller, S. and Nikolov, V. (1997), *Karanovo: Die Ausgrabungen im Sudsektor 1984-1992* (1: F. Berger).

Ivkovska, Aneta (2009), 'Animal husbandry and hunting', in Naumov, G., Fidanoski, Lj., Tolevski, I. and Ivkovska, A (eds.), *Neolithic communities in The Republic of Macedonia* (Skopje: Dante).

Jovčevska, Trajanka (2008).

Karmanski, S. (2005), *Donja Branjevina: a Neolithic settlement near Deronje in the Vojvodina (Serbia)*, Societa per la Preistoria e Protoistoria della regione Friuli-Venezia Giulia, Quaderno 10, Trieste

Kotsakis, K. (2001), 'Mesolithic to Neolithic in Greece. Continuity, discontinuity or change of course?', *Documenta Praehistorica*, XXVIII.

Krauß, Raiko (2011a), 'On the ›Monochrome‹ Neolithic in Southeast Europe', in Raiko Krauß (ed.), *Beginnings - New Research in the Appearance of the Neolithic between Northwest Anatolia and the Carpathian Basin* (Istanbul: Rahden/Westf.: Leidorf), 109-25.

--- (2011b), 'Neolithization Between Northwest Anatolia and the Carpathian Basin – an Introduction', in Raiko Krauß (ed.), *Beginnings - New Research in the Appearance of the Neolithic between Northwest Anatolia and the Carpathian Basin* (Istanbul: Rahden/Westf.: Leidorf).

Kuzmin, Yaroslab V. (2006), 'Chronology of the earliest pottery in East Asia: progress and pitfalls', *ANTIQUITY,* 80 (308), 362.

Linick, T W (1977), 'LA JOLLA NATURAL RADIOCARBON MEASUREMENTS VII - Anza series', *RADIOCARBON,* 19 (1).

Lu, Tracey L-D (2010), 'Early Pottery in South China', *Asian Perspectives,* 49 (1).

Maher, Lisa A., et al. (2012), 'Twenty Thousand-Year-Old Huts at a Hunter-Gatherer Settlement in Eastern Jordan', *PLoS ONE,* 7 (2), e31447.

Marijanović, B. (2003), '»“Crno vrilo” – novi grob starijeg neolitika u Dalmaciji', *Opvscula Archaeologica,* 27, 37-41.

Mock, R. E. (1976), 'The Anza I-III (pre-Vincha) Ceramics', in Maria Gimbutas (ed.), *Anza, Neolithic Macedonia, As reflected by excavation at Anza, Southeast Yugoslavia* (Los Angeless: The Regents of the University of California), 78-116.

Nanoglou, Stratos (2010), 'The representation of phalli in Neolithic Thessaly, Greece', *Documenta Praehistorica,* 37.

Naumov, G., Fidanoski, Lj., Tolevski, I. and Ivkovska, A. (eds.) (2009), *Neolithic communities in the Republic of Macedonia* (Skopje: Dante).

Nemeskeri, J. and Lengyel, L. (1976), 'Neolithic Skeletal Finds', in Maria Gimbutas (ed.), *Neolithic Macedonia as reflected by excavation at Anza, southeast Yugoslavia*. Los Angeles: Institute of Archaeology, University of California, Monumenta archaeologica 1.

Nikolova, Lolita (2007), 'Toward an Evolutionary Model of Gradual Development of Social Complexity Among the Neolithic Pottery Communities in the Balkans (Cultural-chronological and Cultural-anthropological Problems)', in Michela Spataro and Paolo Biagi (ed.), *A Short Walk through the Balkans: the First Farmers of the Carpathian Basin and Adjacent Regions,* Societa per la Preistoria e Protoistoria della regione Friuli-Venezia Giulia, Quaderno 12, Trieste: 89-102.

Oosterbeek, Luiz (2001), 'Re-thinking the Mesolithic-Neolithic transition in the Iberian peninsula: a view from the West', *Documenta Praehistorica,* 28, 75-84.

--- (2004), 'Archaeographic and conceptual advances in interpreting Iberian Neolithisation', *Documenta Praehistorica,* 31, 59-81.

Özdoğan, Mehmet (2011), 'Archaeological evidence on the westward expansion of farming communities from eastern Anatolia to the Aegean and the Balkans', *Current Anthropology,* 52 (S4).

Perlès, Catherine (2001), *The Early Neolithic in Greece - The first farming communities in Europe*.Cambridge: Cambridge University Press.

Phoca-Cosmetatou, N. (ed.), (2011), *The First Mediterranean Islanders: initial occupation and survival strategies* (Oxford: University of Oxford School of Archaeology).

Porr, Martin (2010), 'Palaeolithic Art as Cultural Memory: a Case Study of the Aurignacian Art of Southwest Germany', *Cambridge Archaeological Journal*, 20 (01), 87-108.

Price, T. Douglas and Bar-Yosef, Ofer (2011), 'The Origins of Agriculture: New Data, New Ideas: An Introduction to Supplement 4', *Current Anthropology*, 52 (S4), S163-S74.

Renfrew, Colin (2006), 'Inception of agriculture and rearing in the Middle East', *Comptes Rendus de l'Académie des Sciences*, 5 (1–2), 395-404.

Shepard, Anna O. (1985), *Ceramics for the archaeologist*. Washington D.C.: Carnegie Institution of Washington.

Simmons, Alan H. (1988), 'Extinct pygmy hippopotamus and early man in Cyprus', *Nature*, 333 (6173), 554-57.

Srejović, D. (1971), 'Die Lepenski Vir-Kultur und der Beginn der Jungsteinzeit an der Mittleren Donau', in H. Schwabedissen (ed.), *Die Anfänge des Neolithikums vom Orient bis Nordeuropa, Fundamenta. Monographien zur Urgeschichte A, 3*. Köln/Wien : Böhlau, 1 – 19.

Tchohadjiev, S. and Bakamska, A. (1990), 'Etude du site néolithique ancien de Kraïnitsi dans le département de Kustendil', *Studia Praehistorica*, 10, 51-76.

Theocharis, D. R. (1973), *Neolithic Greece* (Athens: National Bank of Greece).

Thorpe, I. J. (1996), *The Origins of Agriculture in Europe* (London: Rotledge).

Tolevski, Igor (2009), 'Architecture', in Ljubo Fidanoski Goce Naumov, Igor Tolevski, Aneta Ivkovska (ed.), *Neolithic communities in The Republic of Macedonia* (Skopje: Dante).

Tsutsumi, Takashi (2000), 'Adaptive strategies in the Late Glacial Epoch and the origin of pottery', in Wenming Yan and Y. Yasuda (ed.), *The Origins of Rice Agriculture, Pottery and Cities* (Beijing: Cultural Relics Publishing House), 65-80.

Turney, Chris S. M. and Brown, Heidi (2007), 'Catastrophic early Holocene sea level rise, human migration and the Neolithic transition in Europe', *Quaternary Science Reviews*, 26 (17–18), 2036-41.

V.G.Childe (1956), *Piecing together the past* (Routledge \& Kegan Paul).

Vigne, J.D. (1987), 'L'extinction holocene du fond de peuplement mammalien indigene des iles de Mediterranee occidentale', *Mémoires de la Société géologique de France*, 150, 167--77.

Vigne, Jean-Denis, et al. (2011), 'The Early Process of Mammal Domestication in the Near East: New Evidence from the Pre-Neolithic and Pre-Pottery Neolithic in Cyprus', *Current Anthropology*, 52 (S4), S255-S71.

Wright, Katherine I. (1994), 'Ground-Stone Tools and Hunter-Gatherer Subsistence in Southwest Asia: Implications for the Transition to Farming', *American Antiquity*, 59 (2), 238-63.

Zilhão, João (1993), 'The Spread of Agro-Pastoral Economies across Mediterranean Europe: A View from the Far West', *Journal of Mediterranean Archaeology*, 6 (1), 5-63.

--- (2011), 'Time is on my side...', in Angelos Hadjikoumis, Erick Robinson, and Sarah Viner (eds.), *The dinamics of neolithisation in Europe*. Oxford: Oxbow books.

Zvelebil, Marek (2001), 'The agricultural transition and the origins of Neolithic society in Europe', *Documenta Praehistorica*, 28, 1-26.

Šemrov, A., Turk, P. (eds.) 2009, Neolithic Art in the Republic of Macedonia (exhibition catalogue). Ljubljana: Narodni Muzej Slovenije.

Богданович, М. (1987), 'Неолитические поселения в Дивостине и Протостарчевская культура', *Совветская Археология,* 2, 5 – 17.

Ганецовски, Георги (2009), *ОХОДЕН - СЕЛИЩЕ ОТ РАННИЯ НЕОЛИТ* (Sofia: Craft House Bulgaria Ltd.).

Гарашанин, Милутин (2009), 'Заклучок', in Воислав Санев (ed.), *Анзабегово - Населба од раниот и средниот неолит во Македонија* (Штип: Завод за заштита на спомениците на културата и музеј - Штип), 237-57.

Гарашанин, Милутин and Гарашанин, Драга (2009), 'Керамика', in Воислав Санев (ed.), *Анзабегово - Населба од раниот и средниот неолит во Македонија* (Штип: Завод за заштита на спомениците на културата и музеј - Штип).

Еленски, Недко (2002), 'Сондажни проучвания на неолитното селище с. Хотница- „Пещерата-Изток", Великотърновско, през 2001 г.', *Археологически открития и разкопки през 2001 г., XLI Национална археологическа конференция* (София), 28-29.

--- (2006 (2007)), 'Сондажни проучвания на раннонеолитното селище Джулюница-Смърдеш, Великотърновско (предварително съобщение)', *Археология,* 1 (4), 96-117.

--- (2008), 'Раннонеолитното селище Беляковец – Плочите, Великотърновско', *Proceedings of the Regional Museum of History - Veliko Turnovo,* XXIII, 7-75.

Китаноски, Б., Симоска, Д., and Тодоровиќ, J. (1978), 'Нови археолошки истражувања на населбата Чука во Тополчани кај Прилеп', *Macedonia Acta Archaeologica,* 4, 9-32.

--- (1980), 'Населбата Пештерица и проблемот на раниот Неолит во Пелагонија', *Macedonia Acta Archaeologica,* 6, 9-20.

--- (1987), 'Радин Дол-Неолитска населба кај Прилеп', *Macedonia Acta Archaeologica,* 7-8, 7-29.

Корошец, П. and Корошец, J. (1973), *Предисториска Населба Барутница* (Прилеп: Археолошко Друштво на Македонија).

Кузман, Паско (1990), 'Зластрана - неолитска населба во охридско', *Macedonia Acta Archaeologica,* 11.

--- (1993), 'Палеолитот во Македонија', *Macedonia Acta Archaeologica,* 13, 9-19.

Нацев, Трајче (2008), 'Извештај од заштитните археолошки истражувања на археолошки локалитети загрозени со изградбата на повекенаменскиот хидро-систем Злетовица', (1; Штип: Завод за заштита на спомениците на културата и музеј - Штип).

--- (2009), '...Трите керамитки... - Резултати од заштитните археолошки истражувања Злетовица 2007 - 2009', in Завод за заштита на спомениците на културата и музеј - Штип (ed.), (Штип: Завод за заштита на спомениците на културата и музеј - Штип).

Попов, В. (1996), *Периодизация и хронология на неолитните и халколитните култури от поречието на р. Русенски Лом.* Русе : Държавен архив.

Тодорова, Х. and Вайсов, И. (1993), *Новокаменната епоха в България* (София).

Санев, Воислав (ed.), (2009), *Анзабегово - населба од раниот и средниот Неолит во Македонија* (Штип: Завод за заштита на спомениците на културата и музеј - Штип).

Симоска, Д., Китаноски, Б., and Тодоровиќ, J. (1979), 'Неолитска населба во село Могила кај Битола', *Macedonia Acta Archaeologica,* 5, 9-30.

Темелкоски, Душко and Миткоски, Александар (2005), 'Садова керамика од Врбјанска Чука', *Macedonia Acta Archaeologica,* 16, 29-53.

Чохаджиев, Стефан (2001), *Ваксево - праисторически селишта* (Велико Трново: Faber).

--- (2007), *Неолитни и халколитни култури в басеина на река Струма* (Veliko Tarnovo).

Чохаджиев, Стефан, Бакъмска, Анета, and Нинов, Лазар (2007), 'Крайници - ранокерамичното селище от басейна на река Струма', in Mark Stefanovich and Georgi Ivanov Henrieta Todorova (ed.), *Strymon Praehistoricus* (2; Kjustendil, Blagoevgrad, Serres, Amphipolis: Gerda Henkel Stiftung).

Шаламанов-Коробар, Љиљана (2010), 'Истражувања на Палеолитскиот локалитет Голема Пешт, Здуње 1999 - 2006', *Macedonia Acta Archaeologica,* 19, 27 - 39.

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