Neolithic wetland and lakeside settlements in the Balkans

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The Neolithic archaeology in the Balkans witnesses momentous step forward in the research of first farming communities inhabiting this region. In comparison to previous period of examination focused on the determination of archaeological sites and material culture, the last few decades provide a novel approach in multidisciplinary studies and more thorough understanding of Neolithic societies. Many new specialists appear, international collaboration is more frequent and numerous publications, conferences, and workshops are produced that have an effect on the improvement of methods and knowledge employed within prehistoric archaeology. Consequently the major issues in the Neolithic archaeology are reconsidered and strengthened with new data in regard to archaeological science and theory. But, in spite of these advantages, not much was done in the sphere of wetland archaeology. There are a number of Neolithic sites excavated on marshy valleys and lakeshores, but they were not observed in terms of wetland archaeology. And their number is not small if the potential of data is concerned.

Therefore this paper will consider the Neolithic pile dwellings and tells in the Balkan marshes and lakes that are excavated so far, but not incorporated within wetland archaeology. Many of them remain unknown to majority of European archaeologists due to modest publications mainly in local languages, but also partly due to their absence in the most distinctive research, overviews, and handbooks of wetland archaeology. The pivotal focus of wetland archaeology on pile dwellings and omission of other 'dryland' sites established in marshy areas also has an effect in scarce presence and concernment of Balkan settlements in the major publications of this archaeological discipline. Consequently, this paper will concern both wetland and 'dryland' sites in the Balkan Peninsula and propose their networks and geoarchaeological research as further direction of study in the wetland archaeology. It is an attempt to summarise the current knowledge on pile dwellings and tells in waterlogged areas and to put it forward for the future research that can significantly contribute in thorough understanding of Neolithic lakeside and wetland settlements and their environment.

Wetland archaeology in the Balkans

For more than a century wetland archaeology has been part of European methodology, theory, and museology. Even before the Ferdinand Keller's first excavation of lakeside settlement in 1854 there were explorations of wetland sites, but the actual *Pfahlbaufieber* and the creation of artificial *Pfahlbaukultur* took place in the second half of 19th century (Menotti 2012). It seems that the *lake-dwelling rush* does not reach the Balkans as it had effect in Central and Western Europe. The region of Southeast Europe was still not aware of it even when the wetland studies progressed into processual archaeology. Many propose political circumstances and

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geographical conditions as main factors for the absence of wetland archaeology in the Balkans, but as current studies will demonstrate neither politics nor quantity and quality of sites was the cause. The archaeology of Southeast Europe was open to western methodology before and after the World War II (Novaković 2011), and its ecosystem provided environment for numerous prehistoric pile-dwellings. It is worth to note that there were few observations of such sites, but even then they were sometimes not confirmed as prehistoric settlements, but as fishing systems and docks (Koco 1951; Mikov 1950; H. Škorpil and K. Škorpil 1921).

Although the potential prehistoric pile-dwellings were indicated earlier, the first Neolithic wetland sites in the Balkans were excavated after the World War II. Some of these sites were explored largely in 1960's and 1970's and several are initially excavated recently. Majority was considered as dryland settlements without significant consideration of geoarchaeological survey, while those excavated on lakesides were not given larger attention. In many overviews on the Balkan Neolithic and the prehistory in general there is no concern to these sites, or were just mentioned as isolated feature without emphasis on their specific character (Bailey 2000; Benac 1979; Korkuti 1995; Perlès 2001; Todorova and Vaisov 1993). This could be a result of misapprehension of the wetland archaeology as separate component within the archaeological discipline and more understood as something that is integral to diverse methodology and ecosystem. Even in some of the substantial studies and handbooks on European and World wetland archaeology there is nothing on its counterparts from the Balkans, or few were included only in a line or two (Menotti 2004, 2012; Menotti and O'Sullivan 2013). Such unpleasant state with the absence of Balkan wetland archaeology could be a result of several factors. Majority of wetland and lakeside sites were not extensively published and there is not much information about them, or they are involved only in publications in local languages that were also not accessible to western authors. But even in the case of more local overviews, these sites were not particularly concerned. This could be due to deficiency of wetland archaeology as concept in Southeast Europe and therefore consideration of these sites as uncommon or as something that could not be studied with usual archaeological methods.

The 'absence' of wetland sites in the Balkans is not due to its geography and inadequacy of its landscape, as it was proposed before. Besides the scarcity of published reports or monographs associated with these settlements, there was not a particular interest in lacustrine and marshy areas that could be also a result of deficit of equipment and the necessity of more complex methodology, logistics, and the infrastructure essential for excavation of such sites and study of organic material. The underwater archaeology is not unknown field in the Balkans, but it is mainly applied on Classical sites, and extremely rarely on prehistoric (Bekić 2009; Georgiev et al. 1991; Peev 2008). Even in the case of prehistory, these sites belong to Bronze and Iron Age (Angelova and Draganov 1995; Kuzman 2013; Naumov et al. 2018a; Todoroska 2009), while none of the Neolithic is excavated with these methods so far, or it is not published yet. Consequently, the majority of lakeside Neolithic sites were preferably explored in terms of 'standard' archaeology and in seasons that provided approach for research of such areas.

In terms of wetland archaeology in the Balkans it should be asserted that until a decade ago wetlands were not considered as particular feature in

the Neolithic landscape. As result to intensive drainage of smaller lakes and marshes in 1950's and 1960's, many of sites in the vicinity of waterlogged areas were preserved in changed environment and therefore considered as dryland settlements. Nevertheless, some of the previous and recent studies indicate that these marshy lakes were significant factor in establishing social, economic, and symbolic relationship with the wetland landscape (Alexakis et al. 2009; Commenge 2009; Kitanoski et al. 1980; Naumov 2016c; Tripković et al. 2013). The structures of the settlements in wetland valleys were apparently different than that of pile-dwellings, but they do not comprise diverse social basis uncommon for the Neolithic. Although often considered as dissimilar social units and observed separately in so-called dryland and wetland archaeology they shared the major Neolithic features and modes of identity manifestation. Such wetland sites established as tells in the Balkans were never incorporated within wetland archaeology, perhaps due to the scarcity of wooden material and the absence of surrounding water in the excavation seasons.

Nevertheless, the latest research makes emphasis on dried marshes and lakes and gradually contributes these sites in terms of wetland archaeology (Alexakis et al. 2009; Fouache et al. 2010; Naumov 2016a). As result to that it is evident that there are two major features of settlements founded in waterlogged areas i.e. wetland and lakeside villages. In regard to the environment they adjusted its architecture, so that tells were common for wetlands and pile dwellings for those erected in the vicinity of lakes. But with the exception of architecture their material culture was notably similar and integrated in synchronous social processes. Moreover these seemingly different settlements were solidly networked and sometimes shared their identities through trade, rituals and visual culture (Benac 1979; Chrysostomou et al. 2015; Naumov 2016b). Therefore in this paper, they will be presented simultaneously as two components of wetland archaeology and in such way they will contribute in better understanding of communities living next or within marshes and lakes. In addition their mutual relationship will be emphasised in order to propose new avenues of research in wetland archaeology.

Lakeside settlements

The lakeside settlements are distinct phenomenon in the wetland archaeology and as such in the Balkan archaeology as well (Figure 1). Due to their apparent features i.e. pilled houses, platforms, palisades, trackways, and artifacts made of wood, they are considered as different category in the prehistoric architecture and spatial organisation. Although recently studied more frequently, their quantity is still small, especially if compared to those in Circum-Alpine region (Hafner et al. 2014; Schlichtherle 1997; Velušček 2006). Current research indicates that there are potentials for many new sites, so that the geographical factor is definitely excluded for their scarce presence in the Balkan archaeology. This region is familiar for its mountains, but there are also numerous lakes in their vicinity or in the valleys that could be prospective locations for pile-dwellings. Surely, drier climate in the Balkans than that of Circum-Alpine region is a factor for less preservation of prehistoric wooden remains and therefore their number is evidently smaller. But the lakeside areas, as well as marshy valleys, were never thoroughly surveyed, so potentials for wooden structures remain

Figure 1: Map of the Balkan Peninsula with the location of Neolithic pile-dwellings. Greece: 1. Dispilio, 2. Amindeon region — Limnochori II, Limnochori III, Anarghiri III, Anarghiri IXa and Anarghiri IXb; Albania: 3. Maliq, 4. Dunavec, 5. Sovjan; North Macedonia: 6. Ohridati, 7. Ustie na Drim, 8. Crkveni Livadi; Bulgaria: 9. Lake Varna; Bosnia: 10. Rudarska Ulica, 11. Gornja Tuzla; Croatia: 12. Zambratija.

unknown. As some of the recent excavations confirm, the pile-dwellings can be found a bit far from the current lakeshore and consequently some new could be expected in such areas (Chrysostomou et al. 2015; Kuzman 2013). Also some of the sites that were found on the lakeshores of these lakes belong to later prehistory and imply the possibility for the Neolithic settlements to be found in future.

In regard to the chronology of lakeside settlements in the Balkans it should be accented that there are no recorded sites that could be attributed to the Mesolithic. Although there is vast waterlogged archaeological evidence for the Mesolithic of Scandinavia, the Baltic and Britain (Menotti 2012; Van de Noort and O'Sullivan 2006), still there is no confirmation to synchronous pile-dwellings in the Balkans, besides the abundance of sites from this period. Neither Early Neolithic lakeside settlements with wooden constructions are unearthed so far as it seems that the process of Neolithisation was directed rather towards fertile flatlands and on the slopes of hills or mountains than on the lakeshores. The earliest so far pile-dwellings are dated in the Middle Neolithic while its quan-

tity largely increase in the Late Neolithic. The tradition of establishing wooden buildings on the Balkan lakeshores continued in the Chalcolithic, Bronze Age, and Iron Age, but these sites will be out of focus in this paper (Angelova and Draganov 1995; Chourmouziadis 2002; Kuzman 2013; Naumov et al. 2019, 2018a; Rujak 2014; Todoroska 2009).

In order to have a more detailed insight into the lakeside settlements a regional overview will be disposed based on the level and number of research in each of the states incorporated within the Balkan Peninsula. Although Slovenia in terms of prehistory is sometimes geographically considered as part of this region, it will not be included in this overview due to solid presentation in the wetland archeology and its close relationship with settlements from Circum-Alpine area (Velušček 2006). On the other hand, Greece is occasionally not incorporated within the Balkans, but as there are evident resemblances with corresponding sites in Albania and North Macedonia it will be listed as well. In fact, most of the data and knowledge on lakeside settlements in the Balkan Peninsula comes from research in Greece and therefore significantly contribute in the understanding of formation processes, spatial organisation, and material culture associated with communities inhabiting these specific villages made of wooden buildings. The present overview will consist of current data available for the lakeside settlements in the Balkans although many sites lack reports or more elaborated publications. At the current state the available information is still modest, but it enables initial comprehension of the pile-dwelling societies in this region.

Greece

One of the earliest studies of lakeside settlements in the Balkan Peninsula was in Greece on now renowned site of Dispilio at Lake Orestia (Figure 2). The site was discovered in 1932 and small scale excavation were performed, while in 1970's and 1990's more extensive recording of piles and systematic excavation started (Hourmouziadis 1996; Theodoulou 2011). Since then numerous archaeological seasons were performed and they are still going on in more advanced multidisciplinary direction (Chourmouziadis 2002; Kotsakis 2006). The excavation provided abundance of data for this site and enabled reconstruction of chronology, economy,

Figure 2: Photo of Dispilio pile dwelling in 1930's (Facorellis et al. 2014, Fig. 1).

diet, crafts, and architecture. The inhabitants of this settlement were living in pile dwellings on the lakeshore, but also in houses made of clay established on nearby dryland. In various eras the site was changing its structure according to changes of lake levels which gradually made deposit suitable for building of houses on dry ground (Karkanas et al. 2011). These environmental changes and radiocarbon dating imply that Dispilio was a dynamic settlement that fluctuated both socially and economically.

The published radiocarbon analysis confirms that site's earliest occupation was at 5355±125 BC i.e. Middle Neolithic and was continuously active until 3644±118 BC. It was abandoned in period between 3520 and 2460 BC and shortly reoccupied from 2300±160 until 2129±152 BC (Facorellis et al. 2014). In terms of Southeast European chronology, the settlement was established at the end of Middle Neolithic, most dynamic in the Late Neolithic and abandoned in the Chalcolithic. Radiocarbon dates indicate that it was shortly reoccupied in the Bronze Age, while some of surrounding surface material suggests inhabitation of this area even in the Early Neolithic, but none of the dated wooden constructions confirms this yet (Perlès 2001; Theocharis 1973). The nearly 2000 years of the site engagement provided numerous archaeological, geological, zooarchaeological, and archaeobotanic information and thus thorough evidence for the prehistoric communities that lived there.

The spatial analysis of wooden material indicates that there was area densely inhabited and also had open spaces, although discussions of massive platforms and surrounding palisades are still on (Touloumis and Hourmouziadi 2003). Besides pile dwellings, also mudbrick and daub structures were built on areas where the lake level was lower, so in the initial period the settlement was consisted of only palafittes while from the Late Neolithic to Bronze Age there was combination of piled and daub houses (Karkanas et al. 2011). The inhabited dry area was majorly used for processing of food and wooden structures for fishing, although zoological and botanical data suggests that the society was mostly focused on agriculture and stockbreeding, and was not specialised on fishing. On the other hand, the well made fishing tools demonstrate the developed provision of food from the lake and especially at the earlier stages of settlement when bigger spears were made for larger fishes. The food, besides fish, was consisted of einkorn and emmer wheat, barley, lentils, ovicaprides, pigs, cattle, and hunted red deer, roe deer, and boar perhaps for provision of raw material for tools and ornaments (Touloumis and Hourmouziadi 2003). There is also abundance or ceramic finds and stone tools that illustrate the dynamic social, economic, and ritual life at Dispilio in regard to networks that were established with number of sites in the region.

The continuous excavation at Dispilio will furthermore contribute in better understanding of lakeside settlements and communities that dwelled within, but a broader scope of such sites is necessary in order to consider varieties or uniformity of villages established next or onto lakes. In spite of hundreds of Neolithic sites in Greece, of which many gave crucial information on the process of Neolithisation, there are not many pile-dwellings. This could be mainly due to the invisibility of these sites in now dried environment and deposited geological layers, although, in spite of wetlands, the lake areas could still evidence the Neolithic remains. One

of such areas is the Amindeon region of four lakes (Petron, Vegoridis, Zazari, and Chiamaditis). The ongoing extensive excavation which started approximately 15 years ago provide the momentous data on several pile-dwellings and the most comprehensive information at the moment for any of the lakeside settlements in Southeast Europe. Approximately 40 Neolithic sites were determined of which dozens were pile-dwellings dated in the Middle Neolithic at earliest (Chrysostomou and Giagkoulis 2018; Chrysostomou et al. 2015; Touloumis and Hourmouziadi 2003)[1] .

1: More on the recent research on pile-dwellings in Amindeon region in Chapter 8 of this publication.

Among many significant unearthed sites few are exceptionally distinct due to the abundance of wooden and daub structures, as well as because of the numerous specific ceramic, stone, and bone finds. Most of them are dated in the Late Neolithic i.e. phases I and II, and the Final Neolithic (equivalent to the Balkan Chalcolithic), while some had continuous occupation in the Bronze Age and Iron Age. Anarghiri IXa and Limnochori II are the earliest dated pile dwelling sites (5500-3200) and few others appear in the beginning of 5th millennium or in its second half (Chrysostomou and Giagkoulis 2018; Chrysostomou et al. 2015). Dendrochronological analysis provided thorough chronological range for the Middle, Late and Final Neolithic in Amindeon region and contributed in more detailed study of societies that erected these settlements. Majority of buildings were made of wood as individual piled buildings or grouped on platforms, such as the case with those at Limnochori III and most likely Limnochori II and Anarghiri IXb. Some settlements had even two-storey houses and the massive house models found on site contribute in this direction (Limnochori II, Anarghiri III, and Anarghiri IXa). At particular later stages of these Neolithic villages dried areas were more frequently occupied by buildings made of daub and some had circular shape. Few were established on dry ground or within marshes, such as Anarghiri IXa and Anarghiri IXb. The later had three wooden trackways (one 90 m long) that possibly connected this settlement with nearby village or with fishing spot. In regard to wooden structure, an oval palisade from Anarghiri IXa should be accented as it indicates protective system and diverse social dynamism (Chrysostomou and Giagkoulis 2018; Chrysostomou et al. 2015).

In fact all of these settlements evidence social dynamism regarding their complex and diverse structure, especially if other archaeological material made of wood, clay, and bone is concerned (Arabatzis 2016; Chrysostomou and Giagkoulis 2018; Giagkoulis 2016). They were not entirely pile-dwellings and some had houses of daub, with circular shape or grouped onto platforms, while others were built entirely on nearby dry areas. Some were connected with trackways and others protected by palisades that evidently demonstrates different modes of approachability or enclosure of the communities dwelling within. If compared with the lakeside settlement of Dispillio these pallets of villages in Amindeon region gives further emphasis on the complexity of Neolithic wetland archaeology in Greece. Although so far only two regions of this country display lakeside settlements, still the abundance of archaeological contexts and material from their excavations largely contribute in building of thorough knowledge on wetland communities. The research of all these sites is still in progress and majority of material is not yet published, therefore the forthcoming and new publications will give much better and detailed picture of the Neolithic communities and man-made environment on the lakes of Balkan Peninsula.

Figure 3: Photo of Maliq pile dwelling during the 1960's excavations (Bunguri 2009, Fig. 3).

Albania

There are three lakeside settlements in Albania excavated so far, all on the now drained Lake Maliq. The lake was drained in the melioration process common for the Balkans in the period between 1950's and 1960's, so that the current environment gives different perspective of the eco ambient where these settlements were established. The lake itself faced several changes thus its occupation area was bigger in the Neolithic and significantly increased with the two climatic events in 4200 and 2700 Cal BP (Fouache et al. 2010). Consequently some potential Neolithic lakeside settlements were continuously under water and now covered with lake deposits.

The site of Maliq was found first and excavated between 1962 and 1966 (Prendi 1966). In the first half of the 1970's and at the end of the 1980's there were few smaller archaeological campaigns performed, but mostly focused on later levels (Korkuti 1993; Prendi 1976, 2018). The site has been dated to the Late Neolithic, but without dendrochronological or ^{14}C analysis, thus mainly the pottery was used for the chronological determination (Korkuti 1995; Prendi 1982). Besides the Neolithic levels the stratigraphy and material of the site witness Chalcolithic, Bronze Age and Iron Age occupation as well. Many piles were recorded and thus a palafitte settlement was proposed as one of those erected on the riverbeds or lakeshores (Figure 3). Not much information is given on the wooden buildings and their organisation as in this period Balkan archaeology was mainly focused on classification of Neolithic cultures through pottery and thus such material is mainly present in the excavation reports and regional overviews.

Very close to the site of Maliq there is another pile-dwelling that is extended along the river Dunavec and has the same name. It was excavated in 1971 and 1973 and approximately 90 densely disposed piles were recorded and therefore interpreted as remains of platform (Andrea 1983; Korkuti 1995). The provided figures indicate the form of single dwelling, so that the issue on platform should be further discussed. The piles were

burnt in the upper part that implies firing of the settlement, while next to them the remains of floor and walls of daub were unearthed, which confirms the mixture of wood and mud for building constructions. According to unearthed pottery the site was dated in the Middle Neolithic and it seems to be one of the earliest pile dwellings in the Balkans (Korkuti 1995), but the majority of published shards from the first phase are common for the Late Neolithic in the Balkans. The pile-dwelling was the settlement from the first phase, while the second phase evidences the later settlement founded on dry ground. This indicates that in this period the lake level was lower, so that the community inhabiting this village did not maintain the tradition of building pile dwellings, in spite of some other that used wooden dwellings on piles until Bronze Age.

The other lakeside settlement on the Lake Maliq is Sovjan that is approximately 5 km northeast from Maliq. Regarding its structure this site is tell that was cut by the irrigation channels after the drainage of the lake. Due to most distinct remains of piles the research is largely focused on the Bronze Age period and the majority of publication concerns these levels (Fouache et al. 2010; Lera and Touchais 2002). In regard to the Neolithic period only few remains of wooden piles are found and they do not contribute that much in the understanding of Neolithic pile-dwellings of the site, as much as in terms of chronology. Namely, the chronological analysis suggests that the piles belong to the middle of 7th millennium or earlier, which could be one of the oldest wooden remains in the Neolithic Balkans (Lera and Touchais 2002). If the date of the samples is accurate and do not belong to an older wood which was later employed in the Neolithic settlement, than the future excavation of the site can significantly provide more data for the Early Neolithic lakeside settlements. Although still modest, the data from these sites in Albania confirms that the lakeshores on the Balkan Peninsula were frequently used for establishing pile-dwellings.

North Macedonia

The current knowledge of Neolithic lakeside settlements in North Macedonia is also modest and there are only three sites excavated so far. Unfortunately there are no solid reports from the excavations, but several publications concern these sites and provide initial insight into their structures and material culture (Benac 1979; Garašanin et al. 1971; Kuzman 2009; Naumov 2016b; Simoska and Sanev 1976; Zdravkovski and Kanzurova 2016). As in case with Albanian pile-dwellings the main focus was on the material culture and therefore the majority of information is on pottery, figurines, and tools, and not much was specified on wooden constructions. The sites are on Lake Ohrid or in its vicinity and share similar climate conditions that had effect on the settlements established on its shores (Albrecht and Wilke 2008; Hoffmann et al. 2010). They are nowadays in the vicinity or under the cities of Ohrid and Struga and therefore the approach to new data is much harder. Nevertheless, the previous excavation unearthed material culture that could be used for further elaboration of these sites.

Ohridati is a pile-dwelling located right under the city center of Ohrid and close to the lakeshore. The site was found during the construction work in

Figure 4: Photo of Ustie na Drim pile dwelling during excavations in 1962 (Kuzman 2013, Fig. 8).

2003 when a large number of wooden structures were damaged, so consequently a small-scale excavation started in 2006 (Kuzman 2013). The excavation was performed in smaller trench and not much data on pile-dwellings was obtained. The majority of piles were not massive that indicates individual dwellings not grouped on the platforms. Some smaller piles were dug next to bigger ones that could be done for fixing the static of the dwellings or were result of building renewal. Due to tough excavation conditions the spatial organisation of site in this area was hard to determine and thus the absence of information on the number of individual dwellings. Though, they are not on the shore of nowadays lake it questions the vicinity of settlement in regard to Lake Ohrid. Currently there is no information on the lake level in the Neolithic, but most likely it was not that far or at least the pile dwelling was built in the marshes nearby the lake. Along with the pottery many loom weights for nets and harpoons were unearthed that apparently demonstrates that the community was largely focused on fishing and perhaps involved in trade.

The site was initially dated to the Late Neolithic and Chalcolithic that is apparently demonstrated by the pottery. However the dendrochronology analysis performed on two piles indicates a bit earlier dates. Namely, the calibrated dates elaborate the chronological values of 5991-5753 cal BC with 95.4 per cent probability and another of 5616-5378 cal BC also with 95.4 per cent probability (Westphal et al. 2011). These dates are a bit earlier than expected and are common for the Middle Neolithic in Macedonia and the Balkans in general (Naumov 2015; Sanev 1995). Unless the samples belong to juniper tree that was older than the wood used for the buildings on the settlements, it could be one of the oldest dates for the pile-dwellings in the Balkan Peninsula. Also some of the unearthed shards indicate features of earlier decoration, although the majority is common for the Late Neolithic. Nonetheless, two samples are not sufficient for solid chronological sequence and therefore new sampling and dating will be necessary to confirm or reject these quite early dates for a pile dwelling in the region.

Ustie na Drim is a site below the city of Struga, approximately 8 km northwest from Ohrid and was found during the redirection of river channel (Figure 4). The piles of settlements were determined much earlier, but

it was excavated in 1962 in a very short weekly campaign and therefore not much data is provided (Garašanin et al. 1971; Koco 1951; Simoska and Sanev 1976). The site was reconsidered later and part of archaeological material was published (pottery, stone and bone tools, and weapons), thus it was determined as Late Neolithic and Chalcolithic (Kuzman 2013; Naumov 2016b; Todoroska 2016). Chronological analysis was never performed, but similarity of pottery with Ohridati indicates close relationship in the initial stages of the Late Neolithic. The variation of piles diameter, as well as their density in particular areas and absence in other parts suggest that there could be combination of individual buildings and platforms. It is worth to note that the settlement itself was not on the very lakeshore, but on the riverbed of Crni Drim next to it, so the community was using simultaneously two resources for fishing. This demonstrates partially a different practice than at other pile dwellings in the Balkans, but in general it fits to the regional features.

In regard to pile dwellings on riverbeds, the site of Crkveni Livadi should be accented. The site was established on the same riverbed as Ustie na Drim, but 4 km north, thus exhibiting the similar regional feature. The excavation was performed in 1956 and 1972, but only short reports from the initial season are published (Pašić 1957; Pašić and Lahtov 1958). It was also excavated in 2012 and 2013, but there are still no publications out of the fieldwork. Due to its specific character this site was reconsidered in the regional overviews of the wetland sites and the combination of pile dwellings and daub buildings was accented (Kuzman 2013; Naumov 2016b). This archaeological context is similar to that of Dispilo and Anarghiri although on diverse waterscape, i.e. river. The flooding of river made similar marshy ambient which initiated the building of smaller pile dwellings as indicated by the piles. These piles could belong indeed to dwellings or fishing huts, but also could be part of fishing system or fences, structures which cannot be refined until more extensive fieldwork. Although sometimes accented as Chalcolithic and Bronze Age site, the pottery from the first excavation seasons and survey (performed where the baggers were digging deep) emphasise the Neolithic levels. This is further supported by the resemblance of pottery to that of Ustie na Drim, Ohridati, and several sites in the region of Pelagonia, so the dating of this site in Late Neolithic is proposed (Kuzman 2013; Naumov 2016b).

In order to date this site thoroughly, as other palafittes in North Macedonia, there is necessity for dendrochronology analysis that can solidly place it into the time frame of pile dwellings in the Balkans. Nevertheless, its pottery indicates the occupation of site from Late Neolithic until Bronze Age that apparently demonstrates the employment of pile dwellings in later prehistory. Other sites in the region additionally contribute in this direction as some that are established on Lake Ohrid, Lake Prespa, and Lake Dojran were active until Iron Age (Kuzman 2013; Naumov 2016b; Naumov et al. 2019, 2018a; Rujak 2014). The one at Vrbnik (close to Struga) was occupied even in the Classical period and the historical sources from that era indicate wooden huts on Lake Prasias (nowadays Lake Dojran), which confirms that reuse or building of pile dwellings was common not only for prehistory (Kuzman 2013; Todoroska 2009). The building of wooden piled huts and trackways was practiced even in the 20th century on Lake Dojran and Monospitovsko Blato, but mainly for fishing purposes (Namičev 2007; Namičev and Namičeva 2016).

Bulgaria

The debate on Neolithic pile dwellings in Bulgaria is still on. There are many coastline sites on the Black Sea, but none is confirmed as a pile dwelling dated to the Neolithic. Five are determined and only Sozopol and Urdovitza on the coast, and Arsenala in the firth are excavated, but the unearthed material ranges from Chalcolithic to Bronze Age. They are even excluded as pile dwellings as there was a significant increase of the sea level between 6500-4000 BP, so therefore these sites were established next to riverbeds and engaged in a maritime trade (Draganov 1995; Ivanova 2012; Peev 2008). The recorded massive piles are so far associated with the Bronze Age levels and there are no published wooden remains or material culture common for the Neolithic.

The same considers the lakes in Bulgaria although there are still discussions on the settlements found close to Lake Varna. Namely, there was continuous research on the lakeside settlements at this lake and even thirteen were documented. Few of them were excavated and it was proposed that they are lakeside settlements with wooden structures (Margos 1973; Todorova and Tonceva 1975). Nevertheless, the current research also indicates that they are not pile dwellings, but common prehistoric settlements built on dry ground next to riverbed (Ivanova 2008; Peev 2008). In spite of the absence of pile dwellings, these sites also lack Neolithic levels thus it cannot contribute to the overview of lakeside settlements from this prehistoric period. As there are thirteen potential sites around Lake Varna their future excavation can change this picture and perhaps provide new data for occupation of this area in the Neolithic as well.

Bosnia

The recently constructed archaeological park at Panonic Lake in Tuzla raised attention to pile dwellings in Bosnia. The evidence for such settlements was obtained at the end of 1950's and since than they were almost absent from prehistoric archaeology. It is apparently questionable whether this archaeological park is consistently reconstructed, as there is scarcity of data associated with the wooden remains and spatial organisation of the site. The archaeological site is now under the city of Tuzla (therefore named as Rudarska Ulica) and it was excavated six decades ago during the urban development of the city. The excavation has provided wooden piles that lead the archaeologists to propose dwellings grouped on platforms (Garašanin 1979). As there is scarcity of data and only one published report of few pages (Puš 1957), it is hard to confirm whether the lakeside settlement had platforms or individual dwellings. Also the presence of lake is not verified although the outflow of the Panonic Sea into the Black Sea was evident long-term process millions of years ago and could contribute in creation of lakes or marshes. Consequently, the area has abundant remains of salt that could be one of the crucial products for trade even in the Neolithic (Nikolov and Bacvarov 2012).

In regard to the site chronology the dating was primarily done on the basis of pottery comparison. It was proposed that the unearthed shards were part of Butmir III culture and synchronous with Vinča pottery, so that it was dated to the Late Neolithic (Benac 1979). Similar pottery was

found on nearby site Gornja Tuzla, northeastern from Rudarska Ulica, which was dated in the 1960's with two samples (Vogel and Waterbolk 1963). The later date, belonging to Vinča period, was extracted from a charred beam that could belong to a pile from dwelling, but this should be further confirmed or rejected with the excavations that started in 2007. The recent reexamination of the site also included new laboratory dates that position more precisely its chronology in the second half of 6th century and first half of 5th century (Vander Linden et al. 2014). Nevertheless, without further confirmation of wooden remains from the site it cannot be verified whether this site was a pile dwelling although it was spatially and chronologically close to the one southwest.

Croatia

Besides its richness of lakes and vast sea coastline Croatia still have not evidenced the large number of pile dwellings established in the Neolithic (Benjamin and Črešnar 2009). One of the rare information comes from the site at Zambratija (Histria) where 34 piles were documented during the underwater excavation, as well as the layer with horizontal planks (Koncani Uhač 2009). The small excavated area and the disposition of piles cannot contribute to the understanding of the construction practices and spatial organisation of the site so far. The future research will provide new data on the construction techniques, but also on the chronology of site. According to the pottery found in the excavated area it is proposed that it could be active from Late Neolithic until Bronze Age, but the dating of the wooden boat unearthed nearby proposes much later dates in 1st millennium BC (Koncani Uhač 2009, 2012). These dates should not consider the settlement itself, as the bay was constantly occupied and active, so that the future dating of piles could significantly resolve the chronological issues. It should be noted that in spite of previously elaborated sites this one is not a lakeside settlement, but a pile dwelling established on the sea bay. The pile dwellings in Croatia were also built on riverbanks, but later in the Bronze Age.

The overview of pile-dwellings in the Balkan Peninsula apparently indicates that there are a variety of contexts where they were built. Although many were established as lakeside settlements, there were also some erected on the riverbanks and coastlines. The small number of pile-dwellings on seacoast should not be surprising due to significant change of the sea level since prehistory, thus many of these sites are underwater, destroyed or hard to find. Also there is still no data on Neolithic lakeside pile dwellings in Serbia and Romania, although the settlements were erected on now drained lakes and marshes, but without evidence for wooden structures on stilts. Nevertheless, the current state and future prospects of the lakeside pile-dwellings determined so far provides initial insight into these specific architectonic constructions that were not common in the Balkans as those built of wattle and daub on dry ground or close to marshes. The marshy environment also had effect on sites location and their architectural features, so it could be considered in terms of wetland archaeology.

Wetland settlements

Wetland archaeology mainly concerns the pile dwellings and wooden structures as major focus in its research scopes. If the major publications in this discipline are regarded than there is almost nothing on the settlements in wetland environment that has no remains of pile-dwellings (Menotti and O'Sullivan 2013). This particularly concerns the Balkans that are crowded with marshes, but only few pile-dwellings are recorded. Such selective approach in wetland archaeology is due to long tradition of examining wooden structures and vegetative landscape, and especially in the environment that still preserves well the organic remains. But in spite to fruitful data obtained from pile-dwellings the wetland archaeology neglected a vast potential of sites that were established in waterlogged ecosystem. Due to the modified environment i.e. drainage of lakes and marshes in the 20th century, many of the sites in the valleys are still considered as dryland settlements. However, if the original natural setting is regarded than entirely different landscape was surrounding so called dryland settlements in the Neolithic. Latest research indicates that many of these sites were actually established close to lakes, marshes or bigger rivers that frequently flooded and thus generated wetland environment (Alexakis et al. 2011; Benecke et al. 2013; Naumov 2016c).

They are rarely consisted of pile-dwellings, although these organic structures could be absent due to modern drain processes that have an effect on the firm disappearance of wood. But as the excavations of lakeside settlements in Dispillio, Anarghiri, and Crkveni Livadi indicated there could be combination of pile dwellings and ground buildings made of daub, so that the pile dwellings in the Balkan wetlands should not be excluded. As result to the waterlogged, but preferred setting, some of these settlements were established on the small natural bulks in order to prevent the incoming water, and simultaneously to be in its vicinity for the fertile soil and abundance of raw materials and food (Naumov et al. 2018b; Simoska et al. 1979). Surely, not all of the tells were made on such bulks and many are placed on flat terrains, but majority were close to water communications and therefore occupied in long temporal range, which actually had effect on their mound like outline. In such way, the tells could be considered as one of the most specific features for the Neolithic valleys in the Near East and Southeast Europe. As there are hundreds of tells in the Balkans founded next to now drained lakes, marshes, and flooded rivers only a condensed overview will be elaborated although such relationship with tells and wetlands requires additional study and publication.

Tells

There is more than century as the tells have been excavated, but only in the last decade there is particular focus on the processes of their foundation, regional distribution, spatial organisation, ecological conditions, social processes, and symbolic engagement (Hofmann et al. 2012; Rosenstock 2009). The tells phenomenon is present from the Near East to Central Europe since Early Neolithic until Iron Age, although at this final period of prehistory they are rare in the Balkans. As the Near Eastern tradition the tells were introduced in the Balkans along the process of Neolithisation though majority were not established at the very initial stage of the

Figure 5: Map of the Balkan Peninsula with the location of the wetland regions with Neolithic tells. Greece: 1. Thessaly; Albania: 2. Korça basin; North Macedonia: 3. Pelagonia, 4. Skopje Valley; Romania/Bulgaria: 5. Lower Danube; Serbia: 6. Mačva region; Bosnia: 7. Visoko basin.

Neolithic. Their size varies from very small campsites to momentous fortifications and from simple spatial infrastructure of farming hamlets to complex protourban metropolises.

But besides their quantity and thorough research the tells in Europe are rarely studied in relation to the wetland environment. In major focus were the chronology, formation process, architecture, and material culture, and consequently frequently observed as dryland sites. Therefore in this paper the tells will be reconsidered in regard to wetland environment and a summarised overview on those established in the Balkan marshy and lacustrine environment will be provided (Figure 5). In spite of more detailed elaboration of the Balkan pile dwellings in this paper the presentation of the tell sites will be more condensed. This is due to the very large number of tells on the Balkan Peninsula and therefore only those regions with most specific features will be concerned.

The largest quantity of Neolithic tells is in Greece and Thessaly in particular, which was the first wave of influence by this Anatolian architectural tradition. Many were excavated and thoroughly studied, especially in the direction of continuous social and symbolic processes (Kotsakis 1999;

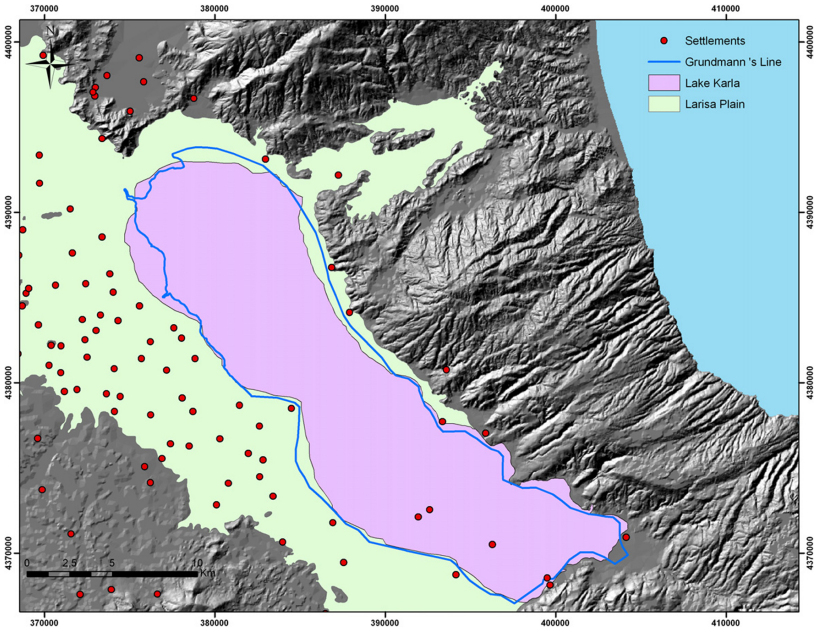

Figure 6: Map with now dried Lake Karla in Larisa Plain, Thessaly (Greece) and disposition of the Neolithic tells in the vicinity of water basin (Alexakis et al. 2011, Fig. 4).

Nanoglou 2001, 2008). However recently the Thessalian tells (*toumba*) were observed in context of the authentic Neolithic environment that concerns the drained Lake Karla as well (Alexakis et al. 2009, 2011; Grundmann 1937). The lake does not exist anymore, but the GIS spatial analysis of tells and geological studies confirmed that many tells were established around this lacustrine area while many others are disposed in its vicinity (Figure 6). These sites may not be considered as lakeside settlements, but the alluvial wetlands were apparently attractive for the Neolithic farmers in Thessaly and therefore many villages were concentrated in this fertile area. This setting is similar to one in the Amindeon region discussed above in regard to pile-dwellings. In this area there were also few tells between the lakes that evidently indicate lacustrine environment as suitable for wetland settlements (Chrysostomou et al. 2015). It could be proposed that there is pattern in the establishment of tells in the Balkan Peninsula frequently associated with lake or waterlogged basins as focal points of inhabitation.

Korça basin in Albania was also elaborated above in relation to pile dwellings, but there were also settlements around now drained Lake Maliq that were not consisted of wooden structures, but mainly of daub. Some of the most remarkable are Podgori, Vashtëmi, Barç, and Sovjan, established in the Early Neolithic around this shallow marshy lake (Korkuti 1995). Some of the dated wooden remains from Sovjan indicate that pile dwelling could be much earlier, but so far these are isolated finds and this cannot be proposed thoroughly (Lera and Touchais 2002). Nevertheless, these sites were initially erected next to waterlogged area and some of them were later developed as pile dwellings, thus maintained the solid relationship with lake and wetland environment.

This pattern of settlement disposal around wetlands and lakes can be traced further to the valley of Pelagonia where the highest density of tells in North Macedonia is recorded (Fig. 7). Approximately 130 tells (tumba or čuka) are documented so far and many are founded in the Early Neolithic (Naumov and Stojkoski 2015; Simoska and Sanev 1976). The recent

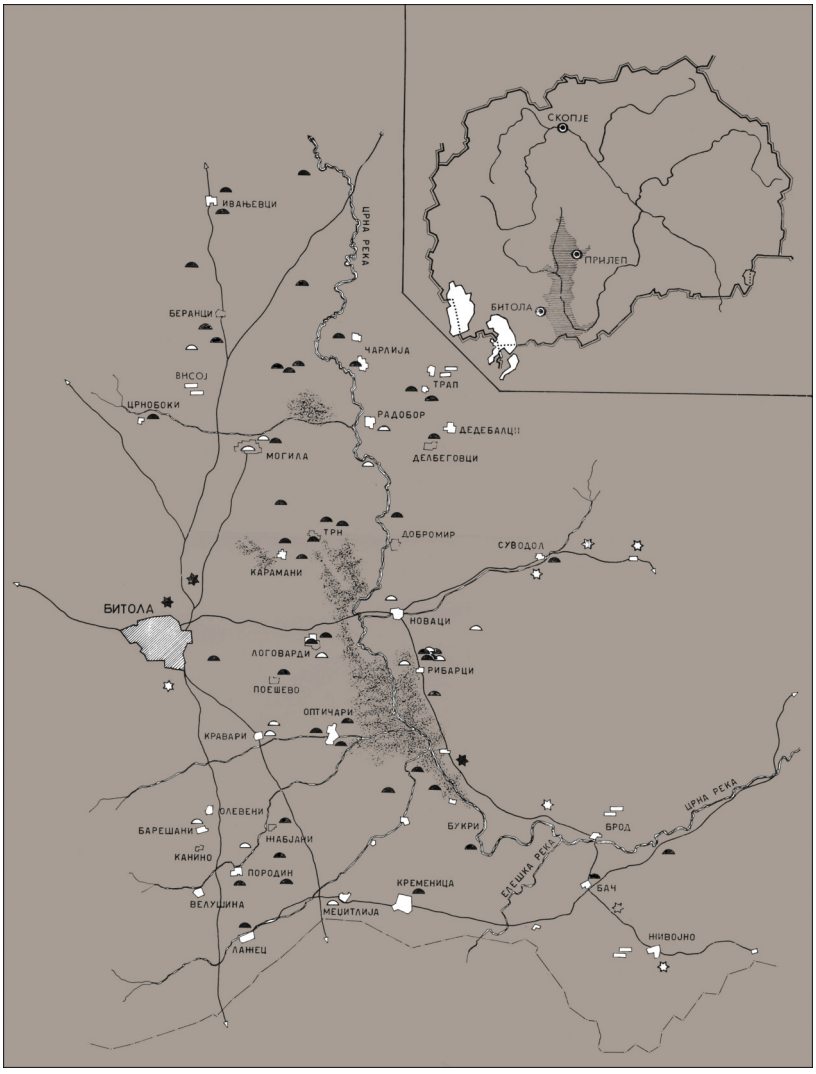

Figure 7: Map with now dried wetlands in Pelagonia (North Macedonia) and the disposition of the Neolithic tells around marshy area (Simoska and Sanev 1976, annex).

research specify that the tells, at least in central part of Pelagonia, were disposed around now drained marshy lakes which were used for fishing and boating until 1960s (Naumov 2016c; Todorovski 2002). This pattern should be tested in other parts of Pelagonia, but it is present as well in other regions in North Macedonia. The Skopje valley is nowadays occupied by the capital city and many of sites were destroyed or vanished in the process of urbanization. But the archaeological excavations recorded number of sites dated in the Middle Neolithic (Sanev 1988, 1989; Stojanova Kanzurova 2011; Tolevski and Stančevski 2017; Zdravkovski 2006). The geological prospection in this area evidenced high fluctuation of Vardar riverbed and consequently vast area of marshes that were dried in the 1950's (Commenge 2009).

The majority of the Neolithic sites were founded next to these marshes as the provision of raw materials and the fertile soils were more approachable than in the upper parts of the valley (Tolevski and Stančevski 2017). It could be noted that the wetland areas were frequently made of shifting riverbeds or floods that partially initiated the development of tells, i.e. mound like settlements a bit higher than ground level. But beside the

mound like elevated structure of the tells, the Neolithic communities inhabiting marshes were also aware of pile-dwellings and most likely were building them. In regard to pile dwellings in North Macedonia also Neolithic house models unearthed in Pelagonia should be considered as they could indicate building of wooden constructions on stilts (Chausidis 2009; Naumov 2010; Zdravkovski and Kanzurova 2016). Although there are indications for such buildings on the Pelagonian tells (Naumov and Tomaž 2015), still the thorough excavation and meticulous study of these sites is necessary in order to determine the presence of pile dwellings in the wetlands.

Such setting is recorded in Romania and Bulgaria as well and the Lower Danube area in particular. The fluvial processes generated number of lakes and marshes that were also drained in the 1960s, but detected in the recent studies (Benecke et al. 2013; Hansen 2015). Large number of Neolithic and Chalcolithic sites, of which many tells (*magura* or *mogila*), were recorded and unearthed while some provided highly sophisticated fishing equipment. In Serbia there is similar setting in the region of Mačva where the river Sava create large wetlands due to its meanders and was settled by approximately 50 tells. These smaller tells (*obrovac*) were mainly dated in the Late Neolithic and had ditches that make sort of enclosures to prevent the settlements of surrounding water (Tripković et al. 2013; Tripković and Penezić 2017). The tells, and some with monumental size, are detected and studied in Bosnia as well and many are established in Visoko basin along the Bosna river (Müller 2012). The fertile soil and approachable sources of food and raw materials were attractive for the first farmers in Bosnia although the tells were founded in the Late Neolithic and some were enclosed, a feature common for many tells in the Balkans (Furholt 2012; Hofmann et al. 2012).

It is apparent that the communities inhabiting these settlements based their subsistence on waterlogged proximity, but not only for fishing, provision of reed, and hunting of birds, but also for communication and trade with neighboring and distant communities along the rivers that was sometimes even faster than land routes. In spite of lakeside settlements which were also using boats for transport and communication, the tells on wetlands close to big rivers were socially more dynamic as the communities could reach much larger area by the rivers. Consequently it is not surprising that many tells were established in the Early Neolithic and some were continuously occupied until Bronze Age, while the pile-dwellings in the Balkans appeared a bit later i.e. in the second half of 6th millennium BC. Although the lakeside and wetland settlements were established and active in different waterlogged settings as they were not so diverse except in terms of architecture. The current research demonstrates the interaction between pile-dwelling and tell societies evidenced by abundance of similar material culture (Naumov 2016a). Although functioning in different environments the communities inhabiting these settlements established networks that go much further than the traditional perspective of wetland archaeology.

Lakeside and wetland networks in conclusion

Commonly, the wetland archaeology is mainly concentrated on the communities in lacustrine and marshy areas that are evidenced by organic

remains such as wooden pile-dwellings, trackways, palisades, fish-traps, tools, wheels, vessels, baskets, leather, vegetation, and even by human skin and hair. These finds enable a comprehensive insight into prehistoric societies and landscape as never before in the history of archaeology and therefore their consideration in more scientifically based studies. They provide a knowledge that is extremely hard or impossible to obtain from so called dryland sites and consequently stimulated the wetland archaeology to have particular focus on sites with abundance of organic remains. In this process of obtaining fruitful results from sites that are underwater, on lakesides, in peatbogs, moors, and marshes, the wetland archaeology underestimated other prehistoric sites in similar environmental setting that do not provide much information on wooden structures and items, basketry, flora, and skin. There are hundreds of sites in wetlands or in now changed environment that due to climate and geological processes do not have preserved organic remains. The communities were interacting with water and used wood largely, but there is not an evidence for that. And for many years the wetland archaeology was ignoring these societies.

Besides the necessity of incorporation of these sites within wetland archaeology they confirm the dynamic networks they had with the pile dwellings on lakesides (which are of special focus in wetland archaeology). They were equally taking part in social processes and frequently traded with those that are apparently still in the waterlogged setting. In many ways the 'dryland' sites in now drained environment were similar to wetland sites and even shared the same identity on the level of material culture (Naumov 2016a, 2018). Apart from the inevitability of more thorough paleoenvironmental research on the 'dryland' sites they need to be reconsidered within the frames of wetland archaeology and the networks they had going in favor to this.

The archaeological excavation of many Neolithic tells and pile dwellings in the Balkans provided numerous finds that apostrophise the mutual contacts these sites had. In the beginning of cultural-historic archaeology they were elaborated as part of the same cultural groups and their similarities were accented (Benac 1979; Garašanin 1979; Theocharis 1973; Todorova and Vaisov 1993), but due to several reasons the 'dryland' sites were ignored in wetland archaeology. Even with the advantage of processual and post-processual archaeology the modern scientific and theoretical models were not included in the accentuation of their mutual relationship. Nevertheless, the post-processual focus on the issue on identity among the prehistoric societies brought forward the close relationship between various societies, and among tells and pile dwellings in particular (Díaz-Andreu García 2005; Insoll 2007; Naumov 2018). In that direction the material culture substantially supports their dynamic interaction, but also geoarchaeological research had impact with entirely different perspective of environment where the tells were established.

If the later is considered and especially the latest environmental studies in Thessaly, Amindeon basin, Pelagonia, Korça basin, and Lower Danube area, than the waterlogged setting of Neolithic tells is evident (Alexakis et al. 2011; Chrysostomou et al. 2015; Fouache et al. 2010; Naumov and Stojkoski 2015). Thus, the development of these settlements was in similar ecosystem to that of pile-dwellings and only the character of water basins (rivers, marshes, and lakes) incite the communities to adjust their settlements to environmental features i.e. erected tells in marshes and river-

banks, and pile-dwellings on lakes. The future research in the peripheral areas of tells could even contribute with potential pile-dwellings/huts on tells and riverbanks as evidenced in Sovijan, Dunavec, Anarghiri, Mogila, Crkveni Livadi etc. Furthermore, the pottery, stamps, human representations, and tools emphasise the networks that tell and pile-dwelling societies had in the Balkans. Frequently similar vessels and stamp designs, figurines, house models, and gear were found in both wetland and lakeside settlements. For example, Dispillo pile-dwelling has many pots decorated as those on Thessalian tells, the pile-dwellings of Limnochori have identical house models as tells in Pelagonia, while Pelagonian tells have anthropomorphic cylinders, incised vessels, and stamps as those unearthed from pile-dwellings on Lake Ohrid and Lake Maliq (Chrysostomou et al. 2015; Naumov 2016a; Touloumis and Hourmouziadi 2003). This network started first between Early Neolithic tells in various wetlands of Greece, Albania, North Macedonia, and Bulgaria and continued in more complex interaction in Middle and Late Neolithic among tells and pile-dwellings. This relationship can be additionally traced on the level of economy, social processes, and rituals that goes out of the scopes of this paper.

The current research indicates that wetland archaeology should modify its methodological approach and consider these significant networks among tells and pile-dwellings in its future studies, and not only in the Balkans, but also in other regions where there is evident communication between 'dryland' and wetland settlements. Although the Balkan archaeology provided abundance of data in regard to tells and pile-dwellings still it requires more advanced methods in thorough understanding of environmental and social processes among settlements in the waterlogged areas. At some point it could be an advantage that the Balkan archaeology is later involved in wetland archaeology in spite of that in other parts of Europe where it had continuous development for more than a century. With the implementation of current advanced methods and knowledge the Balkan wetland archaeology could considerably contribute in explicit elaboration of wetland societies. This will also have an effect in frequent incorporation of the Balkan tells and pile-dwellings in worldwide wetland archaeology that will contribute as well in the improved and more consistent methodological approach within the wetland archaeology itself.

References

Albrecht, C. and T. Wilke (2008). 'Ancient Lake Ohrid: biodiversity and evolution'. In: *Hydrobiologia* 615.1, pp. 103–140. DOI: 10.1007/s10750-008-9558-y.

Alexakis, D., A. Sarris, T. Astaras, and K. Albanakis (2009). 'Detection of Neolithic Settlements in Thessaly (Greece) Through Multispectral and Hyperspectral Satellite Imagery'. In: *Sensors* 9.2, pp. 1167–1187. DOI: 10.3390/s90201167.

– (2011). 'Integrated GIS, remote sensing and geomorphologic approaches for the reconstruction of the landscape habitation of Thessaly during the neolithic period'. In: *Journal of Archaeological Science* 38.1, pp. 89–100. DOI: 10.1016/j.jas.2010.08.013.

Andrea, Z. (1983). 'Archaeology in Albania, 1973-83'. In: *Archaeological Reports* 30, p. 102. DOI: 10.2307/581034.

Angelova, H. and V. Draganov (1995). 'Prehistoric Settlements in the Harbour of Sozopol (preliminary communication)'. In: *Early Bronze Age Settlement Patterns in the Balkans (ca. 3500-2000 BC, Calibrated dates). Part I*. Ed. by L. Nikolova. OCLC: 643903298. Sofia: Agatho, pp. 54–55.

Arabatzis, C. (2016). 'Preliminary Data about the Bone, Teeth and Antler Artifacts from the Prehistoric Wetland Settlements in Amindeon, Western Macedonia, Greece'. In: *Prehistoric Wetlands and Lakes: bringing forward dendrochronology in archaeology*. Ed. by G. Naumov, V. Todoroska, A. Hafner, A. Mazurkevich, E. Dolbunova, Y. Morozova, and P. Shydlovskyi, p. 38. DOI: 10.5281/zenodo.1542928.

Bailey, D. (2000). *Balkan prehistory : exclusion, incorporation and identity*. London: Routledge.

Bekić, L. (2009). 'Podvodni numizmatički nalazi iz uvale Verige na Brijunima'. In: *Jurišićev zbornik. Zbornik radova u znak sjećanja na Maria Jurišića*. Ed. by L. Bekić. Zagreb: Hrvatski Restauratorski Zavod, pp. 36–51.

Benac, A. (1979). 'Prelazna zona'. In: *Praistorija jugoslavenskih zemalja. 2: Neolitsko doba*. Ed. by A. Benac. Sarajevo: Svjetlost, pp. 363–472.

Benecke, N., S. Hansen, D. Nowacki, A. Reingruber, K. Ritchie, and J. Wunderlich (2013). 'Pietrele in the Lower Danube region: integrating archaeological, faunal and environmental investigations'. In: *Documenta Praehistorica* 40, pp. 175–193. DOI: 10.4312/dp.40.14.

Benjamin, J. and M. Črešnar (2009). 'Submerged Prehistoric Site Discovery and a Proposed Application in the Croatian Adriatic'. In: *Jurišicev zbornik: Zbornik radova u znak sjecanja na Marija Jurišica*. Ed. by L. Bekić. Zagreb: Hrvatski Restauratorski Zavod, pp. 52–67.

Chausidis, N. (2009). 'Balkanske 'kućarice' i neolitski keramički žrtvenici u obliku kuće'. In: *Etnokulturološki zbornik* 13, pp. 53–72.

Chourmouziadis, G., ed. (2002). *Διστηλιό - 7500 χρόνια μετά*. Θεσσαλονίκη: University Studio Press.

Chrysostomou, P. and T. Giagkoulis (2018). 'Within and out of boundaries: aspects of spatial organization of prehistoric settlements Anarghiri IXa and Anarghiri XI in Amindeon Basin.' In: *To Arhaiologiko Ergo sthe ano Makedonia, AEAM 3, 2013, Tomos A*. Ed. by G. Karamitrou-Menteside. Aiane: Arhaiologiko Mouseio Aiane.

Chrysostomou, P., T. Giagkoulis, and M. Andreas (2015). 'Prehistoric lakeside settlements (6th - 2nd mill. BC) in the Amindeon Basin, Western Macedonia, Greece'. In: *Archäologie Schweiz* 38.3, pp. 24–32.

Commenge, A. (2009). 'Neolithic Settlement Patterns in the Alluvial Plains of Macedonia: some insights from preliminary geoarchaeological examination of the basin of Skopje, Republic of Macedonia (FYROM)'. In: *Ol' man river: geoarchaeological aspects of rivers and river plains*. Ed. by M. Dapper and F. Vermeulen. Archaeological reports Ghent University 5. Ghent: Academia Press, pp. 229–40.

Díaz-Andreu García, M., ed. (2005). *The archaeology of identity: approaches to gender, age, status, ethnicity and religion*. London ; New York: Routledge.

Draganov, V. (1995). 'Submerged coastal settlements from the Final Eneolithic and the Early Bronze Age in the Sea around Sozopol and Urdoviza Bay near Kiten'. In: *Prehistoric Bulgaria*. Ed. by S. Alexandrov, D. Bailey, and I. Panayatov. Monographs in World Archaeology 22. Madison, Wisconsin: Prehistory Press, pp. 225–241.

Facorellis, Y., M. Sofronidou, and G. Hourmouziadis (2014). 'Radiocarbon Dating of the Neolithic Lakeside Settlement of Dispilio, Kastoria, Northern Greece'. In: *Radiocarbon* 56.2, pp. 511–528. DOI: 10.2458/56.17456.

Fouache, E., S. Desruelles, M. Magny, A. Bordon, C. Oberweiler, C. Coussot, G. Touchais, P. Lera, A.-M. Lézine, L. Fadin, and R. Roger (2010). 'Palaeogeographical reconstructions of Lake Maliq (Korça Basin, Albania) between 14,000 BP and 2000 BP'. In: *Journal of Archaeological Science* 37.3, pp. 525–535. DOI: 10.1016/j.jas.2009.10.017.

Furholt, M. (2012). 'Kundruci: development of social space in a Late Neolithic Tell-Settlement in Central Bosnia'. In: *Tells: Social and environmental space: proceedings of the International Workshop "Socio-Environmental Dynamics over the last 12.000 years: the creation of landscapes II (14th-18th March 2011)" in Kiel. Volume 3*. Ed. by R. Hofmann, J. Müller, and F.-K. Moetz. Universitätsforschungen zur prähistorischen Archäologie Bd. 207. Bonn: R. Habelt, pp. 203–219.

Garašanin, M. (1979). 'Centralnobalkanska zona'. In: *Praistorija jugoslavenskih zemalja. 2: Neolitsko doba*. Ed. by A. Benac. Sarajevo: Svjetlost, pp. 79–212.

Garašanin, M., V. Sanev, D. Simoska, and B. Kitanoski (1971). *Predistoriskite kulturi vo Makedonija*. Štip: Naroden Muzej.

Georgiev, M., A. Petkov, N. Nenov, and C. Angalova (1991). 'Prospecting of underwater archaeological sites using geophysical methods'. In: *Thracia pontica IV*. Sofia, pp. 451–470.

Giagkoulis, T. (2016). 'At the Edge: Preliminary results of some wooden structures from the periphery of the habitation space at the prehistoric lakeside settlement Anardhiri IXb (Amindeon, Western Macedonia, Greece)'. In: *Prehistoric Wetlands and Lakes: bringing forward dendrochronology in archaeology*. Ed. by G. Naumov, V. Todoroska, A. Hafner, A. Mazurkevich, E. Dolbunova, Y. Morozova, and P. Shydlovskyi. Skopje: Center for Prehistoric Research, p. 34. DOI: 10.5281/zenodo.1542928.

Grundmann, K. (1937). 'Magula Hadzimissiotiki. Eine steinzeitlichen Siedlung im Karla-See'. In: *Athenische Mitteilungen* 62, pp. 56–62.

Hafner, A., C. Heitz, and R. Stapfer (2014). 'Pile-dwellings of the Neolithic and the Bronze Age in Switzerland. Long-term research and future tasks'. In: *Quo vadis? Status and Future Perspectives of Long-Term Excavations in Europe*. Ed. by C. von Carnap-Bornheim. Vol. 10. Neumünster/Hamburg: Wachholtz Verlag, pp. 59–83.

Hansen, S. (2015). 'Pietrele – A Lakeside Settlement, 5200–4250 BC'. In: *Neolithic and Copper Age between the Carpathians and the Aegean Sea*. Bonn: R. Habelt, p. 273–295.

Hoffmann, N., K. Reicherter, T. Fernández-Steeger, and C. Grützner (2010). 'Evolution of ancient Lake Ohrid: a tectonic perspective'. In: *Biogeosciences* 7.10, pp. 3377–3386. DOI: 10.5194/bg-7-3377-2010.

Hofmann, R., J. Müller, F.-K. Moetz, and U. Kiel, eds. (2012). *Tells: Social and environmental space: proceedings of the International Workshop "Socio-Environmental Dynamics over the last 12.000 years: the creation of landscapes II (14th-18th March 2011)" in Kiel. Volume 3*. Universitätsforschungen zur prähistorischen Archäologie Bd. 207. Bonn: R. Habelt.

Hourmouziadis, G. (1996). *Dispilio, Karstoria, a Prehistoric Lakeside Settlement*. Thessaloniki: Codex.

Insoll, T., ed. (2007). *The archaeology of identities: a reader*. New York: Routledge.

Ivanova, M. (2008). 'Praistoričeski proučvanija v Bălgarija'. In: *Praistoričeski proučvanija v Bălgarija: novite predizvikatelstva: dokladi ot naicionalnata konferencija po praistorija, Peščera 26-29.04.2006*. Ed. by M. Gjurova. Sofija: Nacionalen archeologičeski institut i muzej BAN, pp. 229–237.

Ivanova, M. (2012). 'Perilous Waters: Early Maritime Trade Along the Western Coast of the Black Sea. (Fifth Millennium BC)'. In: *Oxford Journal of Archaeology* 31.4, pp. 339–365. DOI: 10.1111/j.1468-0092.2012.00392.x.

Karkanas, P., K. Pavlopoulos, K. Kouli, M. Ntinou, G. Tsartsidou, Y. Facorellis, and T. Tsourou (2011). 'Palaeoenvironments and site formation processes at the Neolithic lakeside settlement of Dispilio, Kastoria, Northern Greece'. In: *Geoarchaeology* 26.1, pp. 83–117. DOI: 10.1002/gea.20338.

Kitanoski, B., D. Simoska, and J. Todorović (1980). 'The settlement of Pešterica and the problem of the early neolithic in Pelagonija. (Maked.m.engl.Res.)' In: *Macedoniae Acta Archaeologica, 6.1980*, 9–20, Abb.

Koco, D. (1951). *Nakolnite žilišta vo Ohridskoto Ezero kraj Struga*. Filozofski fakultet na Univerzitetot-Skopje.

Koncani Uhač, I. (2009). 'Podvodna arheološka istraživanja u uvali Zambratija / Underwater Archaeological Researches in Zambratija Cove'. In: *Histria Antiqua* 17, pp. 263–268.

– (2012). 'Prapovijesni brod iz uvale Zambratija: prva kampanja istraživanja'. In: *Histria Antiqua, 21 (2012)*, p. 533–538.

Korkuti, M. (1993). 'Archaeology in Albania'. In: *American Journal of Archaeology* 97.4. Ed. by K. Petruso, p. 703. DOI: 10.2307/506719.

– (1995). *Neolithikum und Chalkolithikum in Albanien*. Ed. by H. Hauptmann. Monographien (Internationale Interakademische Kommission für die Erforschung der Vorgeschichte des Balkans) 4. Mainz: von Zabern.

Kotsakis, K. (1999). 'What Tells Can Tell: Social Space and Settlement in the Greek Neolithic'. In: *Neolithic society in Greece*. Ed. by P. Halstead. OCLC: 468533204. Sheffield: Sheffield academic Press.

Kotsakis, K. (2006). 'Settlement of Discord: Sesklo and the Emerging Household'. In: *Homage to Milutin Garašanin*. Ed. by N. Tasić and C. Grozdanov. SASA special editions. Belgrade: SASA, pp. 207–220.

Kuzman, P. (2009). 'Penelope: Prehistoric Settlement'. In: *Ohrid world heritage site*. Ed. by P. Kuzman, E. Bakovska, M. Tutkovski, and Z. Pavlov. OCLC: 922874702. Skopje: Ministry of Culture of the Republic of Macedonia - Cultural heritage office, pp. 22–25.

– (2013). 'Praistoriski palafitni naselbi vo Makedonija'. In: *Makedonija. Milenium-ski kulturno-istoriski fakti*. Ed. by P. Kuzman, E. Dimitrova, and J. Donev. Skopje, pp. 297–430.

Lera, P. and G. Touchais (2002). 'Sovjan (Albanie)'. In: *Bulletin de correspondance hellénique* 126.2, pp. 627–645. DOI: 10.3406/bch.2002.7114.

Margos, A. (1973). 'Praistorichesko nakolno selishte Strashimirovo 1'. In: *Izvestiya na Narodniya Muzei Varna* 9, pp. 267–284.

Menotti, F. (2004). *Living on the Lake in Prehistoric Europe: 150 Years of Lake-Dwelling Research*. 1st ed. Routledge.

– (2012). *Wetland Archaeology and Beyond: Theory and Practice*. Oxford University Press.

Menotti, F. and A. O'Sullivan, eds. (2013). *The Oxford handbook of wetland archaeology*. 1st edition. Oxford, United Kingdom: Oxford University Press.

Mikov, V. (1950). 'Sledi ot nakolni zhilishta pri s. Strashimirovo'. In: *Izvestiya na arhiologicheskiya institut* 17.

Müller, J. (2012). 'Tells, Fire and Copper as Social Technologies'. In: *Tells: Social and Environmental Space*. Ed. by R. Hofmann, F. K. Moetz, and J. Müller. Bonn: Rudolf Habelt, pp. 47–52.

Namičev, P. (2007). *Razvojot na selskata kukja vo Makedonija od XIX i XX vek*. Skopje: Muzej na Makedonija.

Namičev, P. and E. Namičeva (2016). 'Narodnoto graditelstvo vo Dojran i Dojransko od XIX vek i početokot na XX vek'. In: *Patrimonium*, pp. 307–24.

Nanoglou, S. (2001). 'Social and Monumental Space in Neolithic Thessaly, Greece'. In: *European Journal of Archaeology* 4.3, pp. 303–22.

– (2008). 'Building Biographies and Households: Aspects of community life in Neolithic northern Greece'. In: *Journal of Social Archaeology* 8.1, pp. 139–60.

Naumov, G. (2010). 'Neolithic anthropocentrism: the principles of imagery and symbolic manifestation of corporeality in the Balkans'. In: *Documenta Praehistorica* 37, pp. 227–238. DOI: 10.4312/dp.37.20.

– (2015). 'Early Neolithic Communities in Macedonia'. In: *Archeologické Rozhledy* LXVII.3, pp. 331–55.

– (2016a). 'Among Wetlands and Lakes: the network of Neolithic communities in Pelagonia and Lake Ohrid, Republic of Macedonia'. In: *Southeast Europe and Anatolia in prehistory: essays in honor of Vassil Nikolov on his 65th anniversary*. Ed. by K. Bacvarov and P. Gleser. Bonn: Verlag Dr. Rudolf Habelt, pp. 175–87.

– (2016b). 'Prähistorische Feuchtgebiete und Phahlbauten im Ohridsee, Republik Mazedonien'. In: *Plattform* 23, pp. 4–14.

– (2016c). 'Tell communities and wetlands in the Neolithic Pelagonia, Republic of Macedonia'. In: *Documenta Praehistorica* 43, pp. 327–42.

– (2018). 'The Formation of Wetland Identities in the Neolithic Balkans.' In: *Prehistoric Networks in Southern and Eastern Europe*. Ed. by P. Shydlovskyi. Vita Antiqua 10. Kiev: Taras Shevchenko National University, pp. 48–60.

Naumov, G., A. Hafner, B. Taneski, A. Ballmer, J. Reich, M. Hostettler, M. Bolliger, J. Francuz, A. Machkovski, A. Bogaard, F. Antolin, M. Charles, W. Tinner, C. Morales Del Molino, and A. Lotter (2019). 'Istražuvanje na lokalitetot Ploča-Mićov Grad kaj Gradište (Ohridsko Ezero) vo 2019 godina.' In: *Patrimonium* 17, pp. 11–46.

Naumov, G., A. Hafner, B. Taneski, J. Reich, M. Hostettler, V. Todoroska, L. Emmenegger, C. Stäheli, S. Szidat, S. Papadopoulou, J. Francuz, and M. Bol-

liger (2018a). 'Istražuvanje vo 2018 godina na lokalitetot Ploča-Mićov Grad vo Ohridskoto Ezero'. In: *Patrimonium* 16, pp. 9–36.

Naumov, G., A. Mitkoski, K. TalevskI, A. Murgoski, J. Beneš, I. Živaljević, J. Pendić, D. Stojanoski, F. J. Gibaja, N. Mazzucco, A. Hafner, S. Szidat, V. Dimitrijević, S. Stefanović, K. Budilova, M. Vychronova, T. Majerovičova, and J. Bumerl (2018b). 'Research on the Vrbjanska Čuka site in 2017'. In: *Balcanoslavica* 47.1, pp. 253–285.

Naumov, G. and S. Stojkoski (2015). 'Novi predistoriski tumbi vo Pelagonija'. In: *Zbornik na NU Zavod i muzej – Bitola* 16, pp. 169–85.

Naumov, G. and A. Tomaž (2015). 'The Excavation of Neolithic Tell in Mogila, Pelagonia'. In: *Patrimonium* 13, pp. 67–95.

Nikolov, V. and K. Bacvarov (2012). *Salt and Gold: The Role of Salt in Prehistoric Europe*. Provadia/Veliko Trnovo: Verlag Faber.

Novaković, P. (2011). 'Archaeology in the New Countries of Southeastern Europe: A Historical Perspective'. In: *Comparative Archaeologies: A Sociological View of the Science in the Past*. Ed. by L. Lozny. New York: Springer, pp. 339–461.

Pašić, R. (1957). 'Neolitski naogjališta vo Ohridsko'. In: *Lihnid I-Godišen zbornik na Narodniot muzej vo Ohrid* 1, pp. 115–22.

Pašić, R. and V. Lahtov (1958). 'Zaštitno iskopavanje na lokalitetu Crkveni Livadi u Vraništu kod Ohrida'. In: *Starinar* VII-VIII, pp. 233–34.

Peev, P. (2008). 'Submerged Prehistoric Settlements along the Western Black Sea Coast: the Problem of Situation'. In: *The Geoarchaeology of River Valleys*. Ed. by H. Dobrayanska, E. Jerem, and T. Kalicki. Budapest: Archaeolingua, pp. 161–69.

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

Prendi, F. (1966). 'La civilisation préhistorique de Maliq'. In: *Studia Albanica* 3.1, pp. 255–280.

– (1976). 'Neoliti dhe Eneoliti ne Shqiperi'. In: *Iliria* 6, pp. 21–99.

– (1982). 'The Prehistory of Albania'. In: *The Cambridge Ancient History III (1)*. Ed. by J. Boardman, I. Edwards, N. Hammond, and E. Sollberger. Cambridge: Cambridge University Press, pp. 187–237.

– (2018). *The Prehistoric Settlement of Maliq*. Tirana: Academy of Albanological Studies, Institute of Archaeology.

Puš, I. (1957). 'Neolitsko nasele u Tuzli. Članci i građa za kulturnu istoriju Istočne Bosne'. In: *Zavićajni muzej u Tuzli* I, pp. 86–87.

Rosenstock, E. (2009). *Tells in Südwestasien und Süosteuropa: Verbreitung, Entstehung und Definition eines Siedlungsphänomens*. Urgeschichtliche Studien II. Remshalden: Greiner.

Rujak, Z. (2014). 'Preliminarni rezultati od arheološkite istražuvanja na palafitnata naselba vo Dojranskoto Ezero na lokalitetot Mrdaja od preodniot periodpomegju bronyenoto i železnoto vreme'. In: *Zbornik na trudovivospomen na Emilija Petkovska*. Ed. by Z. Rujak. Strumica: Zavod za zaštita na spomenicite na kulturata i muzej-Strumica, pp. 27–39.

Sanev, V. (1988). 'Neolitskoto svetilište od "Tumba" vo Madjari'. In: *Macedoniae Acta Archaeologica* 9, pp. 9–30.

– (1989). 'Sredselo – Mršевci, neolitska naselba'. In: *Arheološki Pregled* 1987, pp. 41–42.

– (1995). 'Neolitot i neolitskite culturi vo Makedonija'. In: *Civilizacii na poćvata na Makedonija 2*. Ed. by G. Stardelov. Skopje: MASA, pp. 21–46.

Schlichtherle, H. (1997). *Pfahlbauten rund um die Alpen*. Stuttgart: Theiss.

Simoska, D., B. Kitanoski, and J. Todorović (1979). 'Neolitska naselba vo selo Mogila kaj Bitola'. In: *Macedonia Acta Archaeologica* 5, pp. 9–30.

Simoska, D. and V. Sanev (1976). *Praistorija vo Centralna Pelagonija*. Bitola: Naroden Muzej.

Škorpil, H. and K. Škorpil (1921). 'Nakolni postroiki v ezeroto'. In: *Izvestiya na Varnenskoto arheologichesko druzhestvo* VII, pp. 79–XX.

Stojanova Kanzurova, E. (2011). 'Arhitektonski nedvižni objekti od Tumba Madjari'. In: *Macedoniae Acta Archaeologica* 20, pp. 35–52.

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

Theodoulou, T. (2011). 'Evolving relationship between people and water: archaeological evidence'. In: *Culture and Wetland in the Mediterranean: an evolving story*. Ed. by T. Pappayanis and D. Pritchard. Athens: Med-INA, pp. 62–69.

Todoroska, V. (2009). 'Lokalitet Vrbnik – palafitna naselba vo Ohridskoto Ezero'. In: *Jurišićev zbornik: Zbornik radova u znak sječanjana Marija Jurišića*. Ed. by L. Bekić. Zagreb: Hrvatski restauratorski zavod, pp. 390–97.

– (2016). 'Neolitska naselba 'Ustie na Drim''. In: *Neolithic in Macedonia: recent knowledge and perspectives*. Ed. by L. Fidanoski and G. Naumov. Skopje: Center for Prehistoric Research, pp. 41–54.

Todorova, H. and G. Tonceva (1975). 'Die äneolithische Pfahlbausiedlungen bei Ezerovo im Varnasee'. In: *Germania* 53, pp. 30–46.

Todorova, H. and I. Vaisov (1993). *Novo – kamennata epoha v Blgarija*. Sofia: Nauka i izkustvo.

Todorovski, S. (2002). *Arheološki naodi od sreden vek vo arealot na Bitola*. Skopje: Makedonska civilizacija.

Tolevski, I. and I. Stančevski (2017). 'Katlanovskoto ezero-Blato i negovata okolina: kulturni impulsi od neolitskiot period'. In: *Neolitot vo Makedonija: čekor napred vo proučuvanjeto na prvite zemjodelski opštestva*. Ed. by L. Fidanoski and G. Naumov. Skopje: Centar za istražuvanje na predistorijata, pp. 43–56.

Touloumis, K. and A. Hourmouziadi (2003). 'The Man and the Lake: living in the Neolithic lakeside settlement of Dispilio, Kastoria, Greece'. In: *Mediterranean Archaeology and Archaeomoetry* 3.2, pp. 73–79.

Tripković, B., M. Cerović, and D. Bulić (2013). 'Kulturno nasleđe Severozapadne Srbije: lokalitetit tipa „Obrovac" četrdeset godina kasnije'. In: *Rezultati novih arheoloških istraživanja u Severozapadnoj Srbiji i susednih teritorijama*. Ed. by R. Arsić, V. Filipović, and D. Anonović. Beograd: Srpsko arheološko društvo, pp. 45–56.

Tripković, B. and K. Penezić (2017). 'On-site and off-site inwestern Serbia: A geoarchaeological perspective of Obrovac-type settlements'. In: *Quaternary International* 429, pp. 35–44.

Van de Noort, R. and A. O'Sullivan (2006). *Rethinking Wetland Archaeology*. London: Duckworth.

Vander Linden, M., D. Orton, and I. Pandžić (2014). 'New radiocarbon dates for the Neolithic period in Bosnia and Hercegovina'. In: *Godišnjak* 43, pp. 7–34.

Velušček, A. (2006). *The Oldest Pile-Dwelling Settlement in the Ljubljansko Barje*. Ljubljana: Institute of Archaeology at ZRC SAZU.

Vogel, J. and H. Waterbolk (1963). 'Groningen radiocarbon dates IV.' In: *Radiocarbon* 5.1, pp. 163–202.

Westphal, T., W. Tegel, K.-U. Heußner, P. Lera, and K.-F. Rittershofer (2011). 'Erste dendrochronologische Datierungen historischer Hölzer in Albanien'. In: *Archäologische Anzeiger* 2, pp. 75–95.

Zdravkovski, D. (2006). 'New Aspects of the Anzabegovo-Vršnik Cultural Group'. In: *Homage to Milutin Garašanin.* Ed. by N. Tasić and C. Grozdanov. Belgrade: Serbian Academy of Sciences, Arts, Macedonian Academy of Sciences, and Arts, pp. 99–110.

Zdravkovski, D. and E. Kanzurova (2016). 'Neolithic Pile Dwellings in Macedonia and Later Building Traditions'. In: *Acta Musei Tiberio politani*. Ed. by V. Sekulov. Strumica: ZDVILUPT, pp. 156–60.