

The Pile-field of the Neolithic Lakeside Settlement Anarghiri IXb (Amindeon, Western Macedonia, Greece) and the Non-Residential Wooden Structures on the Periphery of the Habitation

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Introduction

The Amindeon Basin, located in the Region of Western Macedonia (Florina, Greece), is a mountainous plateau characterised by the dominant presence of four lakes: Vegoritis, Petron, Chimaditis, and Zazari (Figure 1.a). This rich hydrographic network was probably quite dynamic until the most recent past, since periodical water fluctuations created extended shallow-water or marshy areas, which combined to the neighbouring woodland and fertile fields, formed an advantageous environment for numerous productive activities of the local prehistoric people. The Rescue Excavations Project launched since 2003 by Florina Ephorate of Antiquities (Greek Ministry of Culture and Sports), aiming to the prevention of archaeological remains highly endangered by the intensive lignite-mining activity of the Public Power Corporation S.A.-Hellas in this region, has yielded substantial new evidence for the existence of a distinct culture, which flourished throughout prehistory to later historic periods and is recently named 'Culture of the Four Lakes' (Chrysostomou and Giagkoulis 2016; Chrysostomou et al. 2015; Χρυσσοστόμου n.d.; Χρυσσοστόμου and Γιαγκούλης 2018). The discovery of 54 unknown archaeological sites —

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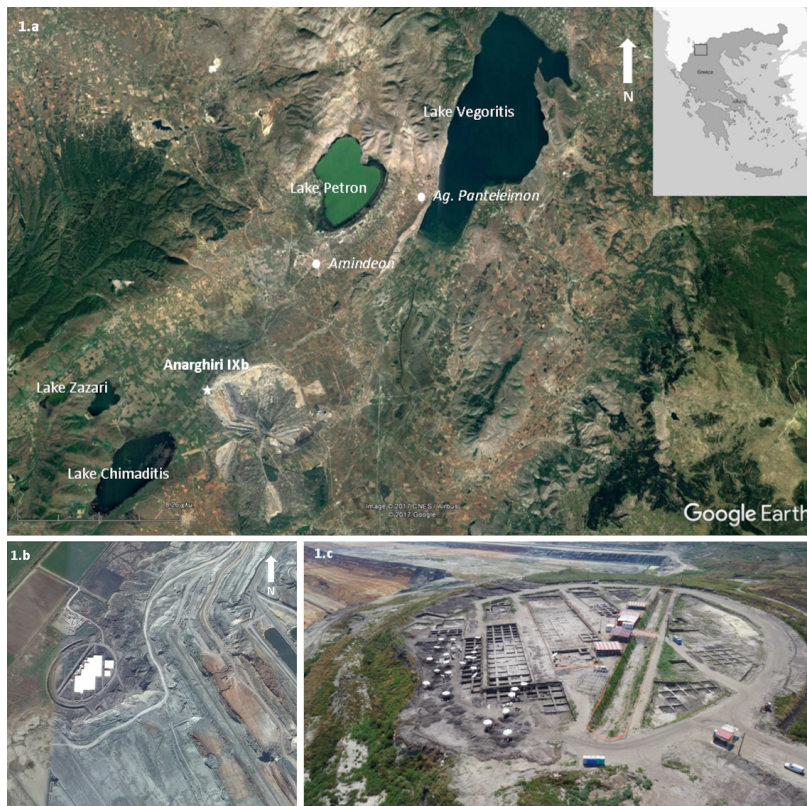


Figure 1: The Amindeon Basin and the prehistoric lakeside settlement Anarghiri IXb. 1.a: Amindeon Basin and the Four Lakes' region (© Google Earth). 1.b: Anarghiri IXb on the edge of Amindeon Lignite-Mining Zone (© Google Earth). 1.c: Aerial view from north of the excavation during 2015 campaign (By courtesy of Florina Ephorate of Antiquities).

some of them dating back to Early Neolithic — placed emphatically Amindeon Basin into the map of Greek and southern Balkans prehistoric settlements, creating new research potentials related to the establishment and diachronic development of farming communities. Of particular interest is the documentation of 27 prehistoric occupations in the surroundings of the region's lakes, for which there are strong indications that they were — at least periodically — influenced by water fluctuations. The selective trial trenches and small-scale excavations carried out in eight of these lakeside settlements located mainly on the northern shore of Lake Chima-ditis revealed successive destruction layers of burned buildings. Numerous wooden, as well as clay structural elements found in a good state of preservation point to the recognition of the layout of stilted two-storied houses arranged in diverse ways (clusters of houses on platforms or individual structures) along the lakeshore (Chrysostomou et al. 2015, p. 28).

The Neolithic Lakeside Settlement Anarghiri IXb

The site is located on the north-eastern edge of Lake Chimaditis, an area covered by shallow water and varied hydrophilic vegetation until the 1960s, when an extended drainage project to expand arable land took place. This modern intervention, together with the intensification of the lignite-mining activity caused the degeneration of the local habitat, which, according to the so far limited systematic palaeoenvironmental studies referring to northern Greece and this specific region, could be characterised as a dynamic wetland along prehistoric times (Bottema 1974, 1982; Gassner et al. 2020; Gkouma and Karkanis 2018; Marinova and Ntinou 2018; Συροπούλου 2010). Although Anarghiri IXb — as well as other prehistoric settlements of the region — was partially destroyed without any archaeological prospection, its existence was documented in 2003, when several test pits at specific areas with visible concentrations of surface material resulted a relative secure estimation of the occupation's maximum size (approx. 2.8 ha). The rescue excavation of the settlement was conducted between 2013 and 2016 as the most challenging endeavor of the Rescue Excavations Project in Amindeon Lignite-Mining Zone, since more than 800 skilled and unskilled workers, 120 archaeologists, and 30 associates of various specialisations were employed in four campaigns. The outcome of this highly-demanding project was the complete excavation of approximately 1.2 ha — mainly on the periphery of the prehistoric habitation — as well as the selective investigation of another 0.55 ha in the central habitation zone, focused on the documentation of the uppermost anthropogenic deposits (Figures 1.b-c).

The study of the enormous amounts of all kinds of artefacts unearthed, together with the investigation of their excavation context is still an ongoing task. At present, the information deriving from the examination of selected trenches' profiles in the Southern Sector of the excavated area enable some preliminary remarks on the settlement's stratigraphic sequence and the general framework of its diachronic development. According to these, the anthropogenic deposits on the periphery of the habitation are nearly 2.5 m thick, while in the central part of the settlement their thickness — as documented on the slopes of the modern drainage canal that destroyed part of the occupation — rise to 3.8 m. Within this relatively thick accumulation of anthropogenic deposits, five archaeological

layers were distinguished in the Southern Sector (Layer I-V) (Giagkoulis 2019, Vol. III, Plan 1). Evaluating their components and texture (inorganic and organic materials, sedimentations), the kind of the structural interventions documented (pits, clay structures, structural wood), as well as the recordable differentiations in the state of preservation of the archaeological material, some general notions regarding the development of the occupation could be stated. Namely, the earliest habitation's phase or phases (Layers IV-V) were established in a more or less humid ground; yet, the extent and degree of water's continuous or periodic presence around or within the habitation cannot be estimated at the current stage of the settlement's study. Furthermore, it could be claimed that the accumulation of anthropogenic layers, together with the possible alterations of the water level in the successive periods could have created the conditions for building in a more dry and stable ground (Layers I-III). Insofar these suppositions can be generalized in respect of the settlement's diachronic development, it is proposed that in the lowest layers the remains of a typical wetland habitation were preserved, while the superimposed deposits correspond to a dryland occupation (Giagkoulis 2019, Vol. I, pp. 22-25).

The implementation of a collaborative project of Florina Ephorate of Antiquities and the Laboratory for the Analysis of Radiocarbon with AMS, University of Bern resulted 79 ¹⁴C dates of wooden structural elements and other carbonized organic materials deriving from representative layers, architectural units and excavation contexts of Anarghiri IXb (Giagkoulis 2019, Vol. III, Plans 2-6). The earliest activities in the site influenced in some degree by the presence of water are dated in the 55th-54th centuries BC and were gradually intensified — at least on the periphery of the excavated area — in the succeeding 53rd-49th, namely within Late Neolithic I period. In the succeeding 48th-44th centuries BC (i.e. within Late Neolithic II and the earliest stages of Final Neolithic) the settlement was gradually developed into a dryland habitation, while around the 43rd century BC the settlement was probably abandoned.

The Pile-Field

With the exception of the systematic research project conducted since the 1990s by Aristotle University of Thessaloniki in Dispilio (Kastoria Lake, Western Macedonia, Greece) (Facorellis et al. 2014; Karkanis et al. 2011; Χουρμουζιάδης 2008; Χουρμουζιάδης 2002), the rescue excavation of Anarghiri IXb constitutes a unique example for Greek archaeology concerning the investigation in such an extraordinary scale of the deposits of a prehistoric wetland. In the deepest layers of the settlement, the dominant features — among the numerous well-preserved organic materials and finds corresponding to various socioeconomic and ideological activities of the Neolithic community — are the wooden structural remains. The recording of their dimensions, physical characteristics, and possible woodworking techniques, together with their mapping utilising GPS technology and digital photos, created a significant amount of data, processed and analysed using suitable GIS applications. The rarity of cross-reference material from the neighbouring lakeside settlements and the subsequent fragmentary information referring to prehistoric structural wood (Naumov 2016; Oberweiler et al. 2016; Γιαγκούλης and Χουρμουζιάδης 2001, 2002; Χατζητουλούσης 2008) add exceptional

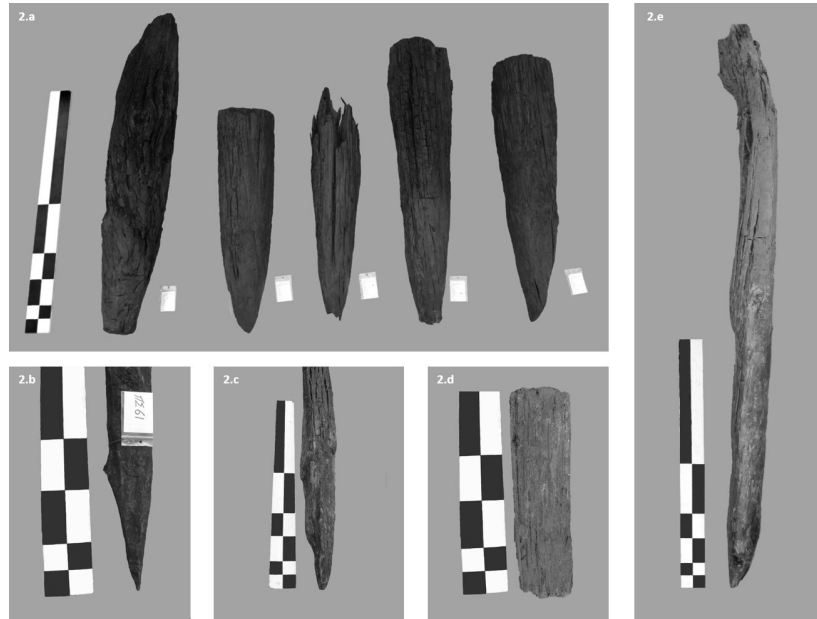


Figure 2: Structural wood from Anarghiri IXb (By courtesy of Florina Ephorate of Antiquities). 2.a: Five extraordinary posts from the northern edge of the excavation. 2.b: Pointed bottom end of a post. 2.c: Wedge-shaped bottom end of a post. 2.d: Plank. 2.e: Post driven out from the lowest wet layers of the occupation.

value to the Anarghiri IXb assemblage due to the potentials offered for a multi-level approach of several issues related to building technology, settlement's layout, and spatial organisation.

The database created for the recording and documentation of the settlement's structural wood contains 3648 elements discovered in the lowest wet layers, which cover an area of 11,250 m² of the main excavation's sector, as well as 2300 m² of an elongated trench on the southern edge of the site. The vast majority of these elements are vertical posts (2871, i.e. 78.7 per cent of total) driven into the marshy soil (regarding the earliest construction episodes) or even into the underlying anthropogenic layers in different depths (Figure 2). Most frequent is the exploitation of roundwood, with some few noticeable examples of half or quarter splits and planks used by the prehistoric builders for construction purposes that are not at present easily distinguishable (Figure 2.d). The length of the posts varies usually from 0.5 to 1.20 m and their diameter ranges from 9 to 12 cm; however, the stratigraphic and spatial distribution of some posts of exceptional length (>2 m) and diameter (>25 cm) could be related to special load-bearing parts of the wooden structures (Figures 2.a, 6.c). In most of the cases the bottom end of the piles was worked to become pointed or wedge-shape with visible tool marks indicative for the implementation of different woodworking techniques (Figures 2.b, c, e).

Considerably fewer (466, i.e. 12.8 per cent of total) are worked and unworked wooden elements deposited horizontally in the lowest layers of the habitation. Their original place and function as structural parts of the prehistoric buildings are difficult to conclude, since there is no secure evidence about their stratigraphic correlation to the neighbouring vertical posts. Nevertheless, in every attempt to suggest any interpretations, a series of depositional and post-depositional processes effecting the formation of the wet layers in a lakeside settlement should be considered (Bleicher 2009, 2013). Similar constraints exist also regarding the extraction of usable information from the examination of a relative small number of thin twigs and small branches (115, i.e. 3.15 per cent of total), although it

is worth mentioning that these are found concentrated in a relative small area (c. 205 m²) at the southeastern part of the settlement, where at any rate the density of posts and horizontal wooden elements is notably high. One last category of material is the woodchips found scattered all over the excavation area; yet, it can be assumed that their limited presence in the excavation record (196, i.e. 5.37 per cent of total) might not correspond to the intense woodworking and building activities of the Neolithic community and is directly related to the sampling choices made by the different trench-supervisors of the settlement's rescue excavation.

The systematic sampling of structural wood realised during the last excavation campaigns resulted more than one thousand samples, constituting the first wood-assemblage deriving from a Balkan prehistoric wetland. The preliminary microscopic examination of 805 samples provided useful indications about the preferences of the Neolithic builders in the use of raw material, together with some initial data for the reconstruction of the neighbouring woodland and its possible exploitation and management. According to the results of the species identification, most of the sampled elements (605) are oaks (*Quercus sp.*), i.e. approx. 80 per cent of total. One second distinguishable group of 140 trees' stems belong to various conifers (i.e. 18.5 per cent of total). There is also a limited number of samples (12 elements, i.e. 1.6 per cent of total) belonging to deciduous trees' species, namely 8 elms (*Ulmus sp.*) and 4 unidentified ones.

The Wooden Structures

Since the investigation of the earliest layers of the habitation was mainly focused on the peripheral zone of the site, the most prominent outcome of the pile-field's analytical approach was the recognition, description and dating of some accessing and enclosing wooden structures that for now constitute exceptional findings for southern Balkan prehistoric research (Figure 3).

Trackway 2 is an elongated alignment of over 500 posts measuring approximately 85 m, which leads from the probable core of the habitation space to the settlement's edges and even further to its peripheral archaeologically uninvestigated zone (Figure 4.a-b). The structure shows a noticeable variety regarding the exploitation of roundwood and splits and the adoption of woodworking techniques by the prehistoric builders. One of the most interesting construction practices documented in specific spots along the trackways' stretch is the driving into the marshy soil of timbers with side branches (Figure 4.c), a deliberate choice that could have been made to prevent the sinkage of the load bearing posts of the structure (Brunning 2007, p. 115). Together with the closer examination of these technical details, the investigation of the fact that the posts were discovered in different elevations could assist the attempts to conclude whether the layout of Trackway 2 is an outcome of a specific architectural design and structural pattern or it should be most probably related to successive repairs and rebuildings. The calibrated measurements of ten ¹⁴C-dated posts from Trackway 2 ranging from 5308-4988 cal BC indicate that the structure was evidently in use for nearly 250-300 years, being at the same time the earliest known wooden accessing structure in Neolithic Europe.

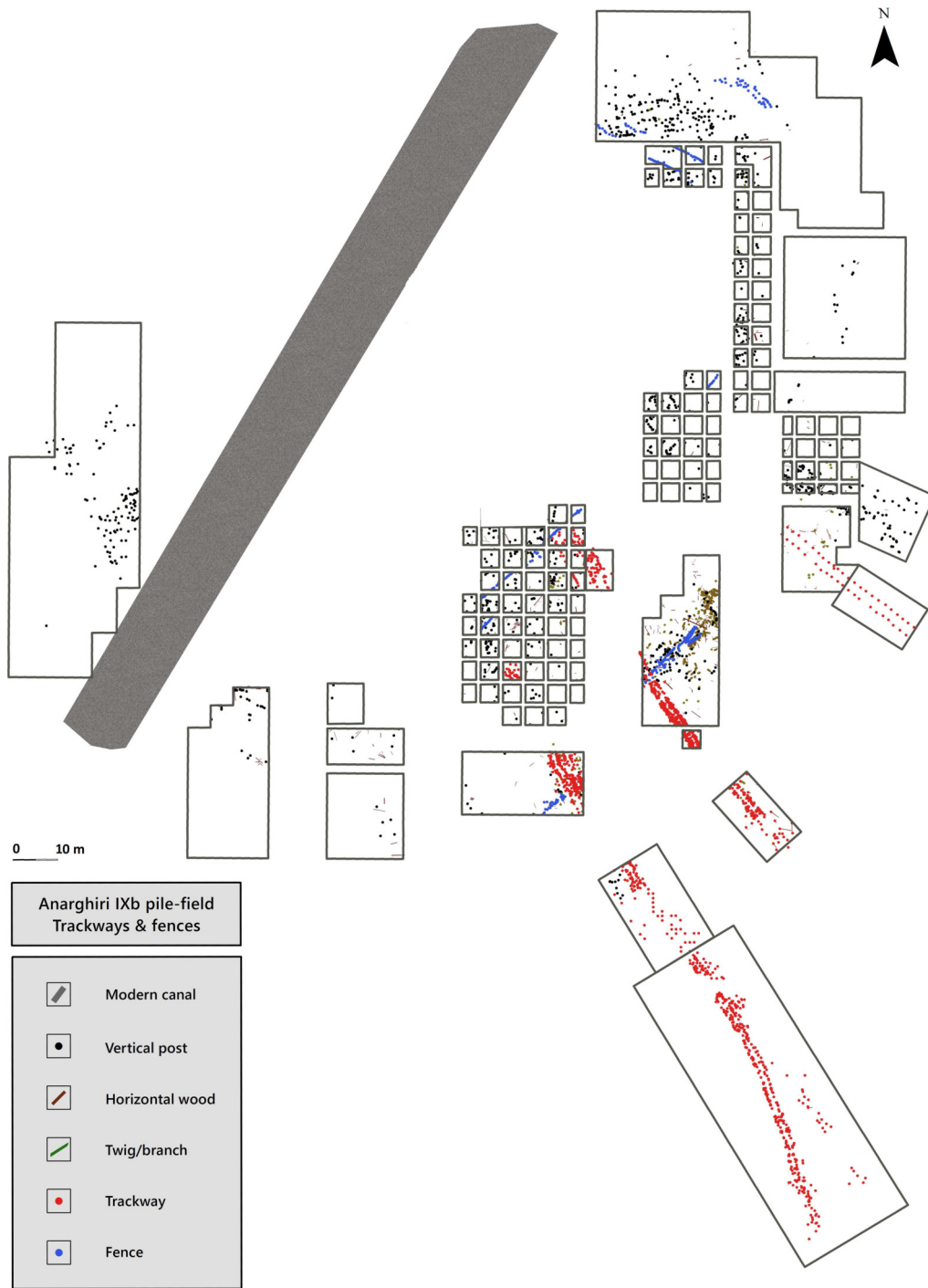


Figure 3: Anarghiri IXb pile-field and the wooden structures of the settlement's periphery (Drawing: T. Giagkoulis).

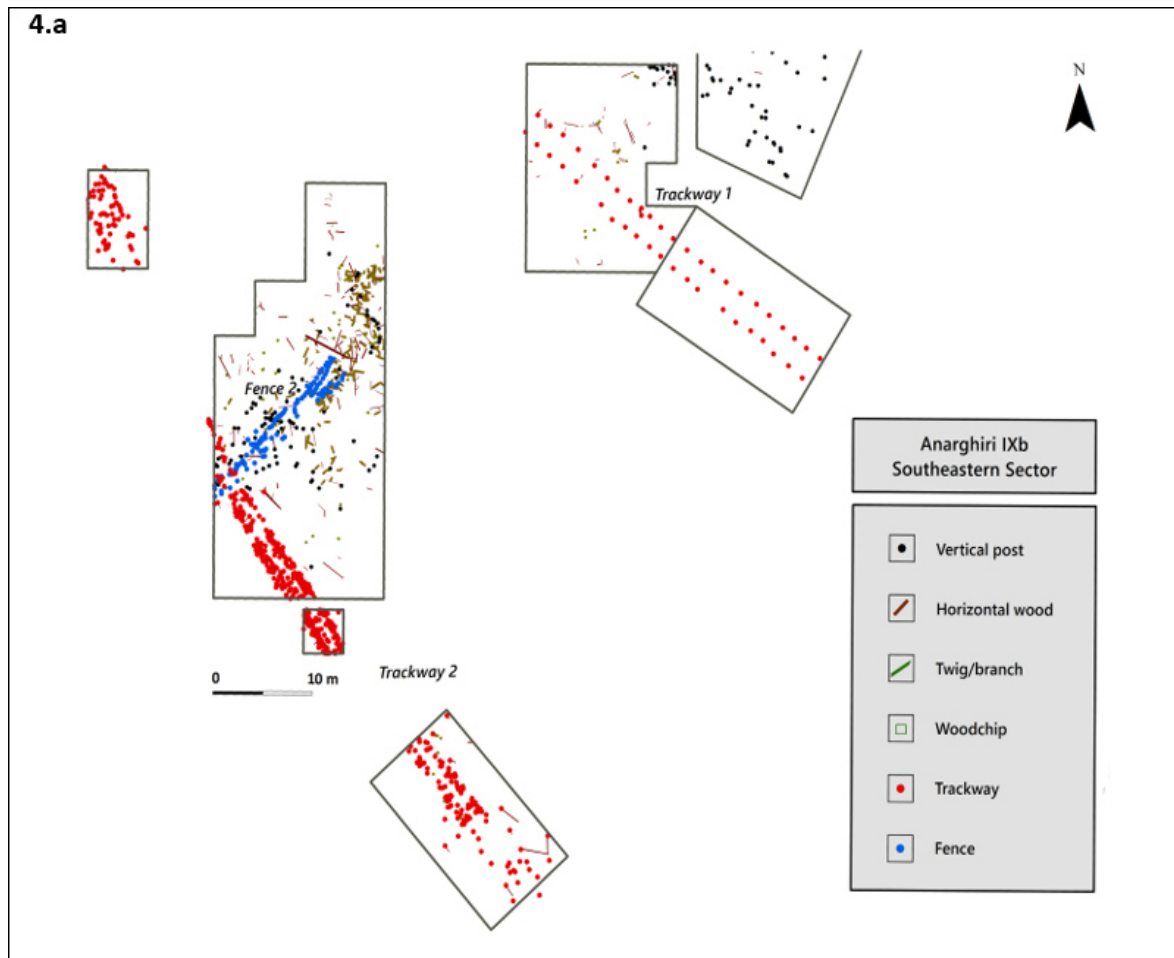


Figure 4: The southeastern edge of the occupation. 4.a: Plan of the pile-field with the remains of Fence 2, Trackway 1 and 2 (Drawing: T. Giagkoulis). 4.b: Aerial view of the excavation's southeastern area (By courtesy of Florina Ephorate of Antiquities). 4.c: Post from Trackway 2 with branches and U-shaped top part (By courtesy of Florina Ephorate of Antiquities). 4.d: Typical post from Trackway 1 with pointed bottom end (By courtesy of Florina Ephorate of Antiquities).

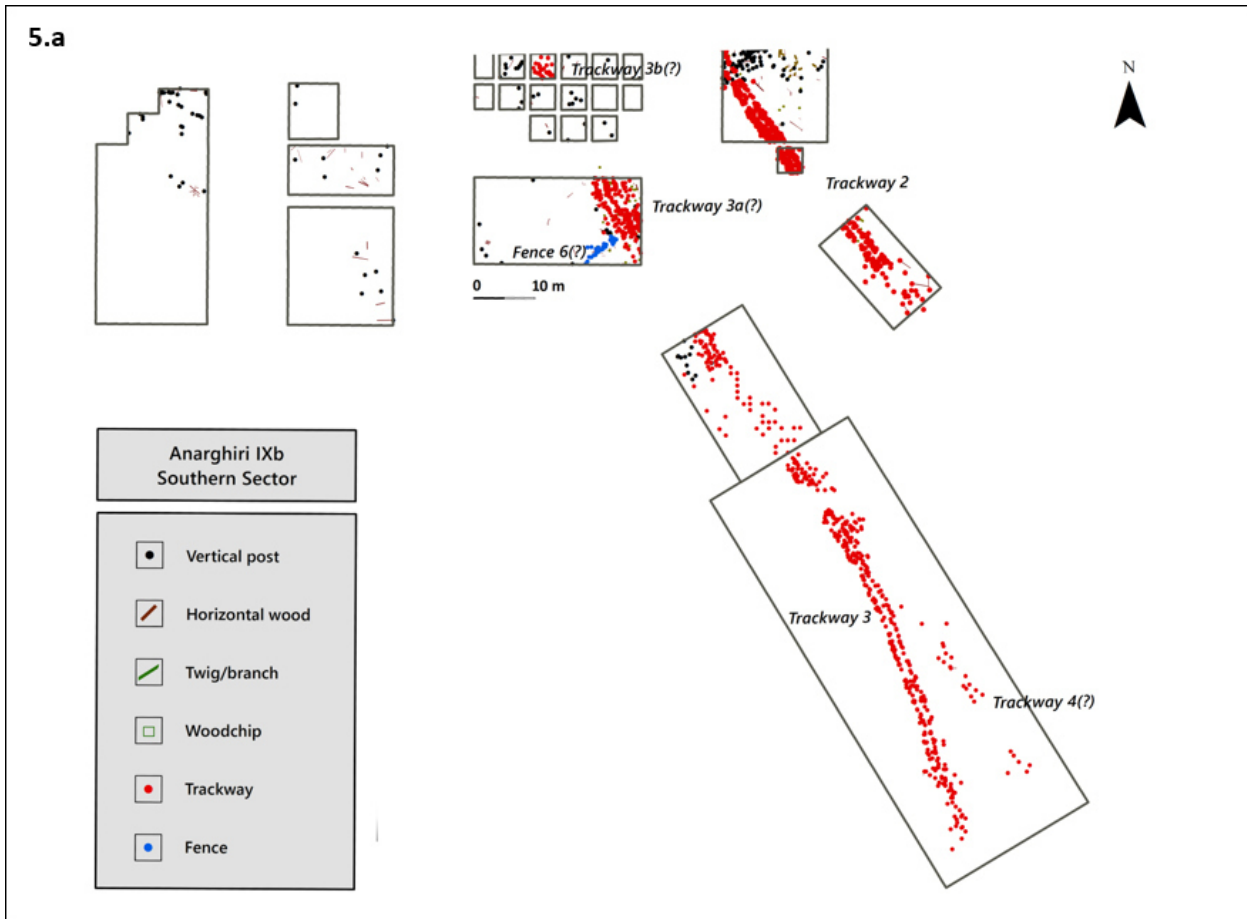


Figure 5: Trackways on the southern edge of the occupation. 5.a: Plan of the pile-field and the remains of Trackways 2, 3, 3a(?), 3b(?) and 4(?) and Fence 6(?) (Drawing: T. Giagkoulis). 5.b: Aerial view of Trackways 3 and 4(?) and the northern edge of the prehistoric dry-land settlement Anarghiri XI (By courtesy of Florina Ephorate of Antiquities). 5.c: View from the south of Trackways 3 and 4(?) and the southern edge of Anarghiri IXb (By courtesy of Florina Ephorate of Antiquities).

Arguably, **Trackway 3** (Figure 5) is the most outstanding wooden structure unearthed so far in Amindeon Basin, not only due to its extraordinary length of approximately 122 m, but also because it was the first definite evidence of certain off-site building activities of the local prehistoric communities. The discovery of this substantial feature in 2013 is not linked to the rescue excavation of Anarghiri IXb, but to the investigation of the outermost limits of Anarghiri XI (Figure 5.b), a dry-land settlement located on a low mound approximately 130 m southeast of Anarghiri IXb with several Early Neolithic to Early Bronze Age occupation phases dispersed horizontally in an area of 11 ha (Χρυσσοστόμου and Γιαγκούλης 2018). The foundations of Trackway 3 consist of more than 540 posts driven into the marl of the former marsh (Figure 5.c), where scattered archaeological material was unearthed, mainly handmade coarse Neolithic pottery and several polished stone axes. According to its dating ranging from 5020-4799 cal BC, it is quite probable that Trackway 3 was built by the inhabitants of the wetland to provide access to the opposite shore, probably after the abandonment (or destruction) of Trackway 2; yet, given that in Anarghiri IXb, as well as in Anarghiri XI several occupation phases have been discovered, the exact spatiotemporal associations between the two habitation areas and the specific role(s) that Trackway 3 could play in a wide range of socioeconomic or even ideological activities of the prehistoric communities are still missing.

Although the arrangement of the vertical structural elements and the lack of horizontal wood do not facilitate the exact reconstruction of the two trackways' form, their comparison to similar structures discovered in European wetlands led to the supposition that they were ground-level features comprising a walking surface of horizontal elements retained and supported by vertical posts. Two similar, but partially investigated double posts' row alignments at the Southern Sector of the excavated area were characterized with some reservations as **Trackway 3a(?)** (approx. 4836-4723 cal BC) and **Trackway 3b(?)** (approx. 5208-4800 cal BC), without excluding the possibility that they constituted structural parts or successive repairs of Trackway 3 or some other accessing structure (Figures 5.a, 7.a).

Trackway 1 is the most clearly recognizable wooden feature of Anarghiri IXb comprising a 35 m long and 2.5 m wide double row of 45 oak timbers on the eastern edge of the settlement (Figure 4.a, d). The dating of the structure in the Early Bronze Age (approx. 2577-2469 cal BC) most probably explains its obvious structural differences compared to the earliest features, namely the elaborately processed vertical posts arranged rather regularly to form a bridge-like crossing to the opposite dryland. This feature, together with the slightly earlier remains of the fragmentary double posts' row characterized as **Trackway 4(?)** (approx. 2862-2581 cal BC) constitute for now the only securely dated evidence for human activity during Early Bronze Age in Anarghiri IXb (Figure 5). In any case, it should be kept in mind that at the opposite dryland habitation Anarghiri XI, several features of this period were documented (Χρυσσοστόμου and Γιαγκούλης 2018, pp. 219-221).

Apart from the trackways that provided access to the settlement from and to the opposite lakeshore, some other distinguishable posts' alignments were unearthed on Anarghiri IXb periphery, possibly related to the organization and/or delimitation of space and activities. On the northeastern edge of the occupation, a 13 m long double posts' row named **Fence 1**

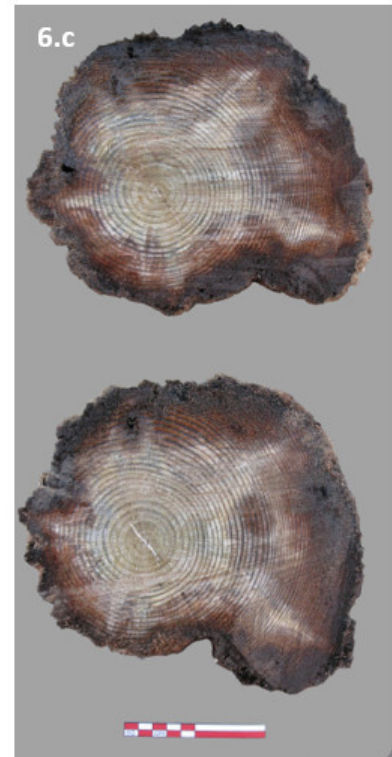
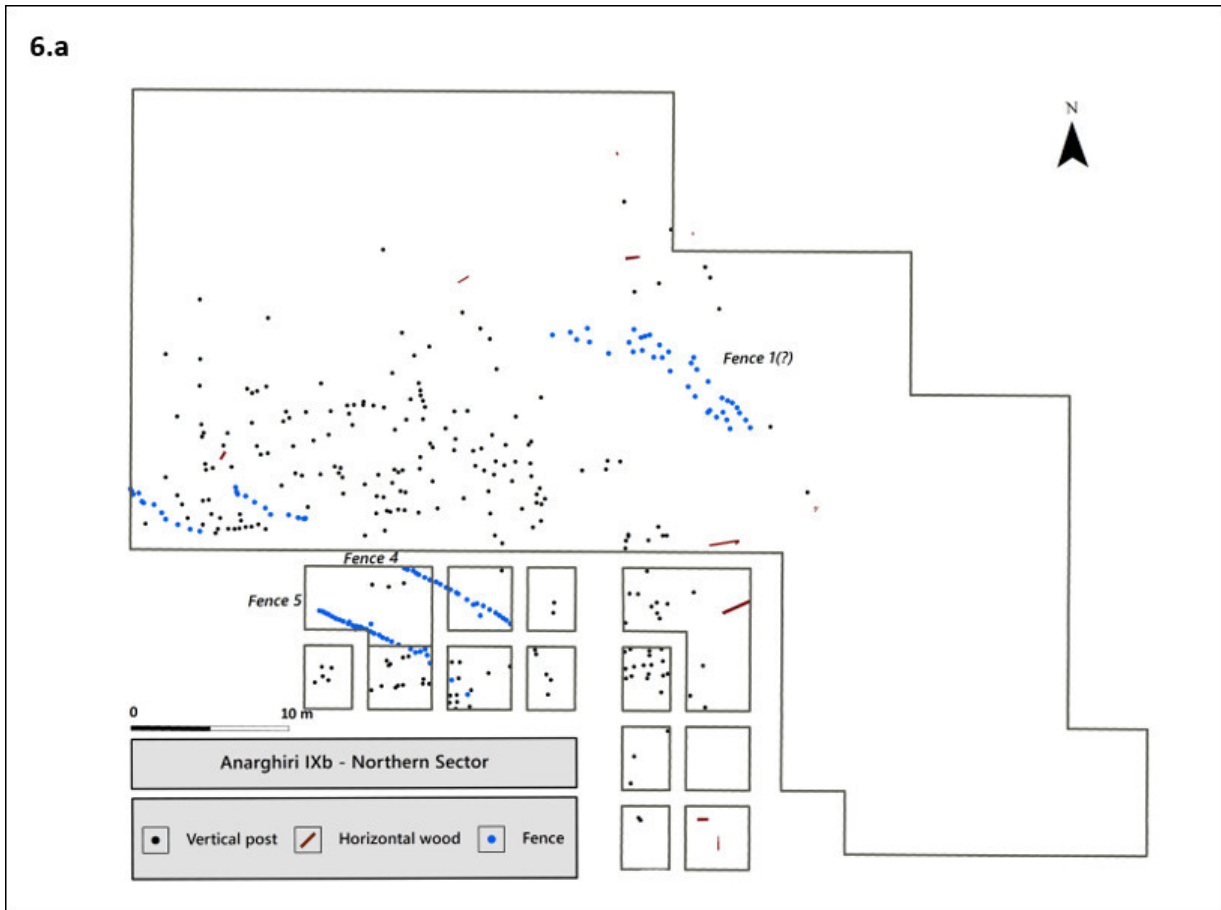


Figure 6: The northern edge of the occupation. 6.a: Plan of the pile-field and the remains of Fences 1(?), 4 and 5 (Drawing: T. Giagkoulis). 6.b: View of Fence 5 (By courtesy of Florina Ephorate of Antiquities). 6.c: Samples of posts of exceptional size from the northern edge of the occupation (By courtesy of Florina Ephorate of Antiquities).

could be used as a boundary between the marginal area with very limited anthropogenic activity at northeast, the area which could be characterised as an open space and the denser built area at southwest (Figure 6). The almost identical dates of two opposing posts (approx. 5209-4984 cal BC) seem to support the abovementioned suggestion, at least about the form of this architectural entity. The irregular layout of this structure, with no evident continuity along the neighbouring excavation trenches, poses for discussion interpretative questions related to construction and organisation of space by the prehistoric builders in ways beyond the dominant archaeological perceptions of building design, bringing at the same time up for consideration factors related to a constantly altering wetland environment and to various human activities which can cause the fragmentation of the structure's initial architectural unity. Some few meters to the south of Fence 1, two more linear posts' alignments measuring approximately 20 m (**Fence 4**) and 22 m (**Fence 5**) were unearthed (Figures 6.a-b). The two dated wooden elements sampled from Fence 4 and 5 (5208-5002 cal BC and 5212-5051 cal BC respectively) make quite plausible the suggestion that these two synchronous features were probably parts of bigger structures built as means for arranging space or even enclosing the habitation or a specific area.

The deposition and the density of wooden elements at the southeastern edge of the settlement — namely 825 objects, i.e. 22.6 per cent of total in 560 m², 4.12 per cent of the overall excavated area containing wet layers — hold back the attempts to trace any distinctively structured space. But all the same, a more careful focus on the excavation's plans, together with the evaluation of the information resulted by the preliminary examination of the stratigraphic succession, the spatial distribution, and the technical characteristics of the wooden elements, led to the recognition of a 15 m long posts' alignment named **Fence 2** (Figures 4.a-b). The structure, which apparently intersects Trackway 2, constituted of a single row of posts directed from SW-NE for approximately 10 m and ended up in two shorter in length double posts' rows, forming a denser entity, maybe supported by some of the numerous horizontal wooden elements found close to its northeastern part. It should be noted that were no dateable samples from this structure. Nevertheless, the closest — spatially, as well as stratigraphically — date deriving by a charcoal from a neighbouring stratified excavation unit (5299-5076 cal BC), indicates that Fence 2 was probably established and used at the same period with Trackway 2.

Fence 3, a continuous single posts' row measuring approx. 30 m discovered some 40 m to the northwest of Fence 2 towards the central habitation zone, seems to be constructed later than any other Neolithic feature documented (approx. 4668-4464 cal BC) (Figures 7.a-b). The feature is probably combined with the adjacent **Fence 8(?)** (approx. 4668-4404 cal BC) constituting of sixteen vertical posts with curved top part probably for carrying horizontal elements (Figure 7.a, c). Lastly, the fragmentarily excavated alignments characterised as **Fence 6(?)** and **Fence 7(?)** could be parts of larger continuous entities, or even connected with some of the more securely documented structures; still, these suppositions are hardly controllable due to the lack of dateable samples from these two last posts' rows.

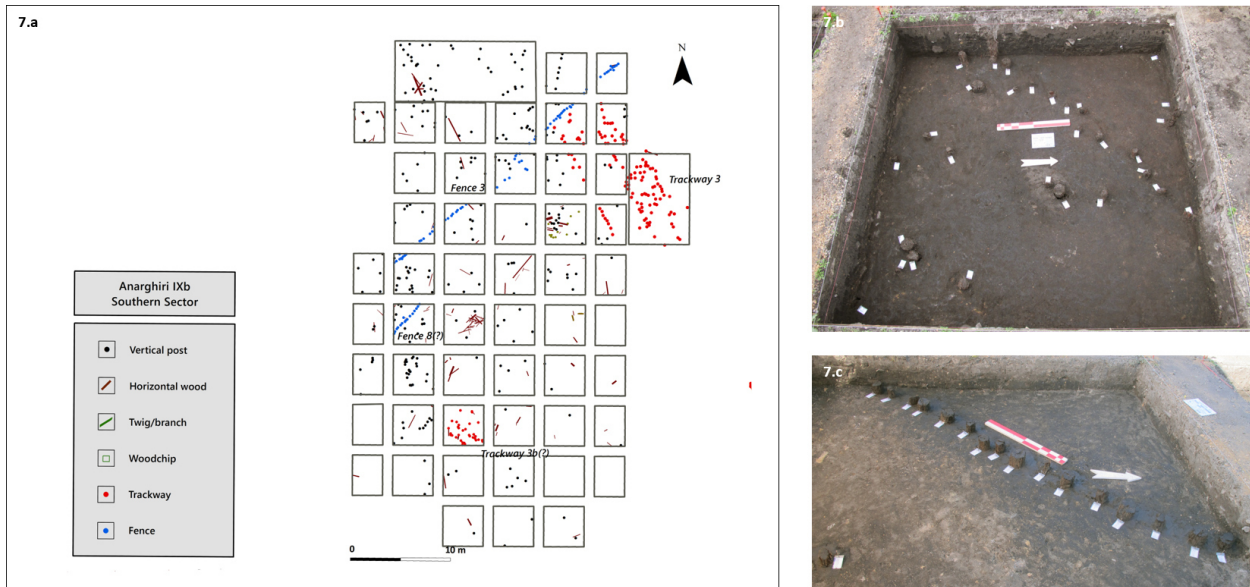


Figure 7: The southern area of the excavation. 7.a: Plan of the pile-field and the remains of Fences 3 and 8(?) and Trackways 2 and 3b(?) (Drawing: T. Giagkoulis). 7.b: View of Fence 3 (By courtesy of Florina Ephorate of Antiquities). 7.c: View of Fence 8(?) (By courtesy of Florina Ephorate of Antiquities).

Discussion

Considering that the overall reconstruction of Anarghiri IXb stratigraphic sequence, pottery and artifact analysis, as well as a series of corresponding studies are pending, the results of the settlement's pile-field analytic approach and the documentation of the accessing and enclosing wooden structures can be currently employed for addressing some general remarks regarding the habitation's peripheral layout and its possible diachronic development. Consequently, it could be supported that Trackway 2 together with Fence 4, 5 and most possibly Fence 2 constitute the earliest recognizable structures established at the marginal zone of the habitation during the Late Neolithic I (namely the last three centuries of the 6th mil. BC), while in the same period the fragmented double posts' row characterized as Fence 1 is dated. Almost immediately after this chronological point at the early-50th century BC Trackway 3 was constructed together with one possible repair of Trackway 3b(?), supposing that this was an individual accessing structure established also in Late Neolithic I. It is worth mentioning that during this last period no recordable evidence for the presence of synchronous enclosing structure is documented. The single available ¹⁴C measurement from Trackway 3a(?) pointing to its establishment and use between the late-49th and the late-48th centuries BC constitutes one of the scant evidences of structural activity during Late Neolithic II in Anarghiri IXb. The dating of Fence 3 and Fence 8(?) within the three succeeding 47th-44th centuries BC seems to document in a more tangible way the existence of structural activity in Anarghiri IXb at the beginning of Final Neolithic period. Especially the size and orientation of Fence 3 most probably refers to an enclosing or space-segregating feature which, together with its clear chronological differentiation from the earlier structures, it is further distinguished in terms of location at the edge of the central habitation zone. After the probable abandonment of the settlement around the 43rd century BC, Trackway

4(?) and Trackway 1 constitute for now the only datable evidence pointing to some activity at least at the occupation's marginal zone during the Early Bronze Age.

These suppositions about the concurrence of accessing and enclosing structures during certain timespans within Late Neolithic I lead to the partial reconstruction of the habitation's outline. Accordingly, it can be claimed that Fence 4 and 5 constituted the possible northern demarcation of the residential space, with the synchronous Fence 1 playing some complementary role to this system. Moving towards southeast, the next spatial limitation to be recognized is Fence 2, while its intersection with Trackway 2 should have created a rather distinctive structural complex at the habitation's margins, that according to the big excavation picture could constitute - at least for some specific period - the main accessing point to the settlement from the opposite dryland. The construction of Trackway 3 some meters to the west of Trackway 2 after its probable abandonment could be considered as an indication for the possible dislocation of the main accessing point to the Late Neolithic I habitation, with the general spatial rearrangement of the building activities remaining one open possibility. Even more difficult would be the attempt to detect the extent or the limits of the Late Neolithic II habitation, inasmuch as any building or other activity actually existed in Anarghiri IXb during this period. The successive early Final Neolithic occupation, according to the location and orientation of Fence 3, seems to be shifted towards west-northwest and developed over an area of accumulated anthropogenic deposits that possibly affected the form, as well as the extent of the building activities.

Beyond this inevitably descriptive level of approach, the discussion regarding the non-residential structures on the periphery of Anarghiri IXb has to move a step forward to specific interpretative suggestions. Thus, apart from the efforts for a well-documented reconstruction of the structural form of the wooden trackways in comparison to selected parallels from a great number of structures of different types unearthed in European wetlands (e.g. Brunning 2007, pp. 188–230; Casparie 1987; Eberschweiler 2004; Hafner 2002; Hayen 1957, p. 171; Heumüller 2016; Winiger 2006), the attempt to test some plausible suggestions concerning their function(s) on the edge of the prehistoric habitation, should be more fruitful. The corresponding discussion begins from the obvious use of the structures as crossings, joining the main habitation space of Anarghiri IXb with the opposite dryland exploited as multivariate productive space, being at the same time part of a broader communication network between Late Neolithic settlements within Lake Chimaditis wetland. Although direct indications in Anarghiri IXb material are missing and the dates of the trackways are early enough, it would be intriguing to introduce the discussion that correlates the construction of some central European wooden trackways dating back to the late-4th mil. BC with animal traction and the use of wheeled vehicles documented by the discovery of well-preserved wooden wheels and other components (Petrequin et al. 2006; Schlichtherle 2002). Some researchers argue that the deposition of 'special' artefacts or groups of materials in the wet surroundings of trackways (e.g. Sweet Track in Somerset, UK) is sometimes deliberate and should be associated with symbolic activities performed by the prehistoric communities (Brunning and McDermott 2013, pp. 368–370; Coles et al. 1973; O'Sullivan and Van de Noort 2007). At the same interpretative direction are also pointing the structural and spatial correlation of

these architectural features with platforms, buildings or open spaces, to which special ritual function is attributed by the excavators. For example, the 110 m long double posts' row trackway leads from the shore of the Swiss Lake Nauchâtel directly to an exceptional structure with three successive building phases in the central zone of the lacustrine occupation in Station Marin-Les Piécettes dated in the mid-4th mil. BC (Honegger 2001, 2007). Discussing in a more general theoretical level it could be claimed that, since planning, building, and repair of trackways most probably constituted communal labour-intensive endeavours, involving also accurate decision-making, adequate material provenance and management, their construction should have played an active role in the development of intra-settlement dynamic relationships between the occupation's inhabitants, as well as certain interactions between neighbouring communities.

Although the remains of wooden structures related apparently to the demarcation of space on the settlement's periphery are unearthed in a more elliptic scale, there are several topics that could be preliminarily approached. The characterisation of all these linear elongated alignments as 'fences' was preferred due to technical features — namely the average small dimensions of the uprights and their relative sparse positioning — instead of the term 'palisade' which is mainly used to describe more massive and dense structures (e.g. Bauer 2009; Guyan 1967; Meyer 2002, pp. 69–70). This methodological choice consequently brings up the function of these architectural entities in a prehistoric wetland settlement, a question open to many interpretations varying from their possible use as means to reduce impacts from waving water and wind, to separate building and/or productive activities' spaces or to control movement of people and livestock from/towards the main occupations' areas (e.g. Bauer 2009, p. 191; Bleicher and Burger 2015, pp. 121–138; Hasenfratz and Gross-Klee 1995, p. 222; Meyer 2002, p. 70). The most controversial suggestions which associate this kind of structures to defensive purposes are citing variable indications in the archaeological record related to phenomena of violence or warfare even during the Neolithic (Hafner 2010, pp. 359–360; Petrequin and Bailly 2004, pp. 39–40; Torke 2009, pp. 264–269; Viellet 2009, p. 285); yet, a number of these interpretations attributed many decades ago to some of the most exceptional architectural complexes of central European wetlands (e.g. 'Wasserburg Buchau' in Germany) bear the marks of decisive influence of the ideological background of the researchers and their era (Keefer 1992; Schöbel 2008). The discussion in Greek prehistoric research concerning the purposes of encircling neolithic settlements by their inhabitants in various ways (ditches, walls, palisades, pits etc) is as old as the first excavations of Thessalian tells in the beginning of twentieth century and evolved over time focusing on different interpretative alternatives, such as planning and spatial arrangement of buildings and activity areas (e.g. Χατζητουλούσης et al. 2014; Χουρμουζιάδης 1979), increasing antagonism and conflicts among Neolithic communities (e.g. Kokkinidou and Nikolaïdou 2004; Runnels et al. 2009) or demarcation of the settlement's, as well as community's boundaries in a symbolic — together with the actual — level (e.g. Chapman et al. 2006; Kotsakis 2006, 2009; Pappa 2007).

Afterword

Taking into consideration the recent theoretical and methodological trends in the research of the European prehistoric wetlands (e.g. Hofmann 2013; Hofmann et al. 2016), it is self-evident that decoding pile-fields and studying structural wood constitute the basic steps of any interpretative attempt to understand wetlands' layouts and investigate their spatial organisation. For the moment, it would be rather premature to expect any synthetic assumptions from the study of Anarghiri IXb assemblage directly comparable to those resulted by the multidisciplinary approach adopted for the analysis of the material recently discovered in the Alpine region (e.g. Bleicher and Harb 2017). Nevertheless, a succeeding level of analysis of selected well-preserved samples would utilise the advances made the last few years by European dendro-archaeologists, aiming to widen the spectrum of future research objectives with topics related to woodland management, dendroprovenance, and reconstruction of local wetland microenvironment (e.g. Billamboz 2011; Bleicher 2013; Suter and Francuz 2010). In addition, the samples' assemblage from Anarghiri IXb together with structural wood collected from other neighbouring prehistoric wetlands, can constitute the core of a significant archive for the introduction of dendrochronology in Greece, as well as in southern Balkans. Until then, the contextualisation of the archaeological evidence from Anarghiri IXb into the dynamically developing discussion concerning the Neolithic communities of northern Greece is already a challenging desideratum. One fresh impetus for the achievement of this objective could be given by the growth of wetland archaeology in Western Macedonia, a region that, except from being acknowledged as the birthplace of Greek wetland archaeology due to Dispilio Excavations, can become a focal point for the in-depth approach of the distinct living-by-the-lake cultural phenomenon in southern Balkans.

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