IX. The Physical and Social Landscape of Neolithic Platia Magoula Zarkou

Stella Souvatzi

Platia Magoula Zarkou (henceforth PMZ) is among the most impressive tell formations of Neolithic Greece (Fig. IX.1) and a complex, spatially intriguing and materially elaborate site, including a long occupation, indications of frequent flooding in the surroundings, influential pottery, a rare cremation cemetery and the famous clay model of a house interior. The site therefore has good potential for shedding more light onto the Greek Neolithic and Neolithic life in general. Despite its limited horizontal exposure, the thorough excavation and vertical exposure of the site down to the sterile soil at a depth of 10.5m, in conjunction with a number of geophysical, geoarchaeological, geological and pedestrian investigations around it, allow an insight into the wider socio-spatial and temporal practices engaged in at PMZ. They also enable comparisons of settlement and habitation patterns between PMZ and other contemporary sites, and thus a placement of the site in its wider physical and social landscape.

This chapter focuses on this larger spatio-temporal scale and examines the ways in which PMZ's space was configured and conceptualised, taking a view of the landscape as a social and historical construct and of the human-environment relationship as dynamic and continuously interactive. Key features include the local landscape particularities; the mound itself and the type of settlement; the possible presence of surrounding ditches; and the existence of a separate cemetery. Throughout the chapter, comparisons and contrasts with other sites, with a focus on spatial patterns, situate PMZ within a broader picture of local, regional, and wider processes. My approach views space and landscape as the number of practices through which people engaged with places

Fig. IX.1 The Peneiada Valley with PMZ, the cemetery and Koutsaki Magoula. View from the south

as well as the history of those engagements. Some central questions include: what was the human-landscape interaction and what the settlement type, given also the flooding incidents during the Neolithic? Was the site defined by boundaries (enclosures or ditches), and if yes, what was their function? What is the relationship of the cemetery to the settlement and what does the existence of the former signify? How can PMZ contribute to our understanding of the meaning and significance of living in a mound in the particular landscape, and how the relationship between people, land and time may have been constituted? And finally, what was the position of PMZ within the broader landscape of newly and earlier excavated Neolithic settlements in Thessaly? My broader aim, in association with the wider aims of the project, is to gain new knowledge about the different ways in which PMZ engaged with society and the economy and interacted with other sites.

IX.1. The Physical Landscape and Human Agency

Located at the northern edge of the Trikala alluvial basin, in the entrance of the Peneiada Valley, near the junction between the Zarkos and Revenia mountains and only 800m north of the Peneios River (see Map 2), PMZ was in proximity to a variety of environments and resources, both upland and lowland. The Peneiada Valley, a narrow inter-mountain alluvial plain, where the Peneios flows from the Western to the Eastern Thessalian Plain and from there to the Aegean Sea, is characterised by numerous meanders either active or abandoned.[1002] The hydrographic network of the Peneios River is the longest in Greece[1003] and perpetually active. Since the deep past and at least up to late antiquity, both of the two major Thessalian plains were partially covered by lakes and/or marshlands, especially the western one, which shows a much denser hydrographic network of Peneios and its tributaries.[1004]

Geoarchaeological research carried out by Tjeerd van Andel and colleagues revealed that the Neolithic settlement was established on the bank of a gully lying to the east at a time when the surroundings were still subject to frequent flooding, which continued throughout the Middle Neolithic.[1005] This led to the suggestion that the location of the site was specially selected so that it permitted post-flood cultivation or even floodwater farming and that the earliest habitation was intermittent and took place only outside the flood season (probably lasting from December through May).[1006] Additional support for these geological features is provided by the recent geophysical prospection around PMZ[1007] and the geological investigation of the broader Peneiada Valley.[1008] Both confirm the establishment of PMZ at the edge of an active floodplain and in a somewhat coastal setting of a narrow gulf, when the Peneiada Valley was characterised by lacustrine-to-marshy conditions. The geophysical prospection also identified another gully to the west. This indicates that PMZ was established between two gullies running from the north and circumnavigating the mound from the east and west.

Similar locales and arrangements occur at several other settlements in Neolithic Greece, for example, at Sesklo, where the tell (or Sesklo A) is flanked by two deeply cut rivulets; at Stavroupoli in Macedonia, which is found on a low hill between two creeks;[1009] and especially at the settlements that are situated in lowland regions in intense flooding zones near rivers or lakes. The 'Innovative Geophysical Approaches for the Study of Early Agricultural Villages of Neolithic Thessaly' (henceforth IGEAN) project for eastern Thessaly has shown that a considerable

[1002] Migiros et al. 2011.
[1003] Caputo et al., this volume, 36.
[1004] Sarris et al. 2017b; Caputo et al., this volume, 40.
[1005] Van Andel et al. 1995, 138.
[1006] Van Andel et al. 1995, 140–141; also, van Andel – Runnels 1995; contra Halstead, this volume, 584–585.
[1007] Sarris et al., this volume, chapter II.2.
[1008] Caputo et al., this volume, chapter II.1.
[1009] Grammenos – Kotsos 2002, 15.

number of the Thessalian Neolithic tells – such as Visviki, Rizomylos 2 and Karatzadagli in the Almyros Plain, and Almyriotiki, Almyros 2 and Perdika 1 – were found on active floodplains and/or were surrounded by numerous palaeochannels and that during flooding episodes the water level reached their foot.[1010] Neolithic and prehistoric settlements generally built on floodplains and demonstrating a close relationship between humans and rivers are fairly common across the whole of Europe and beyond.[1011]

The assumption of seasonal habitation at PMZ, however, is not confirmed by the archaeological data. The stratigraphy of deep Trench A, which was excavated down to the sterile soil and therefore enables diachronic observation, indicates permanence and continuity, while evidence for periodic, even short-term and occasional abandonment during the Neolithic life of the settlement is entirely absent.[1012] Uninterrupted occupation is further attested by the analysis of material culture, no category of which indicated any dramatic breaks or changes in the typological or technological sequence.[1013] The archaeozoological remains and specifically, the slaughter age recorded for young domestic animals, also points to a year-round presence at the settlement.[1014] Instead, the site was abandoned at the end of LN I, ostensibly when the settlement was at its peak and when the mound had risen sufficiently above ground level to not be threatened by flooding.[1015] It was not reoccupied until the Early Bronze Age, and specifically until the Early Helladic II period.[1016]

There are several important implications here. One is that rather than being enforced by environmental factors the rather intriguing abandonment of the site was intentional, likely reflecting a social choice. Secondly, contrary perhaps to what we may assume today, flooding susceptibility does not seem to have acted as a discouraging factor in settlement location, viability or attachment to a place. This serves to emphasise the flexibility and variability of Neolithic socio-economic practice. It also raises the question of the human-landscape interaction or of the relationship between the physical landscape on the one hand, and spatial continuity or long-term locality, habitual social practices, land uses and people's worldviews and perceptions of place, on the other.

While there is little doubt that the Peneios River and its activity considerably influenced people's lives and practices, there is no reason to assume that they passively subjected themselves to external conditions. Besides, the region has never ceased to be flooded regularly from the past to date due to intense rainfall and/or snow melting, or to experience frequent rises of the underground water table. During inundation events, recorded in cycle periods of 25–50 years,[1017] large areas in the vicinity of PMZ turn into a shallow lake. Yet neither habitation nor agricultural production in Thessaly has ever been abandoned since the onset of the early farming communities.

Nor should we envisage the off-tell areas as a space devoid of human activity and agency (see also next section). River incision gradually reduced the risk of flooding towards the end of the Middle Neolithic, while the gully and the surrounding plain were covered by a deep alluvium, allowing the settlement to rise above the level of the plain.[1018] It was also most likely during the Neolithic that the Peneios River established definitively its eastward flow, as well as the connection between the two major Thessalian plains, draining its water into the eastern one and from there to the Aegean Sea instead of to the south.[1019] Consequently, the flooded areas and flooding episodes within the Peneiada Valley began to reduce, exposing relatively drier land. In addition,

[1010] Sarris et al. 2015, 291–292; Kalayci – Sarris 2016, 12; Sarris et al. 2017b, 46.
[1011] E.g. Bailey et al. 2002; Vianello 2015; Parkinson et al. 2019.
[1012] Toufexis – Batzelas, this volume, 138.
[1013] See relevant chapters in this volume.
[1014] Becker 2000; Halstead, this volume, 584, 586.
[1015] Van Andel et al. 1995, 138; Caputo et al., this volume, 48.
[1016] Eva Alram-Stern, personal communication.
[1017] Migiros et al. 2011, 218.
[1018] Van Andel et al. 1995.
[1019] Caputo et al., this volume, 48.

the borehole drilled close to the tell indicated that flood water reached the foot of tell, although not necessarily the settlement, from the south (i.e. where Peneios flows), whereas the north and east sides were not subject to flooding (see Figs. II.1.8, II.2.1). It can also be no mere coincidence that the settlement was established on an elevation in the terrain.[1020] Such a location would be protected from flooding, especially if combined with enclosures, which may indeed be the case for PMZ.[1021] An additional possibility is the presence of causeways, earthworks, embankments, dams or irrigation canals. Such water management systems are known from a wide range of prehistoric settlements along floodplains all over the world, such as the settlements of the Hohokam of Arizona, who converted swamps by digging canals to create highly productive artificially-raised fields;[1022] those of the Bronze Age inhabitants of the Fenlands in England, who built a complex system of causeways to effectively transport goods across islets and marshes;[1023] and the settlements of the 'earthwork populations' of prehistoric Cambodia, who constructed concentric earthen embankments around their long-lived settlements for two thousand years.[1024]

The local landscape of PMZ offered manifold opportunities for a mixed economy. The farming fields were probably in the north of the mound, where the area was safe from inundation. Rain-fed crops rather than floodwater farming is the most likely subsistence base.[1025] At the same time, in contrast to the bare landscape that we see today due to intensive modernised agriculture, the situation in prehistoric times was much more diverse with thick vegetation and dense forests, especially of oak and chestnut, in the uplands – thus with a good potential for water-retaining –, wetlands and open grassland.[1026] The archaeobotanical and zooarchaeological data from PMZ suggest reliance of the subsistence economy on agriculture and animal husbandry.[1027] Relatively small-scale and intensive horticulture rather than large-scale agriculture and a modest scale of animal husbandry with little hints of distant grazing seem to have been the most likely practices. The latter implies the continuous co-existence of humans and animals at or around the site. The ground and chipped stone tool assemblages suggest a range of uses, from farming, herding and fishing to hide working and digging for clay, and from crushing or grinding grain to the processing substancessubstances. Best represented in both stone tool assemblages are cereal harvesting and woodworking.[1028] The chipped stone tools were mostly manufactured of radiolarite, which was derived from more distant sources, regionally rather than locally available, and specifically from the Portaikos River, flowing at a distance of approx. 40km west of the site.[1029] This implies not only that people used geographically different material sources for different stone tools, but that raw material acquisition involved choice, strategy and most likely social rather than merely practical considerations such as participation in social networks. I return to this point later.

The people of PMZ lived in a changing geography with major hydrographic transformations, a vacillation in the water table, alternating phases of dry and wet environmental conditions, and perhaps also of land availability, and related climatic fluctuations. They might have also witnessed the latest phases of the final infilling of the Peneiada Valley and the change of direction of the Peneios' water flow, as well as a progressive change in the absolute altitude of the aggrading alluvial plain and consequently of the extent of flood water.[1030] And although, to us, the frequency, extent and duration of flooding in Neolithic times remains unknown, Neolithic people would have

[1020] Van Andel et al. 1995; Caputo et al., this volume, 48.
[1021] See next section.
[1022] E.g. Ensor et al. 2003.
[1023] Malim 2015.
[1024] Dega – Latinis 2014.
[1025] Halstead, this volume, 584–585.
[1026] Halstead 1984, 2, 7; Sivignon 1992 [1975], 83–105.
[1027] Alram-Stern – Toufexis, this volume, 622.
[1028] Perlès – Papagiannaki, this volume, chapter V.1; Stroulia, this volume, chapter V.2..
[1029] Alram-Stern – Toufexis, this volume, 624.
[1030] Caputo et al., this volume, 55.

observed these phenomena over time and through generations, would have gained experience concerning their impact and would have developed an appreciation of the landscape,[1031] a landscape to which they became increasingly attached, with which they got increasingly entangled and which they finally socialised. When water tables rose, they would have perhaps relocated off-tell activities. Engagement with and use of diverse micro-environments is further indicative of a thorough knowledge of the landscape and available resources. For instance, the selection of specific materials for specific tool types reflects the experience acquired through long interaction with material sources.[1032] Intentionality, agency and landscape uses and associations are further exemplified in the following sections.

IX.2. The Constructed Landscape

IX.2.1. Around the Mound: Boundaries and Water Management Systems?

The geophysical prospection around the tell provided some significant new results,[1033] while confirming the results of the pedestrian survey[1034] and of the earlier geoarchaeological research[1035] with regard to the extent of Neolithic habitation. There are several linear, rectilinear and curvilinear features within the geophysics, including potential ditches or enclosures, gullies or palaeochannels and buildings. Architectural remains at the north foot of the tell and further to the northwest, including a cluster of buildings possibly surrounded by a thin circuit wall, date to the Bronze Age, as do the dense and extensive remains to the south.[1036] The Neolithic findings around the mound consist of only a few potsherds, all dated exclusively to the LN I Tsangli-Larissa phase, and some ground and chipped stone tools. They were almost entirely collected from the east and the south areas below the mound. Intensive Neolithic habitation therefore seems to have been circumscribed to the tell itself. The spatial extent of the Neolithic settlement is further implied by the presence, location and course of potential ditches (or pairs of ditches) that follow the contour of the mound in the west and the south, possibly demarcating its outer limits.[1037]

Given the time-depth of human occupation of the mound, the chronological association between all these features will need to be clarified through excavation. It is possible, however, that the curvilinear ones on the west and south sides may indeed represent sections of concentric ditches, probably double, surrounding the mound and that they date to the Neolithic. This inference is based on i) the position of these features closely around the foot of the tell; ii) their course, which seems to fit into a circular and consistent pattern; and iii) the absence of evidence for Neolithic habitation further away in those areas or anywhere else around the tell.

It is of further relevance that the excavation unearthed a ditch, located at the very bottom of the trench, at a depth of 10.00–10.20m below the surface, and dug into the sterile soil.[1038] A radiocarbon date on a bone from the bottom of the ditch falls between 5889 and 5805 calBC (1σ)[1039] i.e. in the early Middle Neolithic, coinciding with the beginning of the site's life. It is therefore highly likely that this ditch was associated with the earliest phases of habitation, although whether

[1031] Cf. Chapman 2020, 56, 156.
[1032] Cf. Stroulia 2005a; Stroulia 2017a; Bekiaris et al. 2017, 429.
[1033] Sarris et al., this volume, chapter II.2.
[1034] Christos Batzelas, personal communication.
[1035] Van Andel et al. 1995.
[1036] Eva Alram-Stern, Christos Batzelas and Giorgos Toufexis, personal communication.
[1037] See Fig. II.2.12 in Sarris et al., this volume, features highlighted in yellow.
[1038] Toufexis – Batzelas, this volume, Figs. III.6–7.
[1039] Weninger et al., this volume, Tab. IV.1.

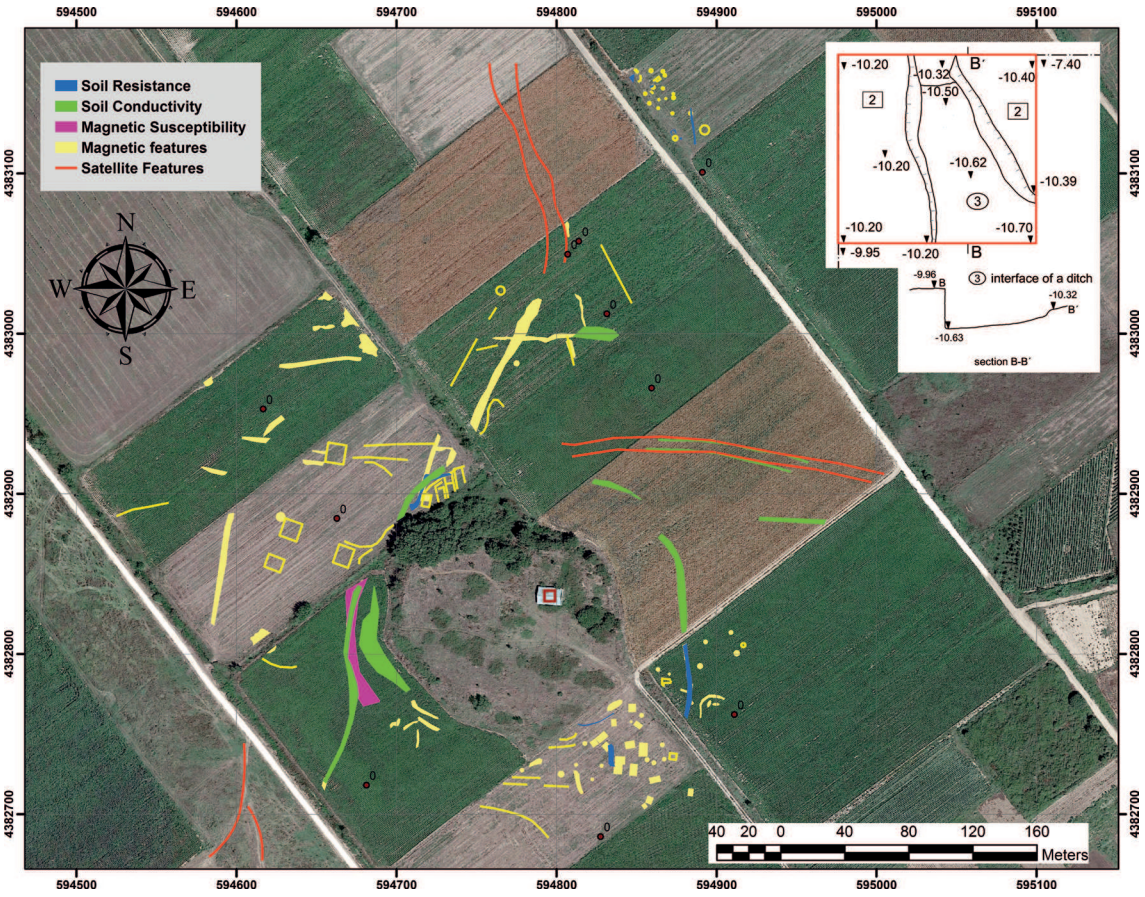

Fig. IX.2 The location of the excavated ditch (in the plan) in relation to the ditches detected geophysically (in the photo, depicted in yellow) (Geophysical picture: A. Sarris, plan: edited by C. Batzelas)

as a boundary or an internal space divider cannot be determined with certainty due to the limited spatial extent of the excavation at that depth. The ditch was exposed for 2.36m, was 0.75–1m wide and 0.40–0.60m deep and had a NNW-SE orientation and an uneven u-shaped profile.[1040] It contained a small amount of pottery, bones, burnt pieces of clay from building material and a few small finds, and it was naturally covered by sand. Interestingly, the orientation and course of the excavated ditch seem compatible with those of the ditches detected geophysically (Figs. II.2., IX.2). They all seem to follow the contour of the mound to the south and the west, and could have all potentially belonged to a unified system of boundaries, at least in the initial habitation phases. If this observation is correct, and assuming that all ditches co-existed at an early stage, the excavated ditch would encircle the east part of the site and would have served as a boundary rather than an intra-site space divider. In this case, it may provide indication of the eastern limit of the earliest settlement. In any case, the presence of the excavated ditch testifies that space marking and ditch-digging was a practice familiar to the people of PMZ from the start. By extension, it strengthens the possibility that the pairs of perimeter features detected below the tell were indeed ditches.

Such practices are very common in the Greek – and broadly European – Neolithic. They appear together with the first farming communities and continue throughout the Neolithic. In

[1040] For detailed description: Toufexis – Batzelas, this volume, 86–87; see also Toufexis 2017, 394.

southeast Europe in particular enclosure has been shown to be standard for many tells and flat settlements alike, contrary to what was previously believed.[1041] All over Greece and throughout the Neolithic, people divided parts of the physical and social landscape and marked out settlement from non-settlement space, and sometimes also intra-settlement space, in a variety of ways, ranging from concentric stone enclosures to partial perimeter ditches, and from habitation terraces to retaining walls.[1042]

Nor are ditches exclusively associated with flat settlements, as is usually thought. Excavated ditches surrounding tells in Thessaly include (in general chronological order): Souphli Magoula (EN or MN), Chalki near Larissa (EN), Achilleion (MN), Sesklo (MN), Otzaki (ditch 4, LN I), Arapi (layers 4–6, LN I), Mandra (LN 2) Argissa (ditch 4, 2), Vasilis near Pharsala (LN 2) and Magoula Sykeon (FN?).[1043] The five concentric ditches dug into solid rock at Makrychori[1044] remain unprecedented. One is dated to the Early Neolithic/early Middle Neolithic, and the other four to the LN I Tsangli-Larissa and Arapi phases, thus being contemporary with the last Neolithic phase of PMZ, as are the aforementioned ditches at Otzaki and Arapi. Excavated ditches surrounding flat settlements include Mavrachades-Tataria and Myrine-Ag. Varvara in Thessaly; and the double system of large concentric ditches at Makriyalos 1[1045] and the ditches probably combined with timber palisades and earthen banks at Promachonas-Topolniča I and II, Kleitos I, Thermi II and III, Toumba Kremastis-Koiladas and Paliambela in Macedonia.[1046] Most of these date to an early Late Neolithic phase.

Furthermore, complete geophysical plans of enclosed sites are now widespread in Thessaly. The IGEAN project detected a great variety of sites in eastern Thessaly, including new site-combinations such as a tell and a flat settlement component, with a diversity of concentric enclosures, both ditched and built, often with opposing entrances and radial passages.[1047] Several tells were both surrounded and internally divided by a series of concentric ditches and built enclosures of various sizes, functions and distances from each other and in various combinations – for example, in rough chronological order, Rizomylos 2 (EN–EBA), Almyros 2 (EN–MN), Almyriotiki (EN–LBA), Karatzadagli (LN), and Perdika 1 and 2 (EN–MN and MBA, and EN, respectively), Visviki[1048] and Koutroulou (MN).[1049] It appears that hardly any settlement existed without some type of boundaries and space divisions, although their particular spatial representation and social and symbolic significance might have varied considerably.

Returning to PMZ, a system of surrounding, concentric ditches would make sense throughout the life of the Neolithic settlement and especially during its early phases, before the mound took form and became more protected from flooding and more prominent in the landscape. It is important not to take the final form of a site to be its initial form. Completed site formations and settlement layouts represent the gradual and collective result of a number of people over considerable spans of time. Thus, no tell began as a fully-formed monument but started life as a 'flat' site,[1050] and PMZ is no exception.

The ditches may have served a variety of roles and functions, including drainage, small-scale irrigation, animal husbandry and storage of water, as well as the demarcation of site boundaries in

[1041] Chapman – Souvatzi 2020.

[1042] For syntheses and discussion: Souvatzi 2008, 175–178; Toufexis 2017, 307–327. For an analytical recording of all the available evidence: Toufexis 2017, 387–428.

[1043] Toufexis 2017, 28–30, 387–398.

[1044] Toufexis 2017.

[1045] Pappa – Besios 1999.

[1046] Data taken from Toufexis 2017, 307–327.

[1047] E.g. Kalayci et al. 2017; Sarris et al. 2017b.

[1048] Alram-Stern et al. 2017.

[1049] Hamilakis et al. 2017.

[1050] Chapman – Gaydarska 2019, 155. Recent research at Dikili Tash offers a very good example of the very slow transformation of a flat site into a tell, see Lespez et al. 2017, 51–52; L. Lespez, in: Darque et al. 2019, 493–548, n. 47.

material, social and symbolic terms, a means of community interaction and land use, and a claim to the surrounding territory. One interesting aspect at PMZ is the combination of the physical and the constructed landscape into a well-thought-out system of natural and symbolic protection of the site: the ditches to the west and the south would be complemented by the natural gullies identified to the west and the east of the mound. One likely function of this system might have been to minimise the impact of seasonal inundations. As mentioned earlier, such combinations of palaeochannels and constructed ditches have been detected in many lowland Thessalian Neolithic settlements located in floodplain environments. At Makriyalos I in western Macedonia thin layers of mud between the deposits of the inner and larger of the two concentric ditches suggest that the ditch might have been filled with water at times.[1051]

While general water management and protection against flooding could have been an important reason for the presence of ditches, it need not be the only one. In general, a solely functional, let alone a mono-functional, interpretation downplays the social and symbolic dimensions of such large-scale, collective constructions. Similarly, the traditional explanation of boundaries in terms of defence, fortification and territoriality[1052] presupposes hostility, territorial competition or social hierarchy, of which there is little evidence. Besides, a territorial demarcation primarily controls access to a site itself, physically or symbolically, rather than within the surrounding lands. With their peripheral distribution, the ditches would have defined and delineated the area of occupation on the tell, creating at the same time a sense of collective identity. They involved planning and communal decision-making, as they involved the entire site, as well as collective labour. Above all, they suggest investment in the construction of a sociocultural space, which incorporated, among other things, social perspectives about space divisions and landscape marking. In addition, boundaries – external or internal – cannot be seen independently of the wider social, cultural and economic landscape or of the areas they enclosed. Unlike the 'roundels', 'enclosures' or 'henges' of much of central, western and northern Europe, with their largely empty encircled areas and their occasional ritual function, in PMZ, as in Neolithic Greece and Southeast Europe in general, enclosures are closely associated with habitation, domestic space and everyday life. They create varying degrees of intimacy, visibility and movement, and reflect people's connections with the social landscape, with other communities and with their own community. In tells like PMZ the territorial demarcation, complemented by the houses and the gradual rise of the mound, would have eventually imposed them on the landscape.

Finally, as with any constructed environment, enclosures – either ditched or walled – incorporate history, temporality and transition. No settlement remained static over time, nor are boundaries and space divisions monolithic constructions. Instead, as most of the excavated examples of ditches and circuit walls clearly show, none of these works constituted a single act but rather a continuous process of building, maintenance and adaptation events. During the lifetime of a settlement, the addition of new enclosures, the abandonment or modification of old ones and the successive accumulation on the mound would have created a network of relationships, exchanges, and obligations.

IX.2.2. The Settlement Type and its Significance

As already discussed in detail, the combined results of the geological, geophysical and pedestrian surveys suggest that the limits of Neolithic habitation lie close to the tell. In all probability therefore, the Neolithic settlement at PMZ was restricted to the mound, at least in its later phases. The post-Neolithic date of a pattern combining a tell and a flat site component at PMZ is attested by the co-occurrence of Bronze Age layers in the mound and building remains of a similar date around it. PMZ, then, apparently belongs to the tell type of settlement, and it seems that the

[1051] Pappa – Besios 1999.
[1052] E.g. Runnels et al. 2009; Alušik 2017.

combination of a tell and a flat site component, such as, for example, in the well-known case of Middle Neolithic Sesklo, was not developed here until after the end of the Neolithic. This, however, does not mean that the Neolithic tell of PMZ remained static over time. Given the location and depth of the excavated ditch discussed above, in conjunction with other stratigraphic data, it is not unlikely that the earliest settlement was slightly dislocated or even somewhat more extended or more dispersed in comparison to the restricted or more compact habitation pattern concentrated on the tell area later.[1053]

Given the many indications of human agency and a dynamic human-landscape interaction explained earlier, it would be too narrow-sighted to suggest that the main reason for spatial restriction at PMZ was the potential flooding episodes in the surroundings. Rather, people consciously decided to live within a well-defined and spatially restricted area, to accumulate successive layers of habitation despite potential problems with flooding and to develop the settlement vertically rather than horizontally and rather than shifting sites. This shows that PMZ, just like any tell, was created as much by social relations as by physical conditions.

The assumption of seasonal occupation of PMZ cannot be retained either. Apart from the stratigraphic, material and subsistence evidence discussed above, the architectural data also attest to an uninterrupted habitation throughout the Neolithic sequence. The mound layers are distinguished into nine building phases, some with sub-phases, spanning from the early Middle Neolithic to the end of LN I, i.e. c. four hundred years, without interruption.[1054] The repeated rebuilding, often on the same spot, of structural features such as hearths or ovens, and the frequent renewal of floors further indicate a concern to emphasise continuity of descent and/or place.

However, continuity of space is not the same as inflexibility or immobility. Although shifts in spatial and social organisation cannot be elucidated in detail for PMZ due to its limited horizontal exposure, they are standard for most sites and buildings of Neolithic Greece whose life exceeded one phase, even for tell sites.[1055] They seem to be present in PMZ too. Detailed examination of the architecture and intra-site use of space suggests that little remained the same over time: different construction techniques and types of floors and space divisions co-existed or were introduced at different times; interior and exterior space often changed location, alternating with one another over the different building phases; and levelling programmes seem to have taken place regularly.[1056] By rearranging house or settlement space, people recraft material conditions, social roles and social relationships.

A lack of fixity and a degree of residential mobility must have also been driven by numerous other reasons – for example, to ensure the reproductive viability of the population through marriage patterns; to work elsewhere; to acquire raw materials; and to exchange goods and visits. The various classes of material culture indicate that PMZ participated in multiple networks of communication and of circulation of materials, information and ideas. For example, the analysis of pottery conducted thus far has clearly shown that the site was a major production centre of distinctive wares throughout its Neolithic life, as well as enjoying a central position in pottery networks.[1057] The development of such networks suggests mobility of people, travel and possibly even seasonal relocation for certain traders or specialists. The presence of Melian obsidian at PMZ,[1058] even though low, attests to participation in the long-distance network of this exotic material,

[1053] Giorgos Toufexis, personal communication; Toufexis – Batzelas, this volume, 126; see also Lespez et al. 2017, 51–52 and Alram-Stern et al. 2017, 145 for early shifting patterns concerning the tells of Dikili Tash and Visviki Magoula, respectively. For instance, recent deep probes into the tell of Dikili Tash suggest that since its establishment in 6400/6300 calBC the settlement remained a large flat, and probably shifting site, for almost one thousand years before it consolidated and started to take its tell form (i.e. from 5400 BC onwards).

[1054] Toufexis – Batzelas, this volume, 137; Weninger, this volume, 195.

[1055] See Souvatzi 2008, 162–175 and Souvatzi 2020 for examples regarding tells.

[1056] Toufexis – Batzelas, this volume, 126, 135.

[1057] Schneider et al. 1991; Schneider et al. 1994; Pentedeka 2011; Pentedeka 2012; Pentedeka 2017a.

[1058] Karimali 1994; Karimali 2000; Perlès – Papagiannaki, this volume, 197–274.

if only through reception of certain specialists moving between sites, who would exchange their semi- or fully prepared cores to be processed by local specialists and depart.[1059] Of equal relevance is the fact that the raw materials used in the chipped and ground stone industries of PMZ were most likely collected at considerable distances from the site. It suggests specific expeditions and possibly also travel by boat on the Peneios River.[1060] Ornaments seem to have been imported almost in their entirety, attesting to a network of communication and exchange, despite their small number.[1061] The presence of *Spondylus* shell objects in particular indicates that PMZ was in contact with trading partners or itinerant specialists. It also implies that the site shared the wider perceptions of intercultural significance and the ideological and social value of raw materials and goods derived from distant origins.[1062] Regarding animal-related seasonal mobility, a combination of foddering and grazing practices in the form of small-scale mobility of herds at proximal distances is a likely scenario. Such mobility would have depended on the seasonal cycles of farming and livestock rearing,[1063] as well as on the fluctuating extent of dry and wet areas in the vicinity of the settlement. At PMZ not even the water table around the site remained static throughout the life of the tell.

Tells are also a material expression of time and history,[1064] and PMZ is no exception. Living directly where the previous generations lived; collectively deciding to build a tell (as well as ditches and a cemetery); reproducing basically the same type of settlement over time; and generally sharing the experience of daily interaction and of lived space over long periods of time – all monumentalised the history of the community. It is also worth noting that PMZ is a multi-temporal site, with substantial habitation remains of the Bronze Age. Given also its abandonment at an early stage of the Late Neolithic, the presence of these later remains shows that PMZ was an important mnemonic site for hundreds of years after its Neolithic habitation.

A common interpretation of the tell pattern in Thessaly is that the location of villages on good agricultural land (Fig. IX.3) inhibited horizontal expansion in favour of rebuilding on the same plots, which in turn created a sense of 'private' land ownership of both house and field plots.[1065] However, such an approach may embrace a narrow conception of land connections. Wider social relationships and dependencies might, in fact, shape the relationship between people and land, and we should also be very sceptical about the idea of 'private' land ownership at the individual house/household level.[1066] Rather, I agree with Chapman's argument that living on a tell,[1067] thus having to use the land outside the settlement for cultivation, allows for land ownership at a communal level. While tells can be seen as territorially-based communities, this does not necessarily mean that individual households can exclude others from the use of community land, or that they acted autonomously. I believe that such a hypothesis is far more likely for Neolithic tells and especially for sites like PMZ, where agricultural land may have been relatively limited spatially or temporally due to flooding, and where measures against flooding or the maintenance of the same settlement type over time would have required collective effort and cooperation as well as relationships and obligations at a wider, community level.

[1059] Karimali 1994, 379.
[1060] Eva Alram-Stern, personal communication.
[1061] Kyparissi-Apostolika, this volume, 578.
[1062] Cf. Séfériadès 2000; Chapman et al. 2011.
[1063] Cf. Koromila et al. 2017, 277.
[1064] Souvatzi 2020.
[1065] E.g. Halstead 1989; Demoule – Perlès 1993, 363; Halstead 1999b; Kotsakis 1999.
[1066] Souvatzi 2013b.
[1067] Chapman 1989.

Fig. IX.3 PMZ and surrounding cultivated land

In turn, collective land-use could have involved collective descent-group lands and resources. A key aspect of living at PMZ may relate to a particular form of kinship. Tells, unlike other site types, combine coresidence and genealogy in the same settlement form.[1068] Both of these factors meet some of the cross-cultural criteria for the identification of unilineal descent groups.[1069] Unilineal descent organisation may be an important reason for the maintenance of the specific settlement type. Collective continuity and the social space that 'covered' the whole mound remained key to the creation of social identities and can be seen as the material representation of stable lineages, as can the process of large-scale construction of the ditches and enclosures. The specific clustering of burials in the cemetery may also reveal lineages or descent groups.

IX.2.3. The Cemetery and the Manipulation of History

The overall thinness of funerary records in Greece seems to indicate that either the full range of burial practices is not visible to us or there was generally no emphasis on the visibility of the dead. The general lack of emphasis on ritual elaboration and grave goods further illustrates this point. Beyond that, the vast majority of human burials are intra-mural and come from everyday contexts, although with a notable diversity in burial patterns, while separate mortuary sites have always been outnumbered. This scarcity of cemeteries, contrasted with the abundance of settlements suggests that independent funerary rituals (i.e. outside the settlement) were not a particularly important means of ancestor veneration or of social identification, integration or distinction. Within this wider social and cultural framework, the rare presence of a cemetery at PMZ deserves special attention.

[1068] Chapman – Gaydarska 2019, 155.
[1069] See Souvatzi 2017 for detailed discussion.

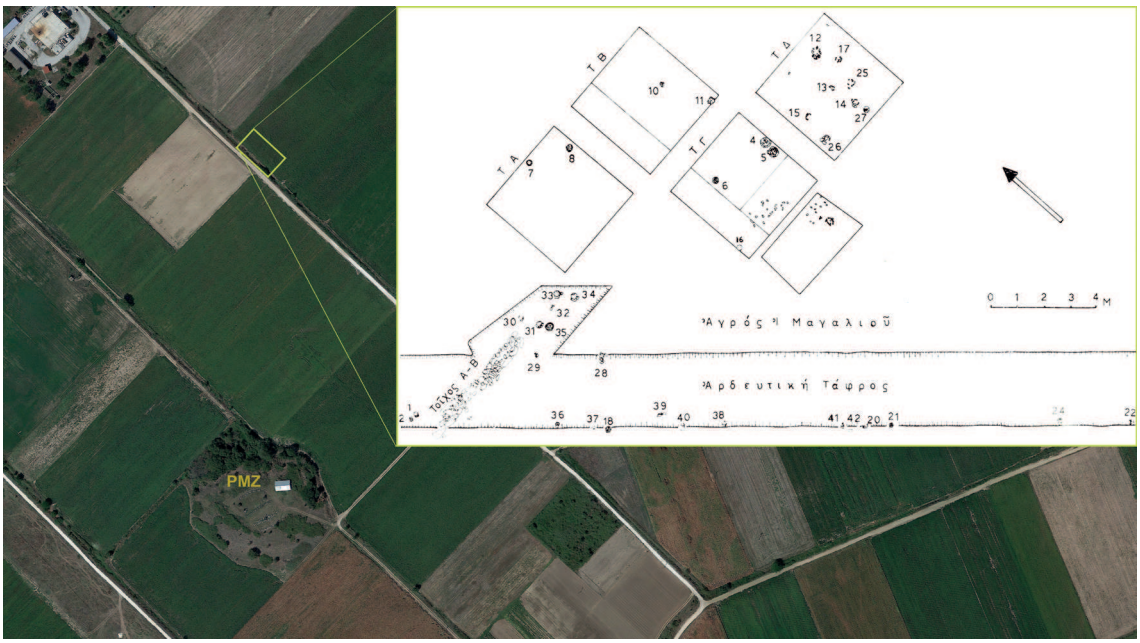

Fig. IX.4 Plan of the excavated part of the cemetery in relation to the present landscape (Geophysical picture: A. Sarris, plan: edited by A. Buhlke)

To date, it remains one of the extremely few cremation cemeteries in Neolithic Greece (another known example being the Early Neolithic and LN I one at Souphli Magoula)[1070] and one of the extremely few cases of association of a Neolithic settlement with a separate cemetery. Finally, it is noteworthy that no burial was found over the entire excavated area of the settlement.

The cemetery lies 300m to the north/northeast of the mound. It was partially excavated in the 1970s to an area of 324m², mostly alongside a modern irrigation ditch, with some trenches opened further away (Fig. IX.4).[1071] It dates exclusively to the LN I Tsangli-Larissa phase and it contained only cremations in pots placed in shallow pits.[1072] The cemetery seems to have been situated on top of a low elevation rise at the boundary of the flooding zone around the mound,[1073] which implies intentional selection of a protected location. At the same time, according to van Andel and colleagues,[1074] the loam into which the graves were dug defines the end of the floodplain stage of the region. Recent geophysical and pedestrian investigations were not able to trace the full original extent of the burial grounds. The pedestrian survey carried out directly above the excavated area yielded only a few sherds, highly worn and non-diagnostic, and no small finds. The geophysical survey was conducted 60m to the southeast of the excavated part of the cemetery and bore no clear information about structural remains. However, some isolated magnetic anomalies recorded at the same depth as the maximum depth of the burials excavated by Gallis (i.e. 1.50m below ground surface, see below) may indicate further burials.[1075]

[1070] Gallis 1982; Gallis 1996c. See also Stratouli et al. 2010 for a burial area with ten cinerary urns at the settlement of Avgi, dated to the early LN II, and Ziota 2014, 326 for scattered cremations in pots at the settlement of Kleitos I, dated to LN I. Although both of these cases from northwestern Greece suggest that the practice of cremation may be more widespread than previously thought, none of them can qualify as a separate cemetery, as is the case with PMZ.

[1071] Gallis 1982.

[1072] Gallis 1982.

[1073] Sarris et al., this volume, 74, 75.

[1074] Van Andel et al 1995, 134.

[1075] Sarris et al., this volume, Fig. II.2.4.

Fig. IX.5 LN I cemetery: cinerary urns in pits

The cemetery was found 0.30m under the land surface of that time and reached a depth of 1.50m.[1076] All burials lie within a layer 1.30–1.50m deep. The pits were c. 0.70m deep and 0.60–0.80m in diameter and usually contained one cinerary urn each (Fig. IX.5). The fire pit used for cremating the bodies was located in the cemetery in the form of scattered charcoal and stone and mudbrick remains over an area of 4 × 3m. The urns were usually placed upright (in 70% of the burials), but inverted examples also occur. They were sometimes surrounded by a few pebbles or placed on a layer of pebbles and were often covered with a small vase, obviously serving as a lid. As a rule, a small empty vessel, usually a bowl, was placed near the urn, perhaps as a kind of offering. In addition, a characteristic red-coloured sherd was commonly found near, over or inside many of the urns.

At least 67 individuals were recognised, usually placed singly in as many burial urns. They seem to include predominantly adults (61% of the identifiable sample), but also adolescents and juveniles, although only 40% of the burials (28 individuals) could be attributed to an age category with certainty due to the high fragmentation of the cremated bones.[1077] Only selected bones were buried, usually the skull and limbs, implying a preference in body part representation. Sometimes the cremated bones or the urn that contained them seem to have been wrapped in a cloth or a straw mat.[1078] Grave goods were virtually absent, consisting of a few flint and obsidian blades, potsherds and animal bones and two figurines in total.[1079]

[1076] Gallis 1982; for a summary in English: Gallis 1996c.
[1077] Fowler 2004, 54–56.
[1078] Gallis 1982, 113.
[1079] Gallis 1982, 78, 113.

However, the kind and type of the funerary ceramics as well as the entire burial practice observed illustrate a complex process and an emphasis on ritual elaboration. The process involved transportation and cremation of the deceased, selection and removal of the bones to be placed in the urns, digging of the pits, placement of the bones into the urn and of the urn into the pit and finally covering the whole grave. The pottery used for the cemetery belongs almost in its entirety to the black burnished and 'grey/grey on grey wares', both known for their high technical and aesthetic quality and their limited distribution and circulation within Thessaly,[1080] and falls into both local and imported fabric groups.[1081] For the rarer grey ware in particular, PMZ must have been a major production and circulation centre.[1082] Although such pottery is also found in the settlement, its exclusive selection for use in the cemetery remains of significance. The urns were large vessels of a variety of types, most commonly open bell-shaped bowls, cups or biconical jars with flat bases and one or two handles. With a single exception, all of the pots were undecorated.

There are many important aspects to the presence of the cemetery and to the particular burial pattern. The cemetery is related to a well-established tell settlement, whose monumentality expresses a collective continuity and an ancestral past upon which individual households were ideologically based. The cemetery itself, even though apparently single-period, further emphasises notions of ancestry and contributes to the construction of an ideologically significant cultural and social space. In fact, given its late date compared to the establishment of the settlement,[1083] the cemetery may be seen to represent a 'statement' of ancestry, locality and spatial importance. It would have acted as a locus of mortuary and ritual expression in a communal space outside the settlement and individual households, as well as a known focus in a landscape of rather dispersed settlements and virtually no other cemeteries.[1084] The probable existence of a demarcation stone wall further assigns importance to the cemetery as a landmark. This wall was traced for 5m in a north-east direction, it was 0.50–0.70m wide and it preserved a height of 0.50m.[1085] Regardless of its apparently short duration, the cemetery would have structured time and memory through the burial of ancestors or of descendants, the repetition of burial practices and the transmission of ritual, social and material knowledge concerning these practices. These actions not only generated memory and history, they also acted as a mechanism of social interaction.

Such interaction and, more importantly, a 'statement' of ancestry and locality might have been essential at the time that the cemetery was established and used, i.e. during the last phase of the Neolithic settlement and just before its abandonment. In other words, the late date of the cemetery, compared with the long life of the settlement, might not be coincidental. Given that all lines of evidence suggest a smooth transition rather than a dramatic break-off from the Middle Neolithic to the Late Neolithic, and therefore no radical changes in sociocultural practices, it is likely that the construction of the cemetery might have served as a means of keeping people together at a time when the pull towards fission, break-ups and abandonment was strong. In that case, a common or communal burial ground and rituals would have been used as a means for maintaining social solidarity and a mechanism not just for interaction but for integration.

These points are further supported by the remarkable homogeneity of the mortuary practices, including the distribution of urn types and the treatment of the deceased. As Fowler puts it,[1086] 'there was only one socially recognised burial type at PMZ'. This implies not only absence of social differentiation but also the downplaying, perhaps deliberate, of social identification or social

[1080] E.g. Gallis 1982; Vitelli 1994; Pentedeka 2011; Pentedeka 2012; Pentedeka 2017a; Pentedeka 2017b.
[1081] Pentedeka 2011, 114.
[1082] Schneider et al. 1994, 68; Pentedeka 2011; Pentedeka 2012; Pentedeka 2017a.
[1083] Unless, of course, there are more parts of the cemetery that still lie buried and which may date to an earlier phase. Even so, the presence of the cemetery would still emphasise continuity and the importance of ancestry, if in a more direct way.
[1084] Cf. Psimogiannou 2017 with regard to Final Neolithic cemeteries.
[1085] Gallis 1982, 88–89.
[1086] Fowler 2004, 58.

distinction. Although the burials tend to be single rather than multiple, thus appearing individualised, the very act of cremation, which made the body disappear; the high fragmentation of the bones, in other words, 'the lack of anatomically complete individuals';[1087] the absence of a clear pattern of sex or age; and the paucity of grave goods apart from the pots all imply that neither the body nor the individual were treated as bounded entities. As such, they further emphasise the primacy of the communal over the individual[1088] or a at least a concern to promote a collective rather than individual identity.

The location and distribution of the burials can also provide a clue to kinship patterns and degrees of social incorporation. The burials tend to be clustered in groups of two or more urns and pits and to be found in discrete areas within the cemetery (Fig. IX.6a–b). While the ubiquitous character of the mortuary practices suggests that all individuals inhumed were incorporated into one lineage or into some sort of integrated collective,[1089] the clustering of burials may reflect different family or descent groups. In one case a child burial was found placed inside a zoomorphic ceramic vessel, probably representing a goat, that was decorated with incised patterns.[1090] It constitutes the only exception in terms of cinerary vessel type and the only decorated example in the entire cemetery. It may provide a clue to the importance of children in physical and social reproduction. In any case, the dominant manifestations of social identity point to the community.

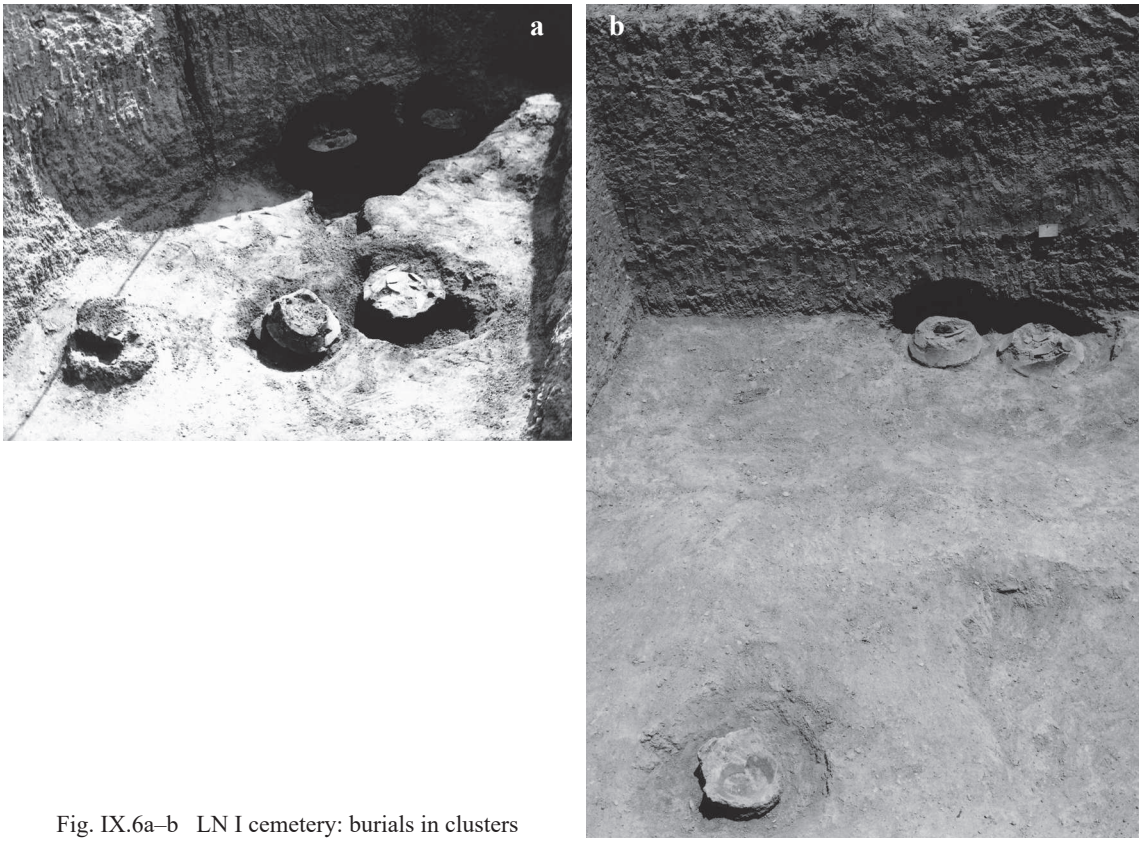

Fig. IX.6a–b LN I cemetery: burials in clusters

[1087] Fowler 2004, 58.
[1088] Cf. Triantaphyllou 1999, 131–132; see also Triantaphyllou 2008.
[1089] See Bloch 1971 for an ethnographic example.
[1090] Gallis 1982, 99–101.

IX.3. The Wider Social Landscape

Situated at the northeastern edge of the Western Thessalian Plain and wedged between the Zarkos Mountains to the north and the Revenia Mountains to the east (Map 2; Fig. II.1.3a) PMZ seems rather isolated from the dense settlement networks in the Karditsa Basin to the south and the Larissa Basin to the east, in both of which dozens of Neolithic tells feature prominently. Only a handful of tells are currently known from the vicinity of PMZ, including Koutsaki Magoula 2.5km to the southeast, Farkadona c. 4km to the west and Peneiada 5km to the east. At present, with the exception of Petromagoula, lying 7km to the south, all other sites in the Western Thessalian Plain are found from 13km to over 20km to the south of PMZ, whereas in the Eastern Thessalian Plain to the east, Mandra at 13km is among the nearest sites.[1091] These are large distances, considering that elsewhere in Thessaly contemporary Neolithic settlements are often located only 2–3km apart. On the other hand, the location of PMZ in close proximity to the Peneios River and at a main connection point between western and eastern Thessaly (and between the regions north of Thessaly and the entire Thessalian plain) places the site in an ideal position for extensive networking and communication.

It is also essential to be aware of the unevenness of archaeological knowledge between western and eastern Thessaly: while eastern Thessaly has been the focus of attention since Tsountas' time, western Thessaly has been comparatively neglected until very recently, and therefore its archaeological record remains rather scanty, while extensive land reclamation in the 1970s caused the flattening of many of its tells.[1092]

Settlement Patterns as Both a Unifying and Differentiating Factor

The Greek Neolithic settlements as a whole utilise a variety of locations, create different spatial and architectural patterns, exhibit multiple principles of organisation and reflect different connections with the physical and social landscape.[1093] Interestingly, the same variability is found across Thessaly alone, and much can be inferred about local and regional social relationships and organisation. Although mostly covered by the plain, Thessaly comprises a diverse physical landscape and a closed geographical unit with mountainous borders on three sides, direct access to the Aegean Sea in the east and several natural sub-divisions in between, including lower mountains, river valleys, coastal plains and lacustrine environments.

While few of the very large number of known sites have been excavated with a strategy that exposes their maximum area horizontally at a given time, in recent years big infrastructure projects have led to large-scale excavations and to possibilities of new intra-site spatial analyses,[1094] whereas remote sensing has brought to light considerable new information concerning the size, scale and complexity of sites in the landscape. The IGEAN project has systematically scanned about 16 tell sites in eastern Thessaly[1095] and, incorporating recent data from the local Ephorates of Antiquities, it has also updated the corpus of Neolithic tells in all of Thessaly to 342.[1096] A similar project, entitled 'Long Time, No See: Land Reclamation and the Cultural Record of the Central-Western Plain of Thessaly' (henceforth LTNS), is currently ongoing in western Thessaly, aiming specifically to digitally reconstruct the lost cultural landscape of the central Karditsa Plain.[1097] It has detected 891 previously unknown archaeological sites, of which 377 are mounds, as well as road networks, cemeteries (of classical antiquity) and fields. Many of the mounds were

[1091] Distances were calculated on the basis of the IGEAN map of sites: Sarris et al. 2017b.
[1092] See Krahtopoulou 2019a and Krahtopoulou et al. 2020 for previous and current research in western Thessaly.
[1093] See Souvatzi 2008, 161–175 for detailed discussion.
[1094] E.g. Toufexis 2017.
[1095] Sarris et al. 2017b.
[1096] See the project's website <https://igean.ims.forth.gr/> (last access 10 Feb. 2022); Sarris et al. 2017b.
[1097] Krahtopoulou 2019a; Krahtopoulou et al. 2020.

ascribed a Neolithic date and were interpreted as habitation sites. Although the explosion of these new data has not yet been fully analysed, the evidence is suggestive. The biggest change has been the revelation that i) flat sites, thus far considered typical of central Macedonia, also occur all over Thessaly, and ii) that enclosures were the norm for many tells as well as for flat settlements (see relevant section here).

Thus, although still predominant, the tell is no longer the only settlement type in Thessaly, as was believed until recently because previous research has always focused on the obtrusive tells. The well-known example of Middle Neolithic Sesklo combining a tell and a flat settlement component is no longer unique either. Makrychori also consists of a tell and a settlement spread below,[1098] as do Almyriotiki and Perdika 1[1099] and probably also Palioskala.[1100] Flat, inconspicuous settlements of an extended and shifting habitation pattern, characterised by numerous pits of varying size, shape, distribution and function and extensive open spaces in between include Galini, Amygdali, Omvria, and Kazanaki in eastern Thessaly,[1101] and Mavrachades-Tataria, Ag. Theodoros-Voulgarolakka and Myrini-Ayia Varvara in western Thessaly.[1102] Many of these sites are rather short-lived and they date exclusively to LN I, thus being contemporary with the last Neolithic phases of PMZ. They were located among the numerous contemporary tells. The co-occurrence of these two settlement types in the same region reflects differences in attachment to specific places and landscapes; in modes of land use; in notions of continuity and social memory; in modes of social integration; and in kinship patterns.[1103]

Many mounds seem to have been organised in habitation sectors defined by circuit walls, whereas the dwellings were often further separated by open spaces. In eastern Thessaly examples include Rizomylos 2 (EN–EBA), Almyros 2 (EN–MN), Almyriotiki (EN–LBA), Karatzadagli (LN) and Perdika 1 and 2 (EN–MN and MBA, and EN, respectively).[1104] In most cases, the central and uppermost part of the mounds was left largely empty. At Visviki Magoula an earlier more dispersed, and even shifting, habitation pattern to the east of the mound was followed by a more compact one concentrated on the central part of the mound, which was now internally organised by three concentric enclosures.[1105] Perdika 2 seems to have had a complex layout with at least three settlement cores, two spatially overlapping in part and one separate, all of which were surrounded by ditches.[1106]

There is also considerable inter-site diversity. For example, in western Thessaly, the excavated mounds of Sykeon, Orgozinos,[1107] Koutroulou and Imvrou Pigadi reflect variations in duration, internal organisation and probably also in economic specialisation. At Sykeon burnt mudbricks and postholes in the Middle Neolithic layers suggest more than one construction technique, whereas a v-shaped perimeter ditch seems to have encircled the tell during the Final Neolithic if not earlier.[1108] At Orgozinos the buildings were probably wattle-and-daub huts rather than overground rectangular structures and the site had a short life which lasted only during LN I.[1109] Judging from the chipped and ground stone industries and particularly the presence of specialised tool kits related to food, wood and hide processing, Orgozinos is interpreted as probably ‘a satellite agricultural

[1098] Toufexis 2017.
[1099] Sarris et al. 2015, 291–292.
[1100] Toufexis 2016.
[1101] Toufexis 2017.
[1102] Krahtopoulou 2019a.
[1103] See Souvatzi 2013a; Souvatzi 2017; Souvatzi 2020 for further discussion and interpretation of the two settlement types.
[1104] Sarris et al. 2015; Kalayci – Sarris 2016; Kalayci et al. 2017; Sarris et al. 2017b.
[1105] Alram-Stern et al. 2017, 145.
[1106] Kalayci et al. 2017.
[1107] Krahtopoulou (2019a, 77) has recently argued that Orgozinos may be a flat site rather than a tell.
[1108] Chatziaggelakis 2012a; Chatziaggelakis 2012b.
[1109] Nikolaou et al. 2008.

unit'.[1110] Middle Neolithic Koutroulou, on the other hand, is a large tell (c. 3.7ha and 6.6m high), typically characterised by a compacted layout and intense building activity on the same spot and showing evidence of investment in terracing, retaining walls and concentric ditches.[1111] Nevertheless, the surprisingly close clustering of AMS radiocarbon dates, even though they are far apart stratigraphically, makes the site a rather short-lived one within the time frame of the Neolithic.[1112] At Imvrou Pigadi (Middle Neolithic) remains of unusual thermal structures delineated by two thick clay walls were interpreted as pottery kilns, suggesting the presence of a specialised pottery workshop.[1113] A similar and contemporary workshop, attested by a complex of six closed ovens associated with large amounts of 'scraped' ware pottery and enclosed by a mudbrick wall, has recently been discovered at Middle Neolithic Magoula Rizava, located about 20km northwest of Magoula Imvrou Pigadi.[1114]

Two important implications from the new evidence concerning tells are i) the presence of considerable variation in intra-site organisation, and ii) the fact that temporally short and spatially shifting or more dispersed habitation is not exclusively associated with flat sites but can also apply to tells.

Regarding settlement size and density, the available data mostly account for tell-like sites. In eastern Thessaly Gallis has recorded 258 Neolithic tells,[1115] while in the IGEAN Neolithic site inventory the number rises to 288.[1116] The mean distance between neighbouring sites is less than 5km, with settlements often located only 2–3km apart.[1117] Tell size ranges from 2 to over 8m in height, and, where such data are available, from 60–300m in diameter, with an average of 150–200m.[1118] For western Thessaly the IGEAN inventory records only 55 tell-like sites, but this paucity may be due to the particular project's focus on eastern Thessaly. A study of prehistoric habitation patterns specifically in western Thessaly conducted by Ch. Papakosta reports 203 Neolithic sites,[1119] of which the vast majority again are tells. There is a clear concentration of sites in the Karditsa Plain and in the area between Pharsala and Domokos to the south, whereas in the Trikala Plain, i.e. in the local landscape of PMZ, the percentage of prehistoric sites of all periods reaches only 13%.[1120] The average tell heights are 3.4m and 7m[1121] and diameters range from 50–500m[1122] with an average of 200–300m. More recent research by the LTNS project further illustrates that site distribution in the Karditsa Plain, and particularly in the Kambos area, is much denser and more diverse than previously thought, although the habitation mounds seem to have a smaller diameter, i.e. from 30–90m.[1123] Interestingly, many of these mounds were found at the junction of radial road networks, such as the Neolithic site of Karnomagoula.[1124]

The temporal trends are equally interesting. According to Perlès,[1125] up to 75% of the Neolithic sites in eastern Thessaly were occupied already in the Early Neolithic and a high number of sites

[1110] Nikolaou et al. 2008, 391.
[1111] Hamilakis et al. 2017.
[1112] Hamilakis et al. 2017, 87.
[1113] Kyparissi-Apostolika 2012.
[1114] Krahtopoulou et al. 2018.
[1115] Gallis 1992.
[1116] Sarris et al. 2017b.
[1117] Halstead 1984; Gallis 1992; Perlès 2001, 121–151; Johnson – Perlès 2004.
[1118] Data calculated from the IGEAN database <https://igean.ims.forth.gr/> (last access 10 Feb. 2022): Sarris et al. 2017b.
[1119] Papakosta 2003, 68.
[1120] Papakosta 2003, 85.
[1121] Papakosta 2003, 81.
[1122] Sarris et al. 2017b.
[1123] Orengo et al. 2015, 307; see also, Krahtopoulou 2019a, 75–77.
[1124] Orengo et al. 2015, 307.
[1125] Perlès 2001, 131–134; see also, Johnson – Perlès 2004.

is also attested for western Thessaly,[1126] with some 120 sites recorded for the whole of Thessaly. The Middle Neolithic is a period of relative territorial expansion across both of the two major plains,[1127] with the single exception of the Trikala region, in which a considerable reduction in the number of sites takes place during this period: 8 earlier sites are abandoned and only 3 new ones founded.[1128] PMZ must have been one of those newly founded sites. In the Late Neolithic, inhabitation of previously uninhabited or sparsely inhabited areas continues and the number of sites increases slightly (although not everywhere),[1129] but around half of the earlier sites are abandoned permanently or temporarily. PMZ may be included in those since it was abandoned at an early stage of the Late Neolithic. Several, although certainly not all, of these new sites seem to be of the flat and rather short-lived type. One effect of this settlement abandonment/establishment pattern is that the number of settlements for each phase remained relatively stable. This, in turn, ensured balanced interaction, durability and sustainability right from the outset.[1130] In fact, in eastern Thessaly, analysis of the correspondence between abandonment of settlements and establishment of new ones as well as the regular spacing of sites implies widely accepted constraints on site size, number and territory.[1131] This long and stable settlement pattern broke in the Final Neolithic, when a dramatic reduction in the number of sites takes place throughout Thessaly and inter-site distances became much larger.[1132]

Based on the available data, the same kind of either homogeneity or variability in settlement types and patterns applies to both the Western and Eastern Thessalian Plains, and no considerable differences between them are observed. The old picture of a disproportionately small number of sites in western Thessaly is changing rapidly. Across Thessaly sites tend to show a general preference for lowland rather than upland regions. The temporal distribution of sites in the two plains largely belongs to the same diachronic pattern discussed above. Tell heights and diameters also seem to be largely analogous, although the smaller tell diameter in the Kambos area of western Thessaly implies smaller spatial extent or greater spatial restriction for the tells there. Three of the most important homogeneous elements in both plains are: i) the general preference for the creation of sedentary villages (though not always long-term); ii) the reliance of the subsistence economy on agriculture and animal husbandry; and iii) the shared concern for the creation of a structured sociocultural landscape, which included, among other things the construction of a variety of structural boundaries that marked out parts of the landscape by dividing the settlement from non-settlement space.

Variation in the degree of settlement density, continuity and abandonment can betray changes in territorial rights and land systems. Closely-spaced and continuous villages like PMZ may indeed have posed 'a demanding subsistence challenge',[1133] but this does not necessarily bring about divisions, competition, conflicts or even warfare, as is habitually assumed.[1134] Based on Thiessen polygons, Perlès reconstructs a typical (Early Neolithic) village territory as having 450ha of exploitable fields.[1135] The small calculated size of Thessalian tell territories (average radius is 1.25km), sufficient to feed a mixed-farming community of some 200 people, implies intensive land use for farming.[1136] However, territorial borders or units can differ considerably, depending on the social and temporal dimensions of different groups, the contemporaneity or discontempo-

[1126] Papakosta 2003, 138; Krahtopoulou 2019a, 76.
[1127] Johnson – Perlès 2004; Krahtopoulou 2019a, 76.
[1128] Papakosta 2003, 141.
[1129] Krahtopoulou (2019a, 76) reports a slight decrease in the number of sites in the Kambos area in the Late Neolithic.
[1130] Cf. Parkinson et al. 2018.
[1131] Johnson – Perlès 2004.
[1132] Halstead 1984, fig. 6.22; Papakosta 2003, 138–147; Johnson – Perlès 2004.
[1133] Isaakidou – Halstead 2018, 73.
[1134] E.g. Halstead 1989; Halstead 1999b; Runnels et al. 2009; Alušik 2017.
[1135] Perlès 2001, 137–139.
[1136] Bintliff in press.

raneity of sites and the local topographic particularities. At PMZ, for instance, the local hydrology may suggest a cyclical pattern of the extent of land availability.[1137] Across Thessaly villages are situated in fertile plains on alluvial deposits, thus having an unlimited amount of arable land at their disposal, and form a dense and homogeneous network, spreading in all directions. As Tomáš Alušik points out,[1138] in flat regions, such as Thessaly, territorial borders do not need to be clearly visible or set, but their disruption or crossing can be easily recognisable. Settlement mobility, discontinuity and fragmentation are all present in Neolithic Thessaly, in parallel to the wider social balance and stability, and say much about the nature and duration of territoriality. They imply regular migration and even conscious relocation of whole villages.

IX.4. Conclusions

Integrated evidence from geology, geophysics, the environment, the architecture and settlement patterns, as well as from plants, animals and material culture suggests that PMZ was a complex and dynamic site that interacted intensely and diversely with its physical and social landscape, ranging from mountains to rivers, and from neighbouring sites to sites and places further away and in both the Western and the Eastern Thessalian Plains.

The formational complexity of PMZ's physical landscape, in conjunction with the settlement's long history, permanence and subsistence strategies, attests to a dynamic human-environment interaction that calls for greater awareness of human perception, agency, knowledge and sensory experience. Examination of the long-term configuration of the human-natural landscape at PMZ with an awareness of the spatio-temporal scales and dynamics of human ecology indicates that the people of PMZ had observed and developed an appreciation of local topographic particularities. They would probably have formed a seasonal worldview and perhaps a cyclical rather than strictly linear perception of time and history, at least a sense of repetitiveness and periodicity.

PMZ is also an inseparable part of the rich and diverse social landscape of Thessaly, in which the settlement pattern contributed to social stability and the maintenance of a well-organised social network throughout the Neolithic. Despite its rather remote location, the site participated actively in shared local, regional and longer-distance networks of communication and in shared habitation traditions and systems of signification. This serves to emphasise the fact that geographical or spatial distance is not synonymous with social isolation, nor is it the major factor in the formation of social relationships and networks.

With a height of 6–7m above its surroundings, a diameter of 200m, a total area of 30,000m² (although it is possible that the whole area was not occupied simultaneously) and Neolithic deposits almost 6m thick, PMZ forms an impressive landmark in the local, and probably also in the regional, sociocultural landscape. In this sense, the settlement as a whole served as a material manifestation of the community's history and identity. Overall, PMZ could be seen as a socially stable place in what in reality was a physical and social landscape in flux, characterised by variability and changes in how social groups defined themselves and how they might have been connected with land and place.

[1137] Cf. Bailey et al. 1998, 392.
[1138] Alušik 2017, 193–194.