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XII

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THE 2012-2017 GHENT-UTRECHT SURVEY PROJECT AT THORIKOS: PRELIMINARY OBSERVATIONS ON THE FINAL NEOLITHIC AND BRONZE AGE SETTLEMENT

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Introduction

Between 2012 and 2015, a team from Ghent and Utrecht universities conducted an intensive survey of the southern slopes of the Velatouri hill, covering the area of the lower settlement of Thorikos (Industrial Quarter) as well as parts of the Thorikos acropolis (**Fig. 1**).[2] This project was completed in 2015, after

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1 Winfred van de Put, Andrea Perugini, Sophie Mortier, Alexandra Alexandridou, Sophie Duchène, Silke De Smet, Carina Hasenzagl & Alain De Wulf.

2 The Thorikos Survey Project (TSP) was directed by Floris van den Eijnde and Roald F. Docter. The former has been responsible for conducting the field survey, assisted by Amber Brüsewitz (then Utrecht University, now Ghent) who also prepared the first draft of this paper, partly based upon van den Eijnde *et al*. forthcoming (on aims and methodology). Roald F. Docter, Margarita Nazou, Winfred van de Put, Sophie Mortier, Alexandra Alexandridou, Andrea Perugini, Sophie Duchène, Carina Hasenzagl and Silke de Smet were responsible for the pottery analysis upon which the preliminary conclusions in this article are based. Cornelis Stal was responsible for the survey-grid, based upon the work of Alain De Wulf, and for creating the distribution maps. The project's logistics over the years have been in the hands of Guy Dierkens, aided by Gunnar De Boel (2012) and Inge Claerhout (2013). First discussions of the Thorikos Survey Project can be found in van den Eijnde *et al*. 2018 and Nazou *et al*. 2018, 136, 140, fig. 4.

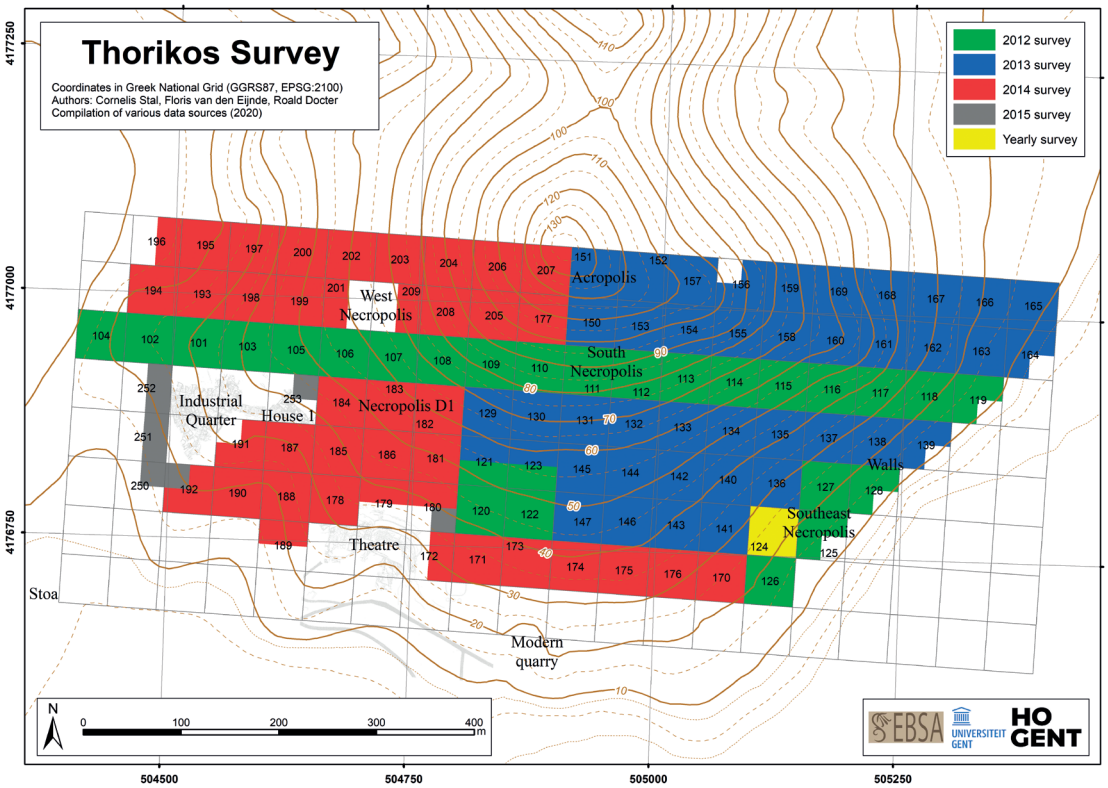

Figure 1. The 2012-2015 Thorikos Survey on the southern Velatouri hill: annual progress (C. Stal/A. Brüsewitz).

which the inventory and study of the 56,901 finds continued through 2016-2017. In 2018, a team from Louvain-la-Neuve and Liège extended the survey to the north with an aim to complete the surface investigation of the entire Velatouri hill.[3] Awaiting the comprehensive publication, it is deemed appropriate to present in the meantime some preliminary results, based on the inventory and study of all finds collected during the 2012-2015 Ghent-Utrecht southern slope survey. In this preliminary report, we will thus outline both the scientific aims of the Thorikos Survey Project and the methodology employed, and focus on the evidence of the Neolithic and Bronze Age occupation on the Velatouri as a case.

[3] See van den Eijnde *et al*. 2018 and Déderix *et al*., elsewhere in this volume.

Aims

At the outset of the Thorikos Survey Project, we formulated several aims. The main goal was to draw the various dispersed excavations on the Velatouri together, incorporating them into a unified narrative of the settlement's historical development.[4] Determining the full chronological extent of the site's use is crucial for understanding its settlement patterns through time. The comprehensive field-walking approach (see below) particularly aimed to shed light on remains from the less studied periods, notably the pre- and the post-Classical period:

1. Determining the location and extent of the settlement in the Prehistoric, Geometric and Archaic periods held special interest, given the limited record of pre-Classical domestic architecture. While there is much evidence from some of these periods in the form of pottery and graves, by contrast only few domestic remains have been uncovered to date.
2. Although post-Classical material is regularly found (albeit in smaller numbers than earlier material) and some evidence of contemporary activity in the mines exists, the occupation of the site in this period is still not fully understood, partly due to a near complete lack of architectural remains.[5]

The survey has allowed us to detect shifts in settlement patterns that were previously unknown. In these pages we will restrict our attention to the Neolithic and the Bronze Age; a more comprehensive all-period publication is projected to follow.

At a more general level, the aim of the survey has been to increase our understanding of the socio-economic history of Thorikos as the main centre of silver mining in Attica. Not only did the survey support the view that mining activities might have started earlier and been more intense than previously thought;[6] they also seem to have continued for longer. A concomitant exploration of Cistern no. 1, near Mine no. 2, has drawn attention to the presence of Late Antique and Early Byzantine material, suggesting a renewed period

[4] See the excavation reports in the *Thorikos* volumes I-XI as well as the series of comprehensive studies on Thorikos (bibliographical overview in Docter & Webster 2018, 58-59). For convenient overviews of the Belgian excavation efforts from the 1960s through the 1980s, see Mussche 1998, and for the more international recent investigations, see Docter & Webster 2018.

[5] Spitaels 1978, 103-106, figs. 60-63; Butcher 1982; Bingen 1990; Mussche 1998, 65; Docter *et al*. 2010, 49-51, fig. 20; Mattern 2010; Van Liefferinge *et al*. 2011, 71-72; Docter, Monsieur & van de Put 2011, 95, 100-101, 106-111, 118-120, figs. 19, 31-36, 42; Konstantinidou, Monsieur & Hasenzagl 2018.

[6] See Νάζου 2013; 2014; 2020; forthcoming (a-b).

of metallurgical (?) activity at Thorikos.[7] The survey results also reinforce the notion that a small, Late Antique revival may indeed have taken place around the Industrial Quarter.

Methods and techniques

The field-walking technique used throughout the 2012-2015 campaigns was designed to fulfill the specific requirements of this type of intra-site inquiry. We were able to use the pre-existing universal grid system at the site, set up by the Belgian excavators in the early 1960s,[8] which greatly facilitated the process. This grid consists of 50 × 50 m macrosquares defined by letters and numbers, aligned on the north-south axis, and materialised on the site using small posts of reinforced concrete in their north-west corners. These posts are positioned on the vertex of each cell with a mutual orthogonal distance of 50 m. The coordinates of the vertices were measured by theodolite- and GNSS measurements during different previous campaigns on the Velatouri hill, starting in the 60s of the last century.[9] Unfortunately, but as expected, some concrete poles had eroded since. Using GPS, the pre-existing grid on the Velatouri was (temporarily) restored, complemented and used to determine the target areas for the intensive field survey in 2012-2015.

For the purpose of the survey, however, higher spatial resolution was required, and new points were added to divide the existing 50 × 50 m grid into smaller sections. The macrosquares were thus each divided into four sectors measuring 25 × 25 m: north-west (1), north-east (2), south-west (3) and south-east (4). These are called mesosquares to differentiate them from the 50 × 50 m macrosquares and from the 5 × 5 m microsquares previously used at Thorikos. In order to materialise the 25 × 25 m mesosquares, new points had to be added and missing, lost or eroded poles had to be replaced. Measured points were temporarily marked using paint or stacks of rocks in order to avoid environmental damage. While this is not a durable solution, it was deemed sufficient for the limited purpose of the survey, since a later revisiting of these squares would only be necessary in rare cases (cf. below, contexts T12-124, T13-124, T14-124 and T15-124). The combination of concrete poles and temporary

[7] Van Liefferinge *et al*. 2011, 71-72, showing that the Late Antique and Early Byzantine material (6th-8th century CE) may have been be the result of intentional dumping, as it appeared to be lacking from the surface material in the cistern's immediate vicinity. See also n. 6 and Νάζου *et al*. 2018, 134-135, 140, fig. 3.

[8] Van Liefferinge, Stal & De Wulf 2011; De Wulf & Stal 2018, with fig.; De Wulf & Stal forthcoming; Verdonck *et al*., elsewhere in this volume.

[9] De Geyter 1967a-b.

markers made it possible to further materialise the grid system on the ground by simply using marker tape to establish right angles and 25 m lines on sight. The resulting (small) inaccuracy of this approach was deemed insignificant in relation to the purpose of the survey; in addition, imprecisions were kept to a minimum by using GPS to double-check the markers' locations. In line with the earlier survey experiences of one of the field directors (Docter) in the Laconia Survey and the Malta Survey, and after consultation with several colleagues working with survey archaeology (in particular Prof. John Bintliff, at that time at Leiden University), the following artefact collection strategy was decided upon.[10]

As a rule, four students walked each mesosquare for 20 minutes. In rare cases, when teams of four could not be formed, two students walked one square for 40 minutes. The standard method was for the four to set out from one corner each and 'hover' toward the square's approximate centre (**Fig. 2**). This enabled the team to scan the entire surface for finds, avoiding dangerous areas – bushes, mine shafts, cliffs etc., and still pay equal attention to each individual square.

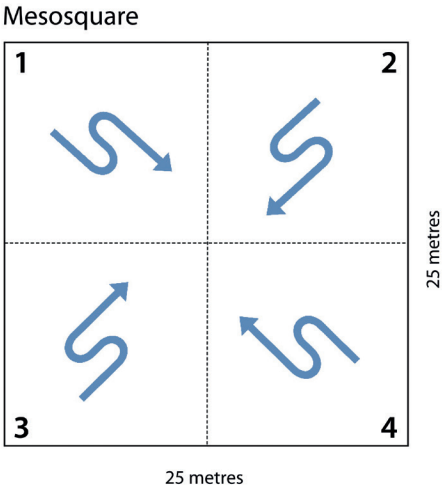

Figure 2: Schematic rendering of the method of field-walking with four students 'hovering' one mesosquare (25 × 25 m) (J. Angenon).

Aside from observing the artefact-scatter, close attention was paid to architectural remains, mine shafts and entrances, as well as rock graffiti. This aspect of the survey adds to the topographical measuring campaign of 2008 on the lower Velatouri hill.[11] A supervisor was present at all times, recording all finds and features on fieldsheets (using an iPad equipped with Filemaker) and documenting factors such as visibility, slope gradient, land use, topography, surface conditions, soil types and vegetation for each individual mesosquare.

All finds were then counted and bagged in the field, per student, and registered in the finds lab at the Archaeological Museum of Lavrio under a single context

[10] On the subject of intra-site artefact survey, see Bintliff 2013.
[11] Van Liefferinge, Stal & De Wulf 2011.

number.[12] The 2012-2015 campaigns were followed up by material processing campaigns until 2017, in which the 56,901 finds were inventoried and studied by specialists and students from several European universities.[13] Of these, 5016 fragments were left out in preparing the distribution maps of **Figs. 3-7** since they stemmed from the systematic re-survey of survey context 124 (see below) and a few other mesosquares. The finds consisted primarily of ceramics (fragments of vessels and building material), but also lithics (such as obsidian, pebbles and grinding tools), sea shell, metals and metallurgical residues in the form of slags and litharge. The pottery chronology spans a wide period, from the Final Neolithic to early modern times. Of the total number of finds, 23,493 (41.3%) were kept and 33,412 (58.7%) were discarded during the inventory process.[14] While the main focus of previous excavations had been on the Bronze Age through Classical remains, no such discrimination was made in the examination of the finds collected in the field survey, since one of the main reasons for conducting an intensive intra-site survey was to establish the full chronological extent of the site as well as to detect shifts in habitational patterns through all its periods of use.

Stages of the Survey

The survey effort of 2012 focused on three areas: first and foremost, we succeeded in examining a full east-west transect of just under one kilometer in length and one macrosquare (50 m) in width across the southern slope of the Velatouri. This transect includes all macrosquares situated directly south of the 51st latitudinal line, from the dirt road encircling the Velatouri at its western footing (C'51) to the coastal asphalt road abutting it to the east (P51). Transect 51 had the benefit of limited previous excavations, ensuring a relatively

[12] E.g. T12-101-1, indicating the season (2012) and denoting both the macrosquare (A'51 = survey context 101) as well as the mesosquare (north-west sector: 1) to create a unique tag. See also van den Eijnde *et al*. 2018, 20 with fig.

[13] See acknowledgments below. In part, the study of the finds took shape as a Fieldschool of Greek material culture, organised for students of the U4 collaboration between Ghent University, the Georg-August University Göttingen, Groningen University and Uppsala University.

[14] The non-diagnostic finds were grouped by fabric (plain, painted, black glaze, etc.) and – if possible – functional category (tile, amphora, beehive, open or closed shape, etc.) as well as by sherd size; they were then counted and entered in the database per category and then discarded in an area designated by the archaeological service on the premises of the Archaeological Museum at Lavrio. Natural rocks and finds of very recent date (post-1960, ca.), were also discarded but without further recording.

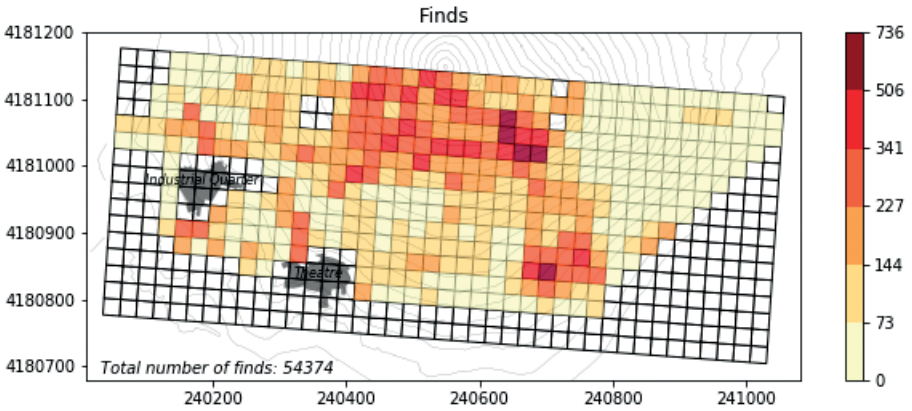

Figure 3. Distribution map of the 2012-2015 Thorikos survey on the southern Velatouri hill, based upon the total of inventoried finds (C. Stal).

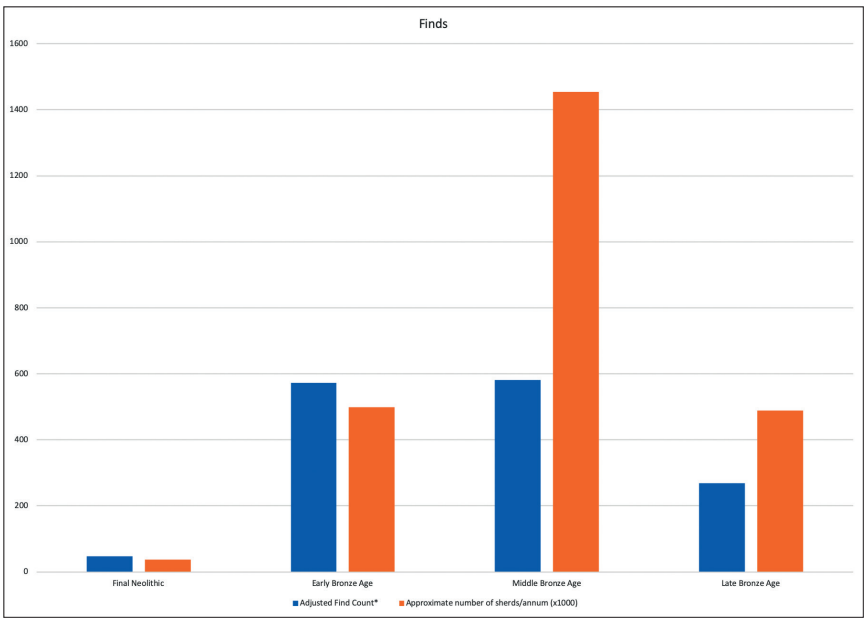

Figure 4. Adjusted find count and approximative number of sherds/annum (×1000) (F. van den Eijnde).

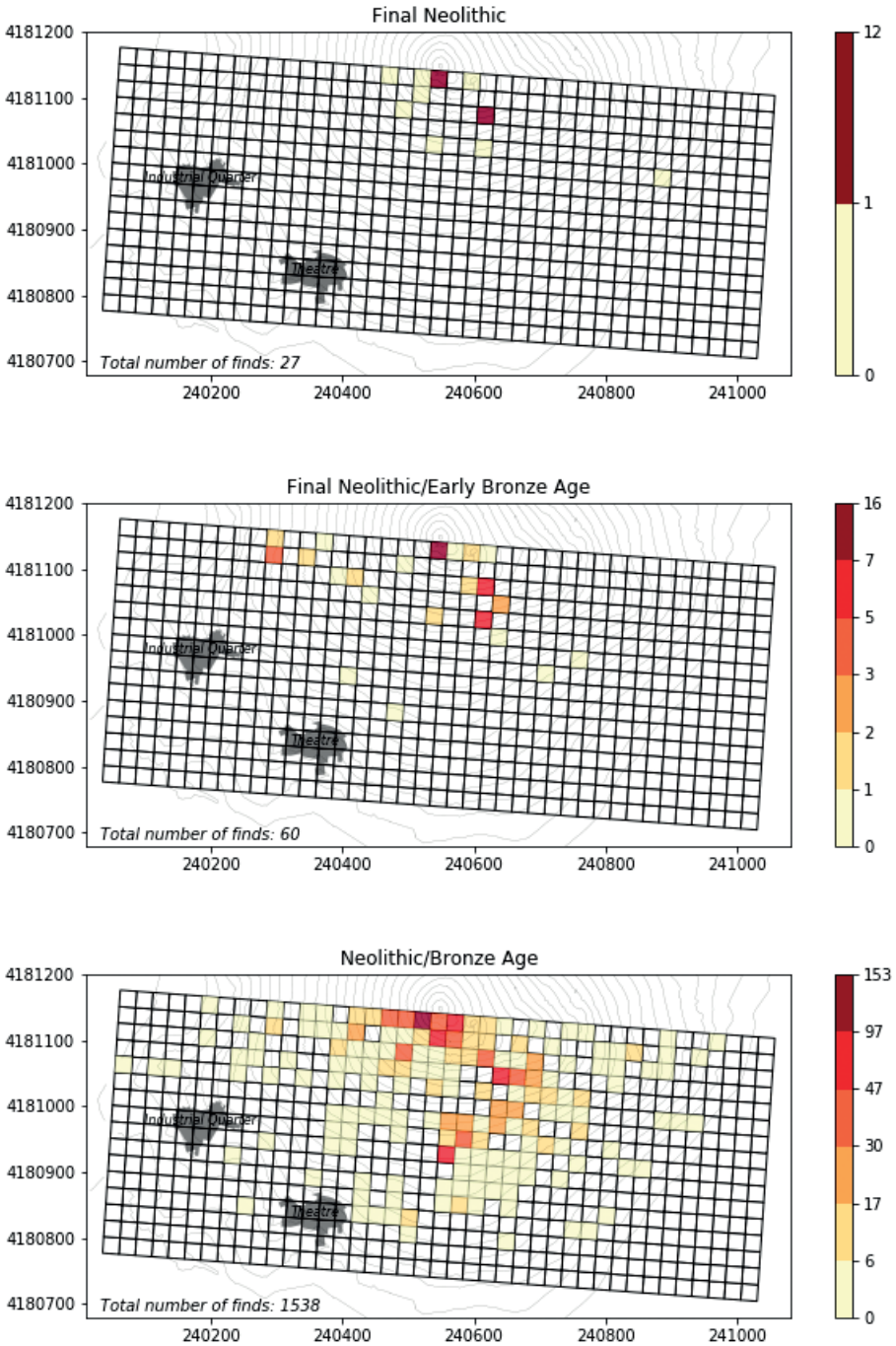

Figure 5. Distribution maps of finds: **A.** Final Neolithic; **B.** Final Neolithic/Early Bronze Age; **C.** Neolithic/Bronze Age (C. Stal, on the basis of first attributions in database).

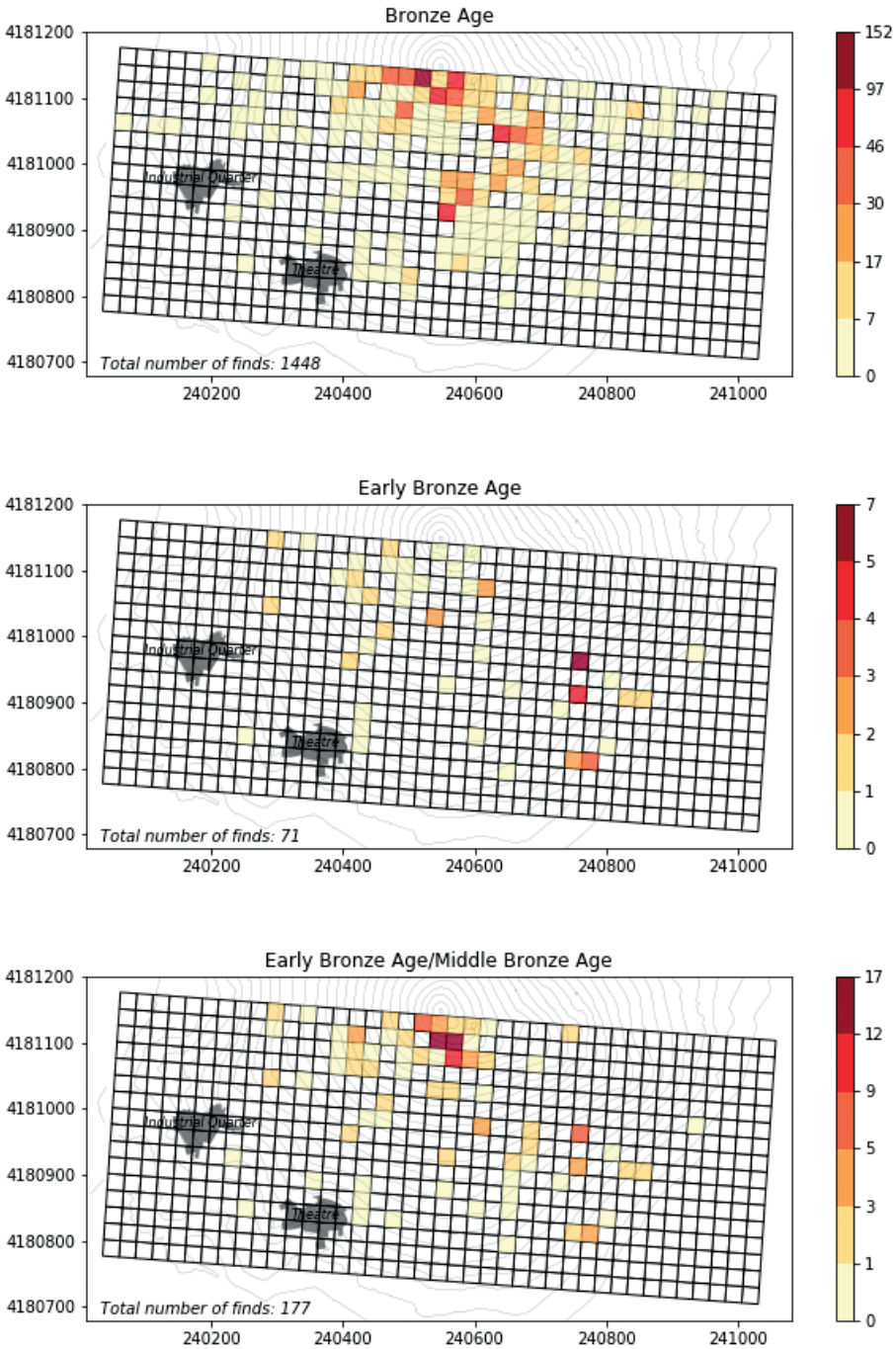

Figure 6. Distribution maps of finds: **A**. Bronze Age; **B.** Early Bronze Age; **C.** Early Bronze Age/Middle Bronze Age (C. Stal, on the basis of first attributions in database).

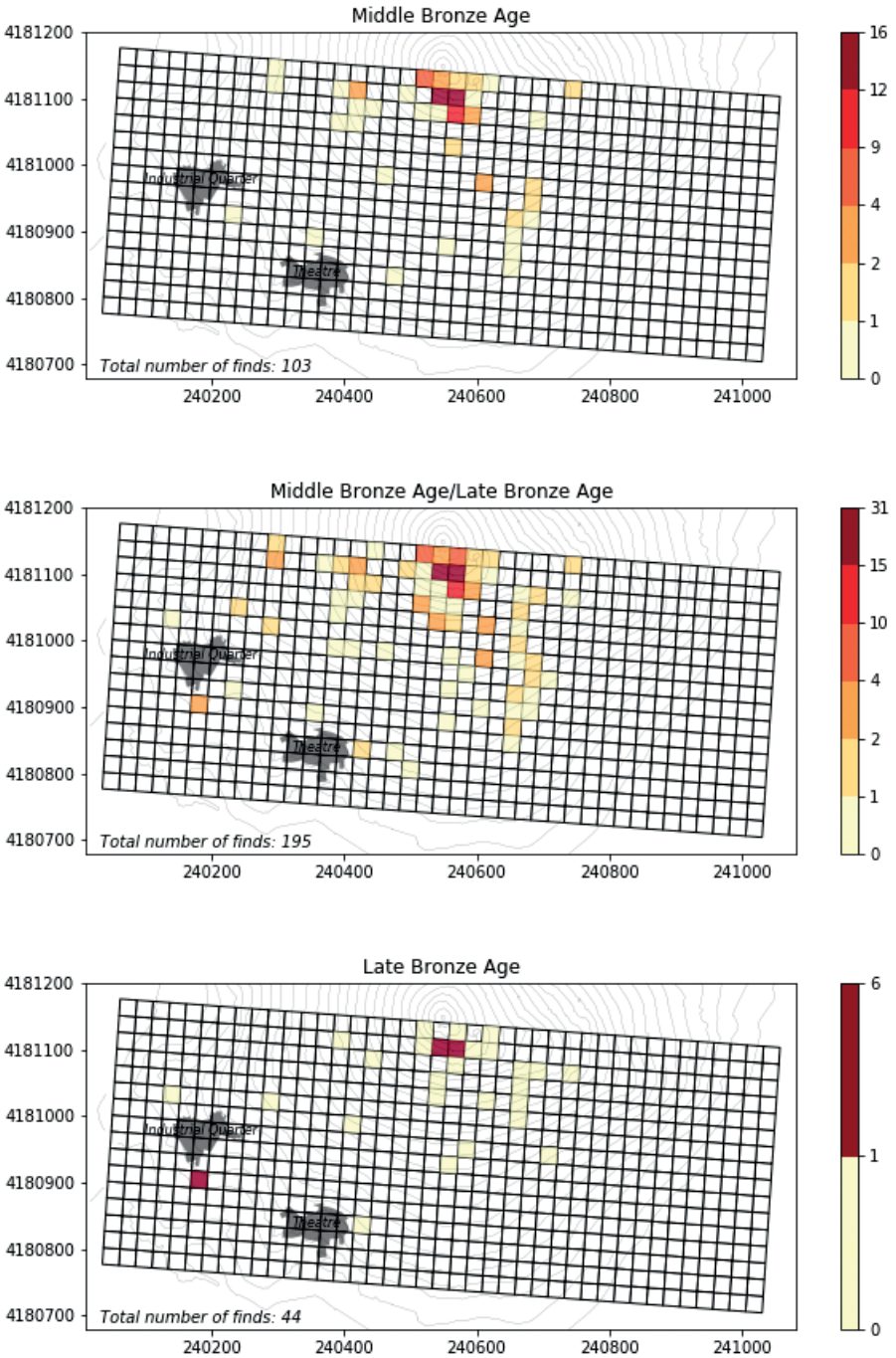

Figure 7. Distribution maps of finds: **A.** Middle Bronze Age; **B.** Middle Bronze Age/Late Bronze Age; **C.** Late Bronze Age (C. Stal, on the basis of first attributions in database).

undisturbed sample.[15] The second inspected area was a roughly triangular field adjoining the coastal road, which was chosen for its location close to the sea and the presence of a monumental Late Classical or Hellenistic structure excavated in the early 70s of the last century by A.G. Liangouras and E. Kakavogiannis.[16] Finally, an area on the southern slope was selected, because an extensive geophysical survey by a team under the direction of Robert Laffineur of the University of Liège (2010) had given strong evidence for a large building on this relatively flat plateau.[17] It was thus expected that the survey would provide indications for a chronology that might or might not warrant the organisation of a future excavation.

The 2013 campaign sought to fill in the gaps between these three separate areas as well as explore the area on the eastern plateau of the acropolis toward the modern coastal road.[18] During the third and fourth seasons, in 2014 and 2015, the survey effort concentrated on the areas left on the south-west slope between the previously excavated areas of the Industrial Quarter and the earlier surveyed squares.[19]

In all, 60,936 objects were collected, 56,901 of which (93.38%) were processed in the Lavrio Museum (**Table 1**) after discarding natural rocks, other non-humanmade items and very recent finds (post-1960, ca.). As noted, of the processed finds, 23,493 were kept for storage in the Lavrio Museum, the rest having been discarded after careful examination and recording. Some 4587 objects, or roughly 8% of all processed finds, were photographed (and when deemed necessary also drawn) with a view to further study and publication.

[15] There are two exceptions: the excavation of the South Necropolis (Servais 1968; Mussche 1998, 22-23) and the excavation of Cistern no. 1 (Van Liefferinge *et al*. 2011).

[16] Λιάγκουρας & Κακαβογιάννης 1972.

[17] See Verdonck *et al*., elsewhere in this volume.

[18] The second campaign was conducted between July 8-25, 2013.

[19] The third and fourth survey campaigns were conducted between July 1-23, 2014 and July 4-8, 2015 respectively.

Table 1. TSP 2012-2015 finds processing.[20]

Year	Field count	Processed finds					% processed vs. Field count
		Stored	% of total processed	Dis-carded	% of total processed	Total processed	
2012	18408	5029	30.01%	11727	69.99%	16756	91.03%
2013	20505	9078	46.66%	10379	53.34%	19457	94.89%
2014	20792	9023	46.27%	10479	53.73%	19502	93.80%
2015	1231	363	30.61%	823	69.39%	1186	96.34%
Total	**60936**	**23493**	**41.29%**	**33408**	**58.71%**	**56901**	**93.38%**

Geomorphology and natural condition of the Velatouri hill

In relation to the methodology of the survey, a short note on the geomorphology and natural condition of the Velatouri is in order. The surface conditions of this part of the Velatouri are generally consistent. The gravel-dirt soil is thoroughly mixed with slabs of greenschist as a result of extensive erosion of the top layer of the Attic Cycladic crystalline belt.[21] Since the geomorphological history of the Velatouri is characterised by erosion, its slopes increase in steepness toward the top, impeding the survey effort, as well as – theoretically – rendering habitation near the summit more difficult. The exception to this pattern is the eastern plateau, commonly referred to as the acropolis (**Fig. 1**, macrosquares H-J53), where a large part of the prehistoric finds has been collected (see below; **Fig. 8**).

The visibility and natural overgrowth vary throughout the site. The terrain is punctuated by the occasional (wild) olive and is otherwise covered with herbaceous vegetation and the generic Mediterranean shrubs that thrive on this type of dry and rocky terrain. The less steep southern slope is generally quite grassy, while the thick, thorny *phrygana* scrub obstructs easy navigation of the steeper east/south-east slope. As far as grassy or overgrown areas are concerned, visibility varied much throughout the 2012-2015 campaigns depending on precipitation levels in the preceding months.

[20] After the first survey in 2012, macrosquare / survey context 124 was systematically revisited in 2013, 2014 and 2015. This methodological case study has been the subject of a recent Bachelor's thesis at Ghent University (Toch 2019) and will be presented separately elsewhere. The numbers in **Table 1** are without the revisits, so only the finds of 2012 (T12-124) have been taken into account here.

[21] Baziotis, Proyer & Mposkos 2009, 133-134; Scheffer *et al*. 2018.

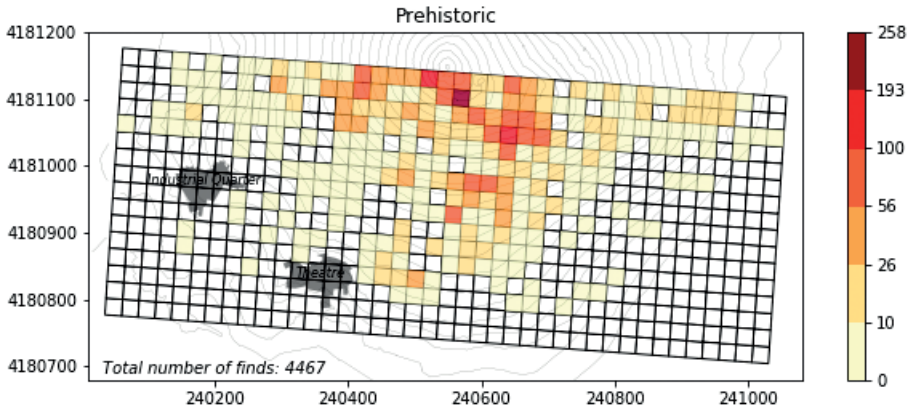

Figure 8. Distribution map of finds: Late Neolithic to Late Bronze Age, including the generic 'Prehistoric' (C. Stal, on the basis of first attributions in database).

The varying degree of overgrowth in particular poses an important methodological question. How reliable is the sherd count in a given mesosquare in relation to another square with different overgrowth and hence variant visibility? To account for differences in visibility between different areas or even the same areas over different periods, conditions were recorded for each mesosquare in the fieldsheets in terms of a percentage of full visibility (i.e. 100%). In the future, the final sherd count may be adjusted to accommodate for the attested variation. In particular, the survey on the east slope suffered from poor accessibility as a result of the *phrygana*, which is likely to have suppressed the yield per mesosquare (**Fig. 3**).

Finally, regarding the coastal geomorphology, a reconnaissance geophysical survey in the area has shown that the ancient coastline of Thorikos looked quite different in the past than it does today. The now silted-up Adami plain and lower Potami valley would have formed an estuary in Antiquity, sheltering the settlement to the south and south-west.[22]

Preliminary results

After studying the surface finds and merging them into distribution maps (see above), it is now possible to offer some preliminary observations on

[22] Paepe 1969; Paepe 1971, esp. 15-16; Mussche 1998, 58; Apostolopoulos *et al*. 2014.

Thorikos' settlement history, limiting ourselves here to the earliest phases. The first distribution map presented here refers to the total number of finds (all periods) collected in the field and inventoried in the finds laboratory (**Fig. 3**). It is apparent that the acropolis and the steep slopes just south of it, as well as and in particular the lower slopes to the south-east, yielded strong concentrations of finds. Since the latter concentration consisted predominantly of Classical and Hellenistic finds, it was conjectured that this may have been an important part of the settlement during that period.[23] Prehistoric finds proved to be largely limited to the acropolis. Perhaps surprisingly, a significant number of finds from this period was not found on but just below the acropolis plateau, on the steep slopes immediately to the south. Rather than indicating that habitation was concentrated on these more inhospitable slopes, we may surmise that this material washed down from the upper levels as a result of natural erosion from the plateau. A particularly strong concentration in and around macrosquare I52 (survey context T13-153-4) can be partially explained by the fact that this area was used as a dump for earlier excavations by Jean Servais on the acropolis (1965 and 1968), the material of which has since eroded further down.[24] A strong concentration on the greater summit of the Velatouri may be interpreted as stemming from the eroded stratigraphy at the confines of Valerios Staïs' excavations (1893).[25] This concerns macrosquares G53 and H53 (survey contexts T13-151-1, T13-151-3, T14-207-1, T14-207-3 and T14-207-4).

A note on period assignation and adjusted find count

The process of studying finds naturally had to deal with the limitations of the quality of the finds. Whereas in some cases, it is possible to assign a defined phase (e.g. Final Neolithic, Early Bronze Age etc.), the general aspect of the finds did not commonly allow for such precision, necessitating approximations in terms of overlapping phases (see **Table 2**). Also, some phases, such as Early Bronze Age or Bronze Age encompass more refined subdivisions such as Early Bronze Age I or Late Bronze Age. It should also be noted that whereas one of the authors (M. Nazou) was able to assign ceramic fragments to the (Final) Neolithic and Early Bronze Age periods relatively easily, on the basis of her knowledge of this material in Mine no. 3,[26] her familiarity with Middle

[23] Van den Eijnde *et al*. forthcoming; see also above, n 16.

[24] For a summary of the excavations on the acropolis, see Van Gelder 2011 with references; Déderix *et al*., elsewhere in this volume.

[25] Στάης 1893; 1895; Papadimitriou 2020; Déderix *et al*., elsewhere in this volume.

[26] Nazou 2013; 2014; 2020; Νάζου *et al*. 2018, 137-138; Nazou forthcoming (a-b). The finds from at least the acropolis have been inventoried and partly studied by her; the material from

and Late Bronze Age pottery at Thorikos was less profound, affecting the resolution of chronological attributions within this timeframe. It should, moreover, be stressed that the chronological attributions used in the following sections are to be considered preliminary since they are mostly based upon only a first inspection during the processing campaigns; a further study by different specialists is foreseen, enabling more detailed publication in the future.

This poses a well-known problem for the extrapolation of reliable quantitative data, especially when judging the intensity of use during a particular phase. In some cases, the numbers may be sufficiently low so as not to affect the data significantly if left out. But what to do, for example, with the 60 Final Neolithic/Early Bronze Age sherds, or the 1106 Bronze Age sherds, when comparing variations in sherd numbers between the four main periods selected for this study (e.g. Final Neolithic, Early Bronze Age, Middle Bronze Age and Late Bronze Age; see **Table 3**)? To leave out the Bronze Age sherds would skew totals unrealistically in favour of the Final Neolithic. However, it is also clear that these numbers cannot be divided in even measure over the three phases of Early, Middle and Late Bronze Age. We have therefore opted to divide the sherd numbers of 'overlapping' chronological phases (e.g. Final Neolithic/Early Bronze Age; see **Table 2**) according to the ratio of the selected non-overlapping phases (i.e. Final Neolithic, Early, Middle and Late Bronze Age). This was done bottom-up, beginning with the smallest overlapping periods, working our way up toward the broadest. Thus, for example, the five Early Bronze Age I and II sherds were added to the 71 from the Early Bronze Age. Then the six Late Neolithic/Early Bronze Age, 60 Final Neolithic/Early Bronze Age and one Neolithic/Early Bronze Age sherds (67 total) were divided according to the ratio between Final Neolithic (which itself had been adjusted upward by two, to 29, as a result of the Late Neolithic/Final Neolithic being assigned completely to the later phase) and the Early Bronze Age sherds, bringing the latter total to 126.[27] This method was repeated for the three Early/Middle Bronze Age sherds, the 1106 Bronze Age sherds and the four combined Late Neolithic/Bronze Age and Neolithic/Bronze Age sherds, bringing the total adjusted find count for the Early Bronze Age to 573.

Finally, in order to contextualise the find numbers while taking into account the uneven time span of the four main periods, we have opted to include the

the campaigns of 2013-2015 has almost completely been inventoried by her or under her supervision.

[27] Note that one single Late Neolithic sherd was omitted as statistically insignificant: TC13.3760, found in context T13-134-2-C (134.2), within the north-eastern sector of macro-square K1, half-way between the summit and the south-east foot of the Velatouri (**Table 2**). It could well have originated on the acropolis and washed down in the course of millennia of erosion processes.

adjusted find count per annum (× 1000 for better visualisation in **Fig. 4**). Obviously, this method is contingent on current standard periodization, but we believe that potential divergences will not significantly alter the main trends revealed by this approach. The main periods were generalised to 4500-3200 (Final Neolithic), 3200-2050 (Early Bronze Age), 2050-1650 (Middle Bronze Age) and 1650-1100 BCE (Late Bronze Age).[28] Most significantly, the extrapolated find count per annum is highest during the Middle Bronze Age, even though its total adjusted find count is slightly smaller than that of the Early Bronze Age. This is due to its much shorter time span.

It is interesting to note that the method of using the adjusted find count results in the suppression of the relative share of Final Neolithic sherds from 11 to 3%, even as its total number increases (from 27 to 48). This is a direct result of the great number of sherds (1106) qualified as 'Bronze Age'. Similarly, the large increase of the share of Early Bronze Age finds (from 30 to 39%), can be attributed to the relatively high number of (Final/Late) Neolithic/Early Bronze Age finds (67, see above).

Table 2. Tally of Neolithic and Bronze Age surface finds.

Period	Find Count
Late Neolithic	1
Late Neolithic/Final Neolithic	2
Late Neolithic/Early Bronze Age	6
Late Neolithic/Bronze Age	1
Final Neolithic	27
Final Neolithic/Early Bronze Age	60
Neolithic/Bronze Age	3
Neolithic/Early Bronze Age	1
Bronze Age	1106
Early Bronze Age	71
Early Bronze Age I	1
Early Bronze Age II	4
Early Bronze Age/Middle Bronze Age	3
Middle Bronze Age	94
Middle Bronze Age/Late Bronze Age	48
Late Bronze Age	44
Total	**1472**

[28] Cf. also the application of the Chronotype system by Gregory 2004.

Neolithic

Focusing on the Neolithic and Bronze Age materials, some patterns can easily be discerned. **Table 2** shows the complete tally for both periods. As mentioned, while some sherds could be dated with the utmost precision by one of the authors, in most cases only a very broad determination spanning multiple (overlapping) periods was possible. Based upon these preliminary data, the occupation of the acropolis may have commenced during the Final Neolithic (ca. 4500 BCE), with a single sherd dated to the Late Neolithic period possibly hinting at an earlier start.[29] During the Final Neolithic, the acropolis thus seems to have been settled, although we cannot at present say whether this habitation was uninterrupted. In his excavations of 1965, Jean Servais had already found walls that he attributed to the Final Neolithic period.[30] The full publication of the 27 sherds attributable with certainty to this period (as well as the two attributed to the Late Neolithic/Final Neolithic) may shed more light on this matter. The distribution maps (**Fig. 5A** and **B**) strongly suggest that habitation was restricted to the acropolis with a western outlier in macrosquare B53 (survey contexts T14-200-2 and T14-200-4), just above a steep slope. Otherwise, what little sherds were collected in the areas immediately below the acropolis can be explained by erosion processes.

Table 3. Numbers and percentages of surface finds in wider periodization.

Period	Simple count	% of total	Approximate number of sherds/ annum (× 1000)	Adjusted Find Count*	% of total	Approximate number of sherds/ annum (× 1000)
Final Neolithic	27	11%	21	48	3%	37
Early Bronze Age	71	30%	62	573	39%	498
Middle Bronze Age	94	40%	235	582	40%	1454
Late Bronze Age	44	19%	80	269	18%	488
Total	**236**	**100%**	**68**	**1471**	**100%**	**426**

Bronze Age

During the Bronze Age, the settlement on the Velatouri was more intensively occupied (**Figs. 5C, 6-7**). In this light, it is significant that Staïs already in 1893 uncovered the core of a nucleated prehistoric settlement near the

[29] See above, n. 27.
[30] Servais 1967, 24-27, pl. II; Van Gelder 2011, 17, fig. 2.

summit.[31] It is, again, around the summit that the densest concentrations of Bronze Age finds were noted, probably because of the impact of Staïs' excavations. While sherd counts are high for the whole Bronze Age, the Middle Bronze Age stands out with the most finds (94) and, on standard chronology, by far the highest number of sherds per annum (**Figs. 6-7**; **Table 3**). Significantly, in the Late Bronze Age, the sherd count (roughly extrapolated per annum, see **Table 3**) drops to approximately the level of the Early Bronze Age. This correlates with the traces of a Middle Bronze Age/early Early Bronze Age settlement encountered by Servais during his excavations on the acropolis plateau in 1965 and 1968.[32] The straightforward conclusion would seem to be that the Middle Bronze Age represents a period of great prosperity when compared to the earlier and later phases.

While the strong concentration on the acropolis and its upper slopes in connection with the settlement may come as no surprise, other concentrations are perhaps more unexpected, even though the absolute numbers remain relatively low. A concentration of Bronze Age sherds around mine entrance no. 6 is to be noted. In particular, sherds that stylistically and fabric-wise cover the whole Bronze Age have been found here in macrosquares F4 and G4 (**Figs. 5C**, **6A**, **7B, 8**).[33] This contrasts with the situation around mine entrance no. 3, where evidence for Early Bronze Age activities – undoubtedly connected with the exploitation of the silver resources – has been known already for some 40 years now:[34] lying within the area that had already been largely excavated, it is hardly surprising that no finds of this period remained to be found during the survey. The new evidence from Mine no. 6, however, suggests that silver exploitation may have played an even larger role than hitherto envisaged. Silver production (in the form of cupellation) at Thorikos was confirmed for the Middle Bronze Age by the important discovery of litharge in a Middle Bronze Age/early Early Bronze Age house excavated by Servais.[35] To this we may now add the indirect evidence of early mining activity at yet another mine.

The distribution maps **Figs. 5-8** show three other patterns that deserve discussion and interpretation although, again, the absolute numbers remain relatively limited. Firstly, a concentration of 'Neolithic/Bronze Age' and generic

[31] Στάης 1893; 1895.

[32] Servais 1967, 20-24, pl. II; Van Gelder 2011, 17, fig. 2.

[33] This mine, as well as mine entrances 3 and 4, are currently being investigated by a team from the University of Lorraine (Nancy), see Morin & Delpech 2018; Νάζου *et al*. 2018, 136-137. The sherds from these survey contexts T14-171-1, T14-171-2 and T14-173-1 have been inventoried by or under the supervision of M. Nazou.

[34] Spitaels 1984; Waelkens 1990; Laffineur 2010, 26, 36-40; Docter *et al*. 44-45, fig. 14; Laffineur *et al*. 2018; Νάζου *et al*. 2018, 137-138; Nazou 2020; forthcoming (a-b). The Late Helladic ceramic evidence from the mine has been published by P.A. Mountjoy (1995).

[35] Servais 1967, 22-24, fig. 16.

'Bronze Age' material can be found due south of the summit and at intermediate height (**Figs. 5C**, **6A**, **8**).[36] Given the lack of a similar concentration on distribution maps of later periods, in combination with the relatively flat terrain, it seems likely that this does not represent down-washing from the acropolis but may perhaps indicate a suburban extension of the main nucleus on the acropolis plateau. If so, a Final Neolithic (?) and Early to Middle Bronze Age chronology may tentatively be proposed for this concentration, even if a Late Bronze Age phase cannot be completely excluded, judging by the distribution maps (**Figs. 6C**, **7A-B**).[37] Secondly, another set of Early Bronze Age and Early Bronze Age/Middle Bronze Age concentrations can be discerned on the southeastern slopes of the Velatouri (**Figs. 6B-C**), but the numbers remain low and consist, moreover, of finds that have not been inventoried by or under the supervision of specialists.[38] A third 'concentration' is visible on **Figs. 7B-C** just south of the Industrial Quarter, but consists only of four wall fragments of red/brown burnished jars, attributed by M. Nazou to the Middle or Late Bronze Age; although remarkable in this part of the site, the small numbers should warn against over-interpretation.[39]

To conclude, the acropolis summit and eastern plateau evidently functioned as the primary nucleus of the Final Neolithic and Bronze Age settlement at Thorikos (**Fig. 8**). The large plateau in particular was suitable for habitation and held a commanding view of the sea and the two potential harbours below: one to the east, protected by the Agios Nikolaos peninsula; the other to the south, in the Adami bay.[40] The choice of the acropolis as a settlement site was presumably conditioned at least in part by the natural terrain towards the east, with a very steep and rocky slope effectively serving as a 'fortification'. Even today, the terrain is so precipitous as to prevent surveying here.[41] Beyond these rocks, the field sherd counts drop off considerably, likely marking the confines

[36] In particular, survey contexts T13-131-1, T13-131-2, T13-131-4, T13-132-1, T13-132-2, T13-132-4, T13-144-2 and T13-145-1 (macrosquares H1, H2, I1 and I2). Also in this case, the sherds were inventoried by or under the supervision of M. Nazou. This area, remarkably, lies just north of where Robert Laffineur had been looking for a possible Bronze Age settlement in his 2009 and 2010 geophysical prospections (see Verdonck *et al*., elsewhere in this volume).

[37] As the sherds of these survey contexts were inventoried by or under the supervision of M. Nazou, this concentration is thought to represent an ancient reality, although further study is required for confirmation.

[38] This holds for macrosquares L4 (survey contexts T12-126-1 and T12-126-2) and M2 and N2 (survey contexts T12-127-2, T12-128-1). Only in the case of macrosquares L1-2 (survey contexts T13-135-1 and T13-136-1) the presence of prehistoric material seems ascertained (a.o. TC13.547).

[39] Macrosquare A'3 (survey context T14-192-2).

[40] See above, n. 22.

[41] The southwestern sectors of macrosquares K52 and K53.

of the potential area of settlement. The border of the Bronze Age settlement is furthermore indicated by Tholos Tomb III in macrosquares K53, L53, K54 and L54 (cf. **Fig. 1**),[42] which was certainly located outside the prehistoric settlement proper.

Conclusions

Occupation of the acropolis seems to have commenced as early as previously assumed by P. Spitaels:[43] the survey has confirmed the area to have been inhabited from the Final Neolithic period on. Surprisingly, a concentration of prehistoric material was also found around mine entrance no. 6, indicating that silver exploitation in this period may have been more intensive than previously thought on the basis of the Mine no. 3 evidence.[44] Judging by current evidence and awaiting further detailed study of the finds, the concentration that can be discerned mid-way on the slopes between the acropolis and the south-east concentration seems remarkable and may perhaps be interpreted as a chiefly Early to Middle Bronze Age extension of the habitation on the acropolis (**Figs. 5C**, **6A**, **8**). The evidence for ascertained Early Bronze Age material on the acropolis, however, is not abundant (**Fig. 6B**), which may be explained by the suggestion made elsewhere that Early Bronze Age occupation was more coastal.[45] Finds seem to indicate that the occupation of the acropolis flourished especially during the Middle Bronze Age period, less so during the Late Bronze Age (**Fig. 7**). The abundance of Bronze Age finds in the survey on both the acropolis and the central-southern slopes of the Velatouri contrasts with the lack of contemporary monumental architecture (Late Helladic III).[46] This may well be explained by the intensification of activity in Athens at the time, where the Late Helladic III period saw the construction of the large fortifications on the Athenian Acropolis and the emergence of Athens as a palatial centre. These developments may have drained the available resources previously spent at Thorikos and elsewhere in Attica.

[42] See Laffineur 2010, 30-33, figs. 10-13; Laffineur 2018, esp. 25-27, with figs; both with full references.

[43] Spitaels 1982, 12.

[44] On the exploitation of silver in this period, see esp. Laffineur 2010, 26-27, 36-40.

[45] Based on the finds of Olga Kakavogianni at the Dei power plant at the coast, where she recovered Early Bronze Age architecture and pottery (Κακαβογιάννη 1985).

[46] Laffineur 2010, 26-27, 40.

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