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THE 'LIVELY' STREETS OF CLASSICAL OLYNTHOS

A SPATIAL ANALYSIS OF URBAN LIFE ON THE NORTH HILL, 432 – 348 BCE

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Abstract
During the last decades growing attention has been paid to the way 'space' is organised in both houses and settlements and the way that this organisation influences human life. The study of 'space' as an important force in the shaping of social processes, identities and other aspects of life has become as important for understanding past societies as the study of their artefacts and architectural remains (Blake 2004, 234). Spatial studies have revealed patterns of social interaction and deeper insights into the functioning of settlements, neighbourhoods and houses (e.g. Stöger 2011; 2014). The article presented here builds on pioneering studies by applying similar methods in a thus far unexplored area as it seeks to shed light on various aspects of Olynthian society in Northern Greece through a spatial examination of its built and non-built environment. Especially since the siege and subsequent destruction of the city by Philip II's army had important consequences for the state of the material record, the employment of spatial analyses offers an additional perspective on Olynthos' urban life, and more precisely on movement, social activity areas and matters of social control and privacy in the city's streetscape.

Keywords
classical Greek archaeology, street networks, urban space, space syntax, Depthmap

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Introduction

Archaeology in the past has focused largely on architectural features, ground plans and the material culture that has survived. The study of non-built spaces like streets and squares has not attracted much attention until fairly recently, as these open spaces might have appeared empty and less appealing when compared to the designed and planned architecture surrounding them (Hartnett 2008, 91-92). However, streets and squares are important networks in a settlement and represent platforms where all sorts of activities of urban life may have taken place. In an attempt to reconstruct such dynamic environments in ancient cities scholars have to rely on syntactic analysis tools that provide a shift from the static built environment represented by the archaeological record to the dynamics that were generated along the streets. This can be achieved with the help of space syntax tools that simulate past environments. This article provides a first in-depth spatial examination of the street network on Olynthos' North Hill. First, it seeks to reconstruct the potential movement flows of people in the streets generated by the city's spatial layout. Subsequently, it looks at the positioning of doorways to reveal dynamics between private and public space in a smaller section of the hill.

The city of Olynthos

The original settlement of Olynthos was located on the steeper South Hill dating back to the fourth millennium BCE (Mylonas 1929, 1-12). Accord-

ing to historical sources, the city expanded towards the end of the fifth century BCE due to a migration movement (known as the *anoikismos* of 432 BCE) with the intention to form a larger and better defendable city in preparation for the rebellion against Athens (Thuc. 1.58; Diod. Sic. 12.34.2). However, it is unclear which cities or specific populations joined this movement and how large the flow of migrants must have been. The archaeological record of Olynthos shows how a sudden growth in population size around this time resulted in the construction of a new residential area on the North Hill, laid out in Hippodamian fashion, with avenues running north-south and *streets* following an east-west direction (Robinson and Graham 1938, 13-14).[1] The newly constructed area was, however, short-lived, as the army of Philip II brought about the city's destruction in 348 BCE. By then some inhabitants might have already left the city with their belongings in advance. Those who remained must have been undoubtedly affected by the siege.

Methodology and theoretical framework

The archaeological dataset available for the spatial analyses are the streets and the houses on the North Hill of Olynthos as published by Robinson (1929-1952) and Cahill (2002). The theoretical framework at the basis of space syntax was formulated by architectural and urban morphologists Hillier and Hanson (1984). The spatial boundaries for the analysis of movement flows are the natural contours of the North Hill in the west, north and east (fig. 1[2]). These coincide with the possible circuit of the city's fortification walls (Robinson and Graham 1938, 39-40). The southern boundary is Street –I. To reconstruct the movement flows within Olynthos' street network, an axial analysis is conducted. In this analysis the street network is divided into the least and longest straight lines that connect the entire street space. Depthmap software,[3] subsequently, calculates the level of accessibility and integration of all the lines within the network. The results are shown in a colour-coded map with a spectral range from red, for the highest integrated lines, to blue, for the lowest integrated lines. The integration value correlates to the potential amount of pedestrians moving along each line (natural movement flows) (Hillier 1996, 119). A visibility graph based on visual integration and a positive correlation between visibility and movement potential complements the findings; the higher the visual integration of spaces, the more movement they attract (Stöger 2011, 194). Again the spectral range goes from red, for the most visible areas, to blue, for the visually most segregated spaces.

Next, the attention turns to an analysis of doorways. Doorways are physical and symbolic points of transition where private life opens up to, closes of from, and intersects with public life (Laurence 2007; van Nes 2011, 101). The location of doors, therefore, reflects how the urban environment was experienced and where potential activity areas of human interaction between the private and public sphere could have occurred. The spatial boundaries for this analysis are House A1 and Street IX, Avenue B, House A12 and the southern edge of Block A IV, and the western edge of Row A (fig. 3). These boundaries enclose a completely excavated area with sufficient data on the architectural remains necessary for the analysis.

The analysis begins with looking at the connection of building entrances to streets. The entrance can be either directly accessible to a street or separated from it by a fence or front yard, providing some form of seclusion and privacy. An examination of which street(s) a building connects to can also give information on its relation to public space. The number of doorways opening onto a street, then, directly reflects the amount of social activity and chances for interaction that might have occurred in the streets (van Nes 2011, 111). For a comparative survey of these *activity areas* across the entire street network all streets have to be divided in segments of similar lengths. By measuring the occurrence of doorways (number of doors per x meters) per segment, then, the potential activity areas are representatively revealed (Laurence 2007, 103).

Lastly, the way that entrances are positioned to each other influences the probabilities for social control (van Nes and Lopéz 2007, 23.7-23.8; van Nes 2011, 111-113). This article, therefore, reports the number of times that entrances are placed directly across from each other, enjoying an *intervisibility* rate of a 100 percent. This implies that the inhabitants might have experienced high levels of social control.

1 In this article a distinction is made between the terms '*street(s)*' as opposed to avenues (in italics or with a capital when it refers to a specific *street*, e.g. Street V), and 'street(s)' for the collection of all avenues and *streets* in general.

2 The small alleys, stenopoi, running from east to west in the middle of each house block are excluded from the analysis, as they were mainly used for drainage and not for passage (Robinson and Graham 1938, 33-39; Nevett 1999, 55-56). Another hypothesis is that the alleys serve as light sources, allowing light to enter the houses through windows placed along the walls (Graham 1958, 322).

3 Depthmap software is created by UCL's Bartlett School of Architecture.

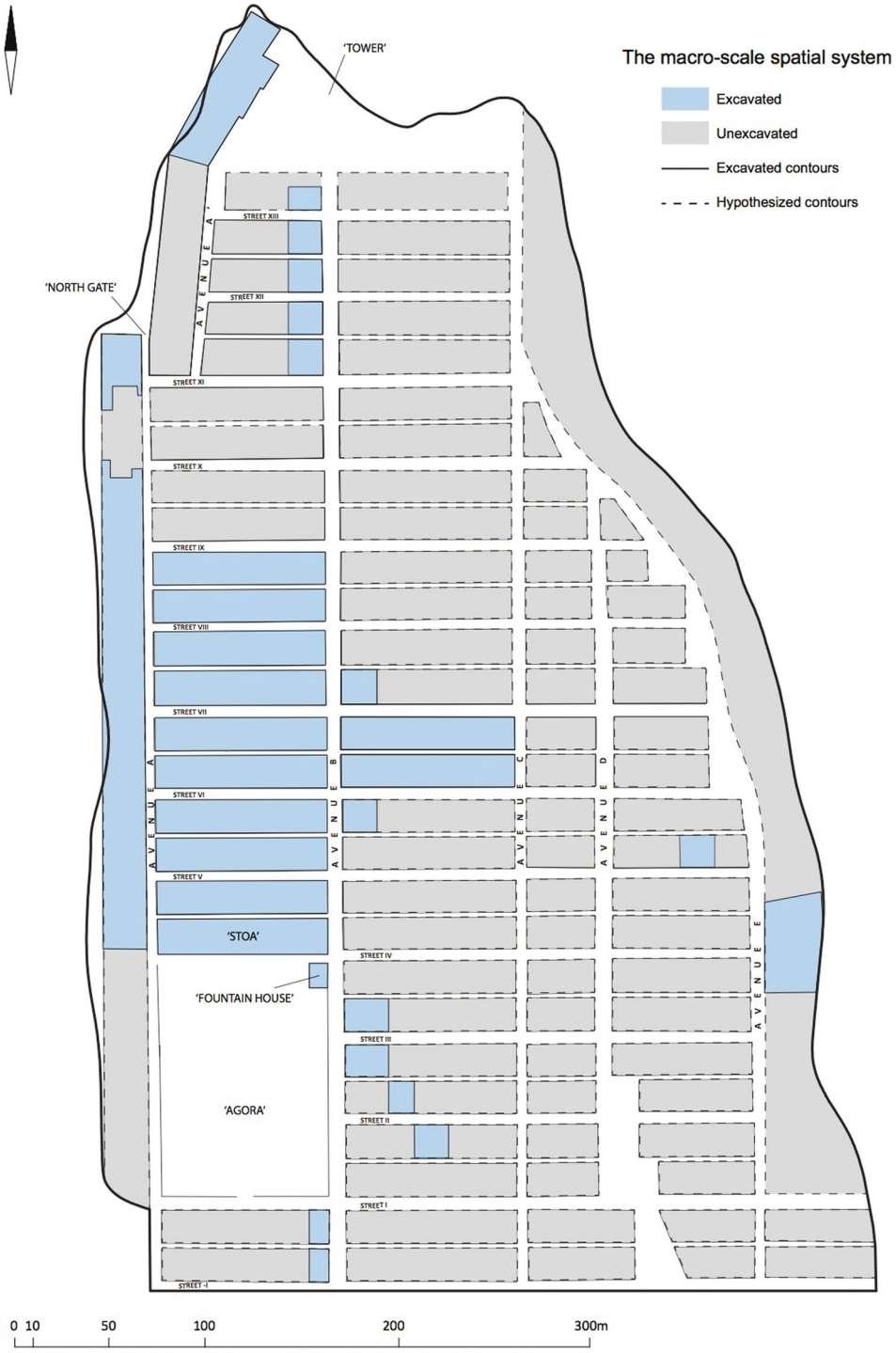

Figure 1. The macro-scale spatial system under study (after Robinson 1946, plate 271)

Macro-scale analysis: the street network

Figure 2 shows the axial map (2a) and the visibility graph (2b) resulting from Depthmap. The integration value per axial line together with the street name that each line represents, is listed in table 1.[4]

The results reveal that the axial line with the highest integration corresponds to Avenue C (line 5), followed by Avenue B (line 4). There is also a noticeable difference between the integration values of *streets* (14 in total), representing east-west movement, and the ones of avenues (9 in total), representing north-south movement. The four axial lines with the highest integration values are all (parts of)

4 As the axial lines have to be straight for the analysis, Avenues D and E consist of more than one axial line, respectively two and three, since they are curved. The different segments are numbered in table 1 according to their position from north to south.

Figure 2. Left: the axial analysis; Right: visibility graph (both created with Depthmap)

avenues. This suggests that the movement of people in north-south direction might have exceeded movement in other directions on the North Hill. The visibility graph, then, demonstrates that, although the range of colours on the map is not far apart and there are only a few highly visible areas, Avenue B probably had the highest visible importance compared to the other streets.

Movement through the city

In his book on Olynthian household and city organisation Nicholas Cahill claims that 'One can easily imagine this avenue [Avenue B] as a lively, bustling thoroughfare with significant interaction between the household and the public streets, with the shops acting as intermediary spaces, accessible both to the stranger from without and to the household from within the house. This avenue thus formed an important commercial artery of the city, a sort of economic axis through the town, similar to the "Westtorstraße" at Priene.' (Cahill 2002, 274). This statement is based on evidence from Robinson's excavations in 1928-1938, which excludes Avenue C, as only a little part of it has been excavated (fig. 1). The axial analysis, however, demonstrates that Avenue C would have had more natural movement opportunities than Avenue B and could therefore have been an even livelier thoroughfare. Future excavations in and around this avenue could provide remarkable information as this avenue probably carried the bulk of movement flows. Subsequently, it turns out that the avenues in general were more prone to movement flows than the *streets*. This could suggest a good connection between the earlier settlement on the South Hill and the newer constructed residential area on the North Hill.

The visibility graph reveals that the city's grid does not seem to give a specifically high rate of visibility to one place over another. This could suggest an ideal of equality (*isonomia*) in the area's organisation and, thus, perhaps between its inhabitants. Archaeologists Hoepfner and Schwandner recognised a form of equality in the adoption of the so-called 'pastas' house type (Hoepfner and Schwandner 1994, 73). This seems, however, contradicted by the housing prices in Olynthos, known from inscriptions. These indicate significant differences between the house values (Nevett 2000, esp. 338-339; Cahill 2002, 276-281). Westgate argues

REFERENCE NUMBER (n = 24)	STREET NAME	INTEGRATION [HH]
5	Avenue C	6.47143
4	Avenue B	5.75238
21	Avenue D (1)	3.23572
1	Avenue A	3.04538
20	Avenue E (1)	2.87619
3	Street I	2.87619
19	Street IV	2.87619
0	Street –I	2.58857
8	Street V	2.58857
9	Street VI	2.58857
10	Street VII	2.58857
11	Street VIII	2.58857
2	Street XI	2.46531
12	Street IX	2.46531
17	Street II	2.46531
18	Street III	2.35325
22	Avenue E (2)	2.25093
14	Avenue E (3)	2.25093
13	Street X	2.25093
15	Avenue D (2)	1.99121
7	Street XIII	1.99121
16	Street XII	1.99121
23	*Agora*	1.39923
6	Avenue A'	1.32747
MINIMUM		1.32747
MAXIMUM		6.47143
MEAN		2.71994

Table 1. Integration [HH] values of the street network

Figure 3. Activity areas in the micro-scale spatial system (after Cahill 2002, 28 fig. 7)

that differences in wealth were not visible from the outside of Classical houses. According to her, this resulted from a prejudice against the projection of economic distinctions between households, while differences in the interior were a different matter (Westgate 2007, 239). As is known from Olynthos' material record, some houses were decorated with mosaic floors or enlarged by expanding into parts of neighbouring houses. However, equality could have been the basis for the construction of the North Hill's housing district.

Micro-scale analysis: doorways

The micro-scale system counts 97 front doors: 70 single doors of little over a meter wide (72.2 percent) and 27 double doors of about two meters width (27.8 percent). There are also 18 examples of a more elaborate form of the exterior doorway, the *prothyron*. This doorway is created by placing the actual entrance(s) maximum two meters inwards of the door aperture in the outer walls of the house. *Prothyra* create an extra, more private, space by distancing the door from the streetscape, while all other entrances in Olynthos are directly connected to the street (Nevett 2009, 80). To investigate whether doorways on certain streets are preferred over others, the analysis looks at the 18 corner houses of the housing blocks, as only these houses were surrounded by more than one street (fig. 3). Out of the 45 doorways, 31 are located on an avenue (68.9 percent) and 14 on a *street* (31.1 percent).

The analysis of doorway occurrences reveals that the lowest value of 6.188 is attributed to Avenue A3 (tab. 2). The highest value is attributed to the eastern segment of Street VII and measures

SEGMENT (*n* = 18)	LENGTH (METERS)	FRONT DOORS	OCCURRENCE OF DOORWAYS
Avenue A 1	49.5	6	8.250
Avenue A 2	49.5	7	7.071
Avenue A 3	49.5	8	6.188
Avenue A 4	49.5	6	8.250
Avenue B 1	44.5	5	8.900
Avenue B 2	44.5	5	8.900
Avenue B 3	44.5	6	7.417
Avenue B 4	44.5	7	6.357
Street V west	43	5	8.600
Street V east	43	7	6.143
Street VI west	43	4.5	9.556
Street VI east	43	6.5	6.615
Street VII west	43	5	8.600
Street VII east	43	4	10.750
Street VIII west	43	6	7.167
Street VIII east	43	7	6.143
Street IX west	43	2	21.500
Street IX east	43	0	0.0
MINIMUM			6.188
MAXIMUM			10.750
MEAN			6.939

Table 2. Occurrence of doorways

10.750.[5] Following the assumption that a higher concentration of doorways increases the chances for social interaction in public space, the analysis shows two areas with the highest social activity; first, the two middle segments of Avenue A (Avenue A 2, Avenue A 3) and Street VIII; secondly, the eastern segments of Street V and Street VI and the two southern segments of Avenue B (Avenue B 3, Avenue B 4). Noteworthy is the observation that the number of doorways significantly increases when proceeding from north to south on Avenue B. And, although information of the eastern side of Avenue B is lacking, the western side already counts 23 doorways – compared to the 27 doorways for the whole of Avenue A. Further, it can be noted that 27 out of the 36 shops (75 percent) are either part of these eight segments or immediately attached to them (fig. 3).[6]

The intervisibility analysis reveals only seven instances in which the doorways of opposing buildings enjoy an intervisibility of a hundred percent. In all these instances, the entrances provide access to domestic spaces, as opposed to commercial spaces. The analysis of the doorways, therefore, suggests that the residents in Olynthos probably experienced limited social control. In addition, social control could also have occurred through windows or by walking in the streets. Unfortunately, there is insufficient evidence to include these variables.

The intersection between 'private' and 'public' space

The fact that most corner houses are connected to the busier avenues rather than to the quieter *streets* could have resulted out of a desire to be part of the social activities that might have occurred in the avenues. Additionally, doorways do not only have a relation to the streets, but also to the buildings' interiors. Therefore, it could also be due to the internal spatial organisation of the 'pastas' house type, which is designed in such a way that the entrance would ideally be placed in the south, east or west.[7] Merely three houses break this ideal organization with an entrance on a *street* in the north, while they also have at least one entrance on the avenue providing access to a shop. Was this perhaps done to create a spatial boundary between the building's public and private space?

Activity levels increase when going from the northernmost segment of Avenue B towards the south; this strongly supports the hypothesis of a commercial centre, or *agora*, to the south of Block A IV (Robinson and Graham 1938, 37; Robinson 1946, 73; Nevett 1999, 55; Cahill 2002, 32).[8] Of the shops, 75 percent is part of the two areas with probably highest activity. The presence of these commercial spaces could, then, further reinforce the amount of activity, resulting in a clustering of shops within Olynthos' residential quarters. The fact that not all shops are located in these areas may indicate that these relied less intensively on the daily movement of people and the activity areas to attract customers. Following this interpretation, one could argue that these shops might have been more specialized or unique in order to survive present competition.

5 The southern part of Street IX has only two doorways and the north part of this street has not been excavated. The values so far, 21.500 for the western segments and 0.0 for the eastern segment, deviate significantly from the median. They are not included in the analysis to achieve a clearer distinction between the other segments in the map.

6 The designations of these shops are indicated in italics in figure 3.

7 It should be noted that the interior organisation of the northern houses of each block was not mirroring the one of the south, but exactly the same. This means that the courtyard in these houses was adjacent to the alley and not to the street and that one of the northern rooms served as the house's entrance.

8 Also the inscriptions of housing prices mentioned before show a negative relationship between the property value and the distance from the agora. This open space has previously been identified as an area for military manoeuvres (Robinson and Graham 1938, 21-22) and as a sanctuary (Hoepfner and Schwandner 1994, 78-79).

Conclusion

This study provided a unique opportunity for a spatial examination of the North Hill of Olynthos in Northern Greece, using space syntax tools. The results suggest a strong connection between the former settlement on the South Hill and the new one on the North Hill. The axial analysis revealed that Avenue C played a prominent role within the street network and would probably yield a significant material culture that has not yet been explored. Furthermore, the analyses identified a possible ideal of equality as the guiding principles when the area was first developed. In addition, the doorway analyses offered insights into social matters, as notions of privacy and limited social control became apparent, and complementary data on Olynthian shops. Further research on the streets, and their connection to domestic and commercial space is desirable to strengthen the observed patterns. Comparisons between Olynthos and other settlements in the region or within the wider scope of Classical Greece or even combined with the Roman world can serve to detect larger regional similarities and differences in antiquity.

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Ancient sources

Diodorus Siculus, 12.34.2

Thucydides, 1.58

Bibliography

Blake, E., 2004. Space, Spatiality, and Archaeology, in L. Meskell and R. W. Preucel (eds), *A Companion to Social Archaeology*. Oxford: Blackwell Publishing, 230-254.

Cahill, N.D., 2002. *Household and City Organization at Olynthus*. New Haven (CT): Yale University Press.

Graham, J.W., 1958. Light-wells in Classical Greek Houses? *Hesperia: Journal of the American School of Classical Studies at Athens* 27, 318-323.

Hartnett, J., 2008. Si quis hic sederit: Streetside Benches and Urban Society in Pompeii. *American Journal of Archaeology* 112(2), 91-119.

Hillier, B. and J. Hanson, 1984. *The Social Logic of Space*. Cambridge: Cambridge University Press.

Hillier, B., 1996. *Space is the Machine*. Cambridge: Cambridge University Press.

Hoepfner, W. and E-L. Schwandner, 1994. *Haus und Stadt im Klassischen Griechenland. Second Edition*. Munich: Deutscher Kunstverlag.

Laurence, R., 2007. *Roman Pompeii: Space and Society. Second Edition*. London: Routledge.

Mylonas, G.E., 1929. *Excavations at Olynthus*, Part 1: *The Neolithic Settlement*. Baltimore (MD): Johns Hopkins University Press.

Nes, A. van and M. López, 2007. Micro Scale Spatial Relationships in Urban Studies: the Relationship between Private and Public Space and its Impact on Street Life, in A.S. Kubat (ed), *Proceedings of the 6th International Space Syntax Symposium, Istanbul, 12-15 June 2007*. Istanbul: Istanbul Technological University, 23.1-23.12.

Nes, A. van, 2011. Measuring Spatial Visibility, Adjacency, Permeability and Degrees of Street Life in Pompeii, in R. Laurence and D.J. Newsome (eds), *Rome, Ostia, Pompeii: Movement and Space*. Oxford: Oxford University Press, 100-117.

Nevett, L.C., 1999. *House and Society in the Ancient Greek World*. Cambridge: Cambridge University Press.

Nevett, L.C., 2000. A Real Estate 'Market' in Classical Greece? The Example of Town Housing. *The Annual of the British School at Athens* 95, 329-343.

Nevett, L.C., 2009. Domestic Facades: A 'Feature' of the Urban Landscape of Greek Poleis?, in S. Owen and L. Preston (eds), *Inside the City in the Greek World*. Oxford: Oxbow Books, 78-87.

Robinson, D.M., 1929-1952. *Excavations at Olynthus*, 14 volumes Baltimore (MD): John Hopkins University Press.

Robinson, D.M. and J.W. Graham, 1938. *Excavations at Olynthus,* Vol. VIII: *The Hellenistic House: A Study of the Houses Found at Olynthus with a Detailed Account of Those Excavated in 1931 and 1934*. Baltimore (MD): Johns Hopkins University Press.

Robinson, D.M., 1946. *Excavation at Olynthus,* Vol. XII: *Domestic and Public Architecture*. Baltimore (MD): Johns Hopkins University Press.

Stöger, H., 2011. *Rethinking Ostia: A Spatial Enquiry into the Urban Society of Rome's Imperial Port-town*. Leiden: Leiden University Press.

Stöger, H., 2014. The Spatial Signature of an Insula Neighbourhood of Roman Ostia, in E. Paliou, U. Lieberwirth and S. Polla (eds), *Spatial Analysis and Social Spaces: Interdisciplinary Approaches to the Interpretation of Prehistoric and Historic Built Environments*. Berlin, Boston: De Gruyter, 297-316.

Westgate, R., 2007. The Greek House and the Ideology

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