

Domestic and social relations in 5th and 4th century BCE
Greece: a re-interpretation of archaeological evidence
from Olynthos using spatial analysis

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University of Wales Trinity Saint David in part
fulfilment of the requirements of the degree of
Master of Arts’

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Master's Degrees by Examination and Dissertation

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Abstract

This research investigates domestic and social relations in Olynthos during the Classical period, drawing on the published results of the archaeological excavations carried out by Robinson and his team in the early twentieth century. The methodology adopts techniques of spatial analysis which utilise floor plans to determine patterns of movement and flow into and around a building. This permits inferences to be drawn about how inhabitants and visitors interacted and the levels of integration/segregation which may have operated within the home. Some comparison with other houses from across the Greek world has been possible. Reference has also been made to more recent work on Olynthos by Cahill and Nevett. The study has contributed to our understanding of the complexity and variety of social and domestic relations across the Greek world during the Classical period. The research demonstrates that, unlike the picture derived from Athenian written evidence, Olynthian society seems to have been relatively open. Visitors appear to have had at least visual access into the heart of the home. No clear evidence for the segregation of groups within the home, by either gender or status, has been found. A housing “genotype” consisting of court, *pastas* and suite of rooms to the north appears to be unique to Olynthos. Evidence has also been put forward that those involved in production and retail activities lived and worked in the city centre alongside purely residential buildings. The evidence from other Greek sites has underscored the variety in house layout and segregation levels within the home which existed in different communities.

Chapter 1: Introduction

1.1 Introduction

Archaeological investigation is often linked to architecture. Archaeologists may seek to locate and excavate built structures or their remains. Until recently the theoretical approaches of archaeology and architecture have been different. It is typically the cultural aspects of a society which are less visible in archaeology, resulting in a focus through a material lens. Architects in contrast, focus their attention on organizational patterns and relationships within a building.¹

Drawing on work by Rapoport and others, Bill Hiller and Juliette Hanson have developed a methodology which interrogates the relationship between social norms and the built environment.² This group of techniques known as space syntax or spatial analysis investigates flows and movement patterns around settlements and buildings. When applied to interiors the methodology is concerned with how building design and layout influence movement flows, specifically with:

“patterns of relations between inhabitants and inhabitants and strangers as they are reflected in the use of interior space in terms of patterns created by boundaries and entrances.”³

In buildings spatial analysis does not focus on the function of spaces but on how access between them may both reflect and be influenced by social norms. This two-way influence can be seen in the contemporary trend for open plan living, reflecting a change in family dynamics where children are no longer ‘seen but not heard’ to

¹ Ching 2014:x

² Rapoport 1990; Hiller & Hanson 1984

³ Foster 1989:40

one where shared family activity takes priority. Newly built homes increasingly reflect this change and older homes may be re-configured by their owners, who wish, or feel pressured, to follow the trend.

This investigation will employ Hillier and Hanson's methodology of spatial analysis to re-examine archaeological data from Olynthos in order to shed light on domestic and social relations, specifically on inhabitant-visitor and inhabitant-inhabitant relations in the city during the 5th and 4th centuries BCE.

1.2 Spatial analysis and archaeology

Hillier & Hanson's theory and methodology has received a mixed response amongst archaeologists. The main concerns can be summarised as follows:

- a focus on the extent to which architecture directly determines behaviour.⁴
- by ignoring symbolic meanings, we “overlook the possibility that design structures have different meanings in different cultural contexts”.⁵
- that spatial analysis cannot reveal anything about the function or meaning of spaces.⁶
- that vision is privileged over other senses, and that the size and shape of spaces, which can influence their place in social interaction, are not taken into account.⁷
- that social control which is based on non-physical forms such as fear, authority and custom cannot be discerned and the non-verbal messages provided through decoration are invisible in spatial analysis.⁸

⁴ Kent 1990:2

⁵ Parker Pearson 1994:30

⁶ Lawrence 1990: 76

⁷ Paliou 2014: 5

⁸ Fairclough 2016:108

- the dependence on access and boundaries requires complete floor plans and knowledge of doorways, which greatly reduces the number of excavated buildings available for analysis.⁹

Despite these concerns, many archaeologists have adopted spatial analysis, recognising its ability to compare large numbers of buildings objectively, and its contribution where written evidence is lacking.¹⁰ This adoption of spatial analysis has occurred alongside archaeological investigation broadening during the twentieth century to include smaller, domestic buildings as well as monumental and civic structures.

1.3 Olynthos

Olynthos is situated between the western and southern arms of the Chalcidian peninsula in northern Greece, about 2.5km from the coast (Fig.1). Its history dates back into the Neolithic period, with early settlement concentrated on the South Hill.¹¹ In response to the Athenian threat in the mid-5th century a decision was taken to move some nearby coastal cities to Olynthos, which was inland and more easily defensible.¹² This appears to have resulted in a major expansion of the city onto the North Hill, which has orthogonal blocks of buildings separated by north-south and east-west streets. The city survived until its destruction by Philip II of Macedon in 348BCE and the enslavement of its inhabitants.¹³

⁹ Cutting 2003: 5; Westgate 2007c: 426

¹⁰For example: Grahame 1997; Westgate 2007c; Drennan 2010; Mustafa 2010; Foster 1989; Thaler 2005

¹¹ Robinson 1938: 18

¹² Thuc. 1.58

¹³ Diod.Sic. 16:52:2-3

The site of Olynthos was re-discovered by Wace in 1915.¹⁴ He was unable to carry out further exploration, but believed that pottery finds which he saw there dated from the Hellenistic period, suggesting that there was some element of re-settlement after 348BCE.¹⁵ This view was not supported by Robinson who carried out the major excavation programme at Olynthos from 1928-1938. Subsequent work at Olynthos, however, has shown that the northwest area of the North Hill (Row A' and blocks Axi - Axihi) do show evidence of Hellenistic activity. If that subsequently is shown to be correct, then it could cause a major upset in the chronology of Greek archaeology in the fourth century BCE, which is based to a great extent on Robinson's dating scheme.¹⁶

With a generous budget and man-power, Robinson and his team exposed a large area of the ancient city. Whilst his methods have produced some justifiable criticism, what he has given us is by far the largest number of excavated houses from a single site known from the Greek classical period.¹⁷ The Olynthos Project (2014-2020), led by scholars from the USA, Greece and the UK, has recently completed six seasons of excavation at Olynthos, investigating both the wider hinterland around Olynthos as well as conducting a very detailed examination of two previously unexcavated houses – one each on the North and South Hills. Detailed results of this study are not yet available and so it is Robinson's excavation data which will provide the raw material which is analysed below.

The city, as currently excavated, has four residential areas: South Hill, North Hill, East Spur Hill and the "Villa" section.¹⁸ With the exception of the South Hill,

¹⁴ Wace 1916:15

¹⁵ Wace 1931: 87

¹⁶ Cahill 2002: 50-51

¹⁷ Kaiser 2015 discusses Robinson's methodological shortcomings in some detail.

¹⁸ Robinson 1938:18-29

Robinson dates all these areas to the 5th and 4th centuries BCE. The South Hill includes earlier housing although it was still occupied during the classical period. If we accept Robinson's chronology, the site has a major advantage. The majority of it is thought to have been occupied for a relatively short period, roughly 80 years.¹⁹ This means that the stratigraphy should be relatively straightforward and that any changes in social norms over the period are likely to be reduced.



Downloaded and modified from: <https://en.wikipedia.org/wiki/Olynthus>
(Accessed 10/11/2019)

Fig. 1: Location of Olynthos

1.4 Domestic life in Classical Greece

Little information regarding domestic life in Classical Greece has survived into modern times. The main sources are texts from Xenophon, Aristotle and Lysias, plus

¹⁹ Thuc.1 .58; Diod.Sic. 16,53,2-3

images on ceramics and references in drama.²⁰ Each of these types of source is challenging. The male, élite bias of the written texts and the patchy information on domestic relationships is further complicated by the specific purposes for which they were produced, creating an unbalanced and partial picture. Drama exaggerates for effect, although situations presumably must be recognisable to the audience to make the dramatist's point. Both these types of source are exclusively Athenian in origin. Images on ceramic vessels are stylized and abbreviated in content and can be equally difficult to understand. Information about the lives of women, *metics*, those of lower economic status and slaves is largely absent. From the later 18th century, the primacy of the literary texts resulted in a view of Greek domestic life which chimed with the European social mores of the time, and has only been seriously challenged in the later twentieth-century.²¹ This perspective viewed Athens as the template for all Greek society. The Athenian texts portrayed élite Athenian men spending their day outdoors on civic duties and in leisure and regarding banausic occupations, which required indoor work, as both physically and morally demeaning.²² Archaeologists have sometimes assumed that also meant geographical marginalization and expected to find such activities on the outskirts of cities.²³ The domestic/female and civic/male divide dominated whilst the idea of "oriental seclusion" of women had a firm hold. As recently as 1985, when discussing the *andron* and *gynaikon*, Keuls could write "the gulf between the two divisions of the house was deeply experienced by the Greeks".²⁴ The development of a feminist approach has been influential in undermining these assumptions and a more nuanced

²⁰ Xen. *Oec.* 7.4-10.13; Aristot. *Oec.* 1.111-1.vl.8; Lys. *Erat.* 1.6-28. For drama e.g. Aris. *Lys.* *Thesm.*

²¹ Katz 1992: 96

²² Aristot. *Pol.* 1277b33; Xen. *Oec.* 4.2-3; Hdt. 2.167

²³ Cahill 2005: 54

²⁴ Keuls 1985:210

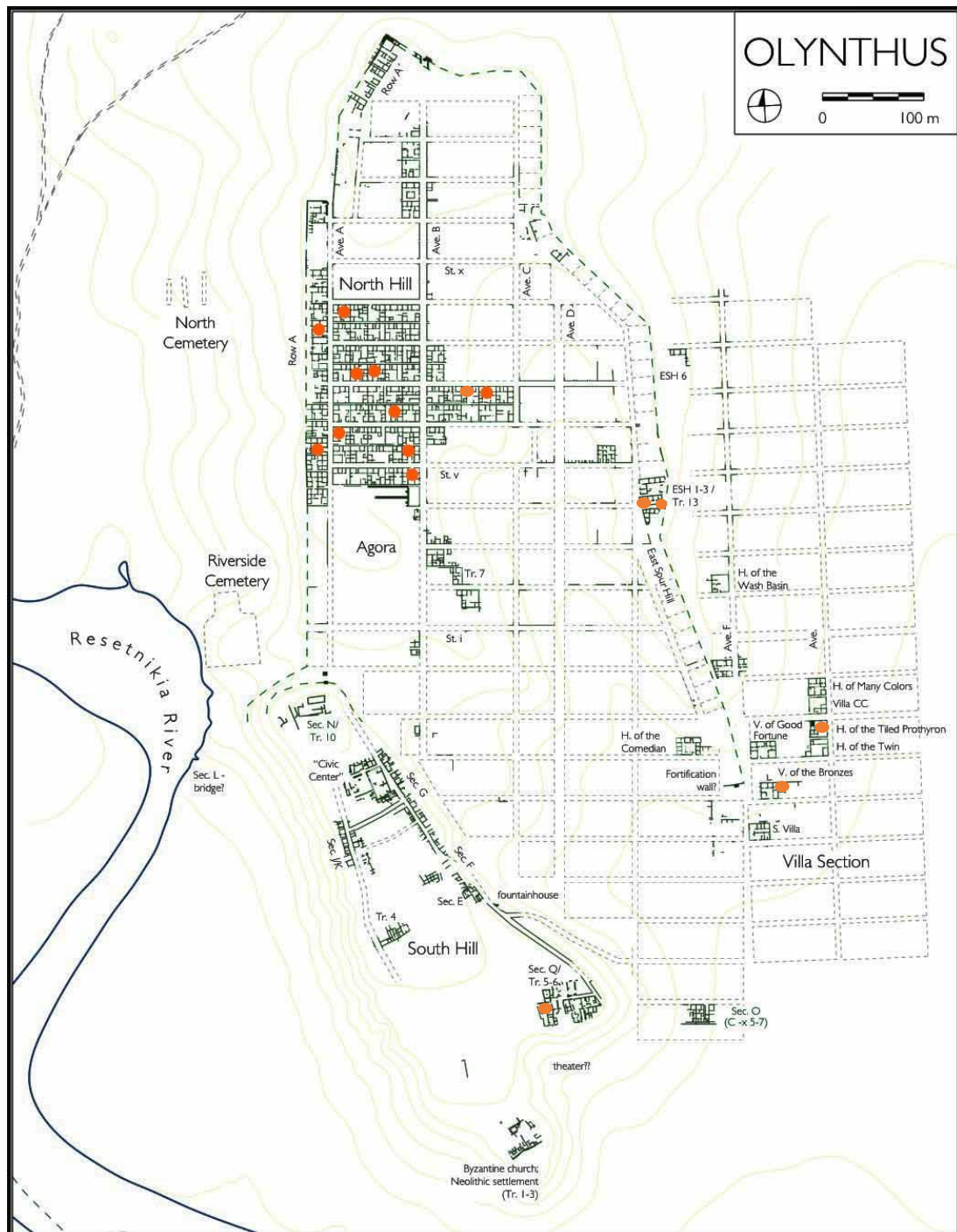
understanding is now developing, which recognises the variation in social norms across the Greek world.²⁵

Extending our understanding of social life at Olynthos is hampered by the complete lack of relevant written evidence from that site, which might otherwise help to counter the dominance of Athens. Researchers are reliant on the archaeological evidence to attempt to understand local norms and customs.

1.5 Dissertation structure

This dissertation will, therefore, re-examine the archaeological evidence from Olynthos, using spatial analysis to see what light can be cast on social relations in the city. Following this introduction, Chapter 2 outlines the key objectives for the research and explains the specific techniques of spatial analysis to be used. Chapter 3 provides summarised data results. The interpretation of the results and a discussion on their implications forms Chapter 4. Chapter 5 places the findings in their wider context and makes recommendations for future work.

²⁵ E.g. Pomeroy 1975; Nevett 1999; Foxhall 2013



Downloaded from: <http://www.newtowninstitute.org/newtowndata/newtown.php?newtownId=1490>
(accessed 10/11/2019)

Fig. 2: city plan of Olynthos showing location of houses selected for analysis

Chapter 2: Methodology

2.1 Chapter outline

In this chapter, the objectives for the research are outlined, the criteria used in selecting houses for analysis are provided and the specific techniques to be used are explained through the vehicle of a case study.

2.2 Objectives

The goal is “to test if employing spatial analysis techniques on domestic buildings can enhance our understanding of social relations in classical Greece, with specific reference to Olynthos.” In order to realise this goal, the following objectives have been formulated.

1. To identify patterns of flow throughout the houses from the perspective of inhabitants and visitors.
2. To identify any underlying rules which may influence house design
3. To contrast results from Olynthos with a small selection of houses from across the Greek world.
4. To assess how valuable spatial analysis is as a methodology in this context

2.3 Selection of houses for analysis²⁶

Selection has been guided by the requirement of spatial analysis that complete floorplans and the entrance from the street and doors into individual rooms are

²⁶ See Appendix 1 for list of houses selected and naming conventions used.

identifiable.²⁷ This limits the number of Olynthian houses suitable for analysis. In many cases the complete floorplan has either not survived, not been excavated or the location of doorways is unclear. From over 100 excavated houses, approximately 65 have complete enough layouts to allow for analysis. Sixteen of these (24%) have been selected, guided by further considerations outlined below. These houses all come from the sections of Olynthos which are not currently believed to have been re-occupied after 348BCE (see Fig. 2).

Where possible the sample includes at least one house from a spread of blocks across the North Hill, as well as examples from the remaining residential areas. Some houses have been chosen as they show atypical features such as larger than usual size or multiple entrances (which may indicate a retail, industrial or residential use). These features may affect the movement flow throughout the house and so are of interest to the study.

Throughout his publications, Robinson refers to all these buildings as houses.²⁸ This is not certain in all cases. Some may be workshops or other production or retail buildings, in part or in whole. It is also possible that some were occupied by more than one family.²⁹ For these reasons the term “building” will be used henceforth in preference to “house”, except when identifying the building by name.

Twelve houses from across Greece have been chosen for comparative purposes. The need for complete house plans and entrances, plus the restricted number of excavated houses available from the classical period, limits the buildings suitable for analysis. Houses have been identified from sites in northern Greece (Thasos, Abdera) where

²⁷ Fisher 2009: 442

²⁸ E.g. Robinson 1930:35

²⁹ Morgan 2010: 59,81

similar climatic conditions apply, as well as from Athens in the south and from Himera in Sicily. These sites may help to identify how Olynthian society was positioned relative to other communities. The minimal sample size from each site means that no firm conclusions can be reached, but outcomes may be suggestive.

2.4 What is spatial analysis?

Spatial analysis is based on the premise that not only do building layouts influence how people live in and move about them, but that social norms and expectations both influence and are reflected in building design i.e. “the relationship between the two is a dynamic one: each modifies and restructures the other.”³⁰ Spatial analysis argues that analysing and interpreting spatial qualities and configurations reveals “the social rules which regulate the interface among people”.³¹ It focuses on properties of adjacency and access, segregation and integration. These are essential to “understanding the patterns of movement and encounter through which social interaction is sustained.”³² Analysis is independent of the size or shape of the buildings and spaces being analysed. Boundaries and doorways between spaces have primacy and demarcate patterns of access.³³ This is demonstrated by two houses which have the same number of rooms and internal layout but place the street entrance and doorways in different positions, as shown below.

³⁰ Bafna 2003: 18

³¹ Osman and Suliman 1994:189

³² Fisher 2009:442

³³ Ostwald 2011: 450

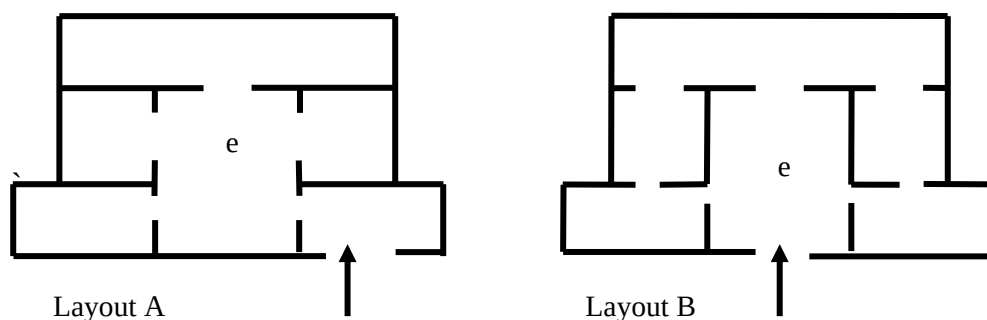


Fig. 3: Impact of different entrances³⁴

In Layout A, in order to move from room to room, individuals must return first to room *e*. In Layout B, once inside the building, the individual has a choice whether to re-enter room *e* to move between rooms or to move in a circular pattern around the building. These apparently small differences fundamentally change the patterns of interaction which are possible.³⁵ Layout A allows greater opportunities for unplanned encounters between individuals whilst Layout B offers greater likelihood of privacy or opportunities for segregation, particularly from visitors.

A second point concerns lines of visibility.³⁶ This is shown by considering the properties of an “L-or T-shaped” space, as shown in the layout below.

The T-shaped area shaded in blue is a single space (Layout C), but not all parts of the space can be seen from all other parts, meaning that it is possible for an individual in one part to be invisible to someone in another. For the purposes of analysis, which is concerned with privacy and segregation, the area needs to be divided into discrete sections, within which all parts are equally visible, as shown by the dotted lines in layout D.³⁷ These are analysed as separate spaces. In the house layouts below, the

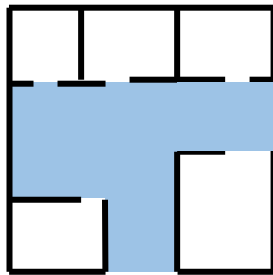
³⁴ Adapted from Ostwald 2011: 459

³⁵ Fisher 2009:441

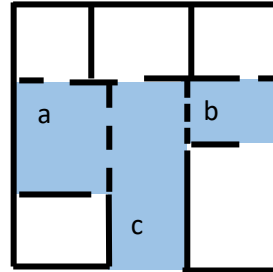
³⁶ Ostwald 2011: 450; Fisher 2009:440

³⁷ Hillier and Hanson 1984:98

boundaries of spaces which are open but have been divided for analytical purposes are shaded in blue.



Layout C



Layout D

Fig. 4: Division of open areas into discrete spaces

2.5. Spatial analysis techniques

Spatial analysis includes a range of techniques, some of which are used by archaeologists to survey landscapes and urban settlements. The specific approaches employed here are appropriate for analysing individual buildings, and are most commonly referred to as access analysis, because they focus on how access around a building is managed and controlled.³⁸ The following section explains three specific techniques used in access analysis: permeability diagrams, relative asymmetry and control values.³⁹ Not all spaces in a building are “rooms”. Some may be open areas or corridors, or uncertain in purpose. For simplicity of description all rooms within a building will henceforth be described as “spaces”. In the diagrams below each space is represented by a letter; the exterior is always treated as a single space and is identified by a crossed circle. Connections between spaces are shown by a line. The length of the line connecting each space is not significant.

³⁸ Hillier and Hanson 1984: 143; Fisher 2009:440

³⁹ Hillier 1998:23-32

A word of caution may be useful here. The individual diagrams and statistics which are produced do not have immediate utility on their own. Their value is revealed when all the results from a building are combined. It has also been argued that the results from an individual building show no more than can be seen from careful examination of the floorplan.⁴⁰ However, because the obvious is translated into mathematical data, the results from one building may be compared with those from many others, and of different sizes, in a level of detail which observation alone does not allow, so that patterns and differences may be discerned. This is where the strength of access analysis lies.

2.5.1 Permeability diagrams⁴¹

Permeability diagrams form the basic unit of access analysis. Their purpose is to demonstrate, in a way which can be analysed mathematically, how spaces in a building connect together.⁴² These spaces are grouped according to their depth from a specific starting point known as the “root”.⁴³

Layouts E and F below show a two-room building, each with different points of access, from outside and inside the building. These layouts demonstrate three properties: *depth*, *choice* and *control*. *Depth* is concerned with the number of spaces through which an individual has to pass to move from one space to another. In Layout E space *a*, which can be accessed directly from the entrance, is designated as being at ‘depth one’; subsequent spaces which are accessed via space *a* are

⁴⁰ Cutting 2003: 2,18

⁴¹ The terminology of spatial analysis is still fluid. Authors also refer to permeability diagrams as justified plans, justified graphs or access plans. Permeability diagrams will be used in this study.

⁴² Ostwald 2011: 449

⁴³ Ostwald 2011:461

designated as depth two, spaces which can only be accessed via two spaces from the entrance are put at depth three and so on.

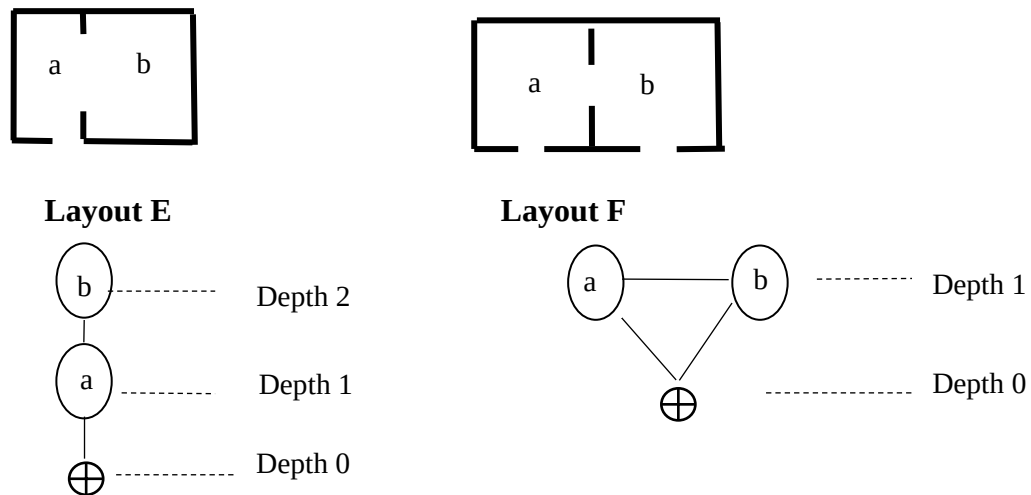


Fig. 5: Layouts showing levels of depth⁴⁴

In Layout E space *a* *controls* access to space *b*, as there is no other means of entry into that space. In Layout F either space can be accessed from the outside as well as internally between the two spaces. This has two effects. Firstly, there are fewer levels of *depth* (only one), as no space requires access through another space and secondly, because there are alternative entry points to each space, the individual has *choice* about how to access that space. This produces a circular plan, whereas Layout E, with no *choice*, has a linear plan.⁴⁵

⁴⁴ Hanson 1998:23

⁴⁵ Hanson 1998: 27

2.6 Case study

In the following section a case study using House Aviii1 will demonstrate how this approach is translated into mathematical data which can then be analysed and interpreted.

2.6.1 House Aviii1

Aviii1 is situated at the northwest corner of a block on the North Hill and is of standard size.⁴⁶ It has a single entrance. There is an exit from room 1 via the alley (*stenopos*). These alleys, which are a standard feature on the North Hill, are narrow, measuring at most 1.4m wide, and are associated with drainage, and in some buildings with rubbish disposal.⁴⁷ They do not appear to have formed part of general circulation space around the city (Fig.7).



Fig. 6: layout showing blocks of buildings on North Hill. (downloaded from www.sithoniahotels.gr/en/monuments-in-sithonia.arxaia-olythos Accessed 8th December 2019.

⁴⁶ Robinson 1946: plate 3

⁴⁷ Cahill 2002:119



Fig. 7: Alley or *stenopos* between north and south sections of blocks.
(downloaded from Wikimedia under the Wikimedia Commons license). Accessed 8th
December 2019.

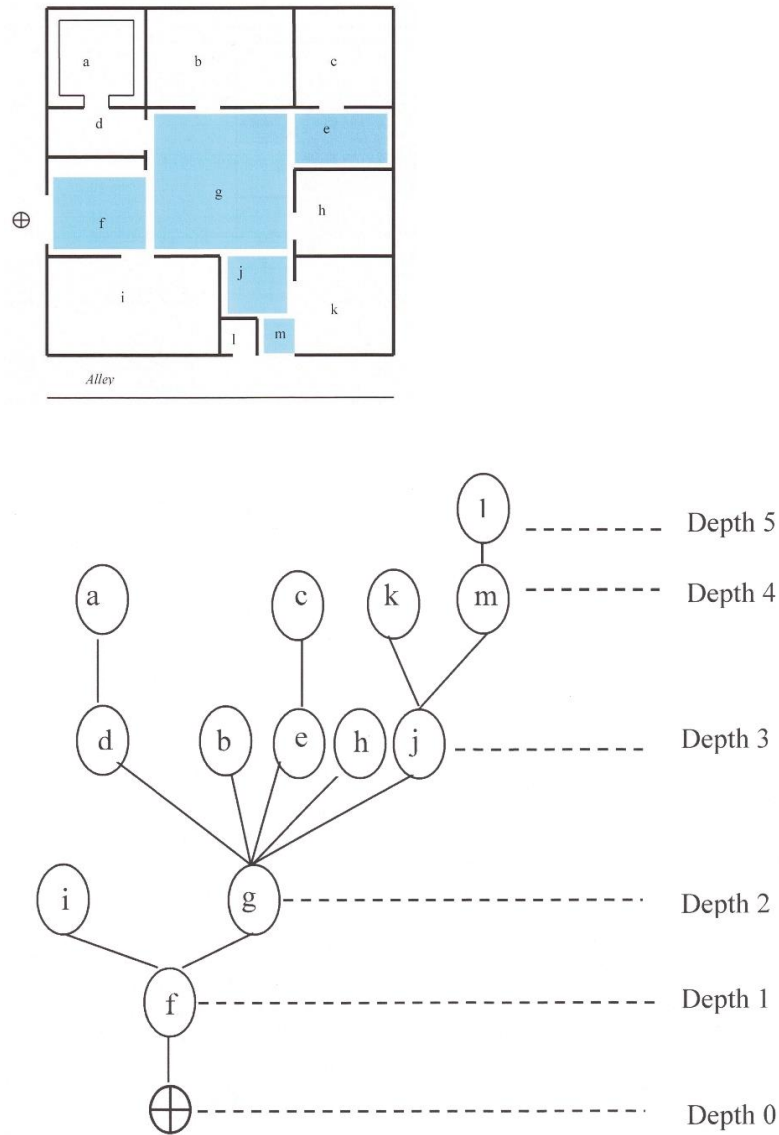


Fig.8: House Aviii1 layout showing sub-divided open areas (shaded) and entrance⁴⁸

In the next section, the procedures for making the various calculations required by access analysis are explained. Permeability diagrams are provided below for each of the spaces as root in order to demonstrate how the building's layout varies when considered from different viewpoints.⁴⁹ Tables of the summary results and brief comments are also provided.

⁴⁸ Robinson 1946: plate 3

⁴⁹ Hillier 2014:21



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	41	3.153	0.358

Figure 9: House Aviii1 -permeability diagram and results for exterior as root

2.6.2 Total depth

The first calculation is to count the number of spaces in the building. This comprises each discrete space, including each of the sub-divided open areas plus the exterior.⁵⁰

⁵⁰ Ostwald 2011: 451

The total in this example is 14 spaces and is shown in calculations as k .

The Total Depth (TD) is then calculated, by multiplying the number of spaces at each depth on the diagram by its specific depth as shown below.⁵¹

Depth	Number of spaces at that depth	Total
Level 0	x 1	0
Level 1	x 1	1
Level 2	x 2	4
Level 3	x 5	15
Level 4	x 4	16
Level 5	x 1	5
Total		41

Table 1: Calculation of Total Depth

2.6.3 Mean depth

From the TD of 41, the Mean Depth (MD) of the spaces in the building from the exterior may be ascertained.⁵² The formula is:

$$\frac{TD}{(k-1)} = \frac{41}{14-1} = 3.153$$

The average depth of any space from the exterior is 3.153 spaces.

2.6.4 Relative Asymmetry

In spatial analysis, *symmetrical* spaces have direct access to each other, *asymmetrical* spaces are separated by one or more other spaces. *Relative Asymmetry* (RA) thus indicates the relative integration or segregation of any space compared to the others in the building.⁵³

⁵¹ Ostwald 2011 452

⁵² Ostwald 2011: 452

⁵³ Fisher 2009:441

Using the formula: $RA = \frac{2(MD-1)}{(k-2)}$ the *RA* is calculated as follows:

$$RA = \frac{2(3.153-1)}{14-2} = \frac{2(2.153)}{12} = 0.358$$

Values for *Relative Asymmetry* range between 0 and 1, those closer to 0 indicate integration whilst those nearer to 1 suggest segregation.⁵⁴ This set of results is presented in future examples as follows:

<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	41	3.153	0.358

Table 2: House Aviii1 - results for exterior as root.

2.6.4 Aviii1 – permeability diagrams

The above calculations analyse the building from the perspective of a visitor at the entrance. From this viewpoint the building layout appears linear and controlling, However, inhabitants, who are familiar with the building, may use different paths to circulate depending on their starting point. For these inhabitants the building may appear less linear, less deep and more symmetrical. In order to demonstrate this, permeability diagrams are produced for each space as the root.⁵⁵ These diagrams and associated results for the remaining spaces are given below.

⁵⁴ Hillier & Hanson 1984:109; Osman 1994:191

⁵⁵ Ostwald 2011: 461

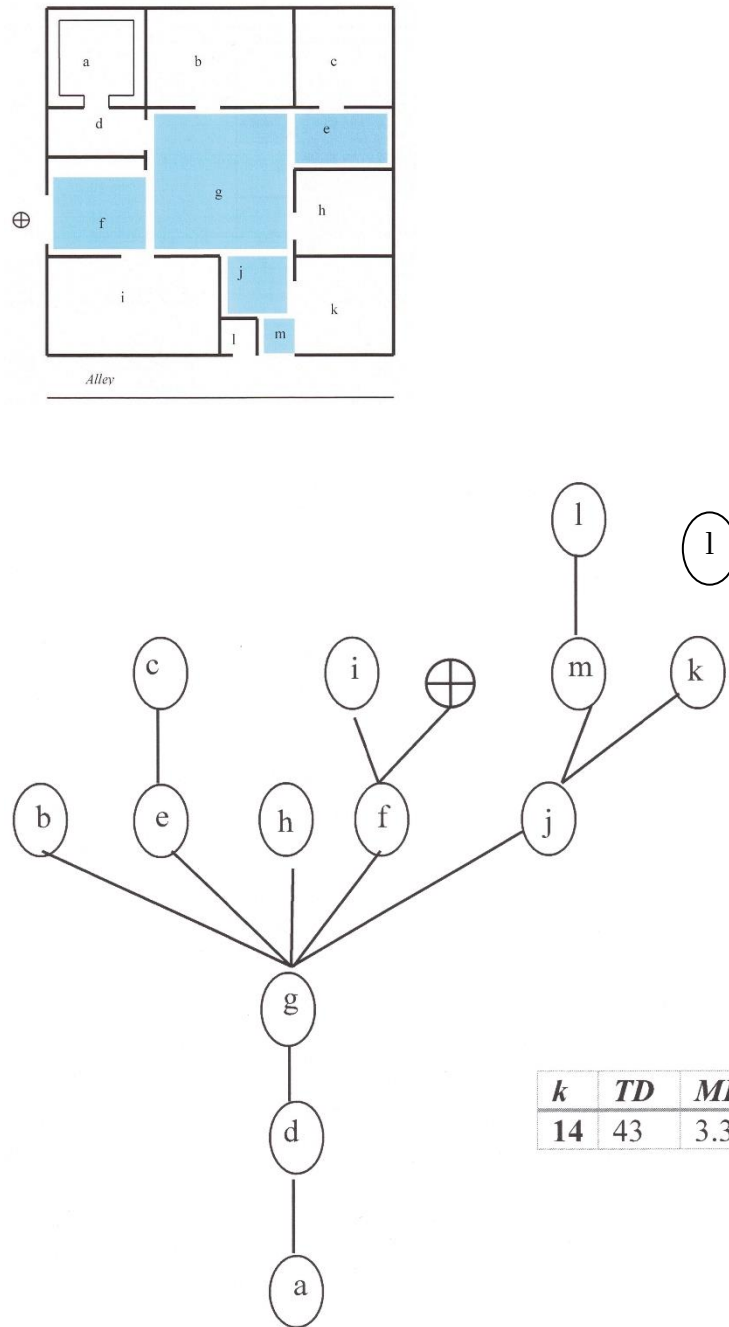
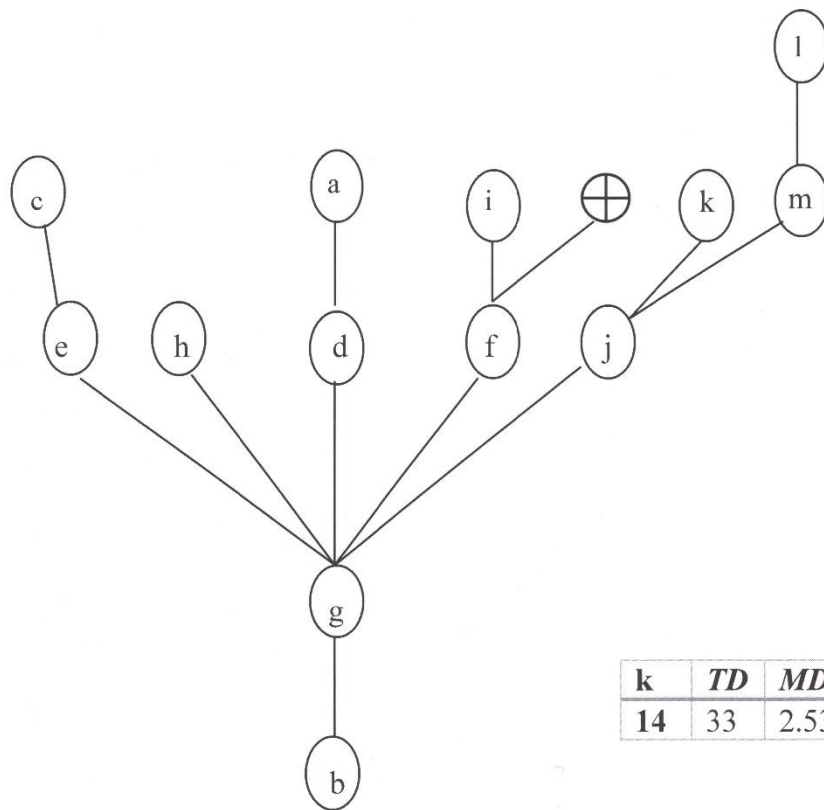


Fig.10: Aviii1 - permeability diagram and results for space *a* as root.

There are 5 levels of depth, each space is an average of 3.307 spaces from the root and the slightly higher *RA* indicates a more segregated space than the exterior.

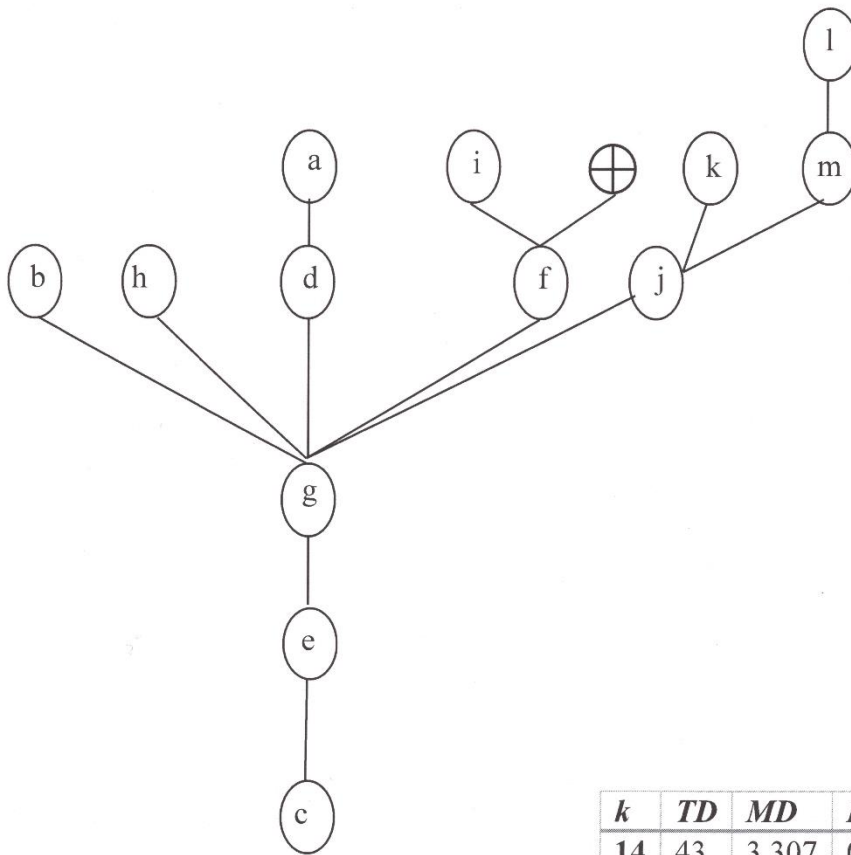


k	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	33	2.530	0.256

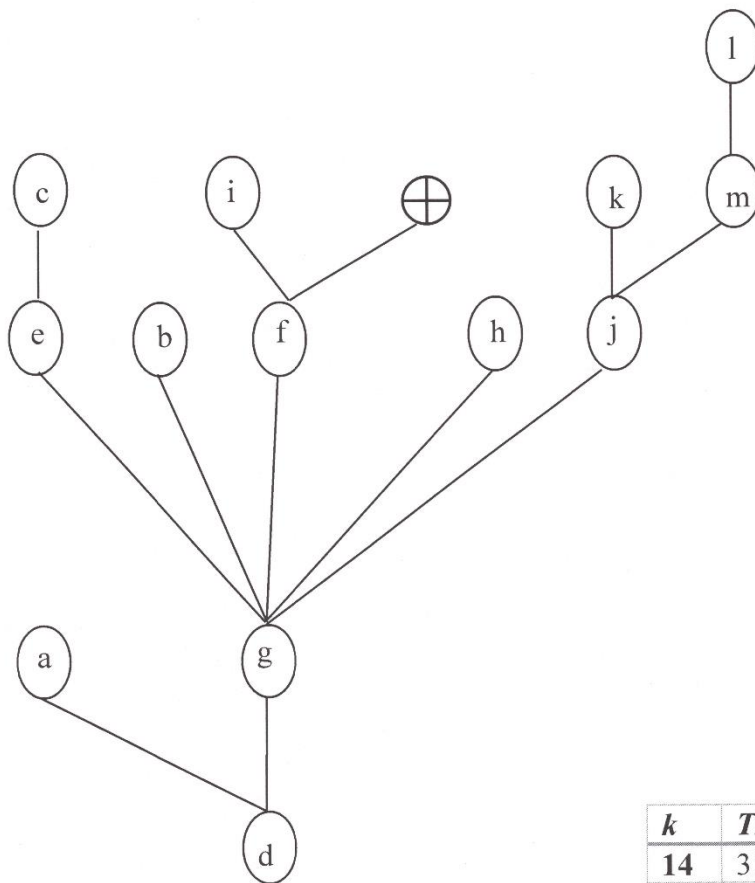
Fig.11: Aviii1 - permeability diagram and results for space *b* as root.

There are four levels of depth from space *b*, with an average depth of 2.530 spaces.

Space *b* is slightly more integrated than space *a*.



This diagram is identical to the depth profile of space a .



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	31	2.384	0.230

Fig.13: Aviii1 -permeability diagram and results for space d as root

Space d above and space e below have identical profiles, have a low *RA*, and are among the more integrated spaces in the building.

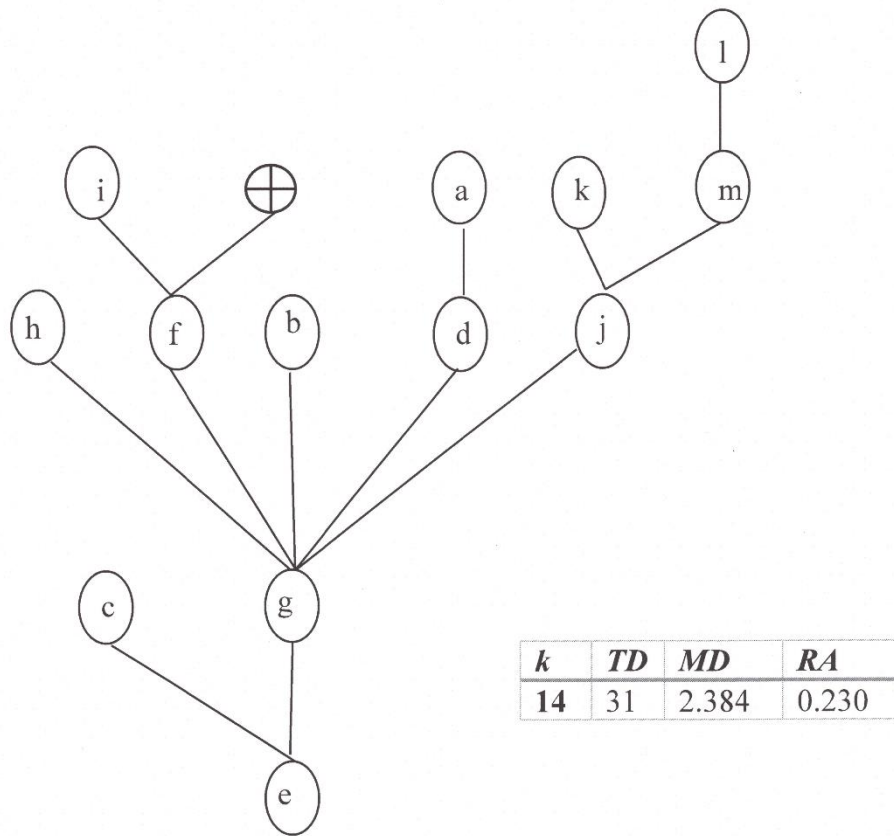
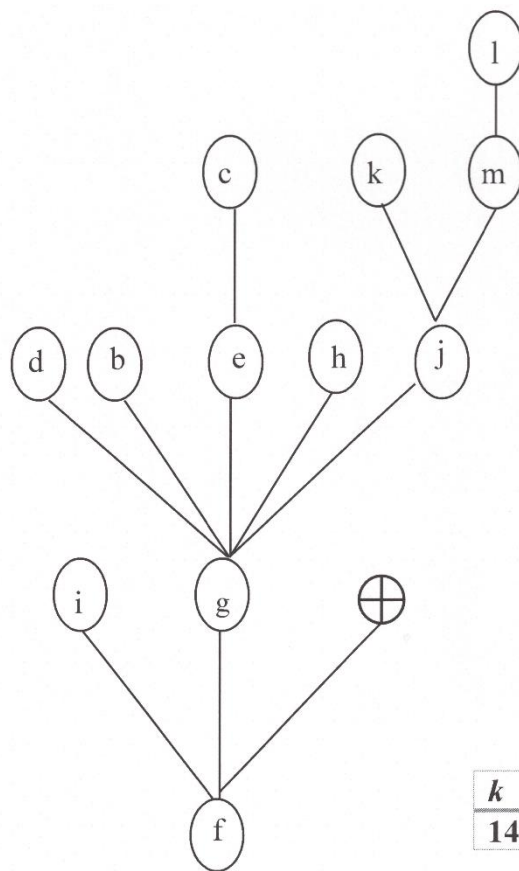
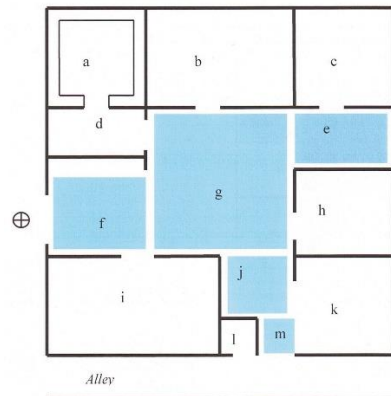


Fig.14: Aviii1 -permeability diagram and results for space e as root.



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	29	2.230	0.205

Fig.15: Aviii1 - permeability diagram and results for space *f* as root.

Space *f* has a lower *MD* and an *RA* reading which shows it is well integrated into the rest of the building.

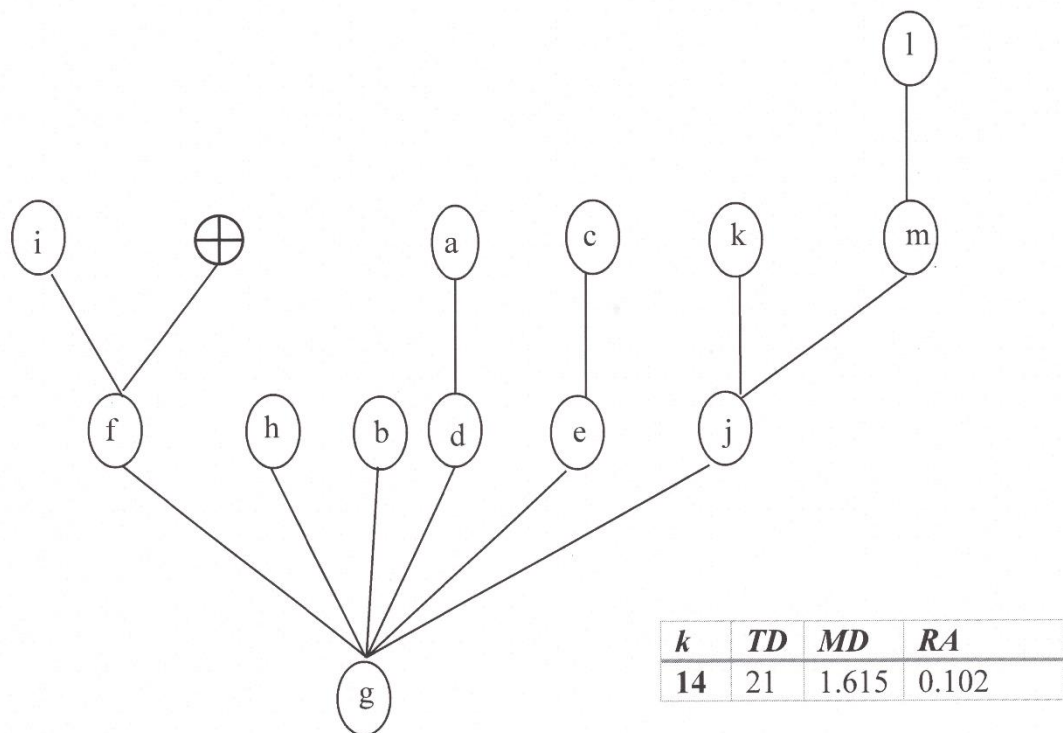
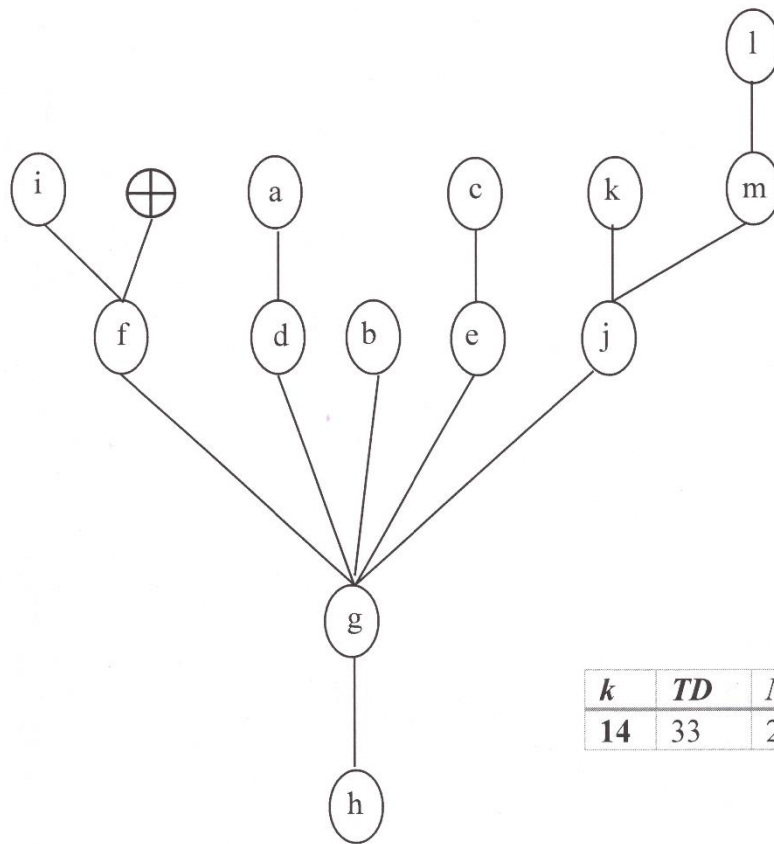


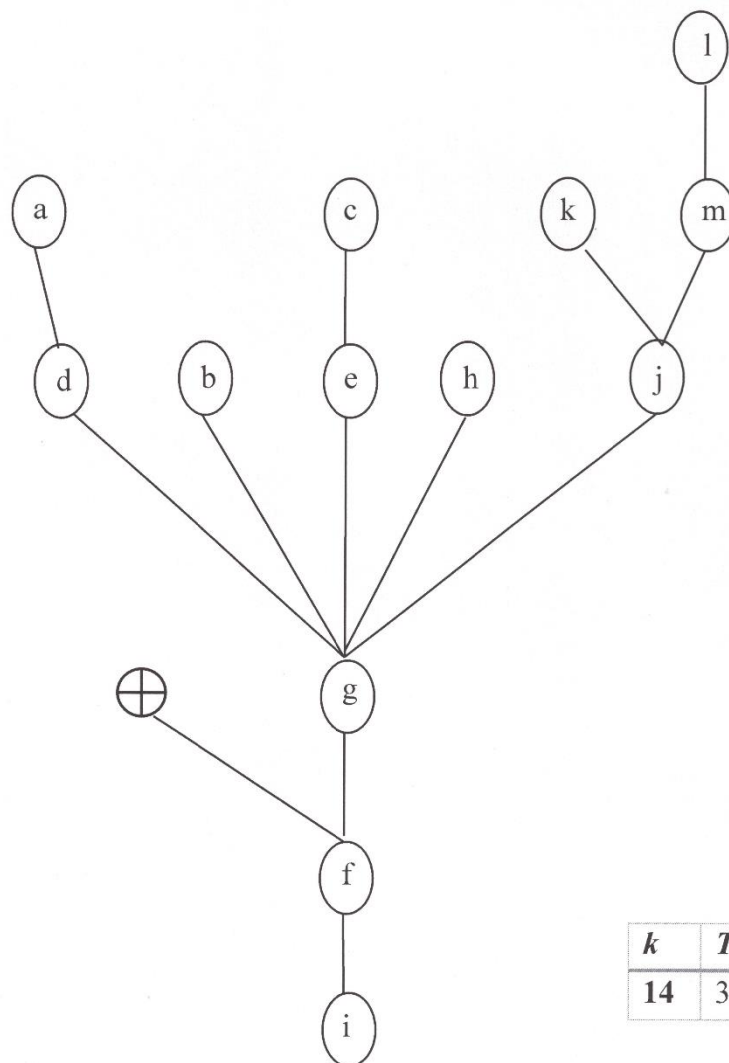
Fig.16: Aviii1 - permeability diagram and results for space *g* as root.

With an *MD* of 1.615 and *RA* of 0.102 space *g* is the most integrated space in the building.



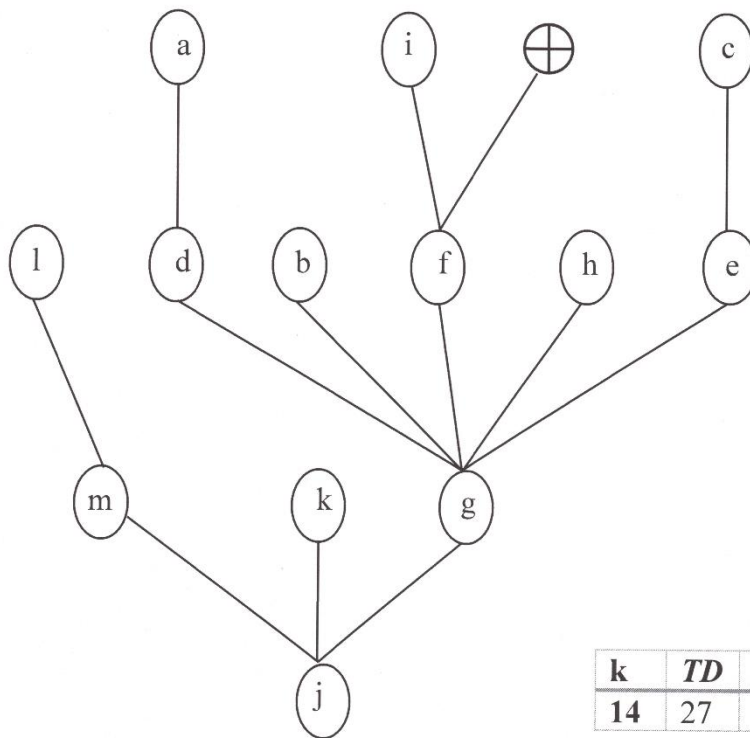
<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	33	2.538	0.256

Fig.17: Aviii1 - permeability graph and results for space h as root.



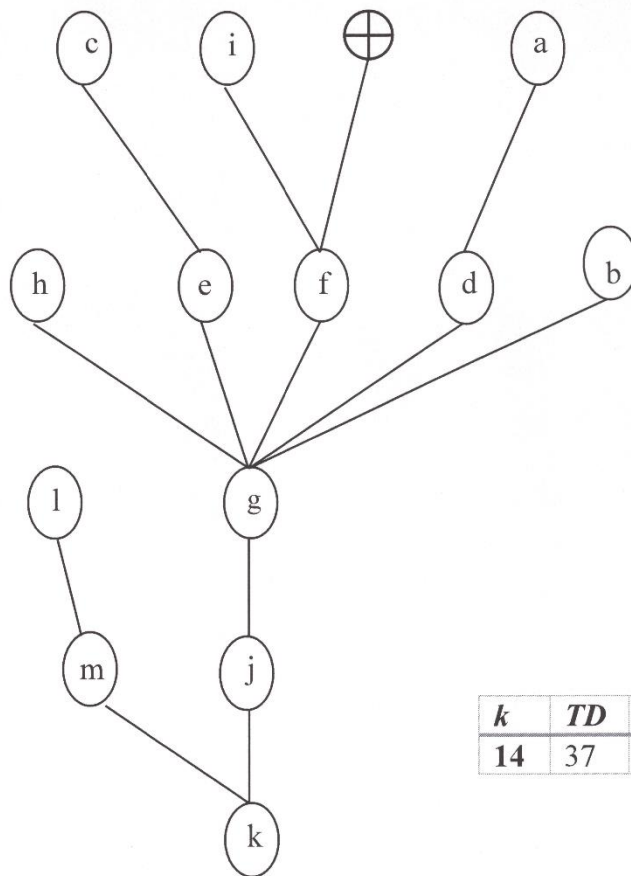
<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	36	2.769	0.294

Fig.18: Aviii1 - permeability graph and results for space i as root.



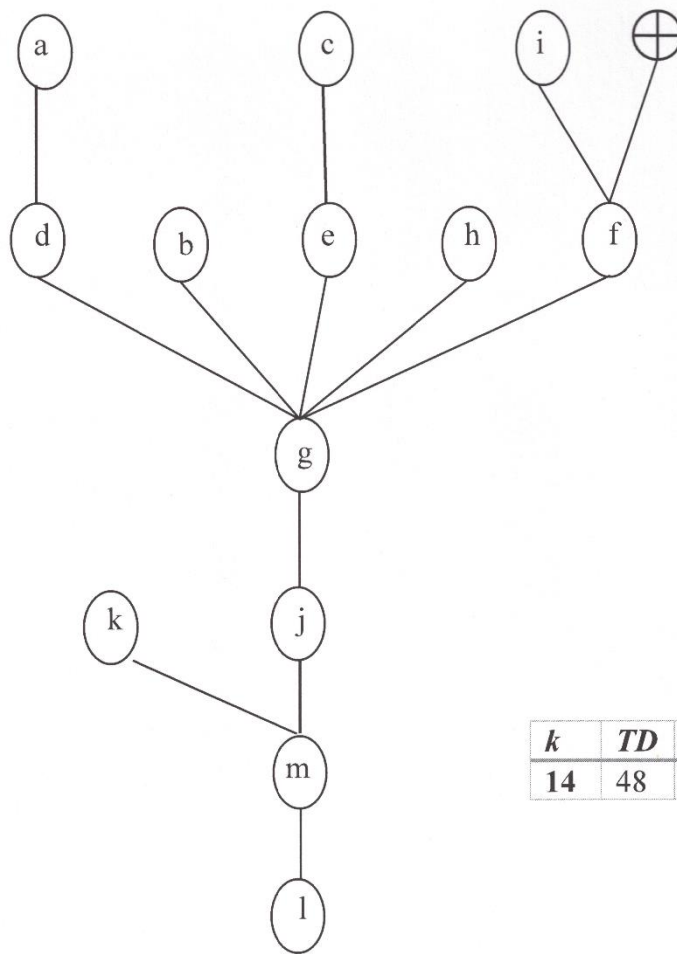
k	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	27	2.076	0.159

Fig.19: Aviii1 - permeability graph and results for space j as root.



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	37	2.846	0.307

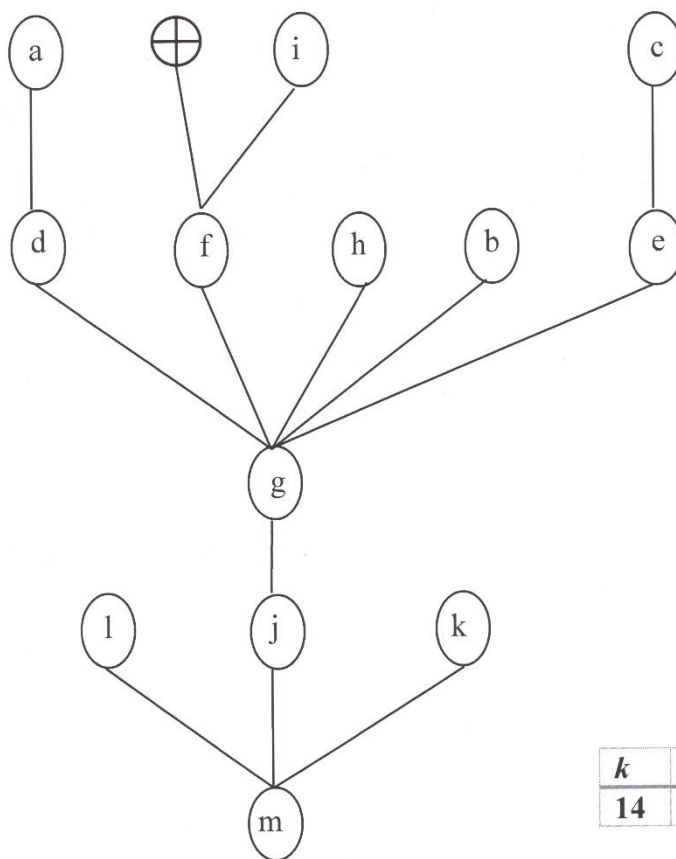
Fig.20: Aviii1 - permeability diagram and results for space *k* as root



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	48	3.692	0.448

Fig.21: Aviii1 - permeability diagram and results for space *l* as root

Space *l* has the highest values of any space, indicating that it is the most segregated space in the building.



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
14	36	2.769	0.294

Fig.22: Aviii1 - permeability diagram and results for space m as root.

The permeability diagrams have produced linear structures for House Aviii1, demonstrating that movement between spaces is directed for the individual, who has no *choice* about which route to take between one space and another.⁵⁶ When viewed from the perspective of individual rooms, *TD* measurements range from 21 to 48. This variation shows that, although the layout remains fixed, viewing the configuration from each room individually provides a very different image of the building and its accessibility issues.

2.6.6. Real Relative Asymmetry (RRA)

The next calculation uses the *RA* result to ascertain the *Real Relative Asymmetry* value for each space. Buildings in Olynthos vary in the number of spaces they contain (the range is seven to sixteen spaces). This results in proportionally smaller *RA* results for those with a large number of spaces compared to those with fewer.⁵⁷ To correct for this, results are re-balanced using a table provided by Hillier and Hanson, using the following formula:

$$RRA = \frac{RA}{D}$$

where *D* (the divisor) is the value derived from Hillier and Hanson's table.⁵⁸

In the case of a building with 14 spaces, this divisor is 0.267. The table below summarises the results for House Aviii1 and gives the *RRA* for each space.

⁵⁶ Ostwald 2011: 460

⁵⁷ The base of all calculations is the *k* value which is the number of spaces per building. As this number increases, the Relative Asymmetry results become proportionally smaller.

⁵⁸ Hillier & Hanson 1984:112. See Appendix 2 of this document.

<i>Space</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>	<i>RRA</i>
$\oplus$	41	3.153	0.358	1.340
a	43	3.307	0.384	1.438
b	33	2.530	0.256	0.958
c	43	3.307	0.384	1.438
d	31	2.384	0.230	0.861
e	31	2.384	0.230	0.861
f	29	2.230	0.205	0.767
g	21	1.615	0.102	0.382
h	33	2.538	0.256	0.958
i	36	2.769	0.294	1.101
j	27	2.076	0.179	0.670
k	37	2.846	0.307	1.149
l	48	3.692	0.448	1.677
m	36	2.769	0.294	1.101
Minimum	21	1.615	0.102	0.382
Maximum	48	3.692	0.448	1.677
Mean	34.928	2.685	0.280	1.050

Table 3: House Aviii1 - Summary data

RRA allows the results for buildings with differing numbers of spaces to be compared accurately. *RRA* values range from zero to infinity, the higher the value the more inaccessible the space will be. In House Aviii1, the most integrated space is space *g*, the most segregated is space *l*.

2.6.7 Control Values (CV)

The final process is to calculate the control value for each space. The more neighbouring spaces an individual space can directly access, the more control it exerts. Control values describe the “pulling power” of a space. Each space in the building is allocated a value of 1. This value is divided by the number of spaces to which the space has direct access. If a space has four neighbours which it can directly access, each of these spaces is allocated a score of $\frac{1}{4}$ or 0.25. The scores awarded to each space by its neighbouring spaces are then totalled. If a space has a total value of over 1 it is a controlling space, if its value is less than 1 it is a

controlled space. This process identifies spaces which exert high control over movement and encounters in a building.⁵⁹

Space	RRA*	CV
⊕	1.340	0.333
a	1.438	0.500
b	0.958	0.166
c	1.438	0.500
d	0.861	1.166
e	0.861	1.166
f	0.767	2.166
g	0.382	3.666
h	0.958	0.166
i	1.101	0.333
j	0.670	0.999
k	1.149	0.666
l	1.677	0.333
m	1.101	1.833
Minimum	0.382	0.166
Maximum	1.677	3.666
Mean	1.050	1

**Divisor for a building with 14 spaces is 0.267*

Table 4: House Aviii1 - Control values

The most controlling spaces (those with a CV of two or over) are *g* and *f* (see Table 4), whilst the most controlled spaces are the exterior, *b*, *h*, *i* and *l*. (those with a CV of less than 0.500), although any space with a control value under 1 is usually seen as controlled.

2.6.8 Interpretation

The case study has demonstrated how the techniques of permeability diagrams, relative asymmetry and control values are applied in practice. This section explains how the resulting data will be analysed.

⁵⁹ Hanson 1998:109

Whilst spatial analysis theory describes the analytical process and interpretation for spaces where the function is known, it does not provide a framework for interpretation where this is less certain.⁶⁰ Individual researchers need to produce their own interpretative strategy. What follows is based on the work of a sociologist (Giddens) and two archaeologists working with domestic buildings: Grahame (Pompeii) and Fisher (Late Bronze Age Cyprus).⁶¹ In order to avoid modern connotations of terms such as ‘public’ and ‘private’, Grahame developed the idea of *presence-availability (PA)* as a non-value laden term to describe the likelihood that others will be available for encounters in any given space.⁶² This is a useful concept when linked to work by Giddens, who drew on the writings of Goffman. He identified two types of situations in which individuals may interact. He names these firstly, as *gatherings* where the encounter is fleeting and usually unplanned. This may be no more than an exchange of glances in a street or corridor. The second type he names *occasions*. These are more formal, may take place in spaces sanctioned for a particular activity, where participants may be specifically invited, and where specialised equipment may be used. Such events include a religious ritual or members of a family preparing food or sitting down, either alone or with guests, to eat in a dining space.⁶³

Fisher was interested in how space was arranged to allow for both interaction and to guard against intrusion.⁶⁴ He drew up a table of correlates which allows us to assess the likelihood that a space will host social interactions. These correlates, (see Table

⁶⁰ Grahame 2000:vii

⁶¹ Grahame 1997; Stoger 2011; Fisher 2014

⁶² Grahame 1997: 150

⁶³ Giddens 1984:70-72

⁶⁴ Fisher 2014:172

5), combined with the concept of *presence-availability* will be used as the basis for further analysis.

<i>High presence-availability</i> • <i>medium to high CV (score of 1-2 = medium, 2+ = high))</i> • <i>low RRA (significantly below the Mean RRA)</i> • <i>generally low depth measure (shallow or close to exterior)</i> <i>Low presence- availability</i> • <i>low CV (score of >1) - space is less subject to intrusion</i> • <i>medium- High RRA (slightly below or above the Mean RRA) - space is not easily accessible/ is less integrated</i> • <i>likely to have high depth measure</i>

Table 5: scoring of presence-availability in a space.⁶⁵

In addition, the use of sightline analysis will be employed to help understand how visual access to the interior of a building may have impacted on inhabitant-visitor contact (see p.100).

The data will be analysed across two dimensions: inhabitant-visitor and inhabitant – inhabitant, in order to meet the first objective of this study which is to “identify patterns of flow throughout the houses from the perspective of inhabitants and visitors”.

The data for House Aviii1 is analysed below.

2.6.8a Inhabitant-visitor analysis

Sustained encounters with visitors are more likely to be *occasions* rather than *gatherings*.⁶⁶ All visitors arrive from the exterior.

⁶⁵ Fisher 2014:172

⁶⁶ Grahame 1997: 159

4 from the exterior) but does have a higher than average *RRA* confirming that it is a segregated space. Access is controlled via space *d* and so is more protected from unexpected intrusion. These characteristics are typical of what might be expected for such a room. However, accessing spaces *a* or *d* requires crossing space *g* which has the highest CV (3.666) in the building and where contact with others is most likely. This might suggest that desire for withdrawal from visitors is not a strong feature in this house. Were this so, it would have been possible to create an entrance to *d* directly from the entrance space *f*, thus avoiding any accidental *gatherings*.

2.6.8b Inhabitant- inhabitant analysis

The linear layout of the building provides inhabitants with no choice regarding the route they follow. Table 6 gives the summarised results from all the permeability diagrams drawn up for House Aviii1 (Figs.9-22). With the exception of spaces *f* and *g*, all other spaces are controlled to a significant degree, with only spaces *d* and *e* having slightly over the average CV, as they control access to spaces *a* and *c* respectively. All these spaces have at most a medium level of *PA* and six spaces score a low level. This suggests that the likelihood of unplanned interaction with others there is small. Having gained access to space *g*, spaces *c*, *k*, *m* and *l* must all be accessed via a further space i.e. they are subject to high control. There is no sign of any differentiation, such as obvious sub-sets of rooms, which might suggest that more than one family group was resident here. Except for the exit to the narrow alley, there are no other spaces with direct access from the street to suggest they had a commercial or industrial use. Space *l*, entered directly from the alley, has a cobbled floor and is approximately 1 metre in width, so is likely to have been used for storage.

Space	Mean depth	RRA	Control value	Potential presence-availability
$\oplus$	3.1	1.340	0.333	Low
a	3.3	1.438	0.500	Low
b	2.5	0.958	0.166	Low
c	3.3	1.438	0.500	Low
d	2.3	0.861	1.166	Medium
e	2.3	0.861	1.166	Medium
f	2.2	0.767	2.166	High
g	1.6	0.382	3.666	High
h	2.5	0.958	0.166	Low
i	2.7	1.101	0.333	Low
j	2.0	0.670	0.999	Medium
k	2.8	1.149	0.666	Low
l	3.6	1.766	0.333	Low
m	2.7	1.101	1.833	Medium

Table 6: House Aviii1 – summary results showing presence-availability potential.

2.6.9 Conclusion

This analysis suggests that House Aviii1 was a domestic residence, inhabited by a single family, that separation of inhabitants from visitors did not have a high priority and that space *g*, controlling access to most spaces in the building, could have been used to oversee the activities of inhabitants, or perhaps acted as a shared workspace. Whilst inhabitants remained in individual spaces, they had a low chance of meeting others by accident but once they moved elsewhere, lack of choice in routes of travel meant that neither inhabitants nor visitors were able to move without the possibility of being seen as they crossed space *g*.

The case study has demonstrated how spatial analysis will be applied to individual buildings, and the methods to be employed in interpreting the findings. The next

chapter will provide results for the remaining fifteen buildings selected for analysis and will test whether the outcomes for House Aviii1 hold true for most buildings.

Chapter 3: Data results

3.1 Chapter structure

This chapter provides a layout, brief description, permeability diagram with the exterior as root, a summary table of results and preliminary analysis for each of the remaining houses. Full permeability diagrams for each building can be found in Appendix 3.

3.2 General features

Whilst identifying room function in Classical houses is challenging, Robinson and his team did distinguish some repeated features. Most houses included a courtyard.⁶⁷ Many houses were divided east/west by a *pastas* which was colonnaded and roofed but open to the court, which was usually located to its south.⁶⁸ This area probably provided a shaded working area in summer and shelter in winter.⁶⁹ About 30% of excavated houses had a room with raised cement borders, which may have been used for formal male dining but probably also had a wider use within the family. These often had an anteroom which promoted privacy.⁷⁰ Robinson's identification of some spaces as "kitchens" is now contested.⁷¹ He saw kitchens and bathrooms as closely associated.⁷² A bathroom was identified in about 30% of the buildings.⁷³ A number of buildings are thought to have included shops or workshops.⁷⁴ In some (Aiv9,

⁶⁷ Robinson 1938:157

⁶⁸ Robinson 1938:159

⁶⁹ Robinson 1938: 143; Mylonas 1940: 394, 399

⁷⁰ Robinson 1938: 170, 176

⁷¹ Foxhall 2007:240

⁷² Robinson 1938: 194

⁷³ Robinson 1938: 142-151, 171

⁷⁴ Robinson 1938:211

Av10), this identification is reasonably secure, in others it is less so.⁷⁵ In order to avoid skewing the results, the buildings have been analysed as a whole. However, when considering domestic and social relations the presence of non-domestic spaces may have an impact on outcomes. This will be discussed in Chapter 4.



Fig. 24: Bathtub found in situ at Olynthos. Downloaded from:
www.odysseus.culture.gr/h/3/eh3562.jsp?obj_is=2481&mm_id17319

Houses on the North Hill were mostly of regular 17.10m x 17.10m size.⁷⁶ Other house sizes varied and are noted individually. House plans are oriented to the north unless otherwise noted.

⁷⁵ Cahill 2002: 273-4

⁷⁶ Robinson 1946:126



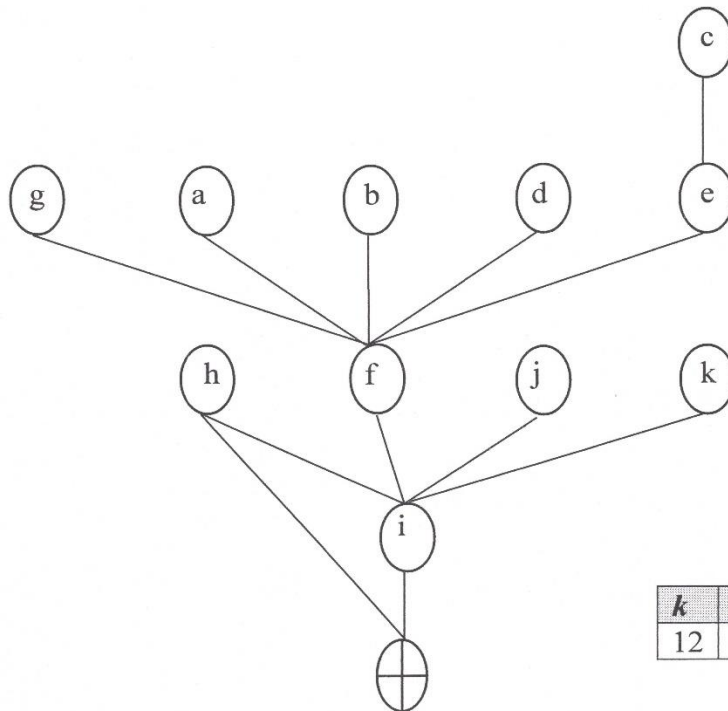
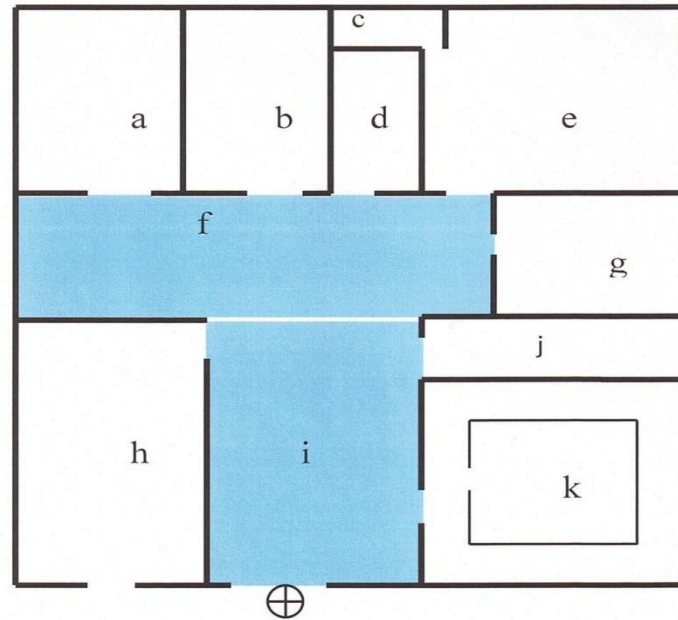
Fig. 25: Avii4 – reconstruction of court and pastas area Downloaded from: http://www.learningsites.com/Olynthus/Olynthus_home.php

Abbreviation	Definition
k	total spaces in a building including the exterior
TD	total number of connections between the root and all other spaces
MD	average depth of any space from the root
RA	measure of segregation from other spaces
RRA	re-balanced RA to account for different number of spaces in different buildings
CV	level of control which a space exerts over its neighbours
*	divisor used to calculate RRA using a table provided by Hillier & Hanson (1984:112)

Table 7: Summary of abbreviations

3.3 Avii4

House Avii4



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
12	28	2.545	0.309

Fig.26: Avii4 layout and permeability diagram with *exterior* as root⁷⁷

⁷⁷ Robinson 1938: plate 100

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	28	2.545	0.309	1.084	0.200	Low
a	26	2.363	0.272	0.954	0.166	Low
b	26	2.363	0.272	0.954	0.166	Low
c	34	3.090	0.418	1.466	0.500	Low
d	26	2.363	0.272	0.954	0.166	Low
e	34	3.090	0.418	1.466	1.166	Medium
f	16	1.454	0.090	0.315	4.700	High
g	26	2.363	0.272	0.954	0.166	Low
h	30	2.727	0.345	1.210	0.200	Low
i	18	1.636	0.127	0.445	4.166	High
j	28	2.545	0.309	1.084	0.200	Low
k	28	2.545	0.309	1.084	0.200	Low
Minimum	16	1.454	0.090	0.315	0.166	
Maximum	34	3.090	0.418	1.446	4.700	
Mean	24.5	2.635	0.284	0.997	-	

*Divisor for a building with 12 spaces is 0.285

Table 8: Avii4 – summary data

3.3.1 Description

The northern end of space *i* is cobble-paved.⁷⁸ Space *k* has a raised border painted yellow, a cement floor and red, yellow and white stucco walls. Robinson describes space *j* as an anteroom for space *k*, as it also has a cement floor and painted stuccoed walls.⁷⁹ However, neither his plans nor his description show an entrance between the two.⁸⁰ Space *j* has therefore been analysed as an independent space. Space *c* was probably a bathroom. A gap in the cement-lined floor was the right size for a bathtub (see example in Fig. 24). Space *h* has an entrance from the street as well as access into the interior of the building and may have been a shop or large storeroom.⁸¹

⁷⁸ Robinson 1938:119-121

⁷⁹ Robinson 1938:120

⁸⁰ Robinson 1938:119-120, and plate 100.

⁸¹ Robinson 1938:120

3.3.2 Inhabitant-visitor analysis

Alternative access into the house via space *h* gave visitors a choice of entrance. If space *h* was used then a visitor would enter the main part of the house close to space *f* and access to the more segregated areas. Entering via space *i* gives access to space *k*, which due to its raised border may have been a dining room and a possible venue for *occasions*.⁸² The low *CV* and relatively high *RRA* of space *k* and its proximity to the entrance indicate that it would have low *PA*, allowing segregation of visitors if desired.

3.3.3 Inhabitant-inhabitant analysis

From the inhabitants' perspective this house is linear. There are two main circulation spaces, *f* which gives access to *a*, *b*, *d*, *e* and *g*, and space *i* which controls access to *k*, *j* and *h*. Each has a high *CV* (4.700 and 4.166 respectively). Only space *e* also has a higher than average control value, as it controls access to space *c*. Other spaces have a low level of *PA* suggesting that they are segregated areas, where inhabitants were less likely to encounter visitors or each other if that was required.

Overall, the house offers opportunities for segregation but the dual access points suggest that this was not of prime importance.

⁸² Both Cahill and Nevett refer to these spaces as “*andrones*”. This term derives from Athenian literature and is linked to symposia or exclusive male drinking parties. It is not clear that such a use is appropriate at Olynthos, where they may have been used as dining rooms for guests or for more general purposes. In this study such spaces will be referred to as “raised-border rooms”.

3.4 House Avii6

House Avii6

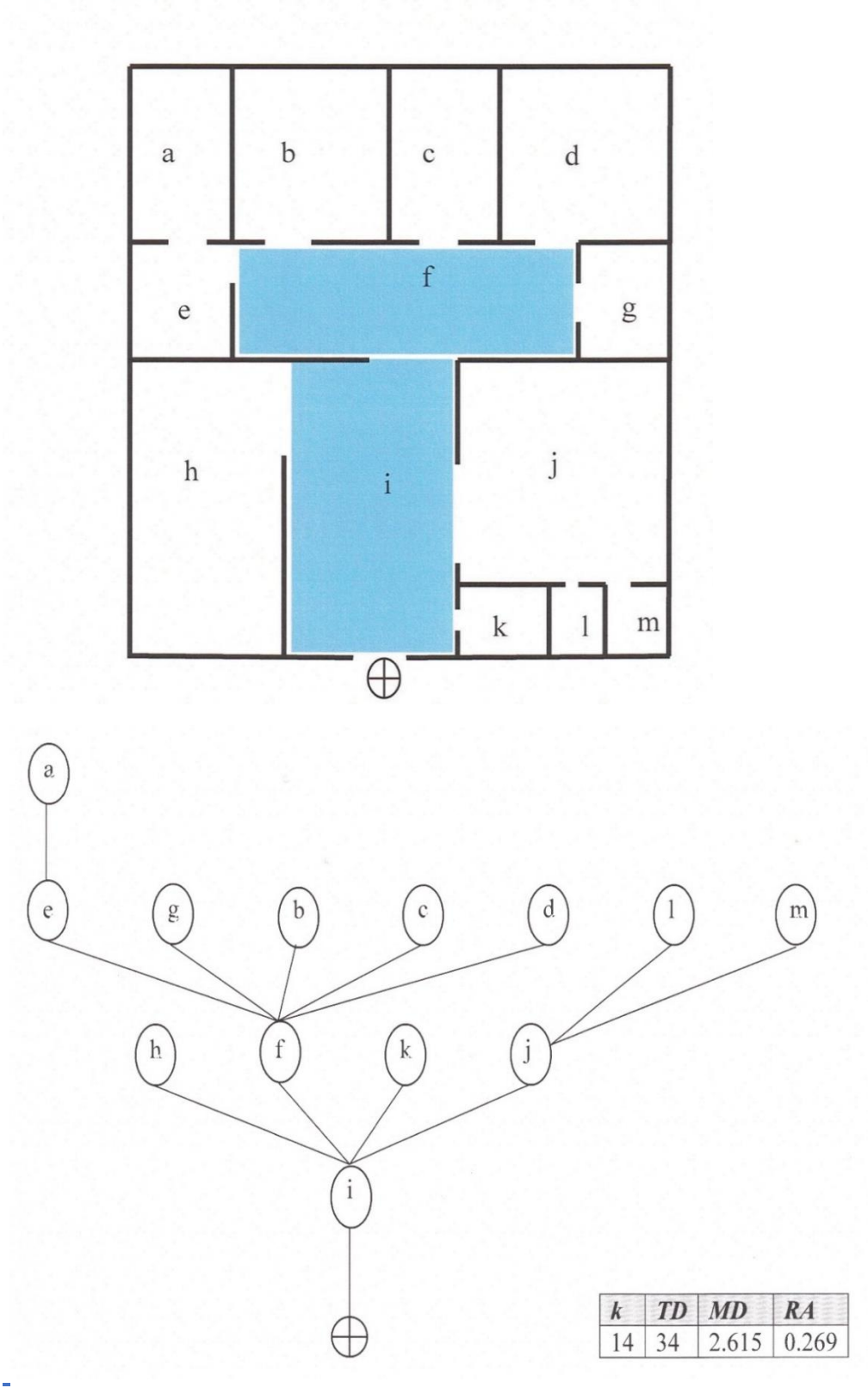


Fig.27: Avii6 – layout and permeability diagram with exterior as root⁸³

⁸³ Robinson 1938: plate 101

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	34	2.615	0.269	1.007	0.200	Low
a	40	3.076	0.346	1.295	0.500	Low
b	34	2.615	0.269	1.007	0.166	Low
c	34	2.615	0.269	1.007	0.166	Low
d	34	2.615	0.269	1.007	0.166	Low
e	32	2.461	0.243	0.910	1.166	Medium
f	22	1.692	0.115	0.430	4.700	High
g	34	2.615	0.269	1.007	0.166	Low
h	34	2.615	0.269	1.007	0.200	Low
i	22	1.692	0.115	0.430	3.496	High
j	30	2.307	0.217	0.812	2.200	High
k	32	2.461	0.243	0.910	0.200	Low
l	39	3.000	0.333	1.247	0.333	Low
m	42	3.230	0.371	1.389	0.333	Low
Minimum	22	1.692	0.115	0.430	0.166	
Maximum	42	3.230	0.371	1.389	4.700	
Mean	33.07	2.543	0.256	0.961	-	

*Divisor for a building with 14 spaces is 0.267

Table 89: Avii6 – summary data

3.4.1 Description

Avii6 has one entrance and provides no evidence for anything other than residential use. Space *j* contains a stone-curbed hearth. Space *m* which has a cement floor is identified as a bathroom.⁸⁴

3.4.2 Inhabitant-visitor analysis

Avii6 has a linear layout. Space *h* has the potential to be a receiving room, as it is close to the entrance. Space *k*, identified by Robinson as a kitchen, can be accessed from the main entrance area allowing visitors direct entry to what is usually one of

⁸⁴ Robinson 1938: 123

the least accessible areas and suggests that inhabitants were not overly concerned with privacy from outsiders.⁸⁵

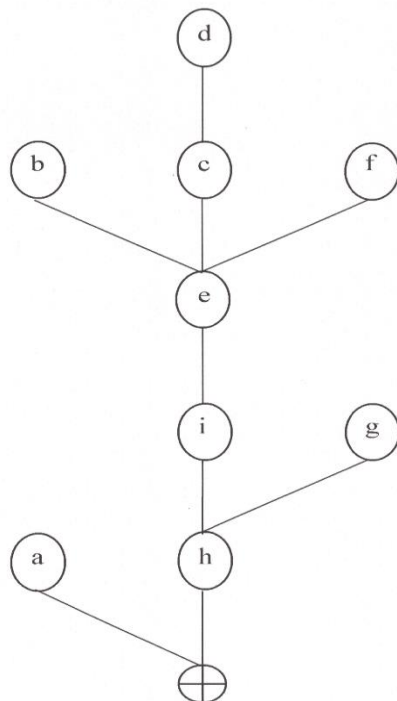
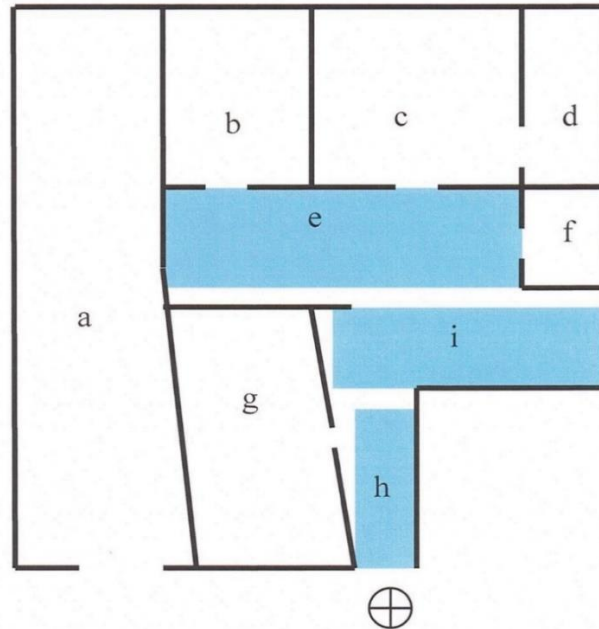
3.4.4 Inhabitant-inhabitant analysis

Spaces *f*, *i* and *j* have high control values (4.700, 3.396 and 2.200 respectively). Space *e* has a slightly raised *CV* as it controls access to space *a*. All other spaces have low levels of *PA* with *CVs* of 0.500 or less. This building is challenging to interpret. The northern run of spaces follows a common layout pattern, but the southern section does not. The kitchen/bathroom complex adjacent to the main entrance, if correctly identified, is unusual on this site and cannot be explained.

⁸⁵ Robinson 1938: 123

3.5 House Avi8

House Avi8



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
10	26	2.888	0.472

Fig.28: Avi8 – layout and permeability diagrams with exterior as root⁸⁶

⁸⁶ Robinson 1938: plate 97

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	26	2.888	0.472	1.542	1.333	Medium
a	34	3.777	0.694	2.267	0.500	Low
b	26	2.888	0.472	1.542	0.250	Low
c	24	2.666	0.416	1.359	1.250	Medium
d	32	3.555	0.638	2.084	0.500	Low
e	18	2.000	0.250	0.816	3.000	High
f	26	2.888	0.472	1.542	0.250	Low
g	28	3.111	0.527	1.722	0.333	Low
h	20	2.222	0.305	0.996	2.000	High
i	18	2.000	0.250	0.816	0.583	Medium
Minimum	18	2.000	0.250	0.816	0.250	
Maximum	34	3.777	0.694	2.267	3.000	
Mean	24.4	2.799	0.449	1.468	-	

**Divisor for a building with 10 spaces is 0.306*

Table 10: Avi8 – summary data

3.5.1 Description

A raised-border room, to the right of the entrance, was at some point integrated into the living space of neighbouring Avi10. Its annexation results in a non-standard outline for both buildings.⁸⁷ Despite this evidence Robinson analysed that space as part of Avi8.⁸⁸ For the purpose of this analysis the room has not been included.

Robinson described space *a* as an animal pen or storage area.⁸⁹ Space *g* has a cement floor, with evidence of grape treading facilities suggesting that a significant area in this building was given over to agricultural processing.⁹⁰ Cahill believes that Avi8 was “largely non-domestic in character” and was taken over by its neighbour Avi10.⁹¹ The building lacks a court, unless space *h* which is narrow and appears to be unsurfaced, had this function. Space *d*, which Robinson identified as a flue for the

⁸⁷ Robinson 1938:112; Cahill 2002:245

⁸⁸ Robinson 1938: 112

⁸⁹ Robinson 1838:111

⁹⁰ Robinson 1938: 112

⁹¹ Cahill 2002: 248, 287

kitchen (space *c*) produced 34 silver tetradrachms which hints at commercial activity.⁹²

3.5.2 Inhabitant-visitor analysis

There is no obvious space for receiving visitors. If space *g* is correctly linked to grape treading, visitors had no option but to access the building via spaces *h*, *i* and *e* (CVs of 2.000, 0.583 and 3.000 respectively) with opportunities to encounter residents as they did so. However, if this is a largely commercial building, segregation from visitors would be undesirable.

3.5.3 Inhabitant – inhabitant analysis

Inhabitants (if any) occupied a reduced floor area at ground level – only four spaces plus the small court area. Spaces *e* and *h* have high CVs (3.000 and 2.000 respectively) with most other spaces opening directly into them. The remaining spaces are segregated, space *d* being particularly inaccessible. Cahill notes the possibility that the whole ground floor was given over to production.⁹³ The annexation of the raised-border room by Avi10 suggests that living space was not a high priority for the owner of Avi8. Two stair bases were identified by Robinson so it is possible that living space was on the upper floor and has not survived.⁹⁴

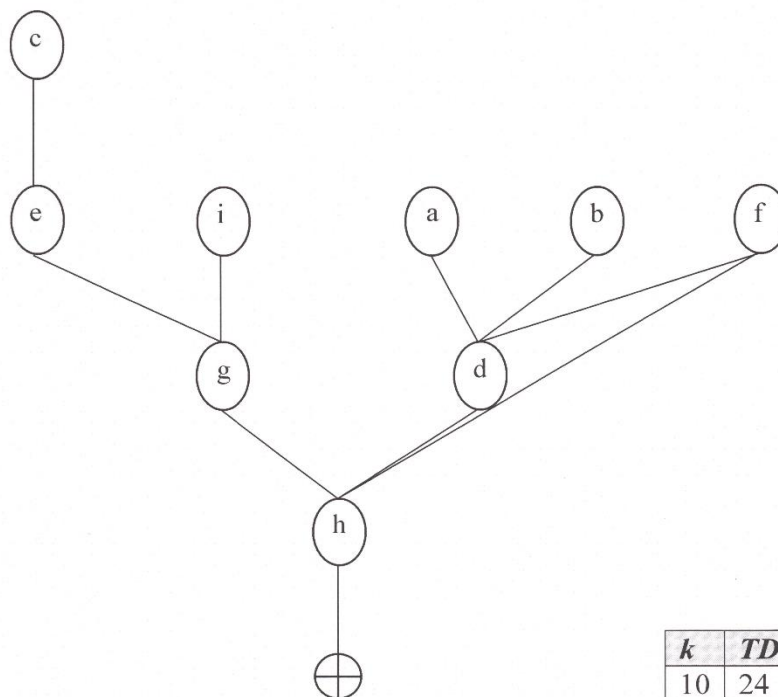
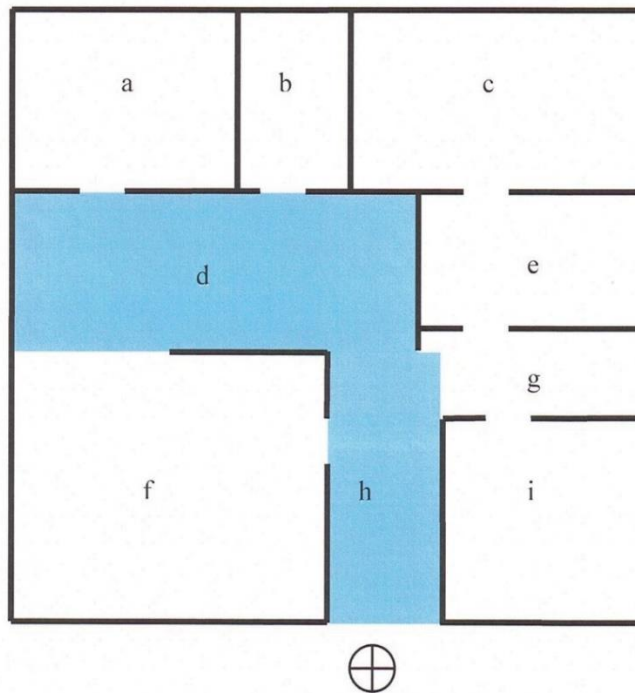
⁹² Robinson 1938:111-113

⁹³ Cahill 2002: 244-5

⁹⁴ Robinson1938: 112-3

3.6 House Av2

House Av2



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
10	24	2.666	0.416

Fig.29: Av2 – layout and permeability diagram with exterior as root⁹⁵

⁹⁵ Robinson 1938: plate 95

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	24	2.666	0.416	1.359	0.250	Low
a	26	2.888	0.472	1.395	0.250	Low
b	26	2.888	0.472	1.395	0.250	Low
c	32	3.555	0.638	2.084	0.500	Low
d	18	2.000	0.250	0.816	2.750	High
e	20	2.222	0.305	0.996	1.333	High
f	25	2.777	0.395	1.290	0.500	Low
g	18	2.000	0.250	0.816	1.750	High
h	15	1.666	0.166	0.542	2.083	High
i	26	2.888	0.472	1.395	0.333	Low
Minimum	15	1.666	0.166	0.542	0.250	
Maximum	32	3.555	0.638	2.084	2.750	
Mean	23	2.555	0.383	1.208	-	

**Divisor for a building with 10 spaces is 0.306*

Table 11: Av2 – summary data

3.6.1 Description

Robinson remarks that the layout of Av2 is “quite regular and calls for little comment”. He notes that space *f* was probably a court, but provides no further clarification.⁹⁶ Nothing is reported about other architectural features.

3.6.2 Inhabitant-visitor analysis

Although no evidence for a raised border was found, spaces *i* and *g* have the typical configuration of a raised-border room and anteroom. Space *i* has a low level of *PA*, space *g* scores high. This follows the pattern of other houses with raised-border rooms and anterooms (Bvi5 -spaces *b* and *j*; Bvi7 - spaces *g* and *d*; ESH2 -spaces *d* and *f*). The unusual feature is that space *g* also gives access to space *e* and from it to space *c*, a feature which is not seen elsewhere. Spaces *c*, *e*, *g* and *i* are a suite of inter-connecting spaces, which means that separation of visitors in space *i* is less

⁹⁶ Robinson 1938: 89-90

assured. Any other option for receiving visitors would require them to enter the *pastas* (space *d*). Separation of visitors appears to have low priority in this building.

3.6.3 Inhabitant-inhabitant analysis

Inhabitants of Av2 have some choice as to how they move around the building. The most notable point is that movement between spaces *c*, *e*, *g* and *j* is possible without going into the main circulation areas (*d* and *h*) of the building. This allows for unobserved activity and movement through more than half of the building. However, if the above interpretation about the use of spaces *g* and *i* is correct, then this freedom from observation could be compromised at some times. Robinson's identification of space *f* as a courtyard is not borne out by its low *RRA* and *CV* values which define it as an area of low *PA*. Again, this building does not allow for a clear analysis, which might suggest that separation of visitors and inhabitants was not paramount.

3.7 House Av10

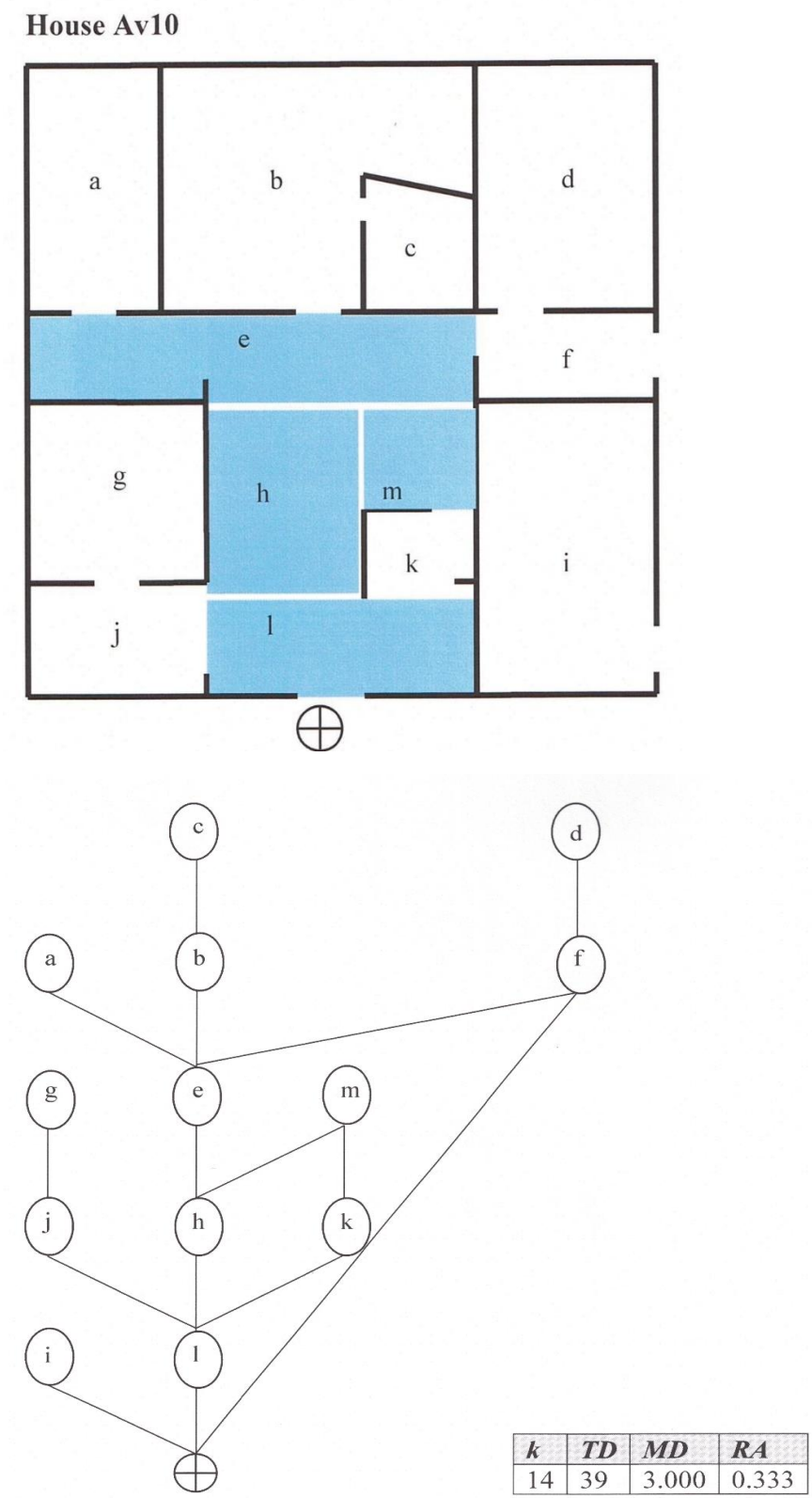


Fig.30: Av10 – layout and permeability diagram with exterior as root⁹⁷

⁹⁷ Robinson 1938: plate 95

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	39	3.000	0.333	1.247	1.583	Medium
a	40	3.076	0.346	1.295	0.200	Low
b	38	2.923	0.320	1.198	1.200	Medium
c	50	3.846	0.474	1.775	0.500	Low
d	46	3.333	0.388	1.453	0.333	Low
e	28	2.153	0.192	0.719	2.499	High
f	34	2.615	0.269	1.007	1.533	Medium
g	51	3.923	0.487	1.823	0.500	Low
h	27	2.076	0.179	0.670	0.783	Medium
i	51	3.923	0.487	1.823	0.333	Low
j	39	3.000	0.333	1.247	1.250	Medium
k	39	3.000	0.333	1.247	0.583	Low
l	29	2.230	0.205	0.767	1.666	High
m	37	2.846	0.307	1.149	1.033	Medium
Minimum	27	2.076	0.179	0.670	0.200	Medium
Maximum	51	3.923	0.487	1.823	2.499	
Mean	39.142	2.996	0.332	1.224	-	

*Divisor for a building with 14 spaces is 0.267

Table 12: Av10 – summary data

3.7.1 Description

Av10 has three entrances, into spaces *f*, *i* and *l*. Spaces *i* and *d* are identified as shops. Twenty-nine bronze coins were found in *d*, eight coins and a bronze stylus were found in *i*.⁹⁸ Space *h* is cobble-paved. Fragments of a terracotta bathtub were found in space *c* which may also have acted as the flue for space *b* which Robinson identifies as the kitchen.⁹⁹ An inscription found in space *g* indicates that the building was bought by Dionysius from Nicander for the sum of 5300 drachmas.¹⁰⁰ The sales inscription notes the presence of a storeroom (πίθεών), along with the sale of slaves/servants or possibly “income-producing shops” (μίσθαφόρα).¹⁰¹

⁹⁸ Robinson 1938: 98

⁹⁹ *Ibid.*

¹⁰⁰ Robinson 1938:97

¹⁰¹ Robinson 1934 :128

3.7.2 Inhabitant-visitor analysis

Despite not having a raised border, space *g* may have acted as a reception room for visitors, with space *j* as its anteroom. Space *g* has low *PA*, space *j* has a medium level, which would provide a raised-border room/anteroom layout. This allowed visitors to enter the building without overtly compromising the privacy of residents, although the court area where much domestic activity took place, would be clearly visible.

Entering via space *f* takes visitors straight into the *pastas* (space *e*) which, if usage here followed expectations, would form the heart of the residential area, where contact with residents was highly likely.

3.7.3 Inhabitant-inhabitant analysis

If the designation of spaces *d* and *i* as shops is correct then this building has six living spaces which are divided into two groups separated by the *pastas* and court/entrance areas. There is little choice about how inhabitants circulate, and access between the two groups of spaces requires movement across areas with high *PA*. The only internal space with more than one entrance is space *k*. This may have been a store but it is unlikely that such a small space would be the store specifically mentioned in the bill of sale. With this exception, movement around the house is directed and linear.

3.8 House Aiv9

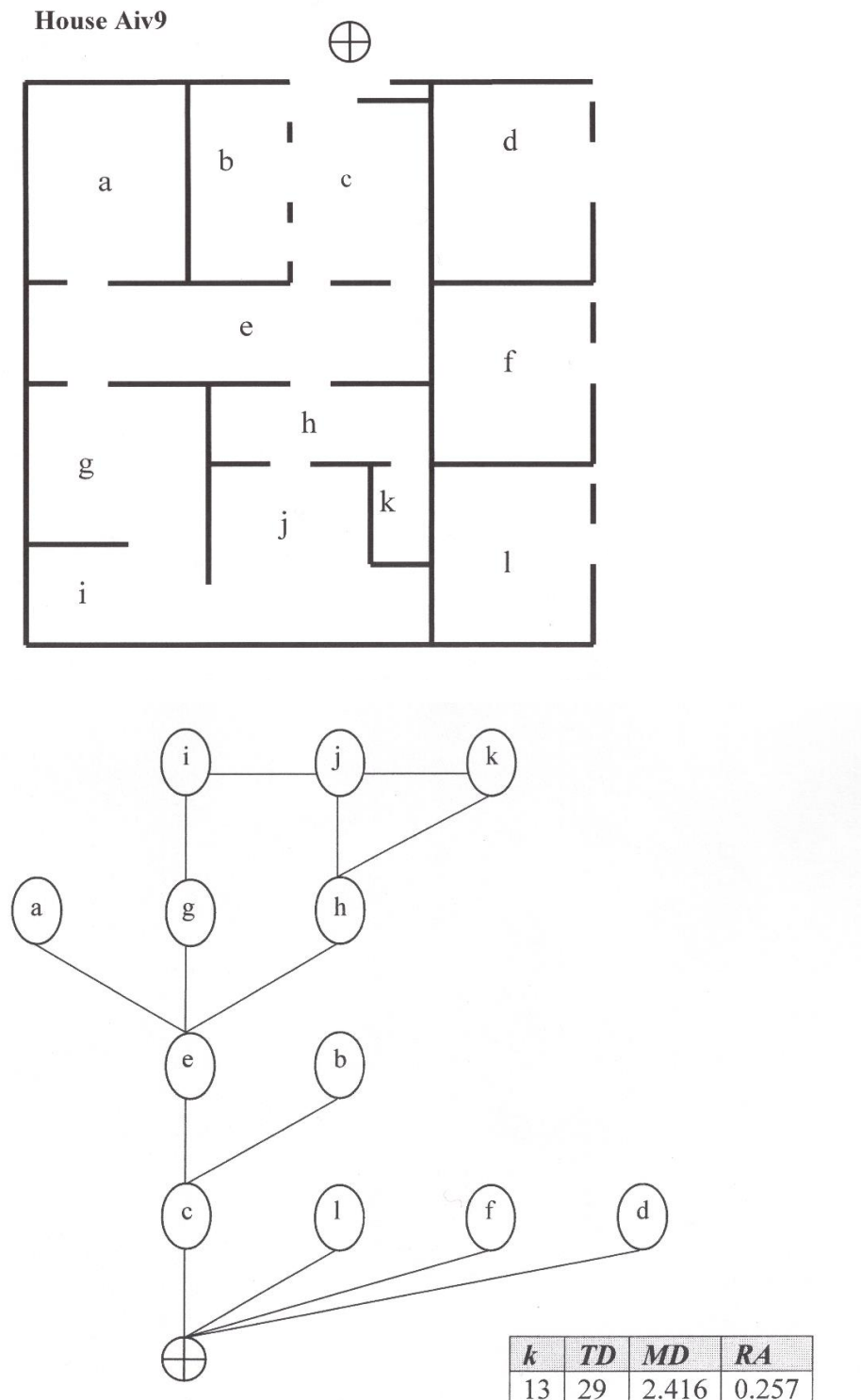


Fig.31: Aiv9 – layout and permeability diagram with exterior as root¹⁰²

¹⁰² Robinson 1938 plate 92

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	29	2.416	0.257	0.931	3.333	High
a	34	2.833	0.333	1.206	0.250	Low
b	35	2.916	0.348	1.260	0.333	Low
c	24	2.000	0.181	0.655	1.500	High
d	40	3.333	0.424	1.536	0.250	Low
e	23	1.916	0.166	0.601	1.583	High
f	40	3.333	0.424	1.536	0.250	Low
g	32	2.666	0.303	1.097	1.083	Medium
h	30	2.500	0.272	0.985	1.583	High
i	37	3.083	0.378	1.369	1.583	Medium
j	44	3.666	0.484	1.753	0.750	Low
k	44	3.666	0.484	1.753	0.333	Low
l	40	3.333	0.424	1.536	0.250	Low
Minimum	23	1.916	0.181	0.601	0.250	
Maximum	44	3.666	0.484	1.753	3.333	
Mean	34.769	2.897	0.344	1.129	-	

*Divisor for a building with 13 spaces is 0.276

Table 13: Aiv9 – summary data

3.8.1 Description

Aiv9 has three rooms to the east which open directly onto the street and were almost certainly shops or workshops as there is no internal access from them into the rest of the building.¹⁰³ The building appears to have two kitchen complexes - spaces *c/b* and spaces *j/k*.¹⁰⁴ Cahill disagrees that spaces *c/b* were a kitchen and flue as no ashes were found in the flue and *c* was “well-appointed for a kitchen”.¹⁰⁵ Space *h*, which was a cobbled court, is unusually small.¹⁰⁶

¹⁰³ Robinson 1938: 87 notes that quantities of coins were found in each of these spaces.

¹⁰⁴ Robinson 1938: 85-88

¹⁰⁵ Cahill 2002: 110

¹⁰⁶ Robinson 1938:86

3.8.2 Inhabitant-visitor analysis

Space *c* is the only entrance into the residential part of the building and is identified by Robinson as a kitchen, due to the presence of a hearth and a flue at its western end.¹⁰⁷ This is the only case in the sample where such a configuration was found.¹⁰⁸ Visitors had to enter through this space. The presence of a second kitchen area (spaces *j/k*) does raise the possibility that spaces *c/b* may have been involved in preparation of food for sale, which would explain its location next to the street and perhaps the better than average decoration. However, finds there include jewellery and perfume bottles which infer a different use.¹⁰⁹ As the court is small, this area may have been an additional unroofed work area. Whatever the purpose, segregation of visitors and residents is not a priority.

3.8.3 Inhabitant-inhabitant analysis

The three shops occupy 30% of the floor space of this building. The presence of the kitchen complex in spaces *j* and *k* (heavy deposits of ash found) may indicate occupation by a second family, although the single entrance via space *c* may suggest otherwise. If much of the ground floor was given over to commercial activity, then it is more likely that this formed the private family area. Space *h* (high *CV*) forms a small court while space *e* (high *CV*) is the *pastas*. Spaces *i*, *g*, *e*, *h* and *j* form a circuit offering choice to inhabitants about how they move around a significant portion of the residential area and provide segregation from the potentially busy commercial areas.

¹⁰⁷ Robinson 1938: 88

¹⁰⁸ Cahill 2002: 110

¹⁰⁹ Cahill 2002: 110-11

3.9 House A3

House A3 House of the Standing Pilasters

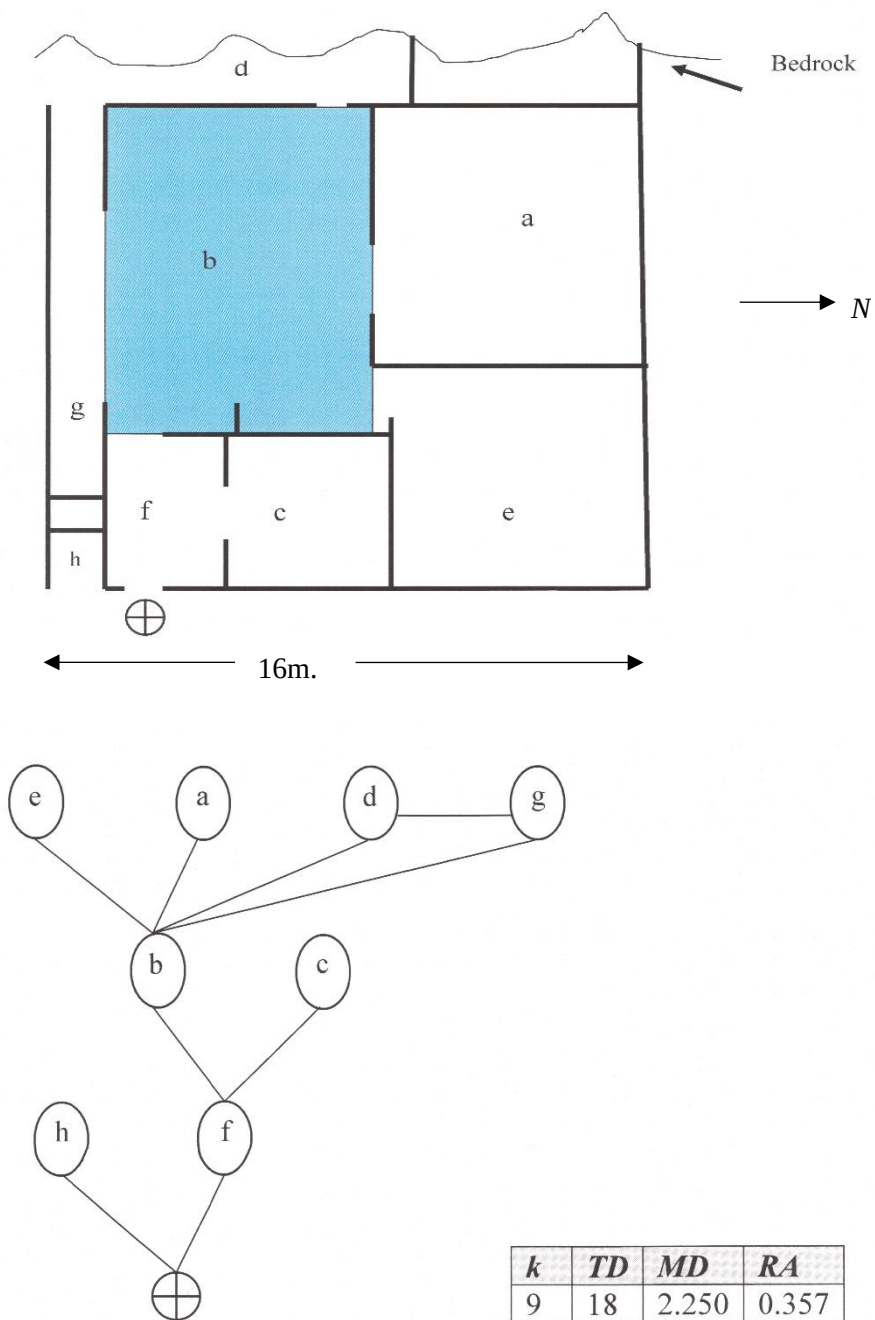


Fig.32: A3 – layout and permeability diagram with exterior as root¹¹⁰

¹¹⁰ Robinson 1930: fig.142

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	18	2.250	0.357	1.031	1.333	Medium
a	19	2.375	0.392	1.236	0.200	Low
b	12	1.500	0.142	0.447	3.333	High
c	20	2.500	0.428	1.350	0.333	Low
d	18	2.250	0.357	1.031	0.700	Low
e	19	2.375	0.392	1.236	1.200	Medium
f	13	1.625	0.178	0.561	0.700	Medium
g	19	2.375	0.392	1.236	0.700	Low
h	19	2.375	0.392	1.236	0.500	Low
Minimum	12	1.500	0.142	0.447		
Maximum	20	2.500	0.428	1.350		
Mean	17.44	2.180	0.336	1.039		

*Divisor for a building with 9 spaces is 0.317

Table 14: A3 -summary data

3.9.1 Description

Houses A3 and A4 (see p.68) are situated against the western wall of the city and are of non-standard layout, with fewer, bigger rooms (see plans). These houses were excavated early in Robinson's campaign and are reported in less detail than later excavations. Robinson makes no mention of a *pastas* for this building, but refers to a *loggia* around the central court area which may have replaced the *pastas*.¹¹¹

3.9.2 Inhabitant-visitor analysis

Visitors enter via space *f* which provides access to space *c* as well as the rest of the building. Space *c* (low *PA*) may have acted as a reception room. Alternatively, in moving directly to space *b*, the visitor entered the space with the highest potential for encounters in the building (*CV* 3.333).

¹¹¹ Robinson 1930: 52-54

3.9.3 Inhabitant-inhabitant analysis

Space *b* is the centre of interaction within this building. Whilst there is choice of movement between spaces *b*, *d* and *g*, the latter two spaces are both narrow and long and were probably not living spaces (Robinson describes them as alleys although they seem to lie within the footprint of the building).¹¹² The areas *a*, *c* and *e* each have a single entrance. This arrangement of fewer, larger spaces suggests communal living to a greater extent than some other buildings, and so less concern for segregation.

¹¹² Robinson 1930: 52

3.10 House A4

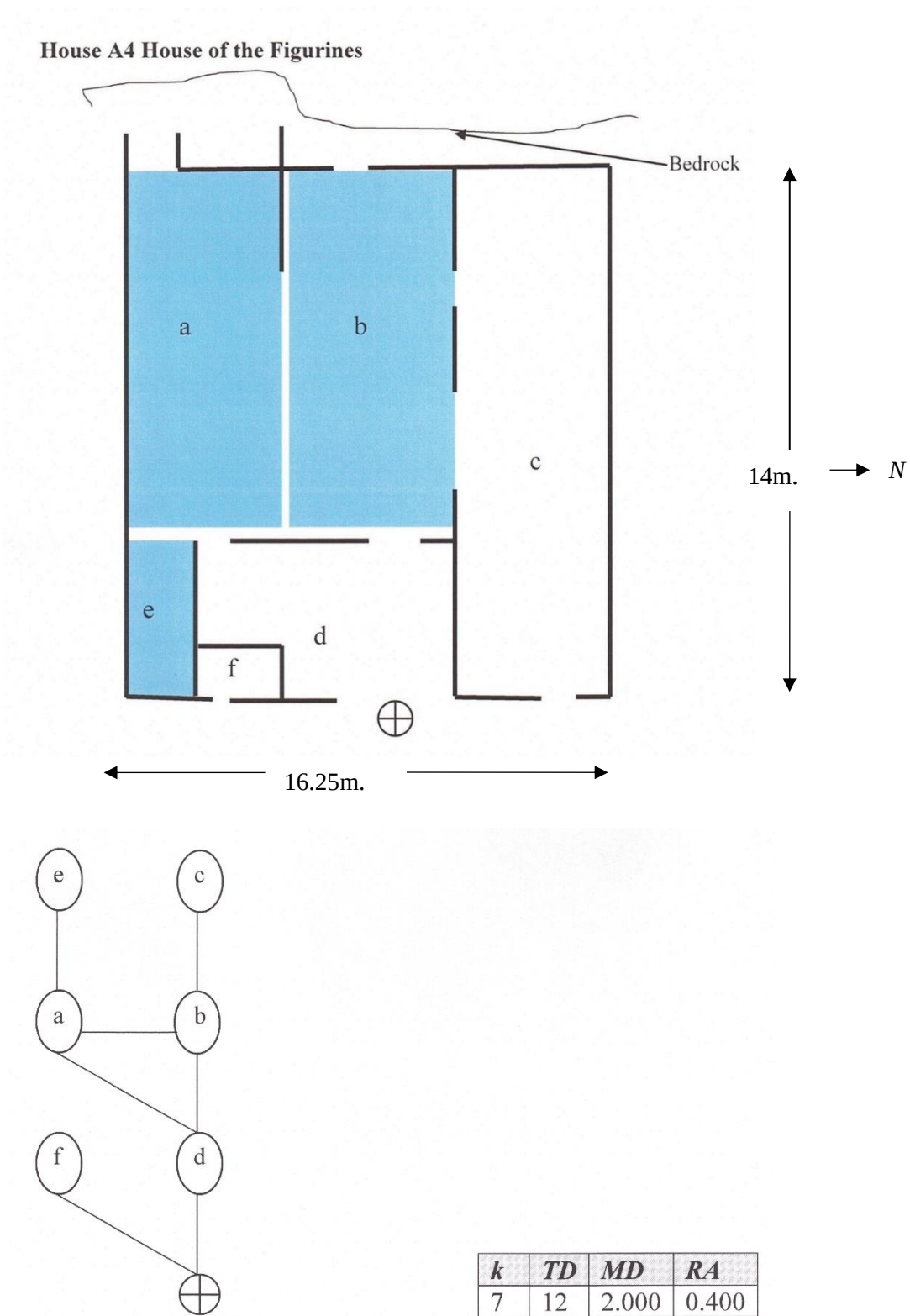


Fig.33: A4 – layout and permeability diagram with exterior as root¹¹³

¹¹³ Robinson 1930: fig.116

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	12	2.000	0.400	1.176	1.333	Medium
a	10	1.666	0.266	0.782	1.666	High
b	10	1.666	0.266	0.782	1.666	High
c	15	2.500	0.600	1.764	0.333	Low
d	9	1.500	0.200	0.588	1.166	High
e	15	2.500	0.600	1.764	0.333	Low
f	17	2.833	0.733	2.155	0.500	Low
Minimum	9	1.500	0.200	0.588	0.333	
Maximum	17	2.833	0.733	2.155	1.666	
Mean	12.57	2.095	0.437	1.287	-	

*Divisor for a building with 7 spaces is 0.34

Table 15: A4 -summary data

3.10.1 Description

A4 has three entrances. Space *f* is identified as a shop and space *c* as a storage room due to the number of pithoi lids found there, although they may also indicate a shop selling staple goods.¹¹⁴ Again, Robinson refers to a *loggia* which he appears to locate within space *b*.¹¹⁵

3.10.2 Inhabitant-visitor analysis

From a total of seven spaces, three have a high potential *PA* score. This, allied to the more open layout of the building, suggests that segregation of visitors was not given high importance here.

¹¹⁴ Robinson 1930:55

¹¹⁵ Robinson 1930: 54-55

3.10.3 Inhabitant-inhabitant analysis

There is some choice in movement routes between spaces *a*, *b* and *d*, all of which have high *PA*. Only space *e* offers any possibility for seclusion. Like its neighbour A3, building A4 appears to promote more communal living than is seen elsewhere.

3.11 House Bvi5

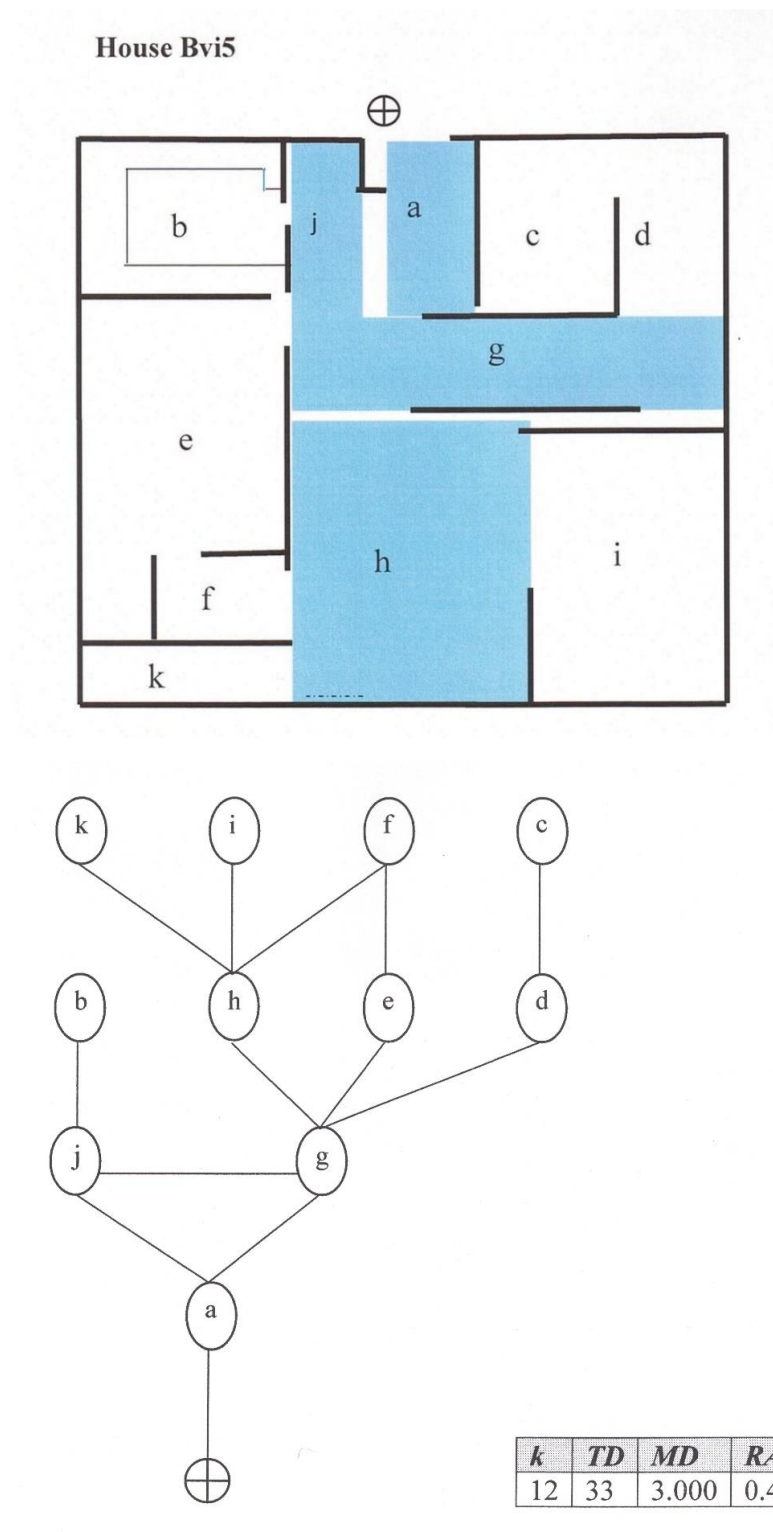


Fig.34: Bvi5 – layout and permeability diagram with exterior as root¹¹⁶

¹¹⁶ Robinson 1946: plate 106

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	33	3.000	0.400	1.403	0.333	Low
a	23	2.090	0.218	0.764	1.533	High
b	41	3.720	0.545	1.912	0.333	Low
c	35	3.181	0.436	1.529	0.500	Low
d	25	2.272	0.254	0.891	1.200	High
e	25	2.272	0.254	0.891	0.700	Medium
f	29	2.636	0.327	1.147	0.750	Low
g	17	1.545	0.109	0.382	1.916	High
h	21	1.909	0.181	0.635	2.700	High
i	31	2.818	0.363	1.273	0.250	Low
j	31	2.818	0.363	1.273	1.533	Medium
k	31	2.818	0.363	1.273	0.250	Low
Minimum	17	1.545	0.109	0.382	0.250	
Maximum	41	3.720	0.545	1.912	2.700	
Mean	26.41	2.589	0.317	1.114	-	

**Divisor for a building with 12 spaces is 0.285*

Table 16: Bvi5 -summary data

3.11.1 Description

Space *f* is identified as a kitchen with a neighbouring cement floored bathroom.¹¹⁷

The unusual double wall to the south of space *g* is thought to have formed a drain from a cistern found in the south-east corner.¹¹⁸

3.11.2 Inhabitant-visitor analysis

The location of a raised-border room (space *b*) which is a segregated space immediately to the right of the entrance provides an opportunity for entertaining guests without any need to move further into the building. It does appear to lack the usual anteroom, unless the short wall which separates space *c* from space *a* was

¹¹⁷ Robinson 1946:124

¹¹⁸ Robinson 1946: 122-124

extended south in antiquity to create a defined area. Access to all other spaces requires penetration into the central circulation areas (*g* and *h*).

3.11.3 Inhabitant-inhabitant analysis

This building offers some choice of movement for inhabitants. Spaces *e*, *g*, *h* and *f* form a circuit, although *g* and *h* are both high *PA* areas. The permeability diagram suggests that *a*, *g* and *j* form a second circuit, but as they are all contiguous open spaces this is of less interest. Spaces *f* and *k* are both at the rear of the building and are segregated. Space *c* is also segregated, requiring access via space *d*. This building along with Av10 has the highest *MD* (3.000) of the buildings analysed, indicating that a greater proportion of spaces are segregated from each other than is usually observed.

3.12 House Bvi7

House Bvi7

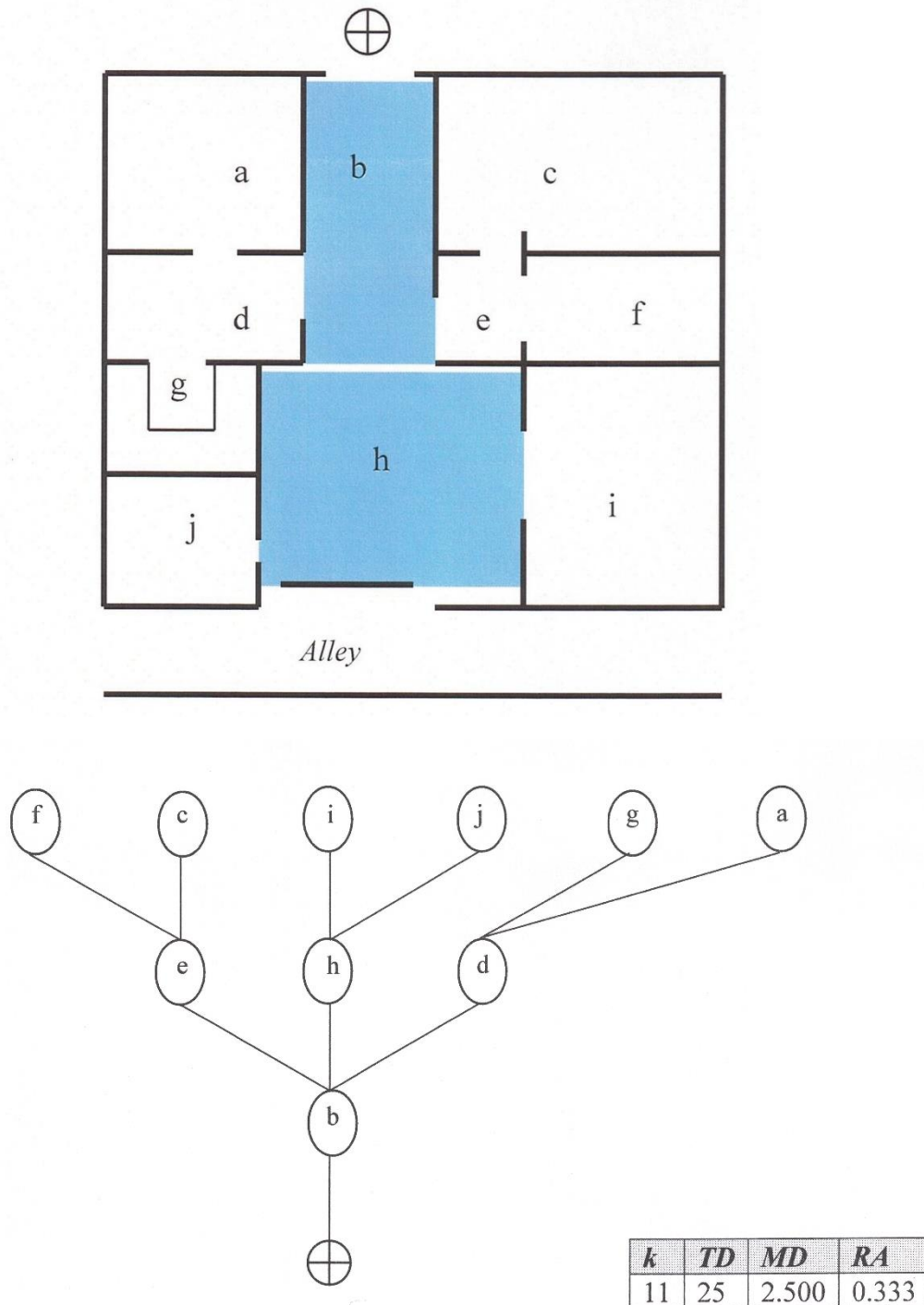


Fig.35: Bvi7 – layout and permeability diagram with exterior as root¹¹⁹

¹¹⁹ Robinson 1946: plate 110

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	25	2.500	0.333	1.128	0.250	Low
a	22	2.200	0.266	0.901	0.333	Low
b	16	1.600	0.133	0.450	1.999	High
c	22	2.200	0.266	0.901	0.333	Low
d	21	2.100	0.244	0.827	2.250	High
e	18	1.800	0.177	0.600	2.250	High
f	27	2.700	0.377	1.277	0.333	Low
g	30	3.000	0.444	1.505	0.333	Low
h	21	2.100	0.244	0.827	2.250	High
i	30	3.000	0.444	1.505	0.333	Low
j	30	3.000	0.444	1.505	0.333	Low
Minimum	16	1.600	0.133	0.450	0.250	
Maximum	30	3.000	0.444	1.505	2.250	
Mean	23.8	2.381	0.306	1.038	-	

*Divisor for a building with 11 spaces is 0.295

Table 17: Bvi7 – summary data

3.12.1 Description

The *pastas* is subdivided into three spaces, of which one (*d*) serves as an anteroom to the space with a raised border (*g*).¹²⁰ Robinson suggests that space *i* formed the kitchen complex with bathroom. The remains of a bathtub were found in the courtyard.¹²¹

3.12.2 Inhabitant – visitor analysis

Bvi7 is very unusual in that its raised-border room (*g*) is in the interior of the building and small in size, particularly compared to its anteroom (*d*). Segregation of visitors is not clear. The visitor accessed space *g* by passing through spaces *b* and *d* both of which have high levels of *PA*, suggesting that segregation of visitors was not

¹²⁰ Robinson 1946: 128

¹²¹ Robinson 1946:125-142

prioritised. Space *d* also provides access to *a* which increases the opportunity for contact between visitors and inhabitants.

3.12.3 Inhabitant – inhabitant analysis

The layout is linear. Spaces *a*, *c*, *f* and *g* are accessed through intervening spaces *d* and *e* respectively which each have a CV of 2.250. Spaces *i* and *j* to the rear are accessed via space *h* (the court). This layout allows for segregation of inhabitants from each other if desired. Spaces *a*, *d* and *g* form one sub-set of rooms and *c*, *e* and *f* provide a second group within which inhabitants could move around without needing to cross spaces *b* and *h*, both of which have high levels of *PA*. House Bvi7 does offer more opportunities for segregation between inhabitants than many other houses analysed.

3.13 House ESH2

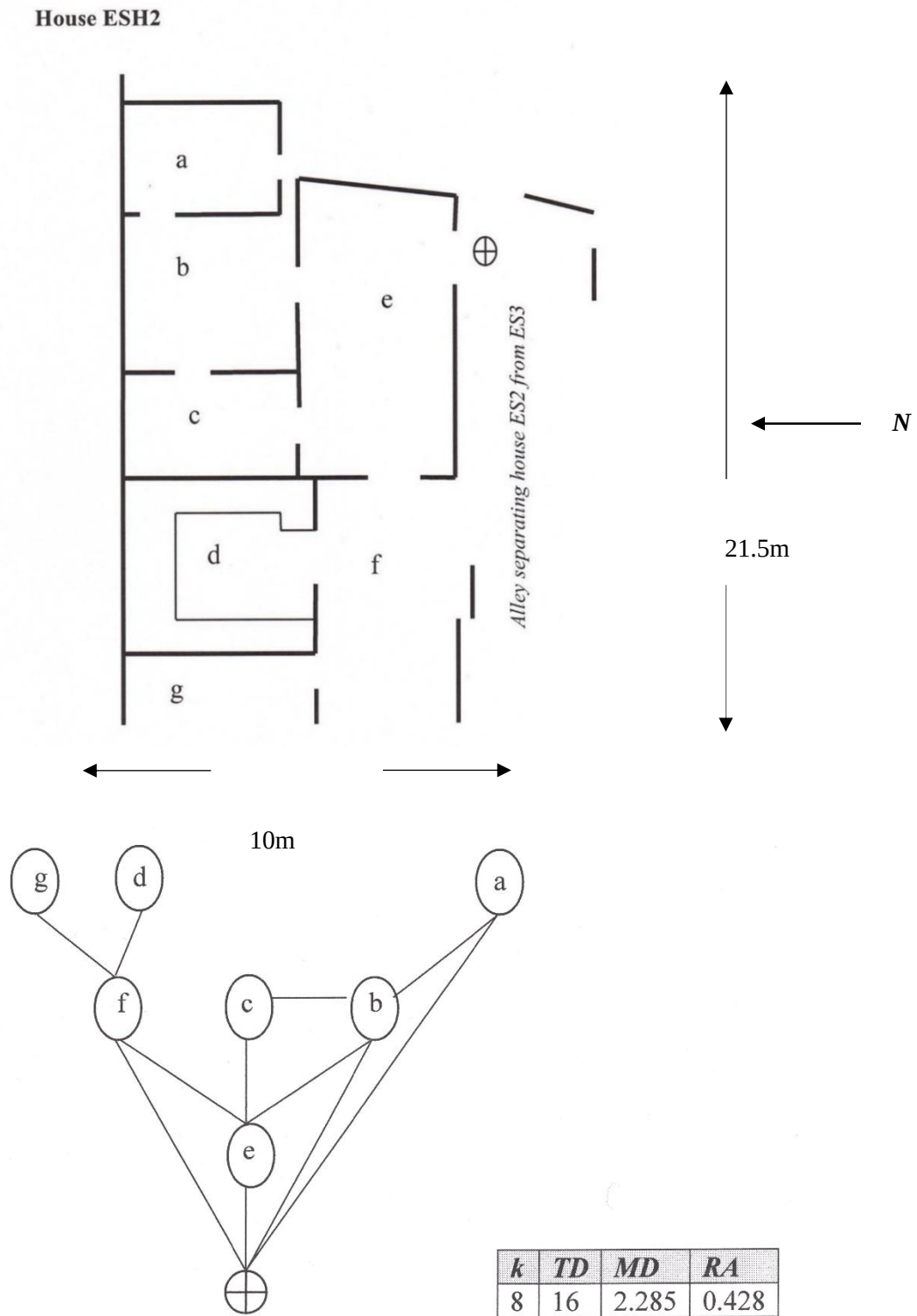


Fig.36: ESH2 – layout and permeability diagram with exterior as root¹²²

¹²² Robinson 1930: fig.267

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	16	2.285	0.428	1.304	1.250	Medium
a	17	2.428	0.476	1.451	0.250	Low
b	13	1.857	0.285	0.868	1.250	Medium
c	15	2.142	0.380	1.158	0.500	Low
d	18	2.571	0.523	1.594	0.250	Low
e	10	1.428	0.142	0.432	2.000	High
f	12	1.714	0.238	0.725	2.250	High
g	16	2.285	0.428	1.304	0.250	Low
Minimum	10	1.714	0.142	0.432	0.250	
Maximum	18	2.571	0.523	1.594	2.000	
<i>Mean</i>	<i>14.625</i>	<i>2.374</i>	<i>0.362</i>	<i>1.104</i>	-	

**Divisor for a building with 8 spaces is 0.328*

Table 18: ESH2 -summary data

3.13.1 Description

ESH2 is of non-standard rectangular layout. It has three entrances, into spaces *e*, *f* and *a*. The gap from the exterior into space *b* is too narrow to have functioned as an entrance.¹²³

3.13.2 Inhabitant-visitor analysis

The most striking feature is the amount of choice available to both visitors and inhabitants. Both spaces *e* and *f*, which are inter-connected, have entrances from the exterior and provide access to sub-sets of rooms. Both these spaces have high *PA*. Space *d*, which has a raised border, although it lacks the usual anteroom, links directly to the exterior via space *f* and may have been a focus for social events. It allows visitors access without entering any of the spaces to the east. From that perspective this house may be effective in segregating visitors from inhabitants.

¹²³ Robinson 1930:114-115

3.13.3 Inhabitant-inhabitant analysis

Choice of route around the building dominates the configuration. Rooms *g* and *d* are the only spaces in the building which have a single entrance. Spaces *a*, *b* and *c* are all inter-connected allowing inhabitants to move around them without entering the larger spaces directly connected to the exterior. However, space *a* is also connected to the exterior. This would usually suggest a commercial activity, but its direct connection to the interior of the building raises questions about such an interpretation. Although there is access between spaces *e* and *f*, this house would permit a division between a family area and an area open to visitors. Room *g*, which is the most segregated space, may be a store for equipment associated with activity in space *d*.

3.14 House ESH4

House ESH4

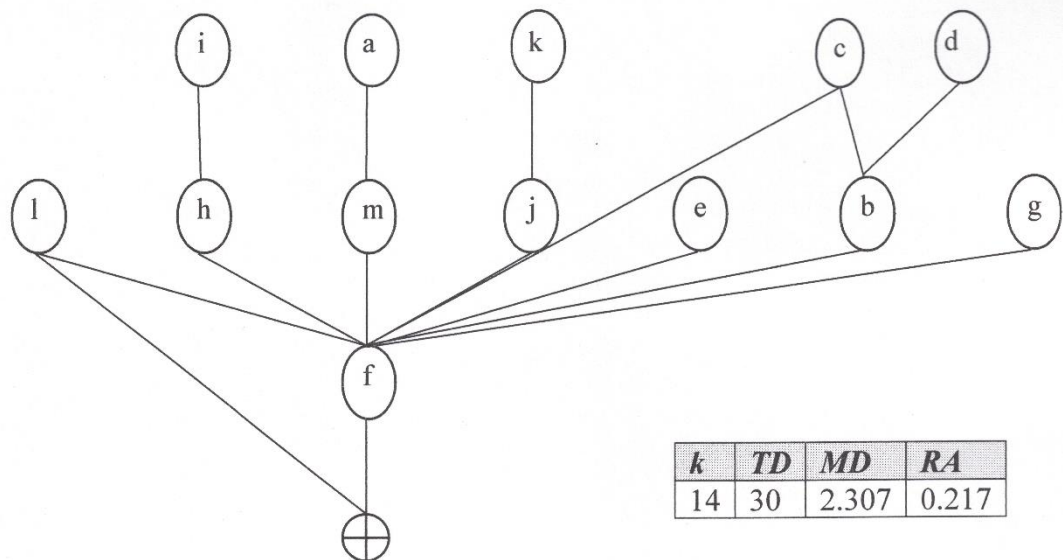
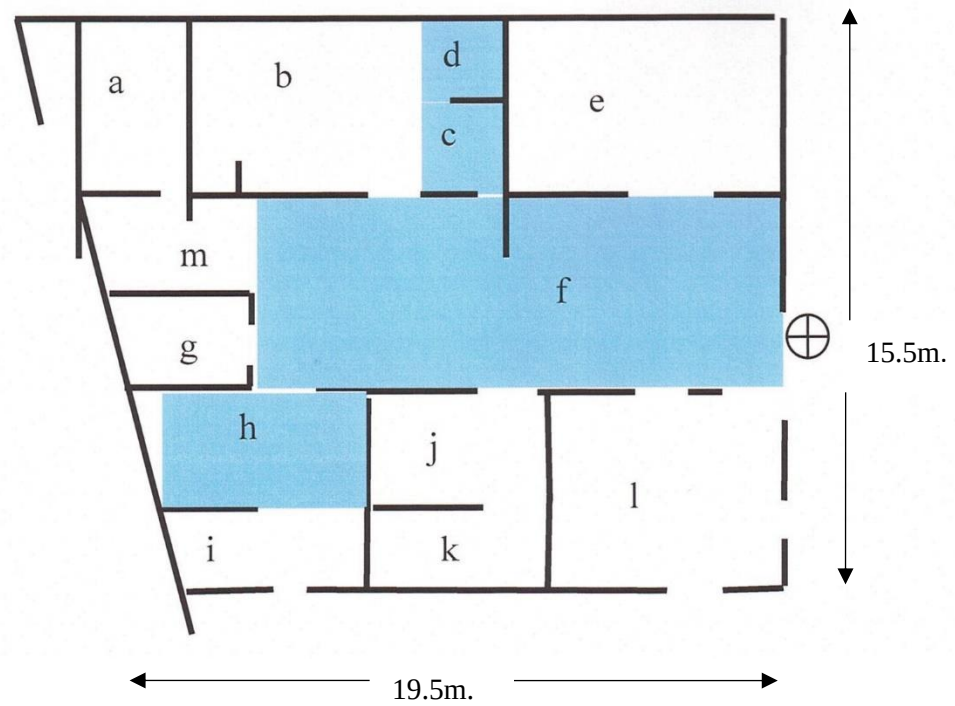


Fig.37: ESH4 – layout and permeability diagram with exterior as root¹²⁴

¹²⁴ Robinson 1938: plate 106

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	30	2.307	0.217	0.812	0.611	Medium
a	39	3.000	0.333	1.247	0.500	Low
b	26	2.000	0.166	0.621	1.611	High
c	39	3.000	0.333	1.247	0.444	Low
d	38	2.923	0.320	1.198	0.333	Low
e	30	2.307	0.217	0.812	0.111	Low
f	18	1.348	0.064	0.239	5.833	High
g	30	2.307	0.217	0.812	0.111	Low
h	28	2.153	0.192	0.719	1.111	Medium
i	40	3.076	0.346	1.295	0.500	Low
j	28	2.153	0.192	0.719	1.111	Medium
k	40	3.076	0.346	1.295	0.500	Low
l	28	2.153	0.192	0.719	0.111	Low
m	28	2.153	0.192	0.719	1.111	Medium
Minimum	18	1.348	0.064	0.239	0.111	
Maximum	40	3.076	0.346	1.295	4.333	
Mean	31.5	2.419	0.236	0.830	-	

*Divisor for a building with 14 spaces is 0.267

Table 19: ESH4 – summary data

3.14.1 Description

ESH4 is non-standard in size and layout. It has four entrances - a single entrance into *f* and *i* and two into space *l*. Each of these spaces also gives access to the interior of the building. The court (*f*) is unpaved and the house lacks a *pastas* but has two bathrooms – space *d* and the western section of space *i*. Space *d* has the remains of a bathtub.¹²⁵ Three hoards of silver coins were found here.¹²⁶ Seventy-five silver tetrobols were found outside the southwest corner of the house and nine in space *a*.¹²⁷

¹²⁵ Robinson 1938: 135-136

¹²⁶ Robinson 1938:136-137

¹²⁷ Robinson 1938: 135-137

3.14.2 Inhabitant-visitor analysis

Multiple access points suggest that visitors were not segregated from any inhabitants, but were able to enter most sections of the building. Lack of an identifiable raised-border room may mean that a formal venue for occasions was not required. It is possible that this building had no residents.

3.14.3 Inhabitant-inhabitant analysis

This is a complex building. Space *b* controls access to *c* and *d*; space *m* access to *a*; *h* to *i* and *j* to *k*. Spaces *a*, *b*, *c*, *d*, *m*, and *g* in the north-west corner are the most segregated from the multiple entrances. External entrances into spaces *i* and *l* suggest commercial activity although access into the main building from both of would be unusual, unless most of the building was given over to retail or production. Space *f* which controls access to *e*, *m*, *g* and *j* has the highest control value within the sample analysed. The building overall has the lowest mean *RRA* score in the sample, which usually indicates high *PA*, but the majority of spaces score low on this scale when the relevant *CVs* are taken into account. One interpretation is that space *f* acted as a central access point into individual shops or production areas.

3.15 House with Triangular Front

House with the Triangular Front

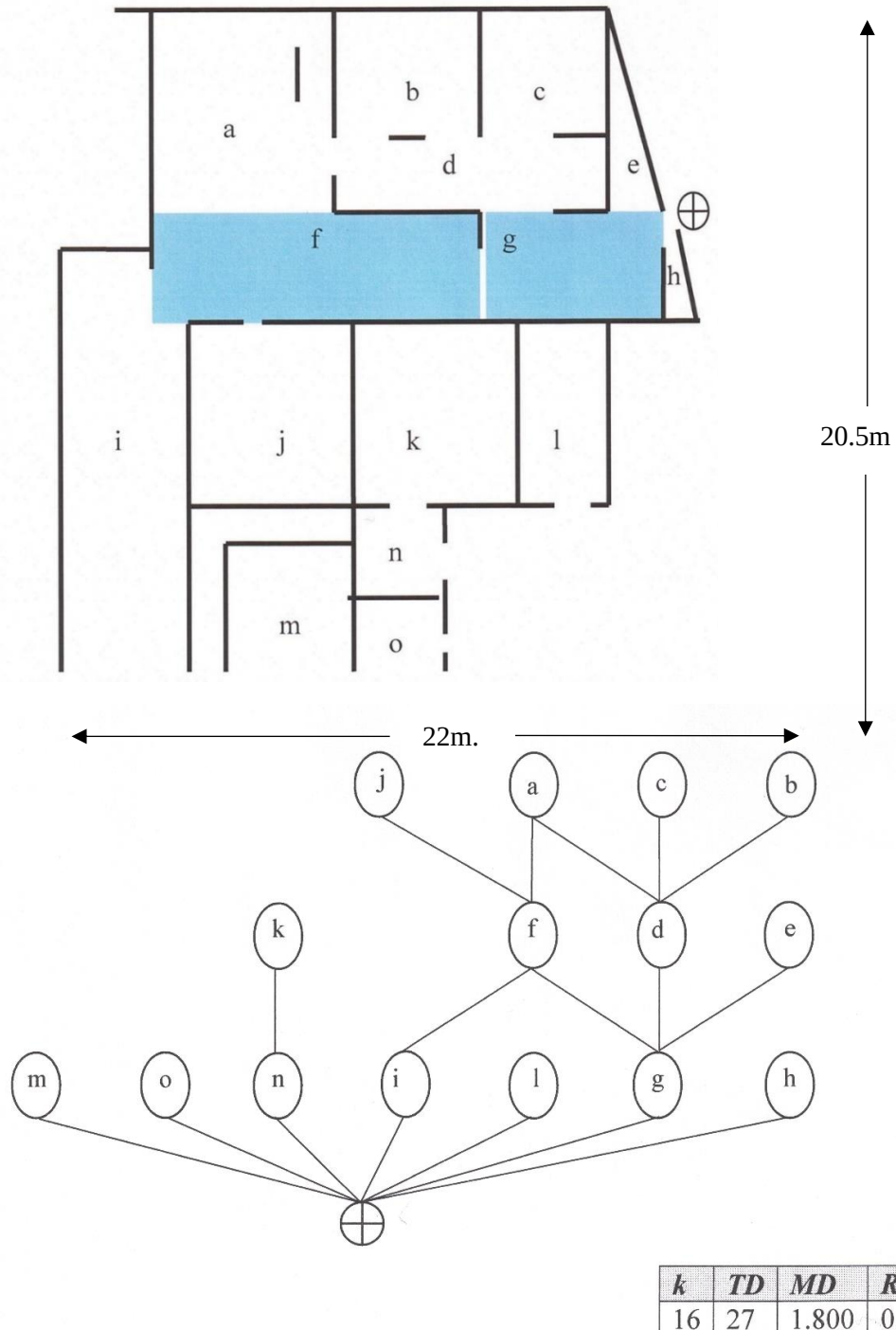


Fig.38: House with the Triangular Front – layout and permeability diagram with exterior as root¹²⁸

¹²⁸ Robinson 1946: plate 234

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	27	1.800	0.114	0.454	5.250	High
a	44	2.933	0.276	1.099	0.500	Low
b	48	3.200	0.314	1.250	0.250	Low
c	50	3.333	0.333	1.326	0.250	Low
d	31	2.066	0.152	0.605	2.750	High
e	38	2.533	0.219	0.872	0.250	Low
f	41	2.733	0.247	0.984	2.250	High
g	27	1.800	0.114	0.454	1.642	High
h	41	2.733	0.247	0.984	0.142	Low
i	35	2.333	0.190	0.756	0.392	Low
j	49	3.266	0.323	1.286	0.250	Low
k	53	3.583	0.361	1.438	0.500	Low
l	41	2.733	0.247	0.984	0.142	Low
m	46	3.066	0.295	1.175	0.142	Low
n	41	2.733	0.247	0.984	1.142	Medium
o	43	2.866	0.266	1.059	0.142	Low
Minimum	27	1.800	0.114	0.454	0.142	
Maximum	53	3.583	0.361	1.438	5.250	
Mean	40.937	2.731	0.246	0.981	-	

*Divisor for a building with 16 spaces is 0.251

Table 20: House with the Triangular Front – summary data

3.15.1 Description

NB: The entrances to rooms *j-m* are guided by Robinson's text not by his plan.¹²⁹

This building is irregular in form. It has the greatest number of internal spaces of any building analysed and the largest footprint. It includes up to eight shops (*e, h, k, i, l, m, n* and *o*).¹³⁰ Space *k* has no entrance into the main building but includes a bathtub.¹³¹ There are the remains of red stucco on the eastern external wall of space *l*, suggesting a further enclosed space, but the south and east walls are lost.¹³²

Robinson suggests that spaces *b* and *c* were storerooms, as they held the remains of two large pithoi.¹³³

¹²⁹ Robinson 1946: 276

¹³⁰ *Ibid.*

¹³¹ *Ibid.*

¹³² Robinson 1946:273-277

¹³³ Robinson 1946:273-279

3.15.2 Inhabitant – visitor analysis

If this building included domestic quarters, it is probable that visitors would enter via space *g*, which gives access to a suite of four rooms (*a*, *b*, *c* and *d*). There is no evidence for a raised-border room.

3.15.3 Inhabitant-inhabitant analysis

This building is probably dominated by commercial activity. This accounts for the unusually high *CV* scored by the entrance, which is a result of additional access points into the shops and workshops in the building. The circular route through *a*, *b*, *c* and *d* could suggest that they were for residential use, although the presence of large pithoi in *c* and *d* may indicate commercial storage. Spaces *b* and *c* are segregated, protected by *d*. Both *b* and *c* show low levels of *PA*, whilst space *d* has a high score. The overall likelihood is that there were no residents, at least in the ground floor areas of the building.

3.16 – Villa of the Bronzes

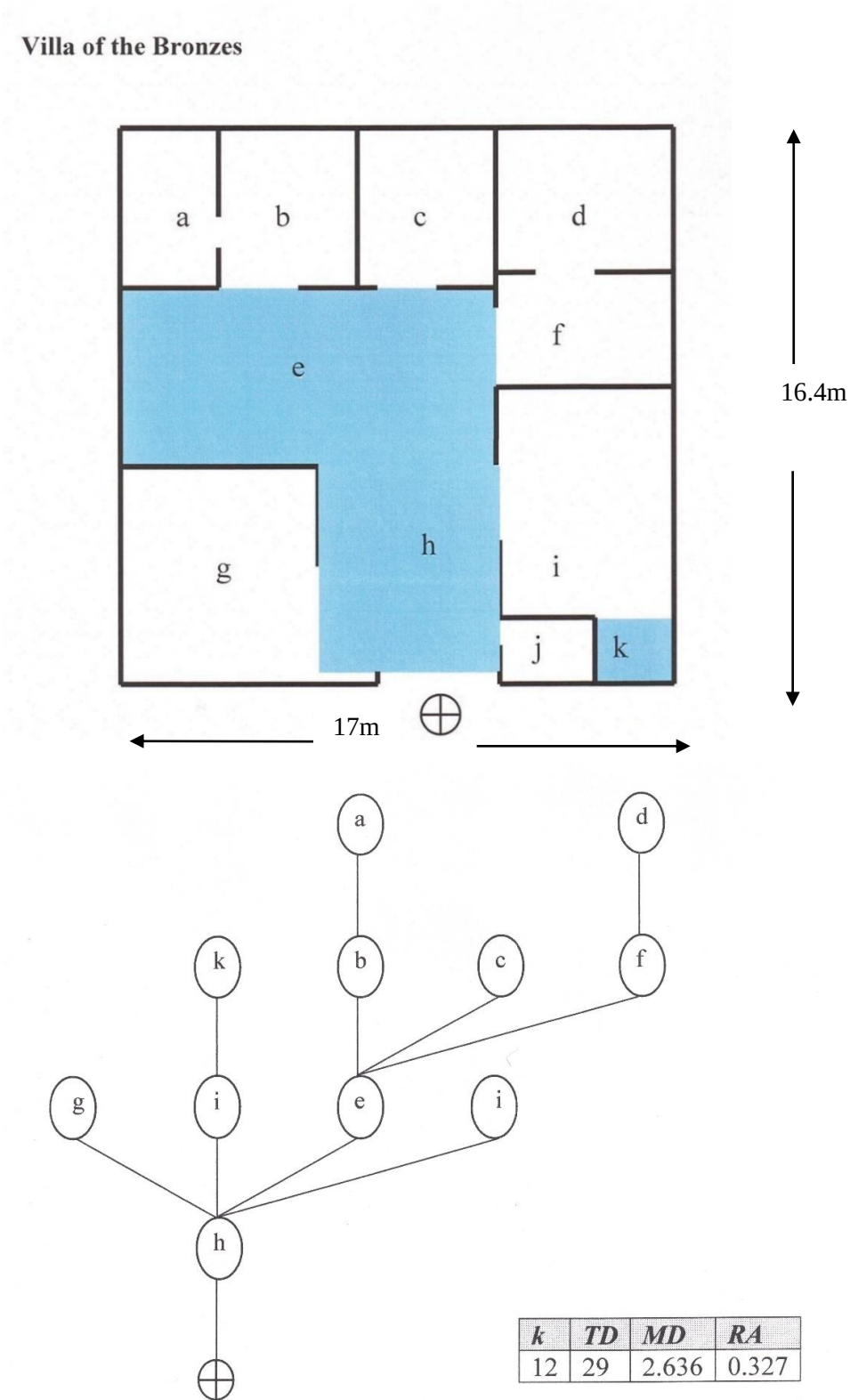


Fig.39: Villa of the Bronzes – permeability diagram with exterior as root¹³⁴

¹³⁴ Robinson 1946: plate 202

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	29	2.636	0.327	1.147	0.200	Low
a	37	3.363	0.472	1.656	0.500	Low
b	27	2.454	0.290	1.017	1.250	Medium
c	29	2.636	0.327	1.147	0.250	Low
d	37	3.363	0.472	1.656	0.500	Low
e	19	1.727	0.145	0.508	2.200	High
f	27	2.454	0.290	1.017	1.250	Medium
g	29	2.636	0.327	1.147	0.200	Low
h	19	1.727	0.145	0.508	3.750	High
i	27	2.454	0.290	1.017	1.200	Medium
j	29	2.636	0.327	1.147	0.200	Low
k	37	3.363	0.472	1.656	0.500	Low
Minimum	19	1.727	0.145	0.508	0.200	
Maximum	37	3.363	0.472	1.656	3.750	
<i>Mean</i>	<i>28.833</i>	<i>2.620</i>	<i>0.323</i>	<i>1.039</i>	-	

*Divisor for a building with 12 spaces is 0.285

Table 21: Villa of the Bronzes – summary data

3.16.1 Description

Space *k* is identified as a bathroom with a cement floor and a bathtub *in situ*.¹³⁵

Space *j*, despite its small size, was identified as a kitchen because of the large quantities of ash found there.¹³⁶

3.16.2 Inhabitant-visitor analysis

Space *b* which has a mosaic floor and red stucco walls may have been a reception room. However, it is one of the deepest in the building and would require visitors to cross the main circulation areas. Space *g* seems to be the best candidate in terms of location close to the entrance although no special architectural features are reported. No firm conclusions on the segregation of visitors from inhabitants can be reached.

¹³⁵ Robinson 1946: 249

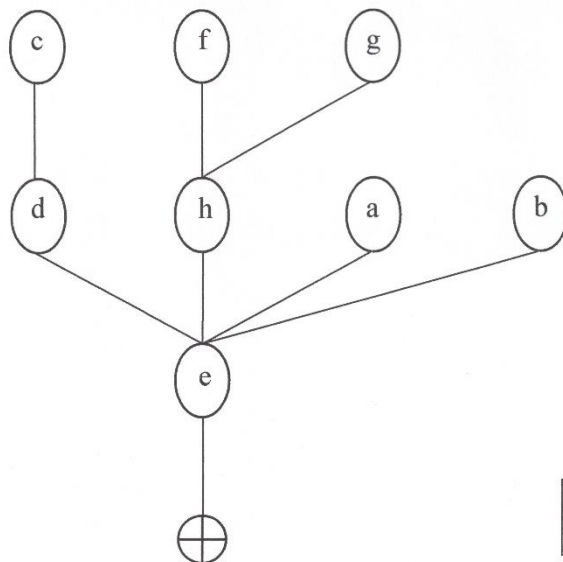
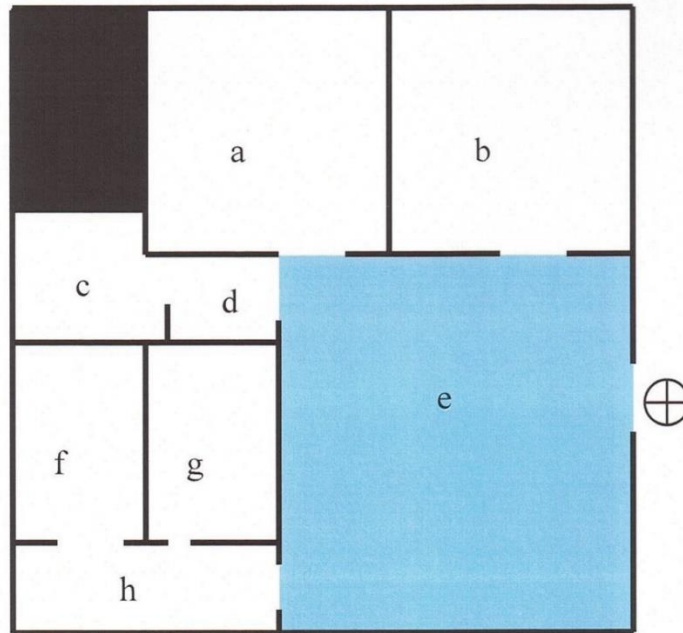
¹³⁶ Robinson 1946:235-258

3.16.3 Inhabitant-inhabitant analysis

Only space *d* and space *k* have any real segregation in this building. All other spaces open directly onto the main circulation areas. Movement around the spaces is linear which may suggest that the activities of inhabitants were communal and overseen.

3.17 House of the Tiled Prothyron

House of the Tiled Prothyron



<i>k</i>	<i>TD</i>	<i>MD</i>	<i>RA</i>
9	18	2.250	0.357

Fig.40: House of the Tiled Prothyron – layout and permeability diagram with exterior as root¹³⁷

¹³⁷ Robinson 1946: plate 176

Space	TD	MD	RA	RRA*	CV	Potential presence-availability
⊕	18	2.250	0.357	1.126	0.200	Low
a	18	2.250	0.357	1.126	0.200	Low
b	18	2.250	0.357	1.126	0.200	Low
c	23	2.875	0.535	1.687	0.500	Low
d	16	2.000	0.285	0.899	1.200	Medium
e	11	1.375	0.107	0.337	3.833	High
f	21	2.625	0.464	1.463	0.333	Low
g	21	2.625	0.464	1.463	0.333	Low
h	14	1.750	0.214	0.675	2.200	High
Minimum	11	1.375	0.107	0.337	0.200	
Maximum	23	2.625	0.464	1.463	3.833	
Mean	17.777	2.222	0.348	1.100	-	

*Divisor for a building with 9 spaces is 0.317

Table 22: House of the Tiled Prothyron – summary data

3.17.1 Description

Robinson notes that the space to the north east (black on the layout) was not dug out by the original builders.¹³⁸

3.17.2 Inhabitant-visitor analysis

This building has no clear evidence for a room with a raised border or anteroom.

Spaces *f* or *g* might fulfil this role, with *h* as the anteroom. Both spaces have red-painted walls applied directly onto mud-brick. Access to these spaces would require crossing the court and *pastas* which were probably the focus of domestic activity.

The same issue would apply in accessing any other space in the building.

3.17.3 Inhabitant-inhabitant analysis

Although the building is of standard size, the relatively large court and *pastas* areas reduce the space available for other domestic activity. Space *c* is segregated by space *d* and spaces *f* and *g* are given privacy by space *h*. There is no choice of access route

¹³⁸ Robinson 1946:208-223

around the building. These factors suggest that segregation was given some importance in this building.

3.18 Conclusion

This chapter has analysed the data derived from the permeability diagrams for individual buildings. The analysis has not identified any dominant pattern of access for visitors or for inhabitants moving around the buildings, rather a range of options have been observed, although non-segregation of visitors and of inhabitants from each other is most frequently discerned. The next chapter will draw together these findings to test the accuracy of this impression.

Chapter 4: Interpretation and discussion

4.1 Chapter structure

This chapter is structured from four perspectives: firstly, some general remarks, followed by analysis of typical features which may lead to identification of a house genotype, then the inhabitant-visitor viewpoint and finally, an inhabitant-inhabitant analysis. This approach will identify what spatial analysis suggests about underlying rules or social conventions influencing house layout and what this tells us about social relations in Olynthos. Outcomes will be compared with a small number of classical period houses from sites across the Greek world.

4.2 Interpretation

Interpreting the outcomes of spatial analysis is more art than science. It is not possible to know in advance which features will be the most relevant.¹³⁹ Hillier and Hanson note the need to use postulates to explain outcomes and to view buildings as a set of interfaces between inhabitants and visitors in order to understand how layouts generate and control social relationships.¹⁴⁰ By postulates they mean symmetry/asymmetry (i.e. segregation/integration) and distributedness/non-distributedness (presence/absence of a choice of route). It is these polarities which underpin the following discussion.

4.3 General points

The calculation of Real Relative Asymmetry allows the relative integration and segregation in buildings of different sizes to be compared.

¹³⁹ Hillier & Hanson 1984: 122

¹⁴⁰ Hillier & Hanson 1984: 122-123

A statistical analysis of the Mean RRA results for the sample from Olynthos is given in Table 23.

Mean	1.086
Error	0.037
Standard deviation	0.147
Confidence interval (95%) of mean	+/- 0.078
• Lower range	1.008
• Upper range	1.165
Minimum value	0.830
Maximum value	1.468
Percentiles	
• 25 th	0.985
• 50 th	1.075
• 75 th	1.127
Coefficient of variation (%)	13.493
Geometric mean	1.078
Anderson-Darling test (for normal distribution)	
• p-value	0.6284
• Pass normality test (p>0.05)?	Yes
Grubbs Outlier test	
• Outlier detected	Yes
• Potential outlier value	1.468

Table 23: Statistical analysis of Mean RRA values. ¹⁴¹

Eight houses (50%) lie within one standard deviation of the mean, indicating a closely clustered set of results, and a further seven houses (43.25%) lie within two standard deviations (see Table 24 below), confirming the normal distribution of the results ($P > 0.05$).¹⁴² One outlier (Avi8) was identified. The range of Mean RRAs is 0.830 -1.468 indicating that the buildings are all more segregated than integrated, although the level of segregation differs markedly.¹⁴³ Almost all the buildings thought to be purely residential cluster together around the mean RRA (houses 5-11

¹⁴¹ The statistics in Table 22 were calculated using MaxStatLite software.

¹⁴² Hart 2005: 339-340

¹⁴³ Hillier and Hanson 1984: 113 - values in the range 0.400-0.600 are strongly integrated. Those which are nearer to, or over 1.00, are more segregated.

in Table 24) plus Aiv9 which has a combined residential/commercial function. This suggests an underlying cohesion in approach, if not in detailed layout, in these buildings.

	Building	Mean RRA	Residential/commercial	Standard deviations from mean	Total features (see Table 25)
1	ESH4	0.830	Commercial	2	2
2	Avii6	0.961	Residential	2	4
3	Triangular Front	0.981	Commercial	2	2
4	Avii4	0.997	Probably residential but ? space <i>h</i>	2	6
5	Bvi7	1.038	Residential	1	5
6	Villa of Bronzes	1.039	Residential	1	4
7	A3	1.039	Residential	1	1
8	Aviii1	1.050	Residential	1	5
9	Tiled Prothyron	1.100	Residential	1	4
10	ESH2	1.104	Residential	1	3
11	Bvi5	1.114	Residential	1	5
12	Aiv9	1.129	Combined	1	2
13	Av2	1.208	Residential	2	3
14	Av10	1.224	Combined	2	3
15	A4	1.287	Residential	2	1
16	Avi8	1.468	Commercial	Outlier	2

Table 24: Buildings ranked by Mean RRA and by residential/commercial activity

The following section seeks to identify if such a cohesive approach existed at Olynthos.

Housing genotype

Spatial analysis seeks to identify the syntaxes or rules which underpin house design in a society.¹⁴⁴ The level of consistency indicated by the *RRA* values in residential buildings suggests that there may be a cultural pattern in Olynthos which spatial

¹⁴⁴ Hillier and Hanson 1984:48

analysis refers to as a housing genotype.¹⁴⁵ Robinson and Mylonas also refer to a typical house in their analysis.¹⁴⁶ They cite:

- a single entrance
- a *prothyron* (porch)
- a storeroom close to the entrance
- a dining-room/anteroom
- a court
- a *pastas*
- an *oecus* unit (kitchen/bathroom/flue complex)

Spatial analysis is premised upon boundaries between spaces which are architecturally visible. As neither storerooms nor *oecus* units can be convincingly identified from the architectural remains but rely on Robinson's interpretation, they are excluded from the analysis in Table 25 below.

¹⁴⁵ Hanson 1998: 32

¹⁴⁶ Robinson 1938: 142-216; Mylonas 1940: 393-397

Building	Single-entrance*	Prothyron entrance	Courtyard	Pastas	Range of rooms to north of pastas	Raised-border dining room and anteroom	Totals (of 6)
Aviii1	Yes	Yes	Yes	Yes	Yes	Yes	6
Avii4	Yes	Yes	Yes	Yes	Yes	Yes	6
Bvi5	Yes	Yes	Yes	Yes	No	Yes	5
Bvi7	Yes	No	Yes	Yes	Yes	Yes	5
Avii6	Yes	No	Yes	Yes	Yes	No	4
Villa of Bronzes	Yes	No	Yes	Yes	Yes	No	4
Tiled Prothyron	Yes	Yes	Yes	Yes	No	No	4
Av2	Yes	No	No	Yes	Yes	No	3
Av10	No	No	Yes	Yes	Yes	No	3
ESH2	No	No	No	Yes	Yes	Yes	3
Avi8	No	No	No	Yes	Yes	No	2
Aiv9	No	Yes	No	Yes	No	No	2
ESH4	No	No	Yes	No	Yes	No	2
Triangular Front	No	No	No	Yes	Yes	No	2
A3	No	No	Yes	No	No	No	1
A4	No	No	Yes	No	No	No	1
Totals (of 16)	8 (50%)	5 (31.25%)	11 (68.75%)	13 (81.25%)	11 (68.7%)	5 (31.25%)	

* single entrance calculation excludes an opening into rear alley but includes entrance into shops.

Table 25: analysis of “typical” feature of an Olynthian “house”

Robinson and Mylonas cite House Avii4 as the typical Olynthian house.¹⁴⁷ In Relative Asymmetry terms it lies at the lower end of the results, and outside the core grouping. Buildings which cluster around the mean of 1.086 *RRA* range widely in the number of Robinson’s features which they displayed.

House A3 has one, Aiv9 has two, ESH2 has three, whilst the remaining buildings display four or five features. The court, *pastas* and suite of northern rooms occur together in six buildings (37.5%) and they are the most commonly found individual features. The *pastas* appears in 81.25% of cases (13 buildings). The court and suite of northern rooms are the next most common features, appearing in 11 cases. A

¹⁴⁷ Robinson 1938:142; Mylonas 1940:400

further seven buildings have two out of three features. All other features occur in 50% or less of the sampled buildings.

Nevett also drew on spatial analysis to investigate houses at Olynthos.¹⁴⁸ Her sample consisted of 52 buildings, all from the North Hill. She provides no tabular data but reports her results in general terms. She also concluded that the court, *pastas* and suite of northern rooms are typical of Olynthian house design. The *prothyron* appears in only eighteen, and the raised-border room in nineteen, of the total houses excavated by Robinson.¹⁴⁹ The issue of a single entrance is less clear cut. In the above analysis any entrance from the *stenopos* has been excluded for reasons previously discussed (see p. 16). Half the buildings have additional entrances. Avi8, Aiv9 and A3 have entrances to commercial or storage facilities which do not connect to the rest of the building. A4, Av10, ESH2, ESH4 and the House with the Triangular Front, however, have additional entrances which do connect to the interior. Each of these buildings are understood to have included some commercial activity. The single entrance is a feature of buildings which are purely residential. Nevett found that 80% of buildings at Olynthos have no rear entrance, also noting that in the wider Greek world a single entrance from the street is the norm.¹⁵⁰

Spatial analysis indicates that Robinson and Mylonas' typical house is less typical than they believed. There was, however, some flexibility about how the genotype was applied in individual buildings. The existence of a housing genotype does not imply a blueprint which is invariably followed. Rather it provides a framework within which great variety is possible, in which individual needs and preferences

¹⁴⁸ Nevett 1999:62

¹⁴⁹ Cuijpers 2016:40; Cahill 2002: plate 1

¹⁵⁰ Ault & Nevett 2005: 84

could be accommodated. Although some common elements have been identified, we see a variety of internal configurations. The results from this analysis do not support the impression of rigidly uniform house layouts which the largely orthogonal layout gives.

4.5 Olynthos - Inhabitant-visitor perspective

The potential for inhabitant-visitor contact is analysed across three dimensions. Firstly, the overall depth of the building from the exterior identifies spaces which are likely to be ‘available’ to visitors; secondly, the depth of the raised-border room from the exterior which may allow access without encountering inhabitants and finally, sightlines from the entrance which indicate the level of visual separation possible between visitor and inhabitant. These approaches will allow for different perspectives on the inhabitant-visitor relationship to emerge.

4.5.1 Depth from exterior

The maximum depth in the buildings analysed ranges from three to five levels (see Table 42, p.106). All houses have at least one space which is a minimum of two steps segregated from the court/*pastas*. Examples are spaces *c* and *f* in House Bvi7 and space *g* in Av10. Where houses have a suite of rooms to the north of the *pastas*, these spaces are usually furthest from the entrance (see individual house layouts). The shade cast by the *pastas* roof would mean that anyone in those rooms would probably be invisible to a visitor entering the building.¹⁵¹ Such spaces offer either privacy for an individual(s) or segregation for groups/individuals who need to be ‘protected’. Spatial analysis does not permit us to be certain if either case pertains here. The need, in spatial analysis, to divide up open areas (marked in blue on the

¹⁵¹ Nevett 1999:65

layouts) has the effect of making some spaces appear deeper and less accessible than they would have seemed to inhabitants and visitors.

4.5.2 Raised-border rooms

Five houses have a raised-border room and an anteroom - Aviii1, Avii4, Bvi5, Bvi7 and ESH2 - 31% of the sample. This percentage is mirrored in the total houses excavated at Olynthos.¹⁵² In the sample analysed, all except the raised-border room in Bvi7 are located close to the entrance and have low *PA* scores, indicating that they are segregated. This fits the traditional view of spaces used for symposia. In Avii6, Av2 and Av10 there are also spaces near the entrance which could fulfil this function although there are no architectural features to confirm this.¹⁵³ Access to the raised-border room however did require movement through the court in all cases, suggesting that separation of visitors and inhabitants was not paramount.

The tendency to refer to raised-border rooms as *andrones* has already been noted (see n.82). This focus understands the space purely as a venue for symposia (male drinking parties). This view is now contested.¹⁵⁴ Foxhall criticises Robinson's attempts to assign a function to individual spaces, suggesting that multi-functionality of spaces was the norm in the Classical Greek world and a single-purpose space such as a male-only raised-border room does not accord with this practice.¹⁵⁵ Equally it is argued that other spaces could host a symposium, even the court might be used in good weather.¹⁵⁶ There is evidence from ceramics that symposia could take place

¹⁵² Cahill 2002: 61; 186.

¹⁵³ See Chapter 3

¹⁵⁴ Lynch 2007: 244

¹⁵⁵ Foxhall 2007: 234; Nevett 1999:68

¹⁵⁶ Trumper 2011: 38; Lynch 2007: 244-5

outdoors or indoors using cushions placed directly on the ground.¹⁵⁷ This may mean that symposia could take place in houses without a raised-border room. If symposia may have taken place outside the raised-border room, it is also possible that other activities took place within it. It is believed that raised-border rooms had windows at high level in their external walls.¹⁵⁸ This may have meant they were the best lit spaces in the home after the court/*pastas*. As such, it is possible that activities which took place in the court/*pastas* in the heat of the summer, were transferred to the raised-border room during colder, winter months, potentially involving all household members. In the houses sampled from Olynthos, none of the houses which include commercial activity include a raised-border room, and none of the houses which do include a raised-border room include obvious signs of commercial or production activity. This suggests that raised-border rooms were a feature either of wealthier inhabitants or those who aspired to inclusion in higher status groups.

4.5 3 Sightlines from exterior

The final perspective to consider is the sightline from the entrance into the interior of each building. This is shown by a yellow triangle in the layouts below.

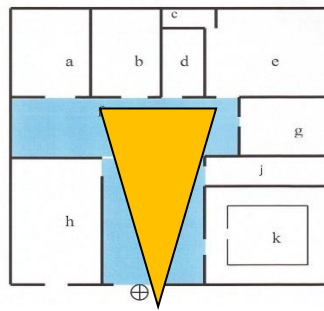
¹⁵⁷ E.g Neck-amphora showing two male figures seated under a tree, c. 500BC (BM Cat. No. 1856.1226.76); kylix showing man and ephebe reclining on long cushions but lacking a couch. c.440BC (BM Cat. No. 1814.0704.503).

¹⁵⁸ Cahill 2002: 192 e.g. A10 and Avi5 at Olynthos.

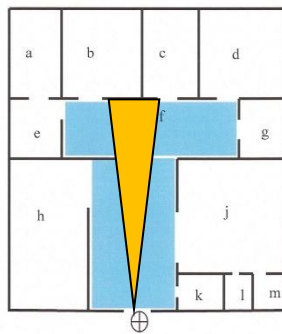
House Aviii1



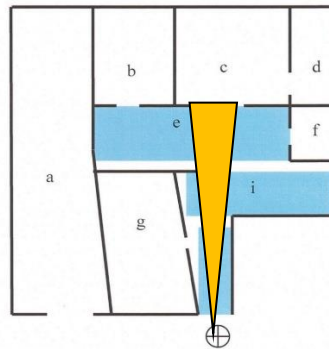
House Avii4



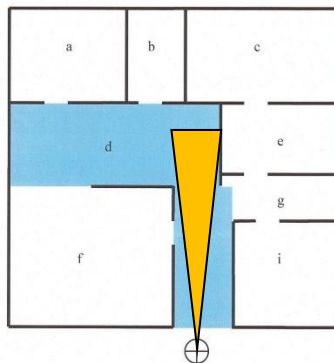
House Avii6



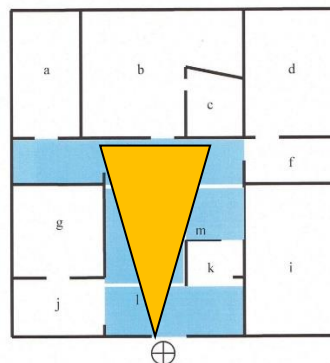
House Avi8



House Av2

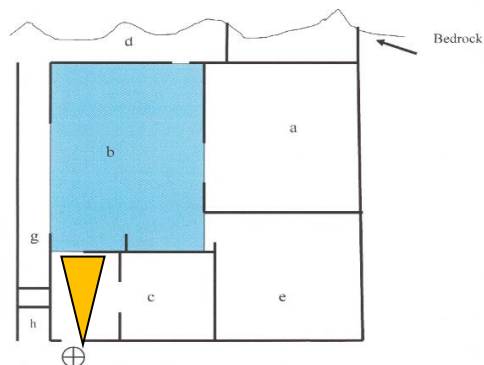
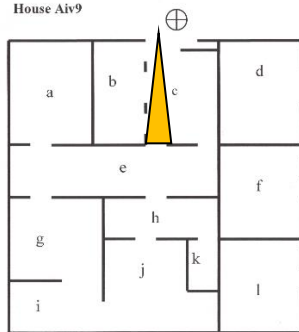


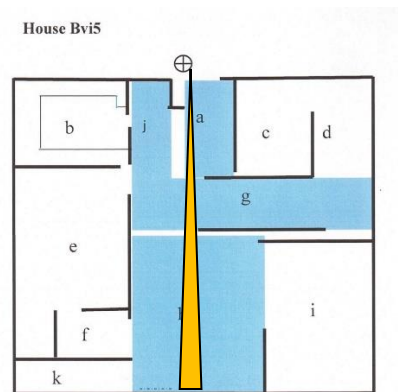
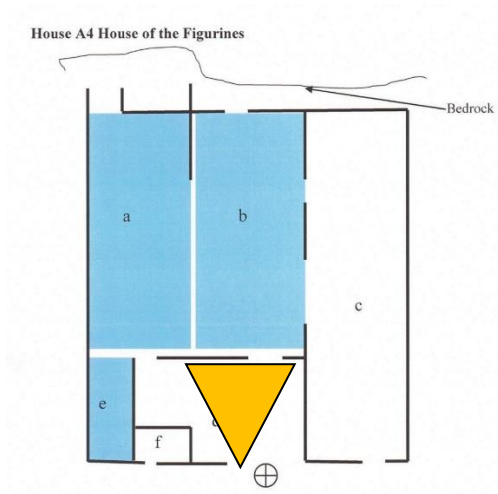
House Av10



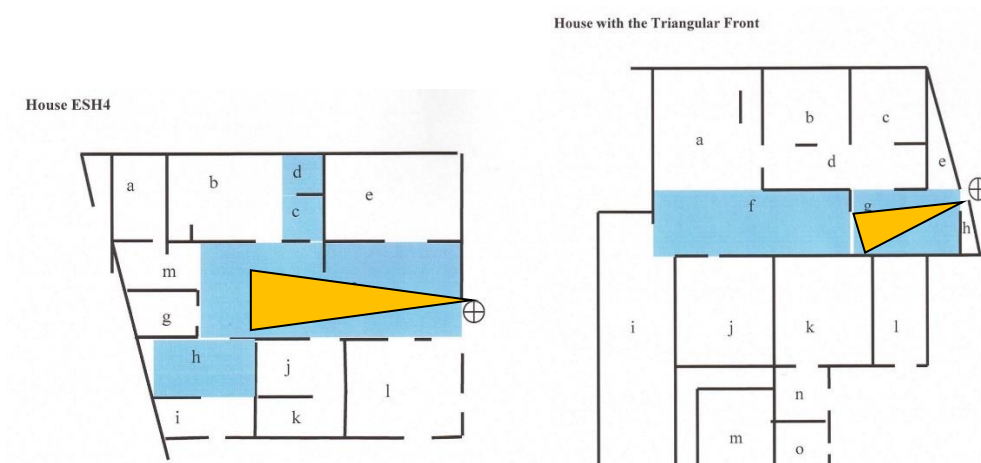
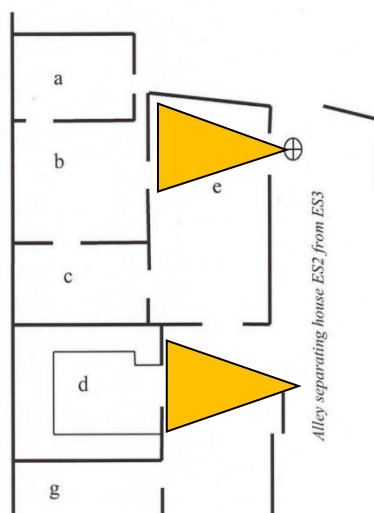
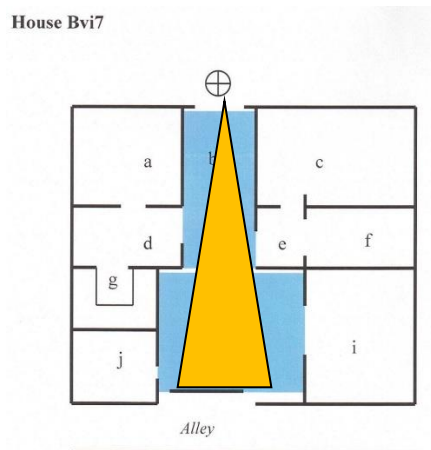
House A3 House of the Standing Pilasters

House Aiv9

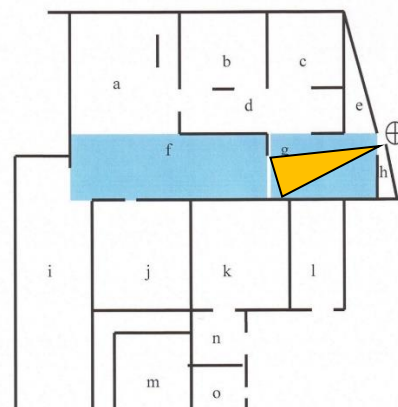




House ESH2



House with the Triangular Front



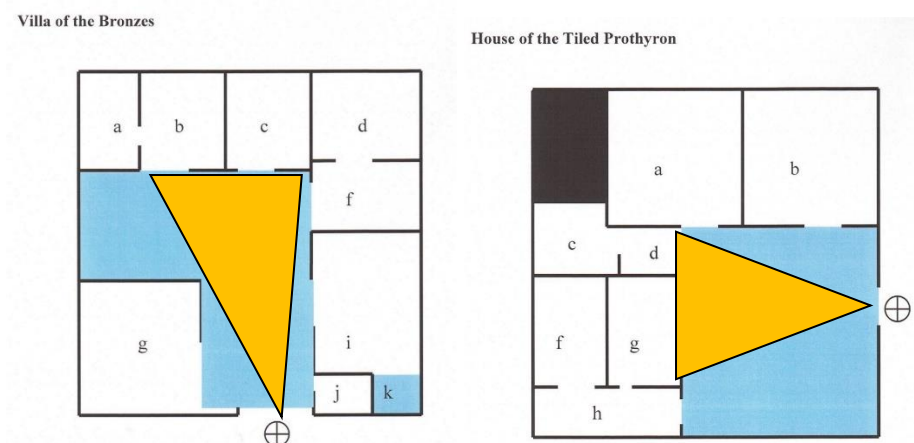


Fig.41: sightlines from entrance into interior of buildings

The position of the entrance and how it relates to interior spaces can have one of two effects: it may curtail visual access of visitors or it may open up the interior to them.¹⁵⁹ Fig.41 shows the sightlines from the entrance into the interior of each building in the sample. In all buildings, except for A3, A4 and Aiv9, there was an uninterrupted view into the court and part of the *pastas*. It is possible that temporary screens such as curtains may have blocked the view in some cases, but as these leave no archaeological trace this is uncertain. Even where the raised-border room is next to the entrance it would not be possible for a visitor invited into that space to avoid seeing anyone present in the court as they enter the building, or for inhabitants to be unaware of visitors. It has been suggested that inhabitants would move out of sight when visitors came to the house.¹⁶⁰ In some situations, this might have been possible, but it assumes that all visitors made appointments before arriving, which seems impractical.

¹⁵⁹ Fisher 2009: 448

¹⁶⁰ Nevett 1999:73

4.5.4 Courts and *pastades*

One of the laws of spatial analysis is that spaces which are the most integrated in relation to others contain activities which draw people together and have a bearing on group identity.¹⁶¹ In Olynthos these spaces are usually the court and *pastas*. This holds true in every building in the sample with the possible exception of A4 where space *d* is the shallowest but does not appear to function as either a court or *pastas*.¹⁶² These spaces were important sites of domestic activity in the ancient Greek world.¹⁶³ The possibility that looms may have been setup in the courts or *pastades*, particularly when good light was needed, or in the heat of summer, is raised by several authors.¹⁶⁴ In the present sample, loom weights were found the court of House Avii4 and in the *pastas* of Bvi5. Other houses also had loom weights in the court or *pastas* but numbers and patterns of deposition make it unclear if these came from looms located there, from a store cupboard or were scattered during the battle for the city.¹⁶⁵ Food preparation may also be carried out in the court.¹⁶⁶ Each of these activities requires the presence of inhabitants at many times during the day and so within the sight of visitors.

It is possible that views into the building's interior would be desirable as this provided an opportunity for display. The court, *pastas* and the raised-border room were often the most highly decorated spaces in a building, with other spaces usually having beaten earth floor and plain walls.¹⁶⁷ Displaying decorated areas to the visitor could indicate status and relative wealth. As well as being the most integrated

¹⁶¹ Hanson 1998: 272

¹⁶² See individual analyses in Chapter 3

¹⁶³ Ault 2005: 62

¹⁶⁴ Nevett 1999: 70; Tsakirgis 2016:169; Goldberg 1999: 149

¹⁶⁵ Cahill 2002:172-173

¹⁶⁶ Cahill 2002: 165

¹⁶⁷ Nevett 1999:65

spaces, this further supports the conclusion that the court, *pastas* and raised-border room were the also the more open areas in the home. Given the above evidence, we must conclude the possibility that at the least *gatherings* would take place between visitors and inhabitants, and possibly sustained contact. It is unlikely that strict segregation could be achieved, although account must be taken of different usage according to time of day and season when inhabitants' presence in the court may have varied. Activity in the court and *pastas* after dark may not have been desirable. Equally, the winter temperature in northern Greece can drop below freezing, so working outdoors would not have been a practical option.¹⁶⁸

4.5 5 Inhabitant-visitor perspective – conclusions

Overall, this analysis has not demonstrated that a clear desire to segregate visitors from inhabitants existed in Olynthos. We have seen examples where this might have been possible, but this applies to less than half of the buildings sampled. The presence of a room with a raised border deep inside Bvi7 suggests that such spaces are not automatically associated with segregation of visitors from inhabitants and the evidence from sightlines provides very suggestive evidence of a more open approach.

4.6 Inhabitant-inhabitant perspective

This aspect is analysed, firstly, by levels of depth from the exterior to demonstrate how the spaces break down between integrated and segregated areas and how this varies between buildings, secondly, by choice of route which allowed inhabitants to avoid open areas and to remain segregated from others in the building, and finally, by control values and *PA* ratings which indicate those spaces which are likely to host

¹⁶⁸ www.accuweather.com/en/gr/chalkidonia/

social interaction. The goal is to investigate the extent to which the movement of individuals or sub-groups within the household could be managed.

4.6.1 Depth of spaces

Fig.42 below shows that all buildings have spaces at a minimum of three levels of depth.

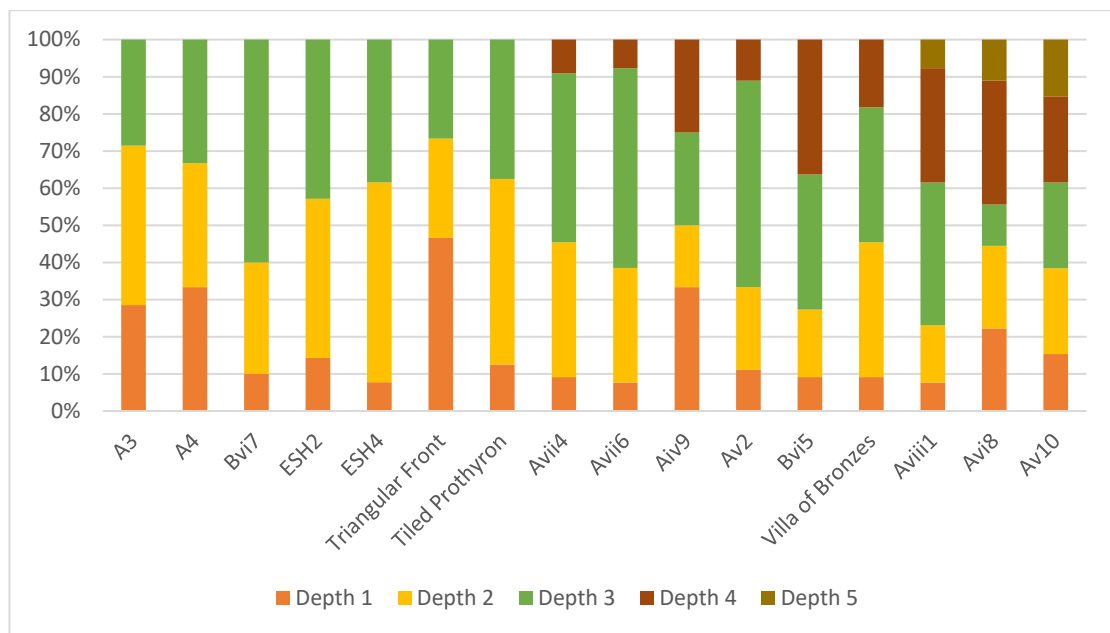


Fig. 42: % of spaces at each depth level in buildings at Olynthos

Those with only three levels are A3, A4, Bvi7, ESH2, ESH4, the House with the Triangular Front and the House of the Tiled Prothyron (43.75%).

Avii4, Avii6, Aiv9, Av2, Bvi5 and the Villa of the Bronzes have four depth levels (37.5%), whilst Aviii1, Avi8 and Av10 have five depth levels (18.75%). This suggests that inhabitants in the latter group of houses are the most concerned with segregation and/or privacy. However, when compared with the *PA* findings we see that house Aviii1 has the lowest percentage of its spaces which score low on the *PA* scale (i.e. the fewest segregated spaces), whilst Avi8 and Av10 are both positioned in the mid-ranking results. It is difficult to see any consistency or patterning in these

outcomes. The assumption that more segregated spaces were used to provide opportunities for withdrawal may be mistaken. Some may simply have been storerooms.¹⁶⁹ Lack of choice is sometimes interpreted as demonstrating a desire to oversee the activities of the household members. This may be so. Alternatively, lack of choice may equate to a lack of concern about control.

The analysis in Fig.43 below does not reveal any discernible pattern in how high, medium and low *PA* spaces occur in these buildings. All buildings have high, medium and low *PA* spaces, except for Av2 and Bvi7 which only have high and low *PA* spaces. The differences in the outcomes are quite marked. Only 14.3% of the spaces in ESH4 are high *PA* whilst A4 has 42.9%. Avii4 has the most spaces which score low (75%), whilst A4 and Av10 have only 42.9% of spaces in the low *PA* category.

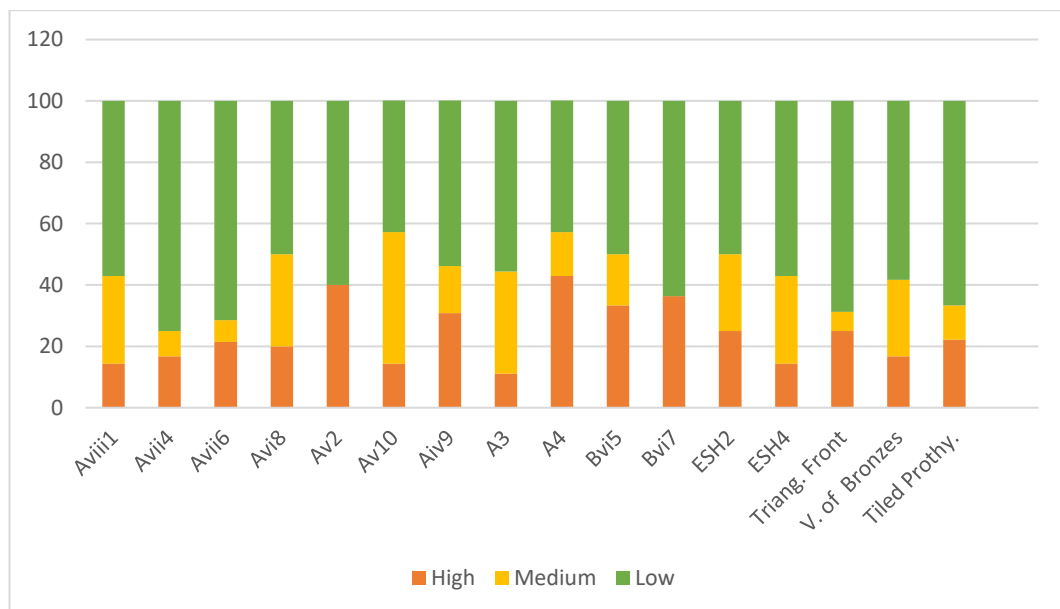


Fig.43: Incidence of high, medium and low PA in sample houses at Olynthos

¹⁶⁹ Xen. Oec. 8.3

4.6.2 Choice

Choice of route relates to suites of spaces which allow the occupants to move around without passing through high *PA* spaces, providing an opportunity for withdrawal or segregation depending on requirements. Simple two-room interfaces such as the raised-border room /anteroom are excluded as they do not involve choice, rather they are directive. Ten buildings (Avii4, Av2, Av10, Aiv9, A3, A4, Bvi5, ESH2, ESH4 and House with the Triangular Front) demonstrate some level of choice in movement for inhabitants. However, this is not as significant as it might first appear. In Avii4, Av2, Av10, Bvi5 and ESH4 the choice relates to a single space which has two entrances/exits; in A3 and A4 the spaces involved are ones which have a high *PA* rating and so do not facilitate privacy or segregation. Only two buildings (Aiv9 and ESH2) demonstrate real choice. In Aiv9 it is possible to move between spaces *g*, *h*, *i*, *j* and *k* without entering a high *PA* space and in ESH2, spaces *a*, *b* and *c* form a suite of low/medium *PA* rooms. These results further support the conclusion that privacy and segregation of inhabitants were not given high priority in the majority of houses at Olynthos.

4.6.3 Control values

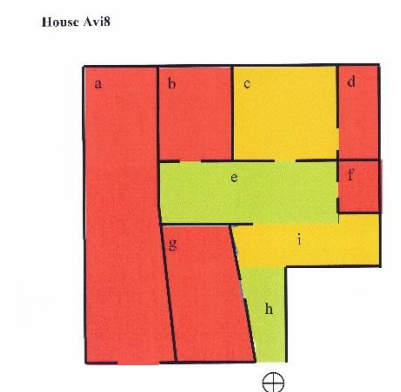
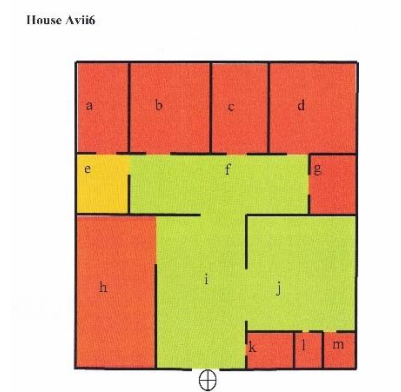
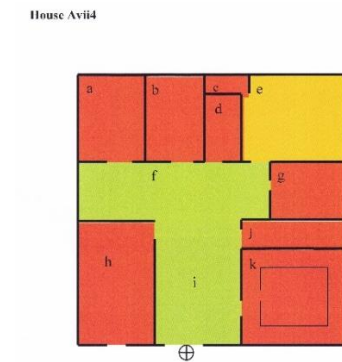
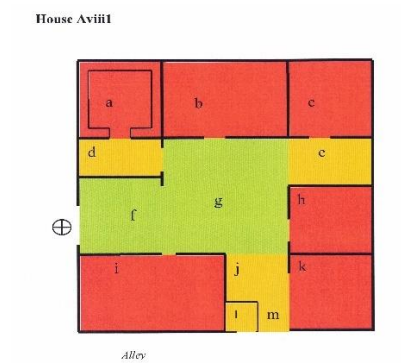
Fig.44 below provides a visual interpretation of the *PA* ratings for internal spaces which are derived from the combination of Real Relative Asymmetry (*RRA*) scores and Control Values (*CV*). In all cases the court and the *pastas* where present, are areas of high *PA*. All buildings have at least two high *PA* spaces, always involving the court and usually the *pastas*. These high *PA* areas form the main circulation spaces of the building and, as previously noted, were probably areas of concentrated domestic activity. In fifteen out of sixteen buildings, the street entrance opens

directly into an area of high presence-availability. Spaces in the medium category tend to be those which control access into one other space.

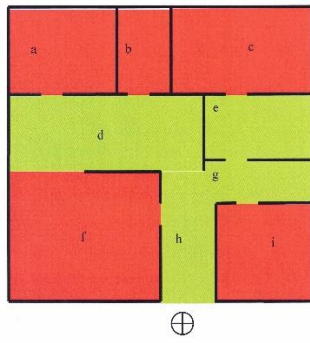
4.6.4 Presence-availability analysis

Key to colour coding

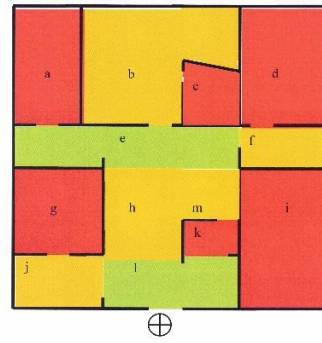
	High PA
	Medium PA
	Low PA



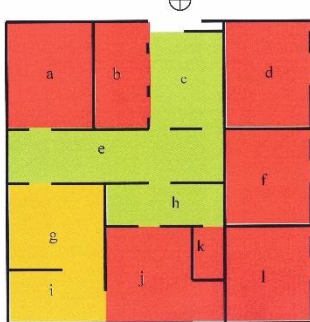
House Av2



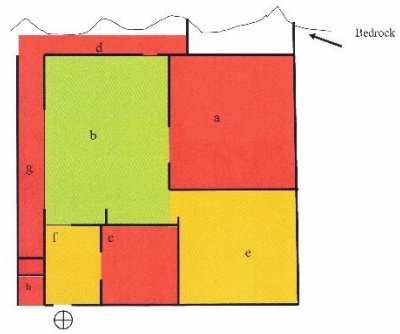
House Av10



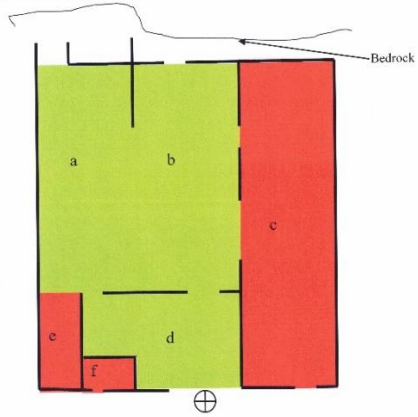
House Aiv9



House A3 House of the Standing Pilasters



House A4 House of the Figurines



House Bvi5

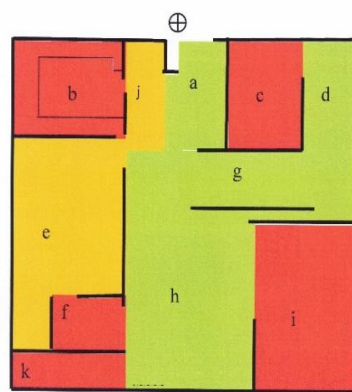




Fig. 44: Presence-availability at Olynthos.

There is no obvious difference between those houses which include commercial activity and those which are solely residential, nor do buildings which cluster around the Mean *RRA* show any similarity. Shops/workshops and those spaces concerned with agricultural activity are all shown as being areas of low presence-availability. This may seem counter-intuitive as such areas would normally be busy but, when viewed from the perspective of any inhabitants, they are usually isolated from the rest of the building and therefore would appear segregated. When the layouts which show sightlines are compared with those which map *PA*, the outcomes further support the earlier conclusion concerning visitors as sight lines from the entrance pass through spaces which have high *PA* values in every case in the sample.

4.6.5 Inhabitant-inhabitant perspective – conclusions

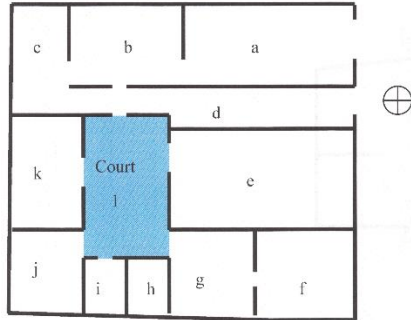
Interpretation of the inhabitant-inhabitant results has concluded that house design in Olynthos was not overly concerned with segregating inhabitants from each other. The understanding that courts and *pastades* were the centre of household life has been corroborated by the high *PA* values which have been indicated in each case and by the lack of choice in how inhabitants could travel around the building.

4.7 Comparison with regional Greek houses

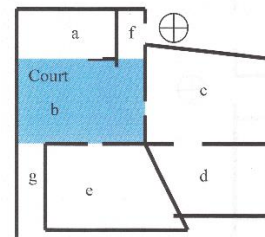
4.7.1 Regional Greek house layouts

The diagrams below provide layouts for houses selected for analysis. Summary results are provided in Appendix 4.

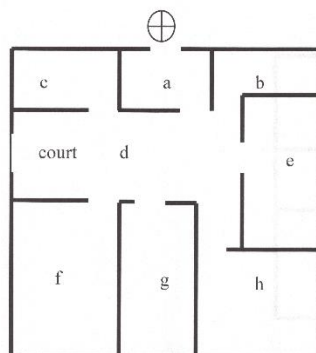
House C, Great Drain, Athens



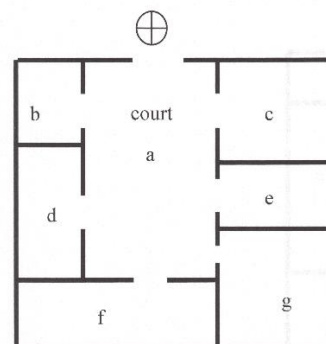
House D, Great Drain, Athens



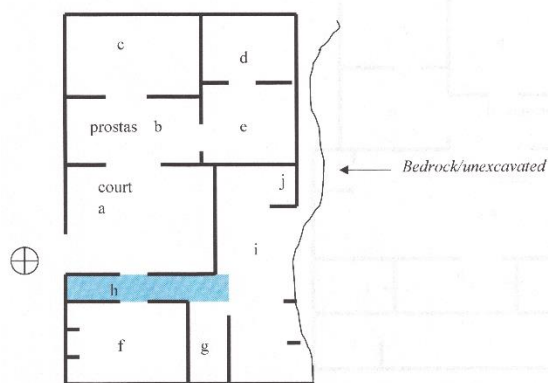
House South Stoa 1, Athens



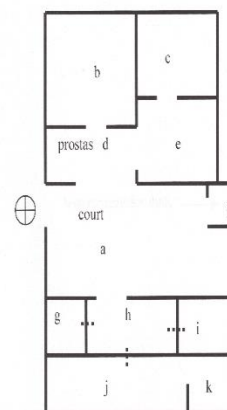
House Northeast slopes Areopagus, Athens



House B, Abdera



House C, Abdera



NB: entrances to spaces g, i and j are unknown and are assumed for analysis as shown by dotted line.

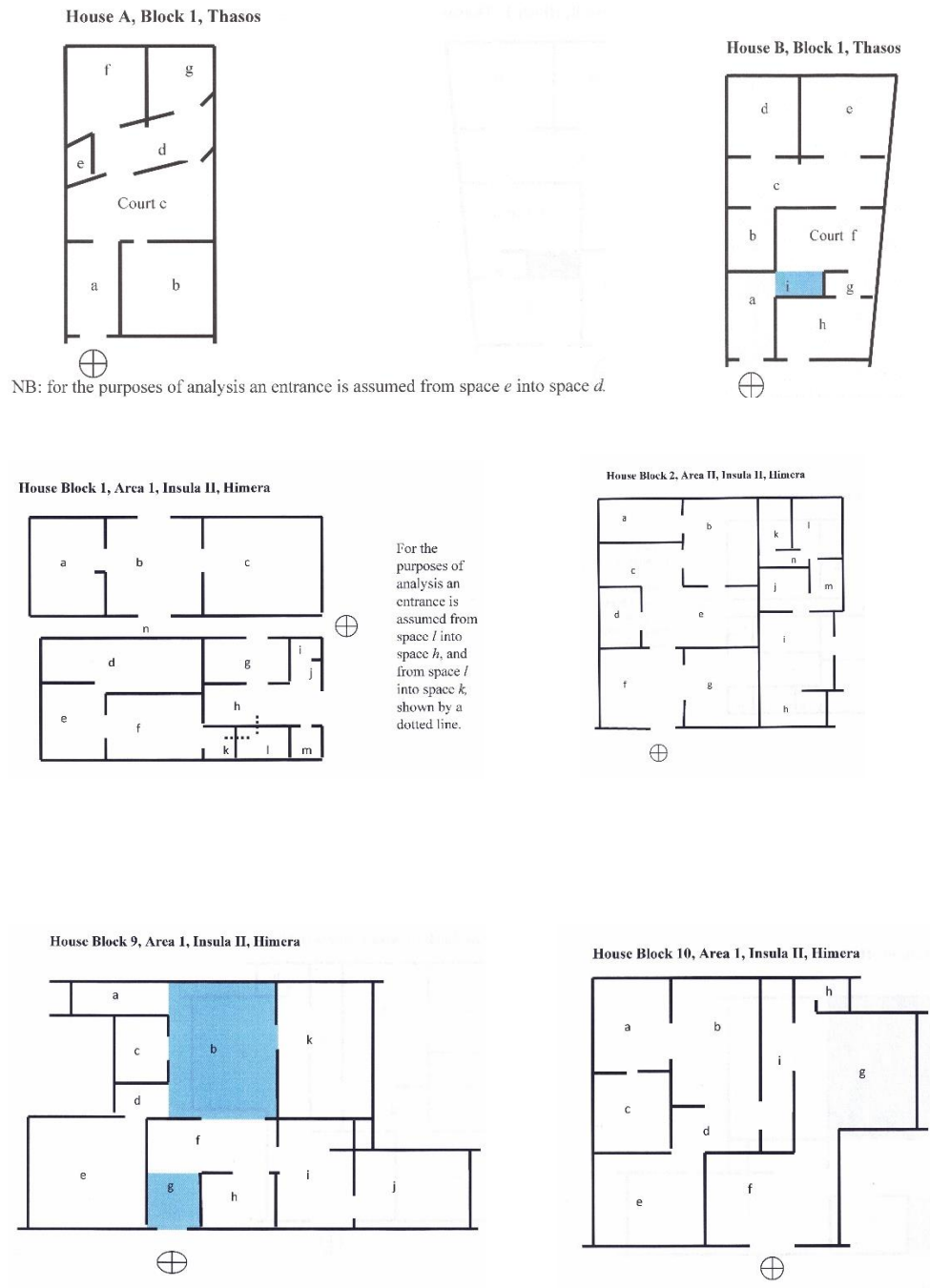


Fig. 45: regional Greek houses - layout¹⁷⁰

4.7.2 General points

Visual inspection of the layouts shows some striking differences. In terms of typical features, we can see that whilst a court appears in most houses, it has not been

¹⁷⁰ **Athens:** Thompson & Whycherley 1972:176-178; Nevett 1999:91. **Abdera:** Graham 1972: 297. **Himera:** Harms 2010: 42,55,58,62. **Thasos:** Nevett 1999: 92-93.

identified in Houses 2, 9 or 10 at Himera. None of the houses have a *pastas*. The *pastas*, associated with a range of north facing rooms, appears to be specific to Olynthos.

Table 26 shows that the Mean *RRA* results for the regional houses cover a wider range than those at Olynthos. The most striking feature is the high *RRA* values recorded in three of the four houses at Himera, which suggests they were significantly more segregated than even the highest scoring building at Olynthos. This is clear from the layouts which show sub-suites of spaces and tortuous access routes. Although the houses from Athens are of very different sizes, their results lie reasonably close together (0.759, 0.836, 0.956 and 1.222).

Building	RRA
House C, Athens	0.956
House D, Athens	1.122
House, South Stoa 1, Athens	0.836
House, NE slopes Areopagus, Athens	0.759
House A, Block 1, Thasos	1.268
House B, Block 1, Thasos	1.288
House B, Abdera	1.355
House C, Abdera	1.227
House Block 1, Area 1, Insula II, Himera	1.724
House Block 2, Area II, Insula II, Himera	1.801
House Block 9, Area 1, Insula II, Himera	1.145
House Block 10, Area 1, Insula II, Himera	1.677

Table 26: Mean *RRA* values for regional Greek houses

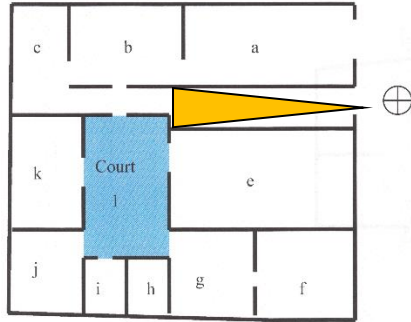
It is interesting that the values from Athens lie at the lower end of the Mean *RRA* range (indeed 0.759 is lower than any house at Olynthos) and so are relatively less segregated. This is not what we would expect in a society which is said to have

placed such emphasis on segregating its female members from both visitors and other family members. However, the very densely packed city centre may have offered limited options. The houses at Abdera are slightly more segregated (1.355 and 1.273) and those at Thasos which are of similar size and layout have similar results (1.268 and 1.288). In both cases these are within the range found at Olynthos although towards the top of the results.

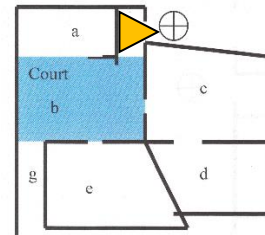
4.7.3 Regional houses - sightlines

The unobstructed sightlines identified at Olynthos are not seen in all the regional Greek houses (Fig.46). In three of the four houses analysed from Athens and both houses from Thasos, sightlines into high *PA* areas are blocked. In contrast the house on the Northeast of the Areopagus at Athens and both the Abderan houses allow clear sight into the court. The situation in Himera is more complex. In Houses 1 and 2 there are sightlines into the house from more than one entrance. As no shops or other commercial areas have been identified in the buildings, they have been assumed to be entrances into the residential areas. It is possible that the buildings were divided into two residences, although the excavators made no comment on this. In both cases the additional entrances allow sight into significant portions of the building. In the other houses at Himera, the direct sightline is blocked although a more oblique perspective might allow sight into high *PA* areas. These findings suggest very different attitudes across Greece and raise the possibility that householders at Olynthos were not unique in permitting views into the interior of their homes.

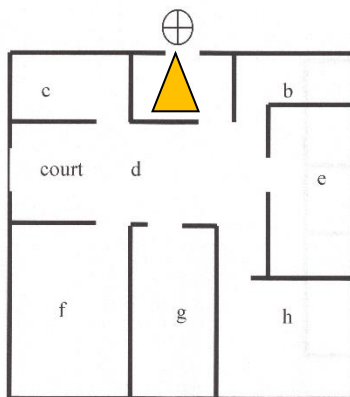
House C, Great Drain, Athens



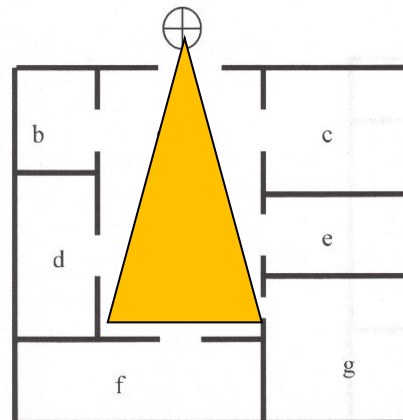
House D, Great Drain, Athens



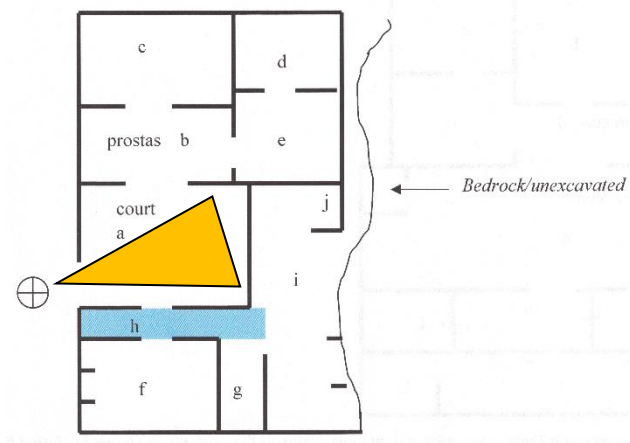
House South Stoa 1, Athens



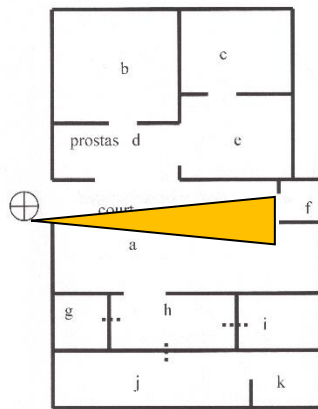
House Northeast slopes Arcopagus, Athens



House B, Abdera

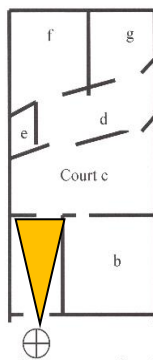


House C, Abdera



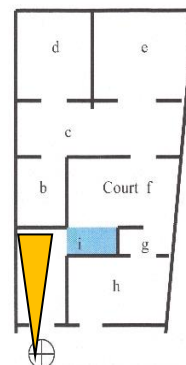
NB: entrances to spaces g,i and j are unknown and are assumed for analysis as shown by dotted line.

House A, Block 1, Thasos

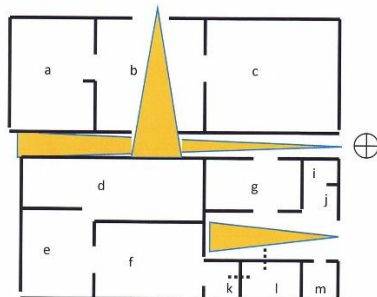


NB: for the purposes of analysis an entrance is assumed from space e into space d.

House B, Block 1, Thasos

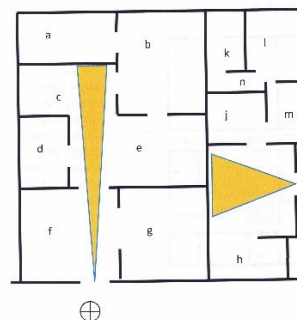


House Block1, Area 1, Insula II, Himera



For the purposes of analysis an entrance is assumed from space l into space h, and from space l into space k, shown by a dotted line.

House Block 2, Area II, Insula II, Himera



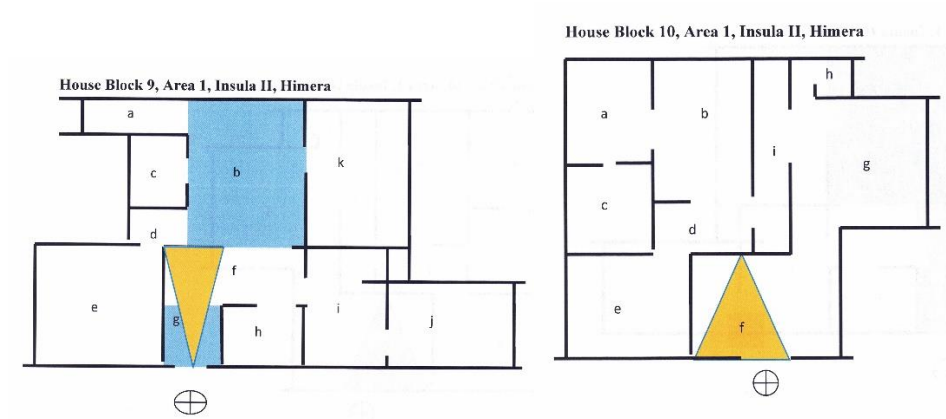
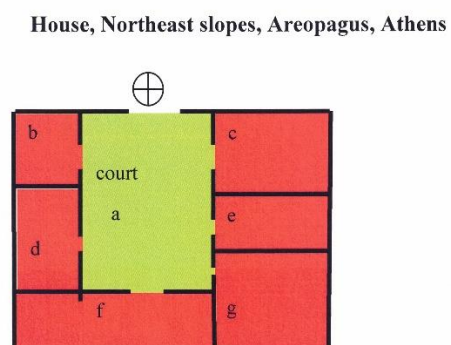
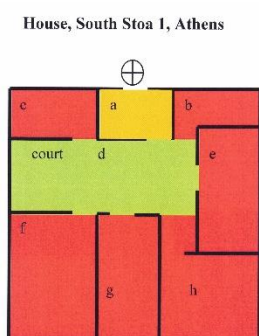
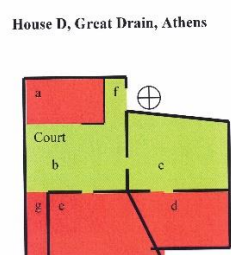
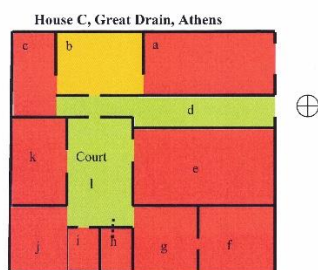


Fig. 46: regional Greek houses –sightlines

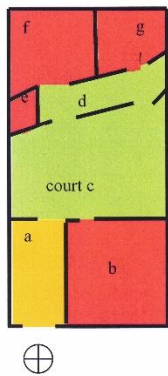
4.7.4 Regional houses – presence-availability analysis.

Key to colour coding

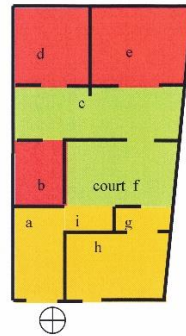
- High PA
- Medium PA
- Low PA



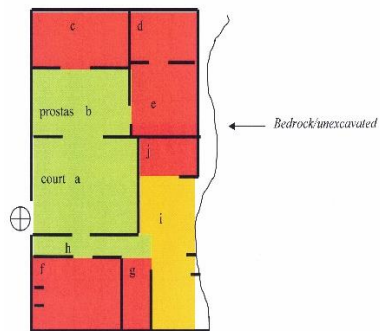
House A, Block 1, Thasos



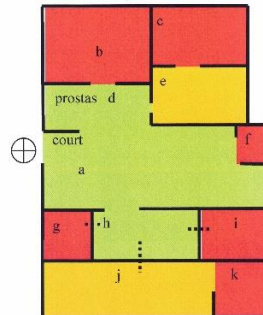
House B, Block 1, Thasos



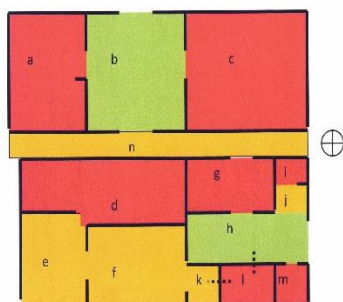
House B, Abdera



House C, Abdera



House Block 1, Area 1, Insula II, Himera



For the purposes of analysis an entrance is assumed from space *l* into space *h*, and from space *l* into space *k*, shown by a dotted line.

House Block 2, Area II, Insula II, Himera





Fig. 47: Presence-availability in regional Greek houses

All houses in the sample have at least one area of high *PA*, normally the court. Where there are two such areas, they are usually contiguous, providing a significant area for domestic activity in the summer, although in Himera, House 1 has two high *PA* areas which are separated by a low *PA* space, although this may relate to two different households. Again, Himera produces different results, suggesting that although it was a Greek city, other influences operated there.

4.7.5 Conclusions

This analysis illustrates the variety in configuration of houses across the wider Greek world. Differences in layout and segregation in the northern cities of Olynthos, Abdera and Thasos indicate that climate was not the deciding factor in house design. Taken together, the evidence further demonstrates that the picture derived from Athenian literature cannot be applied universally.

Chapter 5: Conclusions

5.1 Introduction

This dissertation has sought to investigate domestic and social relations in 5th – 4th century BCE Olynthos, drawing on excavation reports published by David M. Robinson and his team. The chosen methodology was spatial analysis which identifies movement and flow around buildings and indicates how access within them influenced, and was influenced by, social norms, such as desire for privacy or a wish to control the activities of inhabitants. The methodology has highlighted a number of important issues which should inform future investigations into these areas, both at Olynthos and across the classical Greek world. The key messages are highlighted in *italics* below.

5.2 Spatial analysis

Spatial analysis must be recognised as a valid methodology in investigating domestic buildings across the classical Greek world.

Spatial analysis permits investigation and interpretation of a large number of buildings, allowing the individuality of different sites, and the uniqueness of individual community attitudes to domestic and social relations to be more clearly delineated.¹⁷¹ The techniques of sightline and presence-availability analysis have been particularly fruitful. The investigation has demonstrated that visual scans of layouts (as suggested by Cutting) cannot provide the detailed and instructive data which mathematical analysis delivers.¹⁷² Spatial analysis has provided some tantalising glimpses of how non-élite families

¹⁷¹ Morgan 2010:171

¹⁷² Cutting 2003:19

may have lived, which is otherwise unavailable. To date, spatial analysis has been used predominantly by prehistoric archaeologists although there are now some studies in Roman domestic settings, but the methodology remains uncommon in Greek archaeology.¹⁷³ Spatial analysis and publication of detailed outcomes, must now become part of the routine toolkit when analysing Greek domestic space.

5.3 The ‘Greek house’

The ‘type-house’ approach is no longer valid. Future research should recognise and work with the wide variation in house design across the classical Greek world.

Spatial analysis allows us to assert with some confidence that there is no such thing as a ‘Greek house’. A number of different strands of evidence point to this conclusion. The ideological definition of a house, understood in modern Western terms as a purely residential dwelling occupied by a single family, does not translate to the classical Greek world.¹⁷⁴ It has been shown at Olynthos that a significant proportion of the ‘houses’ contain either shops, craft production or agricultural processing areas.¹⁷⁵ This configuration has also been found on a number of other sites, including Athens and Halieis.¹⁷⁶ It is probable that many of the free citizens and slaves occupied in these businesses also lived on site, making them places of both work and

¹⁷³ Fisher 2014; Grahame 2000; Stöger 2011

¹⁷⁴ Morgan 2010:167

¹⁷⁵ See Chapter 3.

¹⁷⁶ Ault 2005:79; Tsakirgis 2005: 67-79

residence.¹⁷⁷ Without any surviving second storeys at Olynthos, it is not always certain that any living space existed in some of the buildings. It is for these reasons that this study has used the term ‘building’ to refer to individual units of analysis rather than the more common ‘house’, and it is recommended that this approach is adopted elsewhere.

When considering the Greek ‘house’ we must beware of over-simplification of the evidence. There have been attempts to classify classical Greek houses into certain types -*pastas*, *prostas* and *herdraum* (hearth room).¹⁷⁸ The outcomes from this study suggest that this approach now needs revision. Most, but not all, of the buildings at Olynthos, have a *pastas*, which was not found elsewhere, the two houses analysed from Abdera have a *prostas* although it was not found in any other buildings, and none of the excavators concerned with the houses analysed report finding evidence of a *herdraum* house. Even the court, thought by many to be a ubiquitous feature, was not found in three of the four houses analysed from Himera.

The study has also demonstrated that climate and geographical proximity are not major influences in building layout. Building configurations at Olynthos, Abdera and Thasos, which all lie along a similar line of latitude in northern Greece, have different layouts. The buildings at Thasos protect sight into their court whilst those from Abdera and Olynthos are more open. Athens, and Himera, which also lie on a similar but more southerly latitude are very

¹⁷⁷ Migeotte 2009:96

¹⁷⁸ Hoepfner and Schwander 1986

different in their design, with Athens typically protecting internal views from visitors whereas inhabitants of Himera appear less concerned about this.

As early as 1972 Thompson and Wycherley noted great variation in relation to Athenian 'house' layout. Rather than trying to classify and reduce buildings into convenient categories, we need to move beyond this approach and recognise and work with the great variety of configurations and individual adaptations which existed.¹⁷⁹

5.4 Social relations at Olynthos

There is no conclusive evidence for segregation of social groups, including women, at Olynthos.

No convincing evidence has been produced to suggest that there was an attempt to segregate groups of inhabitants from each other at Olynthos. Lack of choice of route around the buildings and the infrequency with which sub-suites of rooms have been identified, reduces the option of maintaining separate areas for particular groups of inhabitants. Nevett, who also used spatial analysis, agrees that there is little choice in movement around Olynthian houses, but equates this to social control. This conclusion risks over-interpretation of the evidence. The layout of rooms around the court could indicate a desire to oversee and control movement. It might also suggest a communal ethos which allows uncontrolled and unsupervised movement around the building. It is not possible to be certain which of these

¹⁷⁹ Thompson and Wycherley 1972:179

cases applies, and the temptation to opt for one or the other should be avoided.

Previous studies at Olynthos located the *andron* in a number of buildings, but failed to find a *gynaikon* anywhere on the site.¹⁸⁰ Cahill believed that Robinson's kitchen-complex was the area where cooking took place and so could be seen as women's quarters, but did note a lack evidence that it could be locked to separate it from other spaces.¹⁸¹ Nevett agrees up to a point, but concludes that the whole building, with the exception of the *andron*, may be referred to as a *gynaikon*.¹⁸² Whilst custom and practice may have had a role to play, there is no architectural evidence to locate a *gynaikon* let alone layouts which afforded opportunities for the "oriental seclusion" of women.

Equally, no convincing argument can be made to demonstrate the segregation of visitors from particular groups of inhabitants. Indeed, the picture suggests the contrary. The central role which the court (and in the case of Olynthos, the *pastas*) are thought to have played in daily life, and the evidence derived from sightline analysis, suggests that the court and *pastas*, and any household members present there, would be clearly visible to anyone entering the building. In all but one of the buildings analysed, the entrance opened directly into a high *PA* area (usually the court) where there was the probability of a visitor coming into contact with inhabitants. Nevett posits that segregation was not from men as a whole but from those outside the

¹⁸⁰ Nevett 1999; Cahill 2002

¹⁸¹ Robinson's conclusions are uncertain as he appears to have been influenced by his own cultural expectations. Subsequent research (Foxhall 2007: 240) has demonstrated that cooking was carried out in a number of sites across the ground floor, rather than confined to a specific area as in modern homes.

¹⁸² Nevett 1999: 71-72

family.¹⁸³ She cites the presence of an internal porch in a number of buildings as indicative of this. Whilst the porch may have indicated a desire to shield the interior from the view of anyone at the street entrance, it should not be seen as evidence of a desire for segregation of women. On the contrary, we have seen activities, which must have involved women, carried out in open and communal areas, with no attempt to shield them from the male visitor's gaze. Again, spatial analysis cannot differentiate between the two interpretations, and does not permit certainty about which applied at Olynthos. It is also of interest that analyses of artefact assemblages were equally inconclusive.¹⁸⁴

5.5 Dominance of Athenian literary evidence

Future studies of non-Athenian sites must be analysed independently of Athenian cultural ideals and recognise the individuality of communities.

The influence of Athenian literature is widespread. Athenian attitudes to the segregation of women have been particularly influential in previous studies of Olynthos. It is sometimes assumed that although Athenian authors painted an ideal description of segregation, these must have had some basis in reality, or that as we find such ideas at Athens, it is likely they existed elsewhere as well.¹⁸⁵ This approach should now be revised. As previously discussed, there is no evidence for this at Olynthos. There is, however, evidence of differing attitudes to women from other *poleis* of the period. In Cretan Gortyn an

¹⁸³ Nevett 1994:110

¹⁸⁴ Nevett 1999: 63-64; Cahill 2002:192-193

¹⁸⁵ Cahill 2002: 151; Nevett 1999:72

heiress could inherit property and on the death of her husband, could choose to remain unmarried if she had already borne children.¹⁸⁶ This is different from Athens where the personal property a woman could usually own was trifling in amount. In very specific circumstances she could inherit property, although she may not have had the authority to administer it.¹⁸⁷ From Gortyn there is also testimony that in the case of the alleged rape of a domestic female servant, her word that the rape had occurred was accepted on oath. In Sparta girls had a public education which involved some physical training and at least basic literacy.¹⁸⁸ Whether or not we accept Aristotle's claim that in the 4th century BCE women owned 40% of Spartan territory, ownership of land and other property by women seems to have been accepted.¹⁸⁹ The evidence gathered in the current study suggests that we may now regard Olynthos as a society which offers yet another perspective on domestic and social life, including the lives of women.

These examples demonstrate that Athenian attitudes did not have universal applicability and the dangers of viewing other sites through an Athenian lens. If we are to eradicate the dominance of Athenian literary evidence which has for so long restricted thinking on this topic, then non-Athenian sites must be investigated as individual entities on their own terms. This requires carrying out the analysis without preconceptions, and ceasing to look at other cities "with a copy of Xenophon and Lysias to hand". Even this small study has demonstrated how different Olynthos was from Athens, the variety in building configurations which existed across the classical Greek world and

¹⁸⁶ Sealey 1990: 63-67

¹⁸⁷ Sealey 1990:42-45

¹⁸⁸ Cartledge 2001:113-115

¹⁸⁹ Aristotle Pol. 2.1270a 23-25

the different approaches to visual contact between visitors and inhabitants which existed. It is not realistic to accept that these differences were accidental, rather they must reflect real variation in the social and cultural attitudes prevailing on the various sites and at the same time.

(16303 words)

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