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The mobility of goods and the provisioning of buildings within the Late Minoan IB settlement of Kato Zakros

ABSTRACT

The street networks of Minoan urban sites were primarily used for the communication and circulation of the people within the settlement, as well as for the mobility of the goods and products that either covered the daily needs of the inhabitants or were part of the economic life of the community. Focusing on the Neopalatial settlement of Kato Zakros, this paper aims to examine the significance of its street network in the political economy of the settlement and in the domestic economy of individual buildings. Certain issues will be raised, associated with the categories of the goods that were mobilised, the means of such mobilisation and the distances that had to be covered; in that perspective, we will also examine the features that the road network had (or should have had) in order to facilitate this transportation, and to what extent the internal organization of the buildings took into account their provisioning needs. A general brief discussion will follow on the formation processes of the street system at Kato Zakros, with references to the neighbouring Neopalatial town of Palaikastro.

KEYWORDS: Far East Crete, Zakros, Prehistory, Bronze Age, architecture, street system, street network, Neopalatial, settlement

In early preindustrial settlements, extensive and well-planned street systems are considered to be a key criterion for the identification of their urban character; in fact, advanced street networks – due to their significance in urban planning¹ and organization – are among the basic “external” characteristics of urban sites, along with the size of the site, its dense layout and the existence of monumental structures (Konsola 1984, 41-47).²

The street networks of Minoan urban sites were primarily used for the communication and circulation of the people within the settlement, as well as for the mobility of the goods and products that either covered the daily needs of the inhabitants or were part of the economic

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¹ The term “urban planning” is used here in the sense attributed by Lampl as “the organization of the buildings and the open-door spaces, according to an ideal form and order, following established functional, ritual and aesthetic rules” (Lampl 1968, 6).

² This follows the general descriptive definitions of the town as the basic urban unit in space. Indicatively, see Lavedan and Huguency 1966, 62-74; Konsola 1984, 41-47; Derruau 1991, 474-5. Regarding Minoan Crete, see van Effenterre 1990, 489-490.

life of the community (imports, exports, production and distribution of certain goods). In order to identify their specific role in each case, there have been certain attempts to identify street types based mainly on morphological and/or functional criteria. Six general groups/categories have been discerned: main and the secondary streets, narrow and blind alleys, and official and commercial roads (Palyvou 1986, 185-188; Palyvou 2005, 29-34; Chryssoulaki 1990, 377; Salichou 2012, 86; Gomrée 2013, 693-697).

THE ROAD NETWORK AT KATO ZAKROS: CONSTRUCTIONAL AND ORGANIZATIONAL FEATURES

The location of the Neopalatial settlement at Kato Zakros on the slopes of the hills surrounding the valley of the Late Minoan IB palace, along with the crucial role of the site as a port and a palatial urban centre, gave its street network an individual constructional and organizational character, affecting the social and economical life of the community. The streets run along axes perpendicular and vertical to the hill slopes, thus forming building blocks (Chryssoulaki 1990, 378, with references; Platon 1990, 384) (Fig.1). According to Nikolaos Platon's general description (Platon 1974, 237-238), the basic features of the street network at Kato Zakros are the paved streets, the existence of steps alternating with ramps/terraces, the formation of small plateau-like squares, and the existence of sidewalks and a drainage system below the street level.

Stella Chryssoulaki and Lefteris Platon pointed out that "[t]he original street system appears to have been more complicated [than the currently preserved], but in the Neopalatial period several

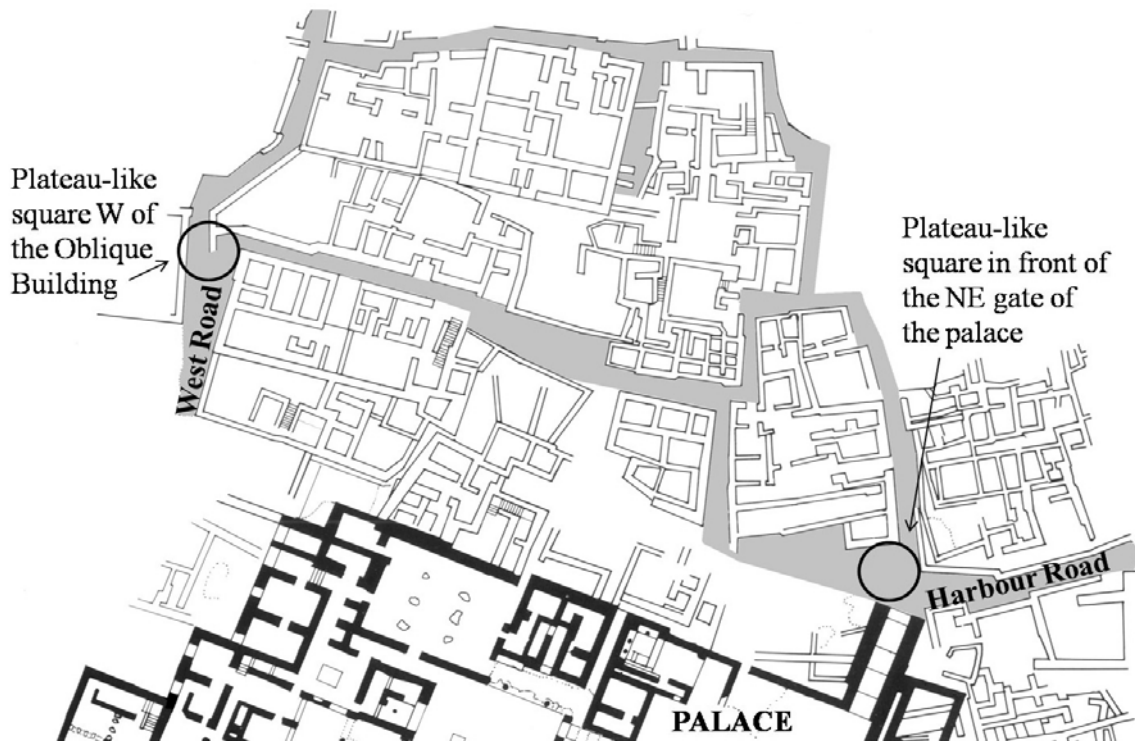


Fig. 1. Plan showing the buildings on the north hills. The street network is indicated in grey (Myers, Myers and Cadogan 1992, 294: fig. 44.3, annotated by the author).

sections of the streets were covered over by the construction of new houses or by extensions” (Chrysoulaki and Platon 1987, 77). Despite the adopted modifications (Salichou, forthcoming a),³ the basic original forms of the street network seem to have been maintained throughout the Neopalatial period in order for this to remain functional and useful.⁴ This allows us to proceed to certain preliminary observations concerning its form and function during the final phase of the Neopalatial settlement, at the end of the Late Minoan IB period.

It is a logical assumption that the street network at Kato Zakros was basically developed as a response to the needs concerning the mobility of goods and the provisioning of the buildings (including, last but not least, the palace complex). The basic features of the streets – as mentioned above – as well as the lack of identified wear marks from vehicles indicate that most of the loads were transported by people on foot. But the question remains: what was happening when the loads were hardly manageable and therefore could not or would not be moved in this way? The occasional use of vehicles certainly cannot be excluded, but this is rather doubtful because of the steepness of the streets descending the slopes of the hills and the street width which is reduced to 0.80 m in some places,⁵ while the distance between wheels of a Minoan vehicle has been estimated between 1 and 1.50 m. (McEnroe 1979, 201). Furthermore, the Kato Zakros road network would hypothetically allow the passage of only one vehicle at a time – based on the ranging width of the streets (from 0.80 to 2.60⁶ m) – thus making vehicle intersection extremely problematic. Of course, there would have been cases, such as the construction of a building, where the use of vehicles – or other corresponding means – would be inevitable due to the volume or the weight of the loads. In those cases, we could assume the use of temporary worksite roads, not preserved today.

Thus, it seems quite safe to argue that pack animals were used at Kato Zakros, where the mobility of goods and products would have been frequent due to the character of the site. In this case – as is already known from similar examples during antiquity – the pavement of the streets and the steps alternating with terraces would facilitate the movement of animals, in order to avoid injuries. Furthermore, the broadenings of the roads and the plateau-like squares, especially in front of the entrances of certain buildings (Fig. 2), would not be used only as “outdoors resting places” (“*ὑπαίθρια ἀναπαυτήρια*”), as Nikolaos Platon originally suggested in his preliminary excavation reports,⁷ but would also facilitate the circulation of people and pack animals.⁸ Manoeuvring vehicles or pack animals would have been possible at these ‘squares’.

³ The available data are discussed extensively in Salichou 2012, 178-189, 203-213.

⁴ For examples, see Salichou 2012, 147.

⁵ This is the minimum width of the street moving on a vertical axis to the hill slope north of the palace, east of the Building H and the Strong Building (Gomrée 2013, 619, 624).

⁶ This is the maximum width of the Harbour Road at Zakros, according to the excavator (Platon 1973, 155; Platon 1975, 369; Platon 1978, 268).

⁷ Plateau-like squares have been identified in the part of the settlement north of the palace: in front of the east entrance of Building H (Platon 1970, 236), in front of the (blocked in a later phase) pathway between Buildings H and G (Platon 1970, 235), at the intersection of the west vertical axis and the street north of the “Oblique Building” (Platon 1969, 230; Platon 1974, 238), as well as in front of the NE gate of the palace (Platon 1968, 151-152). In the part of the settlement NW of the palace, the so-called “*Άγιος Antonios quarter*”, there is a similar arrangement in front of the SW entrance of House B (Platon 1962, 152-153).

⁸ Similar areas serving as “outdoors resting places” have been also identified in Gournia and Pseira (Betancourt 2000, 92).



Fig. 2. The plateau-like square west of the Oblique Building (viewed from the NW) and the plateau-like square in front of the NE gate of the palace (viewed from the W) (Photos by the author).

It is almost certain that there would also have been some commonly accepted road rules forcing the users of the street network to adopt certain behaviours in order to avoid circulation problems. Even if the exact circulation patterns still elude us, the continuity and the uniformity of the road system of Zakros (Fig. 1), ensuring the smooth movement of people and vehicles, may be consistent with a certain kind of movement behaviour within the settlement termed by van Effenterre (1980, 270) as ‘circumnavigation’ (“circumambulation”).⁹ Occasional one-way roads could be considered a part of this pattern.



In general, ‘main streets’ (“rues principales”) facilitated communication between the ‘town’ and its administrative centre/the palace, thus acquiring an eminently public character (Gomrée 2013, 695, 709). At Kato Zakros, two main streets have been identified: the Harbour Road, leading from the east (the presumed harbour of the site on the coastline) towards the Central Court of the palace (Fig. 3), and the ‘West Road’, moving perpendicular to the NE hill slope, leading to the West Court of the palace (Fig. 4). What is significant in this case is the imposition of the palace plan on a pre-existing settlement plan that forced the central administration into

Fig. 3. The Harbour Road, viewed from the W (Photo by the author).

⁹ Thibaut Gomrée extensively discusses this model in his PhD dissertation (Gomrée 2013, 874-887).



Fig. 4. The 'West Road', viewed from the S (Photo by the author).



Fig. 5. View of the Harbour Road from the W showing the steps preserved in front of the façades of the buildings and the sidewalk along the north side of the street (Photo by the author).

using already extant settlement facilities (Platon 2004, 390; Salichou 2012, 122, 146),¹⁰ including earlier forms of the Harbour Road and the 'West Road', so that these two would acquire or maintain their function as main streets.

The public character of the Harbour Road is primarily demonstrated by its function as a main street of the settlement connecting the palace with the coastal zone (Platon 1968, 152; Gomrée 2013, 695, 709).¹¹ Its significance is also suggested by its morphological characteristics—namely the width ranging from 1.70 to 2.60 m (Platon 1973, 155; 1975, 369; 1978, 268), the broad paved plateau-like square in front of the NE gate of the palace (at the end of the road) (Platon 1974, 237) (Figs 1, 2), the steps preserved in front of the façades of the “Building of the Niches” and the “East Building” (Platon 1975, 370) and the sidewalk along the north side of the street (Platon 1973, 155; Platon 1975, 379; Platon 1977, 434) (Fig. 5), as well as by the pavement of the part approaching the palace with coloured slabs (Fig. 6), thus forming a kind of causeway, similar to the Royal Road at Knossos (Platon 1968, 152).

Fig. 6. Segment of the Harbour Road leading to the NE gate of the palace, viewed from the E. The pavement in this part is distinguished by the use of coloured slabs (Photo by the author).



¹⁰ Gournia provides similar evidence (Soles 1979, 155-156: cf. Salichou 2012, 124, 146).

¹¹ As Nikolaos Platon (1974, 238) first noted, it cannot be excluded that there might have been another way to approach the settlement from the east, via a street connecting the south coast of Zakros with the East Wing of the palace (Adams 2007, 272-273; Gomrée 2013, 878-879). However, archaeological evidence supporting this assumption is not yet available.

These specific features of the Harbour Road seem to be dictated by its socio-political role rather than its economic character. The transportation of products (presumably luxury goods/ imports via maritime trade routes) would have an added ideological significance, aiming at the public demonstration of these goods and therefore the reinforcement of the status of the palace. This hypothesis is also supported by the fact that the Harbour Road leads to the monumental NE gate of the palace, through which the products were probably transported to the palatial storage areas in the West Wing, passing through the Central Court.

The West Road is the other preserved main street leading to the palace with potential direct access to the West Wing (where the storage areas of the palace were located) (Figs 1, 4). This makes this street the most likely route for products destined for the palace.¹² However, the West Road – even though of similar dimensions –¹³ was not of the same elaborate construction as the Harbour Road, sharing the same morphology with the other paved streets at Zakros, namely the steps alternating with ramps/ terraces and the formation of a triangular plateau-like square to the NW of the 'Oblique Building' (Platon 1974, 238) (Figs 1, 2). It therefore follows that this street was probably of purely economic significance, an assumption also supported by the fact that this route possibly passed through the so-called 'Hogarth's sector' where streets were wide¹⁴ and met the specifications for pack-animal movement. Furthermore, the early identification of House A in Hogarth's sector as a kind of "customs house", based on the large number of sealings that were found there (Weingarten 1983, 45-46; Weingarten 1986, 293-294; Schoep 1999, 206), is also consistent with this hypothesis.

South of the palace, on the slopes of the Ayios Antonios hill, another sector of the settlement has been excavated, consisting so far of nine buildings; six of these have been fully excavated, namely Houses A, Δ, Δα, B, Z and Complex E (Fig. 7). The topography, the architecture of the buildings,¹⁵ and the concentration of wine-presses in that area¹⁶ led to the identification of this quarter as a kind of an industrial zone associated with wine production (Salichou 2012, 125-136; Salichou 2015, 361-362; Salichou forthcoming b). The fact that no wine-press installation was found inside the palace, as well as the proximity of these two sectors, might hint at a special economic relationship between the Ayios Antonios quarter and the palace, in which the former

¹² This view is consistent with the data indicating the existence of another entrance to the NW part of the palace (Driessen and MacDonald 1997, 237; Adams 2007, 272-3; Gomrée 2013, 709). However, the function, the character and the constructional phases of this entrance still elude us.

¹³ The maximum width at the area of the triangular square is approximately 3 m. and the minimum 1 m. east of House N, where an extension to the street was constructed in a later phase of the building, in LM IB.

¹⁴ N. Platon refers to a maximum width of 3 m. north of the House B (Platon 1978, 297), while the maximum widths of the streets passing between Houses B and Γ, Γ and Δ, and Δ and E are 2.00 m., 2.75 m. and 3.85 m. respectively (Platon 1979, 319-320; Gomrée 2013, 599-605).

¹⁵ The clustering of the buildings on the Ayios Antonios hill and their separation from the rest of the site seems to be meaningful for the identification of that part of the settlement as a separate 'sector'. In favor of this view are the observed similarities in the architecture of the buildings, namely the occurrence of a courtyard in each complex, their internal division into two parts by long continuous wall and the occurrence of a spacious room with a central column on the ground floor of the complexes.

¹⁶ Four of the seven wine-presses found in the settlement of Zakros were discovered in buildings on the Ayios Antonios hill, namely in House A, House North of House Δα, House Z and House B (Chrysoulaki and Platon 1987, 83; Kopaka and Platon 1993, 56-90).

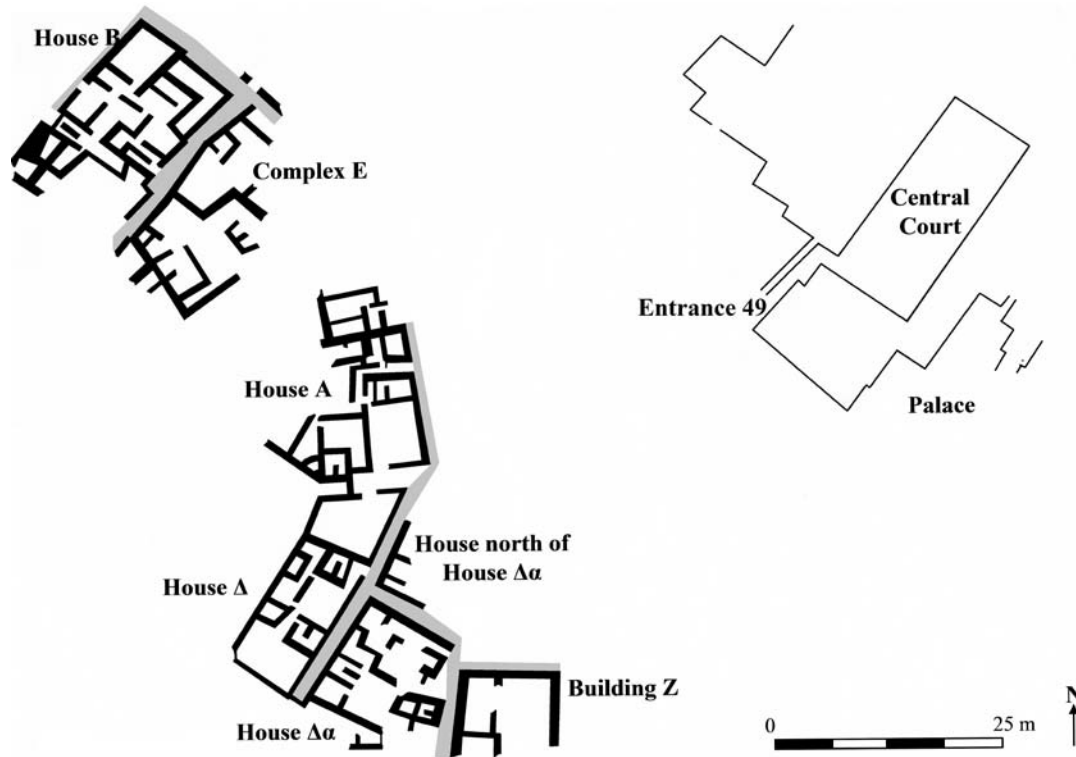


Fig. 7. Plan showing the buildings on the Ayios Antonios hill and their topographical proximity to the palace (the latter drawn only in outline). Roads are indicated in grey. Prepared by the author.

supplied the latter with wine. The assumed role of the palace in the performance of ceremonies associated with wine consumption supports this view.¹⁷

Although such a special relationship suggests increased needs for transportation in this part of the settlement, the streets of the Ayios Antonios quarter are narrow, with an average width of 1.50 m.,¹⁸ while no main street leading from Ayios Antonios to the palace has been found. This need not mean that no such a street ever existed, while there is another direct access from the Ayios Antonios quarter to the palace, through entrance 49 in the SW part of the palace complex, providing direct access to the Central Court and, therefore, to the workshop and the storage areas located in the South and West Wings respectively (Chrysoulaki and Platon 1987, 78; Salichou 2015, 362). The seeming lack of extensive storage facilities in the buildings on Ayios Antonios, unlike the adjacent palace complex (Christakis 2011, 251-252),¹⁹ might suggest

¹⁷ Hamilakis 2002; cf. Salichou 2012, 131-135; Salichou 2015, 361-362; Salichou, forthcoming b.

¹⁸ The street between Houses B and E, with a maximum width of 2.70 m. in front of the entrance of House B, is considered to be the only exception. Nevertheless, even in this case, the width is reduced to 2.30 m. in the east part and to 1.35 m. in the west part of the street (Gomrée 2013, 637).

¹⁹ Christakis has reached a similar conclusion for Knossos, attributing the lack of extensive storage areas in the monumental buildings around the palace to the special economic relationship that the residents of the former possibly had with the latter (Christakis 1999, 12).

that transportation in that part of the settlement was not conducted on a massive scale, matching the rather moderate scale of production in the Ayios Antonios sector.²⁰

THE ROAD NETWORK IN RELATION WITH THE DOMESTIC ARCHITECTURE AT KATO ZAKROS

Among the basic features of the domestic architecture of Kato Zakros are the concentration of storage and working spaces on the ground floor of the buildings (rooms with central column,²¹ courtyards, storerooms, rooms with wine-presses) and the restriction of 'private' areas on the upper floor (Chrysoulaki and Platon 1987, 78), as well as the existence of more than one entrance, at least in some cases. Such an arrangement ensured direct or easy access from the exterior of the buildings to the aforementioned working and storage spaces of the ground floor, thus facilitating the activities that took place there.

Especially in the case of the Ayios Antonios quarter (with the special industrial functions that can be attributed to it, see above), such an arrangement could be considered a specific architectural provision intended to facilitate the movement of the raw materials and finished products in and out of the buildings (Christakis 1999, 10). More specifically, in House B (Fig. 8),

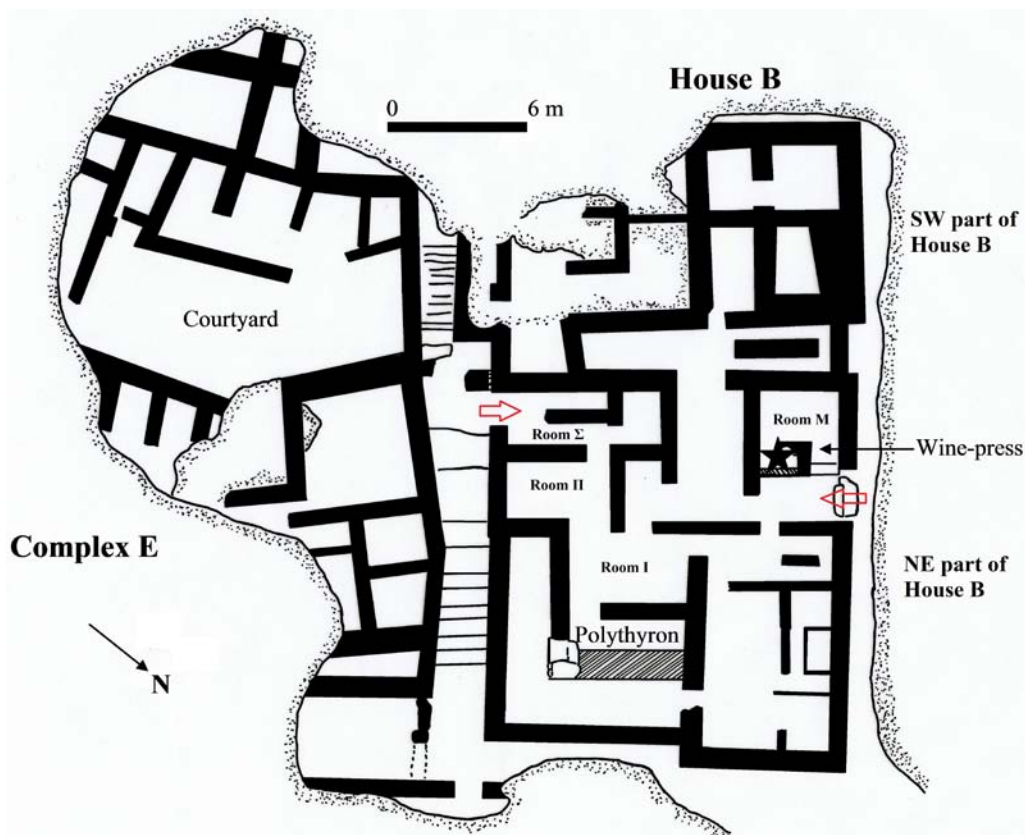


Fig. 8. House B on the Ayios Antonios hill. Plan prepared by the author.

²⁰ Especially for wine production and transportation, see Platon 1988, 398.

²¹ Concerning the function of the room with the central column, see Begg 1975, 196-199; Michailidou 1987, 522; Letesson 2015, 724-725.

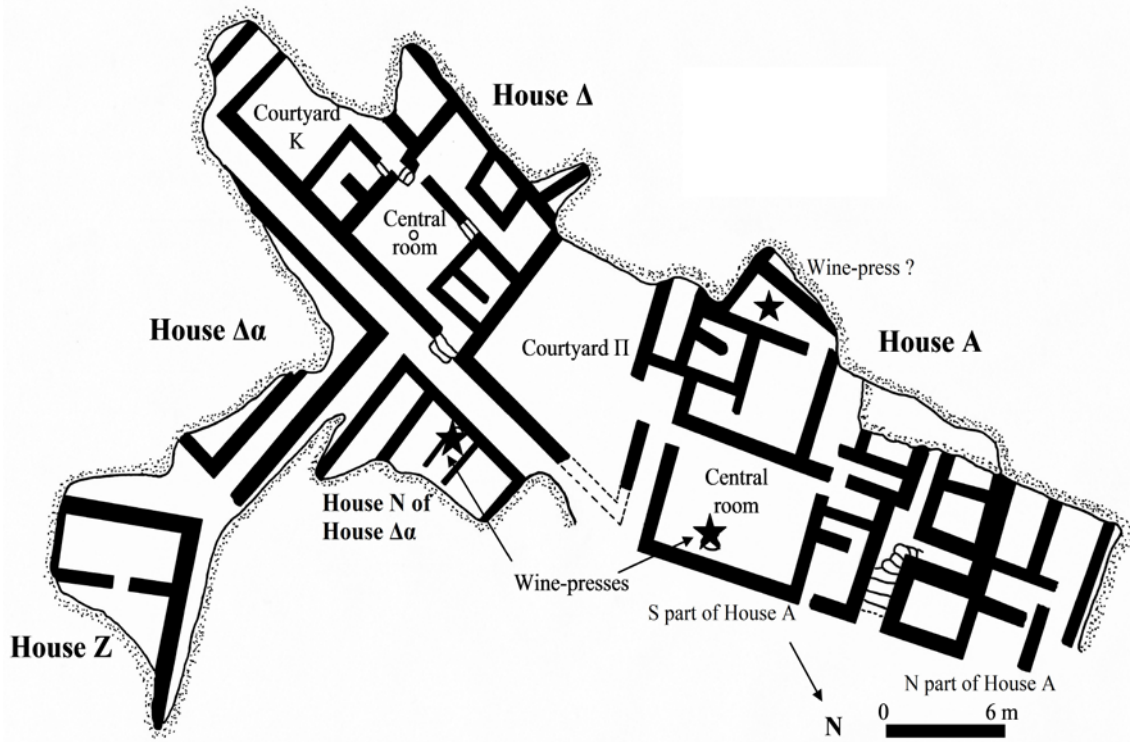


Fig. 9. Houses A and Δ on the Ayios Antonios hill. Plan prepared by the author.

the SW entrance gave direct access to storage areas Σ and Π, and through the latter to the room I, which has been identified as a kitchen (Platon 2011, 154-156). On the other side of the building, the wine-press in room M (Platon 1962, 148-149; Kopaka and Platon 1993, 56) is directly accessible from the NE entrance, thus facilitating the provisioning of the installation. The SW part of the complex, consisting of storage rooms built into the bedrock, was originally a separate building (Platon 1962, 152; Platon 2011, 153-154); a separate entrance may therefore be justifiably assumed to have existed, even if this has not yet been identified.

Houses A and Δ (Fig. 9) have a similar arrangement since their entrances lead directly either to courtyard Π, which according to the excavator functioned as a working space (Platon 1962, 146) and was probably used by the residents of both houses, or to the rooms with central columns in each building, namely rooms Λ (where a wine-press was found) and Z respectively; the identification of these rooms as working/industrial spaces was supported by Nikolaos Platon in the preliminary excavation reports, based on the finds recovered in them (Platon 1962, 144, 147). Furthermore, in House Δ, room Z provided access to the 'private' courtyard K, which has also been identified as a working area (Platon 1988, 238). In House A, room Σ, where there was possibly another wine-press (Platon 1988, 243; Kopaka and Platon 1993, 59), was easily accessible from the exterior of the building via room P, where steps cut into the bedrock (Platon 1963, 162) led, descending from the west.

Just like House B, House A also consists of two parts: the southern, which has been identified as the main building, and the northern, where working and storage activities mainly took place



Fig. 10. The Strong Building at Kato Zakros originally consisted of two architectural units (north and south), indicated by different colours (blue and purple), and had four entrances. The Building H also originally consisted of two architectural units (north and south), indicated by different colours (yellow and green). The Building of the Pottery Deposits further to the south (brown) was connected with Building H (after Platon 1971, Table A, annotated by the author).

(Platon 1961, 217-219; Platon 1962, 143). An outdoor stepped pathway between these two parts (Platon 1961, 217) gave access to both, thereby facilitating the provisioning of the northern part. House Δα seems to be a similar case, since it has been identified as the main building of a complex, while industrial/ storage activities took place on a larger scale in the neighbouring 'House North of House Δα' (Platon 2011, 159-160), where a wine-press installation was found (Platon 1963, 164-165; Kopaka and Platon 1993, 56-58).

The buildings north of the palace seem to have followed similar architectural principles: the Strong Building, the 'Building of the Pottery Deposits' and Buildings H and G are characteristic examples of this kind of arrangement (Fig. 10). The Strong Building originally consisted of two parts (north and south), each having two entrances: one giving access to the central room and the other to storage and working spaces (Platon 1969, 212-2135; Platon 1971, 244-245; Platon 2000, 60). Even in a later architectural phase of the building, when two out of four entrances were blocked (Platon 1968, 158, 160; Platon 1969, 210, 214; Platon 1970, 218), the storage and working spaces remained directly accessible via the other two remaining entrances, one on the east and the other on the west of the building, thus indicating an interest in maintaining some

facility in the provision of goods. Building H had a separate entrance to the north section of the complex, which probably functioned as a production and storage area (Salichou 2012, 259-260), while the 'Building of the Pottery Deposits', which was added to the Building H in a later phase (Platon 1970, 239; Salichou 2012, 60-61), had only one entrance giving direct access to the production or storage rooms.

Building G had also a separate south entrance giving direct access to its south storage areas (rooms I-IV) (Platon 1970, 235, 237-239: cf. Salichou 2012, 91-92). This entrance was accessible via the 'private' pathway between Building G and Building H, which was blocked in a later phase (Platon 1970, 235), when architectural modifications also occurred in the storage rooms of Building G (Platon 1970, 229, 232; Platon 1971, 265-266: cf. Salichou 2012, 65-66 for a summary). Corridor XV between the Building of the Niches and the East Building seems to be a similar case (Platon 1976, 430; Salichou 2012, 262-263). This corridor facilitated the provisioning of these two buildings, giving direct access to the south storage rooms of the House of the Niches (Platon 1975, 365, 367) through its north entrance, as well as to the west part of the East Building (rooms A, B, Γ, Δ), which accommodated industrial/ working activities, as inferred from the finds (Platon 1977, 426, 428, 432-433).

CONCLUDING DISCUSSION

Based on the above data, the street network at Kato Zakros served the traffic inside the settlement and the communication of its inhabitants on the one hand, and facilitated the provisioning of the palace and the surrounding buildings on the other. The comparison with the neighbouring site of Palaikastro could be enlightening on the formation processes that were followed, since it seems that there are significant differences between the two sites concerning both the construction and the function of their street networks.

More specifically, as Cunningham pointed out, the "straight" and "regular" street network at Palaikastro "facilitates movement through the settlement rather than between the domestic buildings" (Cunningham 2001, 80).²² Furthermore, the placement of the central room of the buildings "at the farthest point from the street", along with the lack of extensive storage spaces (Cunningham 2001, 79-81), clearly indicates that the provisioning of the domestic buildings was not among the prior needs that the street system was designed to cover. Based on the above, Cunningham argued that "[t]his street system is not simply an organic growth of space unoccupied by buildings, but has rather been specifically planned and created. In this sense, it can be said to belong to some other entity whether abstract (such as the 'polis') or discrete (such as 'ruler')" (Cunningham 2001, 81).

This means that, in the case of Palaikastro, a "top-down" process was followed in the creation of the street network, which seems to have been planned and constructed by a central authority (Buell 2014, 60-61). At Kato Zakros, on the other hand, the street system was developed in order to facilitate movement between buildings, serving the local inhabitants rather than the elite,

²² For another point of view, see Branigan 2001, 45, where he observes that "... although parts of the street system at Palaikastro suggest something approaching a planned system, other parts seem to lose direction and regularity or width".

while building blocks may occur, but in non-canonical form (as agglutinations of built spaces). Hence, the street system at Zakros was probably the product of a bottom-up process.

Nevertheless, even though the construction of the street network at Kato Zakros does not seem to be a central authority initiative, later modifications can be interpreted as a coordinated effort by the palace and/ or the inhabitants of the buildings. This is also supported by the fact that any attempt towards its improvement was made with respect to the original forms of this network.²³ Thus, the street system at Kato Zakros remained functional even in the later phases of the settlement, until its final destruction.

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²³ For the architectural modifications that have been identified in relation to the street network of Kato Zakros, see Salichou 2012, 178-189 and Salichou forthcoming a.

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