

Learning with Arkhanes' model

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ABSTRACT. The present study analyzed the role of architectural representations – drawings and three-dimensional models –, on the process of knowledge building of architecture history. The article focuses on Arkhanes' model and its relationships with the reconstitution of architecture, work of the architects of the time, and the representations' role on education.

Key words: architectural models, scale models, reconstitution of architecture.

RESUMO. Aprendendo com o modelo de arkhanes. Este artigo analisa o papel das representações da arquitetura - desenhos e modelos tridimensionais -, no processo de construção do conhecimento da história da arquitetura. O artigo concentra-se no modelo de Arkhanes e nas suas relações com a reconstituição da arquitetura, com o trabalho dos arquitetos da época, e com o papel das representações na educação.

Palavras-chave: modelos arquitetônicos, maquetes, reconstituição da arquitetura.

Introduction

In 1915, digging near Malia archaeological site, on the Northeast coast of Crete, Joseph Hadzidakis found the first evidences of the architectural ensemble that, 15 years later, would be identified by archaeologists from the École Française d'Athènes (EFA) as the Palace of Malia (Figure 1).

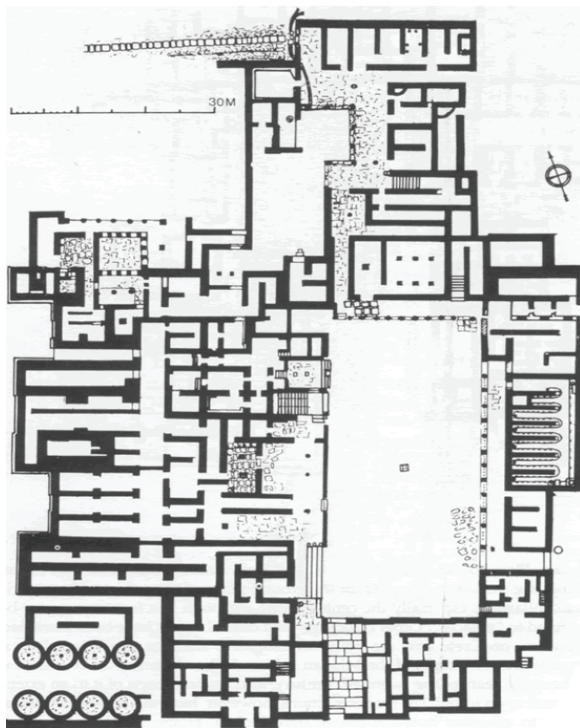


Figure 1. Ground Floor Plan of the Palace of Malia. With graphic Scale.

Source: Harry's Greece Travel Guide (2010).

The ruins from this architectural ensemble were dated as belonging to a Minoan palace built around 1,650 BC (Neopalatial Period), on remnants from an older first palace dating from the early second Millennium (c. 1,900 BC- Protopalatial Period) (Figure 2).



Figure 2. Aerial picture of the ruins from the Palace of Malia. Source: The University of Texas, Austin (2010).

On the Northeast side of the Palace of Malia, in an annexed area with 2,500 m², remains from protopalatial structures were identified (c. 1,700 BC), probably destroyed by a devastating fire. This

area – named *Quartier Mu* – has not been reoccupied after the fire, and thus preserved its original protopalatial configuration that attributed to this place a singular significance in the study of Minoan architecture (POURSAT apud SCHMID, 1985).

The architectural ruins of Mu are composed by preserved stone walls with a height between 50 and 150 cm above the floor (SCHMID, 1985). The existence of walls with these heights allows determining, with some precision, the position of spans and passages, such as doors and windows. The combined study of these spatial configurations with objects fragments (as stone tools, metal objects, seals and inscriptions) led to suppose that this area house workshops, *ateliers*, residencies and small ancillary buildings, directly linked to the Palace (Figure 3). But how would be the architectural look of this place, at its time?



Figure 3. Picture of the archaeological site of the *Quartier Mu*, Malia, Crete, with arched roof to protect the ruins, under the care of the *École Française d'Athènes*.
Source: Wikipedia – The Free Encyclopedia (2010).

Reconstructions

In 1962, James Walter Graham published a reconstitution drawing of the residence known as House Da (c. 1,700 BC) from Malia (Figure 4).

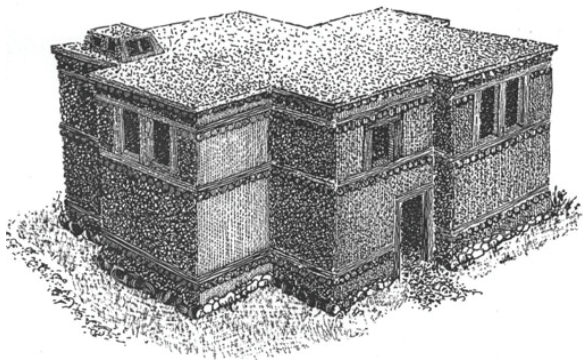


Figure 4. Graham's reconstitution of House Da (c. 1,700 BC), Malia.
Source: Graham (1962).

Based on the ruins and archaeological evidence from a constructive system essentially composed by stone and wood, Graham drew a compact architecture, with two floors, flat roof, and uninterrupted walls, from basements to the top. The architecture proposed by Graham architecture presents a closed volumetry, with few openings. Apparently there are not openings on the ground floor besides the one for the main entrance. The upper floor is also quite closed with just a few windows. The flat roof is continuous, and overlaps the entire architectural volume.

Fourteen years after the publication of Graham's reconstitution drawing, Lebessi (1976 apud SCHOEP, 1997) published an article about a small-scale architectural model, hitherto inedited, found in archaeological excavations at Arkhanes, Crete in 1970 (Figures 5 and 6).

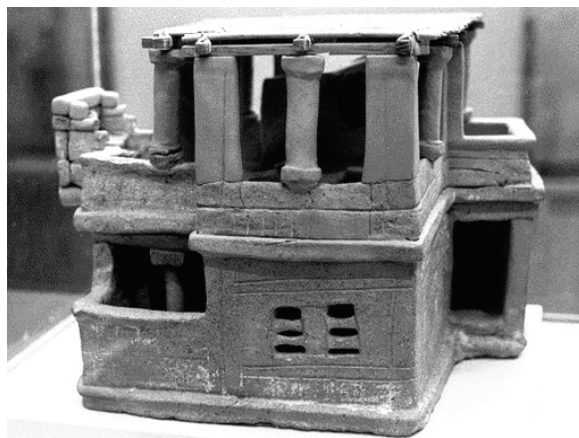


Figure 5. Arkhanes' architectural model; front view. Date: 1,700-1,630 BC. Material: Terracota with polychromy. Dimensions: Height of each floor: 15 and 18 cm; Width: 31 cm; Depth: 28 cm. The top roof of the model was reconstituted.
Source: Hellenic Ministry of Culture and Tourism (2010).

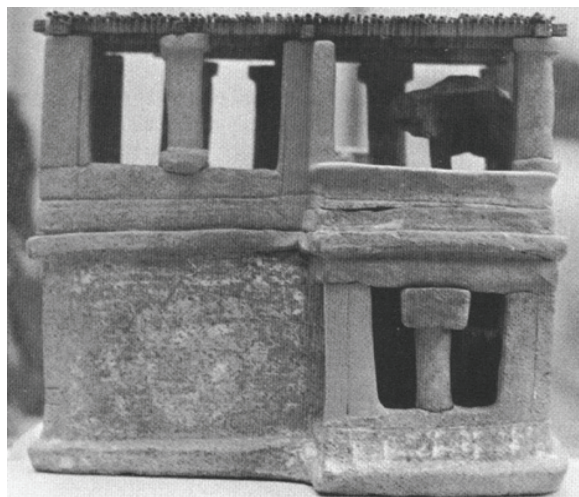


Figure 6. Arkhanes' architectural model; rear view. The wooden top roof is a reconstitution.
Source: Hellenic Ministry of Culture and Tourism (2010).

This terracotta model, with polychrome traces, had been found in a noble residence, in the area named Tourkogeitonia, 180 m from a probable palatial building of Arkhanes (SCHOEP, 1997).

This object is known as the "Arkhanes' model" (c. 1,700-1,630 BC), and is recognized as one of the most complete and intriguing architectural models, throughout Antiquity at the Mediterranean basin (ROZESTRATEN, 2003; SCHOEP, 1997), and its discovery would put in check Graham's proposal of reconstitution of Malia's House Da.

It is the oldest example of articulated or dismountable architectural model, i.e., an object composed of parts that can be opened to reveal the internal space. Such articulation allows the viewer to examine the object in a full and dynamic way, from the parts to the whole, and vice versa. By providing both a process of construction, mounting, and a process of dismantling, Arkhanes' model allows parallels with the projective thought, and with the constructive process characteristic of architecture.

Another prominent aspect is the extreme similarity between the various architectural elements in the scale model, and the real elements that can be seen in Minoan architecture ruins.

Additionally to this formal similarity, the model is scaled: the various architectural elements (pillars, walls, windows etc.) present in the model are proportional to each other, and the model as a whole is proportional to the settings of residential architecture of the time.

Finally, the model presents a *sui-generis* plastic richness with traces of painting, internal divisions, miniaturization of constructive elements and several ornamental details.

Regarding the spatial configuration, Schoep (1997) points out similarities between the model ground floor plan (Figures 7 and 8), and deployments verified at Malia's architectural complex, especially at *Quartier Mu*, House Thita and House A, on the Southern side of the Palace.

Schmid (1985) also relates the Arkhanes' model to the House A from Malia, and Houses A and C and from Tylissos (Figure 9) as for spatial configuration and constructive modulation.

Although all these similarities can in fact be identified, the model does not seem to correspond to an actual specific architecture. Arkhanes can be taken as a model in the broad sense of the term: example, ideal standard, reference, type; that gathers together generic characteristics typical of protopalatial Minoan traditional architecture.

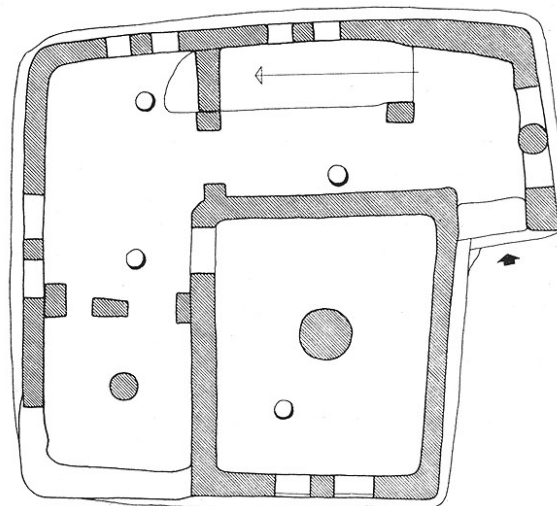


Figure 7. Arkhanes' model ground floor plan. Drawing without scale. Source: Las Casas Del Alma (1997).+++

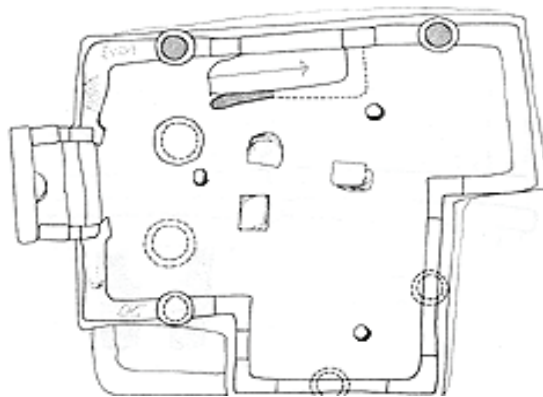


Figure 8. Arkhanes' model second floor plan. Drawing without scale. Source: Las Casas Del Alma (1997).

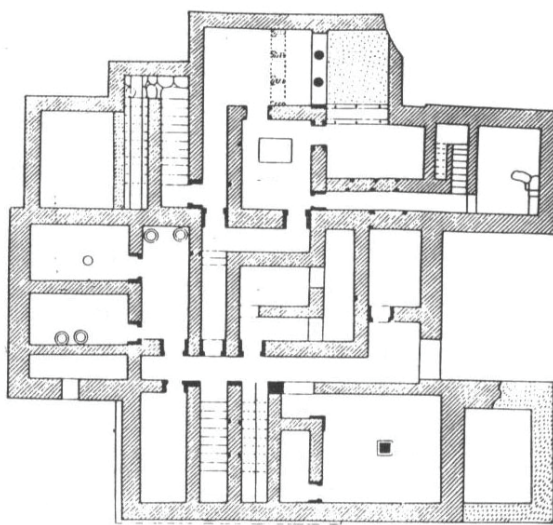


Figure 9. House C from Tylissos ground floor plan. At the lower right corner of the figure there is a Minoan hall with a square section central pillar similar to the one of the Arkhanes' model. Drawing without scale. Source: Schmid (1985).

The similarities between the formal and spatial Arkhanes' model configuration and Minoan protopalatial architecture can be interpreted as expressions of traditional principles of architectonic composition, which can be expressed as:

1. Asymmetry. Undemanding arrangements without rigid lines of symmetry.
2. Orthogonal composition alternating adjacent square and rectangular shapes.
3. Aggregation of the "square inside the square" (LAWRENCE, 1998). The subdivision of internal spaces is defined by a smaller square within a larger one.
4. Centrifugal Agglomeration. New dwellings are grouped rotated around a central core.
5. Cutouts on high floors and roofs. Indents and advances of floors and ceilings creating patios, terraces and light entries.

As a "type", the Arkhanes' model is distant from a characterization as a study design model, or even as a presentation scale model for a building to be done. However Arkhanes could be interpreted as a didactic model, i.e. an object used to display, in a clearly and synthetic way, the spatial principles and formal elements of the architecture of the time. Considering the context of the Minoan models, the hypothesis that this object had another social use – ritualistic, decorative or votive –, not associated with architects' works, cannot be discarded. The knowledge about the architectural design process of Protopalatial period in Crete could allow further interpretation on the use of Arkhanes' model at that time, but this subject is controversial.

About the role of design in Minoan architecture there are two diverging positions.

Preziosi (1983 apud LAWRENCE, 1998) states that there would be a full Minoan architecture planning, both for residences and palaces, since the protopalatial period. According to Lawrence (1998), this thesis is based on the clear orthogonality in most of Minoan buildings, and on the supposed modular units, which should set the environmental scaling in the plans of that time (SCHMID, 1985).

Lawrence (1998), nevertheless, argues that the planning during the protopalatial period should be less rigorous, flexible and subjected to changes during the work. For the author, even in the neopalatial buildings the concept of an integral project should be applied with restrictions. Intuitively, when concerning a large sized building as a Palace, the notion of integral project and the work of architects are more easily accepted. But in relation to small residential buildings traditionally constructed – notably Arkhanes –, it is difficult to

apply the concept of a rigorous integral project that demanded architects.

Since the Arkhanes' model, dating from the same period of the Malia's House Da, and supposedly representing a typical residence of that time, it is possible to suppose an architecture spatially richer than Graham (1962) imagined, for example.

The model volumetry suggests a multifaceted and dynamic architecture, with cutouts, advances and retreats of floors and ceilings, jags, and displacements.

The model also suggests an architecture with balanced relationship between full and empty. On the ground floor, the model presents several openings for ventilation (one of them as a hollowed masonry). Besides these openings, indents of the upper floor configure balconies with high sills.

The upper floor is almost completely open, with pillars and small stretches of masonry edges probably made to support a lightweight coverage. At this top-level the offset between coverage and floor configures open terraces.

In 1996, the École Française d'Athènes, EFA, promoting a large project of reconstruction of ancient Greek space through scale models, built up a reconstitution model of Malia's *Quartier Mu* (Figures 10 and 11).

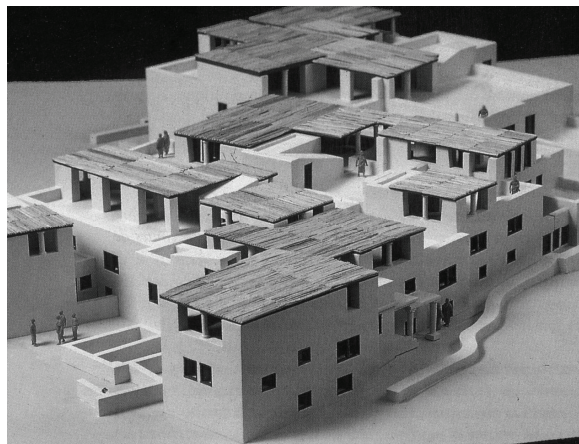


Figure 10. Partial view of the reconstitution scale model of Malia's *Quartier Mu* done by the École Française d'Athènes in 1996. Source: L'espace Grec (1996).

EFA's model revealed another interpretation of the Minoan protopalatial space, quite different from Graham's proposal (1962), and certainly considered formal and spatial references from the Arkhanes' model.

On the reconstituted architectural ensemble, in small-scale, it is evident an asymmetric volume composition with orthogonal arrays with squares and rectangles arranged not necessarily parallel, with varied angles, indents and advances of walls, floors and ceilings, shaping patios and balcony, varied

rhythms of openings, as doors and windows that integrate internal and external spaces, which results a much higher spatial diversity than imagined until then for the Minoan architecture.

Regardless how much was known from archaeological remains, and even two-dimensional representations of architecture of that time, the *Quartier Mu* would be hardly totally recomposed, with such architectural richness, without the three-dimensional references preserved at the Arkhanes' model.

This permits to assert that, if in its original context the didactic role of the Arkhanes' model is ambiguous – and cannot be clearly stated (to the detriment of other mentioned uses herein) –, this didactic character has been evident, since the 1970s, for all the studios of the Minoan architecture. We all learned with the Arkhanes' model. Based on the comparative study of the ruins, the model and graphical representations it was possible to know unsuspected aspects on design and constructive conception from the protopalatial Minoan architecture. Pre-conceptions and anachronisms were exposed, revealing how much desire and fantasy were involved in the interpretation of the past.



Figure 11. Detail of a sector of the reconstitution scale model of Malia's *Quartier Mu* done by the *École Française d'Athènes* in 1996. Source: *L'espace Grec* (1996).

Conclusion

The reconstitution of Architecture is always an imagination exercise, sustained by relationships that may be established between the archaeological vestiges of foundations and walls, the reminiscences of used constructive systems, and shape references eventually preserved in artistic representations, such as images or three-dimensional models.

Malia's and Arkhanes' case exemplifies how the interactions between archaeology, history and the study of architectural representations may open new perspectives for the study of architectural remnants, as for cultures and their imaginary.

In addition to assist the recovery of ancient architectures, the study of architectural models enables better understanding of the relationships between the representations of architecture, real architecture and historical characteristics of architects' work.

In summary, the study of architectural models, and more broadly, the study of architectural representations is one of the possible unfolding of the architecture history, with emphasis on the history of architectural design and interactions with the imaginary.

This bias that investigates the relationships between thought and material shapes, allows both the deepening in specific aspects of the architectural knowledge – such as constructive and structural technical issues – as the approach to general aspects of human knowledge, relating to time and space, learning and creative activity.

The three-dimensionality issues, the role of representations and their relationships with the process of knowledge constitute a field of contemporary research with strategic importance for education. Over the last years, efforts in this area revealed new possibilities, interactions and necessary deepening that require further researches. Reflections that, increasingly, unveils the scope of interactions between representations – drawings, pictures, videos, texts, notes, scale models and electronic models – and the understanding about cognitive and creative processes and, therefore, with the possibilities and challenges of current and future education.

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