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BEYOND THE ARCHAEOLOGICAL IMAGINATION. OBSERVATIONS ABOUT KODJADERMEN-GUMELNIȚA-KARANOVO VI ARCHITECTURE BASED ON A STUDY OF EXPERIMENTAL ARCHAEOLOGY

Cătălin Lazăr[1], Theodor Ignat[3], Sebastian Stan[2], Katia Moldoveanu[1], and Florin Rădulescu[4]

[1] National History Museum of Romania, Calea Victoriei 12, 030026 Bucharest, Romania
[2] "Ion Mincu" University of Architecture and Urbanism, Str. Academiei 18-20, 010014 Bucharest, Romania
[3] Museum of Bucharest, B-dul I.C. Brătianu 2, 011413 Bucharest, Romania
[4] Department for Culture and National Heritage Călăraşi, Str. 13 Decembrie 9, 910014, Călăraşi, Romania

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Corresponding author: Cătălin Lazăr (lazarc@arheologie.ro)

ABSTRACT

The experimental archaeology project presented here aimed at the reconstruction of a dwelling, at the 1:1 scale, belonging to the Kodjadermen-Gumelnitsa-Karanovo VI culture (5th millennium BC), based on archaeological data accumulated from research carried out mainly at the site of Sultana-Malu Roşu (South-East Romania). This reconstruction was followed by the estimation of the volume of materials used for raising the construction in conjunction with the human factor and the time needed for building it. Further, a reconstruction and verification of different techniques for the construction of surface area houses was made. The sources for this project were based on archaeological remains discovered in the field, such as, fragments of walls with impressions of building materials, charred fragments of posts, the size and arrangement of the post holes, and on the indirect information provided by miniature house models of Kodjadermen-Gumelnitsa-Karanovo VI dwellings, which are mostly reflected by ethnographic data. These data were used to verify some of our hypotheses.

KEYWORDS: Experimental archaeology, architecture, Eneolithic, Kodjadermen-Gumelnitsa-Karanovo VI.

INTRODUCTION

Reconstructing the distant past always has exercised a special attraction for archaeologists. Prehistoric findings generally fall into this category, the challenge being much greater than for other chronological periods, especially due to the lack of complementary information sources (written sources, oral sources, direct observation).

Under these conditions, the data provided by archaeological excavations remain the only ones able to help us in the understanding of prehistoric communities and their material creations. This process is extremely complex and involves good quality archaeological excavations based on appropriate methodologies and a high level of accuracy of field data recording, accompanied by numerous interdisciplinary studies to complement the information spectrum. Also, researching archaeological findings implies several levels of analysis. If typological and technological analysis of things is less problematic as technical information is quantified, verifiable and difficult to exaggerate, the interpretive processes put more problems for archaeologists. In this case archaeologists have a greater freedom of theorizing as complementary sources of information are lacking. Often assumptions made about some archaeological findings are speculative or unrealistic, based largely on the imagination of archaeologists.

Precisely because of these deficiencies, but also to complete the lack of data about prehistoric communities, we can appeal to experimental archaeology to test and propose hypotheses related to some archaeological discoveries by using different methods, techniques, analyses, and approaches. Thus, experimental archaeology is becoming an important research tool that can complement the information we have about the distant past.

ARCHAEOLOGICAL BACKGROUND

One of the most flourishing civilizations from the last half of the 5th millennium BC was the Kodjadermen-Gumelnița-Karanovo VI culture. Actually this is one of the most important cultural complexes from South-East Europe which resulted from the first great cultural synthesis which occurred between the southern Balkans and the Carpathian Mountains (Fig. 1). In Romania, the area of this culture includes Muntenia (just up the river Olt to the west and the Sub-Carpathian region in the north), and Dobrudja, as well as the south of Basarabia and Ukraine towards east. To the south it spans the eastern half of Bulgaria, both to the north and to the south of the Balkan Mountains (Kodjadermen – Karanovo VI) reaching the Aegean Sea (Todorova, 1978, 1986; Dumitrescu et al., 1983; Marinescu-Bîlcu, 2001; Petrescu-Dâmbovița, 2001).

The great majority of the Kodjadermen-Gumelnița-Karanovo VI culture settlements are multi-layered, tell type settlements. However, flat settlements with a single habitation layer also occur in this area. The internal structure of the tell-type settlements is especially complex. It presents specific patterns of house positioning, either organized on parallel lines or randomly, without a symmetric plan. Also, the dynamics of successive habitations suggests a great intensity and diversity.

In most of cases, the buildings are surface structures with a rectangular plan, often with a single room. However, there are cases of houses with two rooms (e.g., Căscioarele-*Ostrovel* – house no. 11, Medgidia I - house no. 1, Hârşova – house no. 48, Măriuța – house no. 2, Sultana-*Malu Roşu* – houses no. 2 and 5) (Dumitrescu, 1965; Popovici and Rialland, 1996; Haşotti, 1997; Parnic and Chiriac, 2001; Andreescu and Lazăr, 2008). In some situations, annexes to the main buildings had been identified (e.g., Bucşani, Căscioarele-*Ostrovel,* Hârşova), which, through their characteristics, cannot be considered proper rooms but storage spaces (Dumitrescu, 1965; Popovici and Rialland, 1996; Marinescu-Bîlcu et al., 1998; Bem, 2001, 2002). Rarely, especially during the first phase of the Kodjadermen-Gumelniţa-Karanovo VI culture, pit houses had been discovered (e.g., Costineşti) (Galbenu, 1971).

Figure 1: Kodjadermen-Gumelniţa-Karanovo VI culture area.

From point of view of architectural elements it is known that the walls are built on a structure made of posts directly put in the soil at regular distances one from another and joined through a net made of rods, branches or reeds (Fig. 2). After this structure was erected, it was covered with clay mixed with chaff. Another building method used foundation trenches of which dimensions varied according to the lenght of dwellings. The floor was made of clay or trodden clay (Fig. 2). Other dwellings had a floor on a platform built of halved trunks of trees, subsequently covered with clay (Hârşova) (Popovici and Rialland, 1996; Popovici et al., 2000; Popovici, 2010). Sometimes the dwellings were suspended above a so-called "sanitary vacuum" on a network made of pillars and planks with the aim of a better insulation against moisture (Bucşani-*La Pod,* Hârşova) (Popovici and Rialland, 1996; Popovici et al., 2000; Bem, 2001, 2002; Popovici, 2003).

In exceptional cases, houses preserving traces of painting on walls were discovered (e.g., Căsciorele-*Ostrovel,* Radovanu, Petru Rareş, Sultana) (Berciu, 1935; Dumitrescu, 1965; Comşa, 1990; Andreescu and Lazăr, 2008).

Figure 2: House no. 2 from Sultana-Malu Roşu.

The archaeological researches offer information about the architectural and utilitarian elements from inside the houses – internal walls, pillars or pit props, hearths and ovens, attics, etc.

Supplementary data referring to house typology and other architectural elements are known due to miniature house models made of clay discovered in the area of the Kodjadermen-Gumelniţa-Karanovo VI culture. They represent an interesting source for understanding prehistoric buildings completing successfully the data from the archaeological excavations. These burnt clay models represent in miniature forms various types of Eneolithic buildings and even house interiors. These models have a good informative value as through archaeological excavations only some of the architectural elements of the prehistoric buildings are discovered.

Based on these miniature models, it can be assumed that the roof of such constructions had two or four slopes. Furthermore, based on incisions and grooves which occur on the sloping roofs, either perpendicular or parallel to the ridge of the roof, it can be assumed that wood, straw, and reed or bulrush were the raw materials the roofs were made of. Also they were interpreted as beams for fixing the roof against the wind (the perpendicular lines) and horizontal beams put over rafters (the parallel ones). Also, the vertical lines may represent the rafters themselves (Fig. 3) (Dumitrescu, 1965). It is assumed that the houses had round or oval windows.

Figure 3: Miniature house models from Căscioarele (after Dumitrescu, 1965, 221).

Another detail present in the representation of buildings is the opening, interpreted as entrance or window. In general, those pieces with two large and circular openings were interpreted as ovens, as for example the model from Izvoarele (Comşa, 2000). As for the main (frontal) opening, it is usually large, circular in form. Only in a few cases (Aldeni, Căscioarele) it can be said that the buildings would have had a door. For example, the model from Aldeni (Ştefan, 1941) has a rectangular opening with a threshold and an edge represented in relief (Fig. 4).

The walls are most often represented as being upright, but there are cases when they appear as oblique. An interesting detail is present on one of the models from Spanțov (Şerbănescu, 1997): the

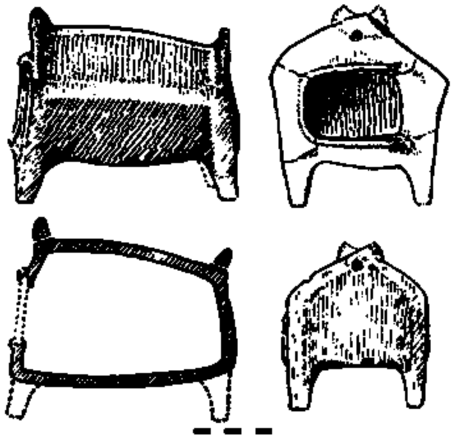

Figure 4: Miniature house model from Aldeni (after Ştefan, 1941, 95).

longitudinal walls of the piece are crossed by vertical ribs, which could be the pit props of the building's structure. Some models have some type of decoration of the walls and sometimes of the roof which are made either by incision or painting, often following geometric designs, sometimes very complicated, as it appears on the Spanțov models.

Also, models are an important source to acknowledge the proportions of the Neolithic buildings and the relationship between different construction elements. In fact, these miniature models can be viewed as three-dimensional images of houses almost 6000 years ago.

In other cases, the models represent even more details about the interiors of houses with various facilities (benches, fireplaces, containers, etc), a welcome completion to data from archaeological excavations. Thus, the model from Ovčarovo presents a house on piles with the entry through an open porch, and inside, a clay bench, an arranged space for storing grains, and an oven. The painted walls of the model are represented only on a certain height (Todorova 1974).

THE EXPERIMENTAL ARCHAEOLOGY IN THE BALKANS

Archaeological experiments proposing reconstructions of buildings have been made over time in different parts of Europe for a better understanding of past human communities (Hansen, 1964; Coles, 1973, 1979; Startin, 1978; Reynolds, 1979; Harsema, 1982; Larsson, 1985; Blockley, 2000; Rasmussen, 2007).

Unfortunately, the experimental archaeology, aiming at the reconstruction of prehistoric houses and building techniques, as well as the types and quantities of raw materials etc., was not a priority of the archaeologists from this area. Thus, excepting some examples from Romanian archaeology (which will be presented separately), experimental researches are known only from the ex-Yugoslav region and from Greece.

The first project was conducted in the '70s at Jerinin Grad in the Lower Morava River Valley of northern Serbia (Bankoff and Winter, 1979). Unfortunately, the goals of the experiment were only to establish the ways of burning of a contemporary house, built some time after the World War I, located not far from the archaeological site (Bankoff and Winter, 1979, 1982). In the opinion of the authors of this experiment the house was similar to wattle and daub houses built in prehistoric times (Bankoff and Winter, 1979). There were no data on construction techniques, types and quantity of raw materials.

A more complex experimental research was realized for the Vinča culture (ca. 4700–4500 B.C.), at Opovo, in the province of Vojvodina (Stevanović, 1996, 1997). In addition to reconstructing the quantities of structural materials, the intention of the *Opovo Archaeological Project* was to identify the types of materials employed in house construction, but also burning of the house, firing techniques, the model of destruction and the effects of firing (Stevanović, 1996, 1997). Without doubt, this was the best experimental research conducted in Balkan archaeology, with very useful results for understanding the architecture of prehistoric communities from the Balkans.

Figure 5: Prehistoric house reconstructed in the new experiment from Sultana-Malu Roşu (West view).

Finally, we mention the reconstruction of Dispilio lake side settlement (Kastoria) from Northern Greece. The site lies on the western shore of Lake Orestis, at 8 km south of Kastoria and was accidentally discovered in 1932 (Chourmouziadis, 1996; Chourmouziadis and Sophronidou, 2007). The excavation was restarted in 1992 by a team directed by G. Ch. Chourmouziadis. Based on data from archaeological excavation of the very spectacular Neolithic lake side settlement from 7500 years ago, in an area of 20.000 square metres, a part of the prehistoric village was reconstructed at 1:1 scale (Touloumis and Hourmouziadis, 2003; Chourmouziadis and Sophronidou, 2007; Kotsakis, 2007). The Dispilio Ecomuseum was a case-study for students and archaeologists in order to better understand the relationship between the people and the lake during prehistory, and the significance of the prehistoric landscape for the daily life (Touloumis, 2007).

No information is available about reconstructions of prehistoric buildings in other countries from the Balkans (e.g., Bulgaria, Albania, etc.).

THE EXPERIMENTAL ARCHAEOLOGY IN ROMANIA

In Romanian prehistoric archaeology there are already a series of archaeological experiments aimed to the reproduction of some prehistoric buildings using techniques specifically for the period represented.

The majority of these projects had been realised for the study of buildings belonging to the Vădastra, Precucuteni and Cucuteni cultures, with special attention to the reconstruction of the construction techniques, manners of building, the raw materials used, the quantities of raw material, ways of burning, etc. (Cotiugă and Cotoi, 2004; Gheorghiu, 2005, 2008, 2009; Monah et al., 2005; Cavulli and Gheorghiu, 2008; László and Cotiugă, 2008; Cotiugă, 2009; Dumitrescu, 2011). Some of experiments were very complex, trying to trace the entire operational chain beginning with the making of the necessarily tools and their utilization for raw material acquisition and finishing with the raising of the building (Cotiugă and Cotoi, 2004).

In the case of the Kodjadermen-Gumelnița-Karanovo VI culture, there are only two experimental archaeology projects done previously. The first was realized in 2003 as part of the 'Vădastra experiment', aiming at the reconstruction of a building of megaron type excavated at the site of Radovanu (Gheorghiu, 2009).

The second project was conducted in 2007 aiming to reconstruct a house on piles found at the site of Bucşani-*La Pod*. However, the project focused rather on artistic effects and less on scientific purposes, the building serving as setting for the realization of a documentary film (Simion and Bem 2007).

THE NEW PROJECT

Under these conditions, in 2010, by the initiative of the National History Museum of Romania, in collaboration with the Romanian Association of Archaeology, the Department for Culture and National Heritage Călăraşi, the Mânăstirea Village Hall (Călăraşi County), the 'Ion Mincu' University of Architecture and Urbanism Bucharest and the Faculty of History (University of Bucharest), we started *The Experimental Archaeology & Architecture Project: Reconstruction of Prehistoric Dwellings.*

Unlike other experimental archaeology projects carried out in Romania, our project aimed at the reconstruction of a dwelling at the 1:1 scale, belonging to the Kodjadermen-Gumelnița-Karanovo VI culture, based on archaeological data accumulated from research carried out at the site of Sultana-Malu Roşu, but not only (Fig. 5). This reconstruction was followed by the estimation of the volume of raw materials used for raising the construction in conjunction with the human factor and the time needed for building it.

Another purpose of the experiment was the reconstruction and the verification of different techniques for the construction of surface area houses, based on archaeological remains discovered in the field (fragments of walls with impressions of building materials, charred fragments of poles, the size and arrangement of the pits of poles) and on indirect information provided by miniature house models of Kodjadermen-Gumelnița-Karanovo VI dwellings which are mostly reflected by ethnographic data (these data were used to verify some of our hypotheses).

The project also aims to track and record for a five years period of time how the prehistoric construction is deteriorating, but also the effects caused by climatic factors. This paper will present the results obtained in this project.

On the one hand, the dwelling is included in the visiting tour at the archaeological site, trying to provide the general public with a better understanding, through this reconstruction, of a long gone world but still able to excite us through its creations. On the other hand, the project aims to provide professionals the results of an experiment, based on various assumptions made about the architecture and construction techniques specific for the

Kodjadermen-Gumelnița-Karanovo VI culture. It is hoped that the project's results will help us to understand better this prehistoric civilization.

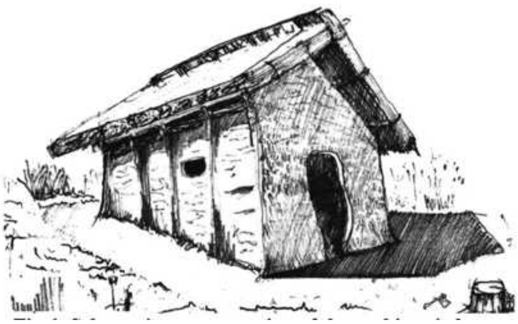

Figure 6: Schematic representation of the prehistoric house reconstructed in the new experiment from Sultana-Malu Roşu.

The project was realised in the village of Sultana (Mânăstirea, Călăraşi County, Romania), where is situated the famous *tell-site* of Sultana-*Malu Roşu,* attributed to the Kodjadermen - Gumelnița - Karanovo VI culture (4500-3800 B.C.). The very existence of this archaeological site determined us to choose this location for the making of the project. On the other hand, the involvement of the local community through the Mânăstirea City Hall permitted us to administrate and protect the building.

The project was designed to run over a period of five years, totalizing more specific stages of construction, recording and analyzing of the resulting data.

The first stage (2010) began with the gathering of documentation about the future construction. The field records of the 2001-2009 excavations at Sultana-*Malu Roşu* were studied, as well as data from older published excavations (Andrieşescu, 1924; Isăcescu, 1984a, 1984b; Andreescu, 2001; Andreescu and Lazăr, 2008).

Also, we collected information from other settlements attributed to the Kodjadermen-Gumelnița-Karanovo VI culture regarding construction, architectural elements and technical solutions identified in the field, being selected those sites that have benefited from an archaeological excavation of good quality - Borduşani, Bucşani-*La Pod,* Goljamo Delčevo, Hârşova, Ovčarovo, Poljanita, Vinica etc. (Todorova et al., 1975, 1983; Radunčeva, 1976; Todorova, 1982, 1986; Popovici and Rialland, 1996; Marinescu-Bîlcu et al., 1997, 1998; Popovici et al., 2000; Bem, 2001, 2002; Popovici, 2003). On the other hand, the miniature house models found in the Kodjadermen-Gumelnița-Karanovo VI settlements north and south of the Danube were considered (Todorova, 1974, 1978, 1982, 1986; Bailey, 1990; Mareş, 1993; Şerbănescu, 1997; Morintz, 2004). Finally, during the same first year of the project, the dwelling was built.

The stage corresponding to 2011 aimed at recording how the building was damaged by climatic factors, its repairing and maintenance, as well as the painting of the external walls.

In the next stages (2012-2014) we will observe the way in which the building is degrading as well as the contribution of climatic factors to the degrading processes, in parallel with the necessarily repairs.

METHODS AND RESULTS

Given the archaeological data available for the site of Sultana-*Malu Roşu* (Isăcescu, 1984a, 1984b; Andreescu and Lazăr 2008), we proposed to build a small building (5 x 3 m), with a single room and a rectangular plan, oriented NW-SE with the entrance on the north-western side. The orientation of the building was determined by the organization of the host site, which imposed the alignment and the withdrawals. The constructive technique adopted was the wattle and daub system with foundation trenches for the walls.

The time required for the harvesting of raw materials, and the raising and finishing of the building was 25 days, participating in various activities 12 people on average.

To realise the proposed building, we were based on three types of information:

1. Archaeological data from the excavations at Sultana-*Malu Roşu,* more precisely the recordings of houses no. 2 and 5 (Andreescu and Lazăr, 2008), in conjunction with observations made on other well researched Gumelniţa settlements (Hârşova, Borduşani-*Popină,* Căscioarele-*Ostrovel,* Bucşani-*La Pod,* Măriuţa) (Dumitrescu, 1965; Popovici et al., 2000; Bem, 2001; Parnic and Chiriac, 2001; Popovici, 2003);

2. Indirect data provided by miniature house models from the Kodjadermen-Gumelniţa-Karanovo VI culture;

3. Ethnographic observations realised in the village of Sultana referring to the traditional construction techniques utilized by the local inhabitants (Fig. 7).

It has to be noted that the experiment had not made use of tools specifically for the prehistory for the purchase of the raw materials and construction of the building, as other experiments in Romania did (Cotiugă and Cotoi, 2004). As shown above, we targeted only the determination of the construction techniques and technical solutions applicable, together with the quantification of the raw materials utilized. In these circumstances, to carry out the various operations of collecting and processing the raw materials and, the actual construction, we preferred the use of modern tools (saws, adzes, knives, axes, etc.). Except for wood cutting operations necessary for the building's structure, no mechanical means were used, all operations taking place manually.

Figure 7: Traditional construction made of wattle and daub from Sultana village.

Raw materials

As known from archaeological data, to build their houses, Kodjadermen-Gumelniţa-Karanovo VI communities used rationally those raw materials from the the surroundings of the settlements, adapting to resources present in the area.

The inhabitants of the prehistoric settlement from Sultana-*Malu Roşu* used for making the walls and floors the clayish sediment from the Mostiştea Lake's terrace, a place where consistent deposits of loess are recorded by geologists (Ghiţă, 2008). This sediment was further mixed with more or less chopped straw resulted from the harvesting of cereals. Also, they used other herbaceous species from the spontaneous vegetation (especially wild gramineae) specific for the steppe and forest steppe areas. The wood utilized for making the infrastructure of the buildings varied in accordance with the necessary structural strength and the species present in the area. Finally, reeds were used for making the roofs.

Given the potential of the area, obtaining the necessary raw materials for the project was not a problem. Thus, the loess was taken from the current clay quarry of the village, located on the shore of the Mostistea Lake. Reed, sand, wheat straw and various varieties of wild plants necessary for preparing the wattle and daub have been obtained also within the area of the village of Sultana. Some of the wood species (willow, locust tree, mulberry) were obtained from the Sultana village perimeter and others (oak, elm, beech, carob tree) from the Ciornuleasa forest, located 7 km west of Sultana.

The types of raw materials as well as the quantities utilized are presented in detail in Table 1.

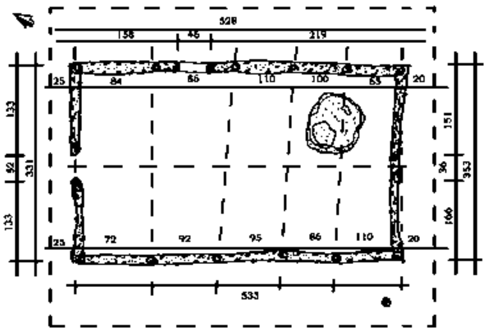

Figure 8: The plan of the prehistoric house reconstructed in the new experiment from Sultana-Malu Roşu (scale 1:50).

Figure 9: The north-eastern foundation trench and post holes. Sultana-Malu Roşu experiment.

The building process

In a chronological order, the stages of the construction of the building have been as follows. In the first phase the vegetation was removed, the orientation of the house established and the construction site outlined. By lining out the construction site an outline of which shape and form are close to those from the Eneolithic period was targeted. For tracing the outline we used twisted hemp rope, resulting in an approximately rectangular shape about 5 meters long and 3 meters wide. The rectangular shape of the outline was visually controlled as we considered that any geometric control method would not meet the spirit of the age.

Later, four foundation trenches were realized, with dimensions of 5 m and 3 m in width (on the long sides) and 0.30-0.40 m in width (on the short sides). Their orientation was NW-SE for the long trenches and NE-SW for the short ones. After that, inside the long side trenches, 12 post holes (6 for each trench) were dig, regularly placed, at variable distance (Fig. 8, Table 2). On the centre of the south-eastern short side a pit was dug for a supporting post for the cornice. To waterproof as best as possible the post holes and to avoid the processes of decaying of the posts we decided to daub the holes (Fig. 9). We made this with a mixture of loess and water, without any vegetal materials added, and then we left them to dry.

Some of the sediment removed from foundation trenches and post holes (ca. 50%) was gradually deposited in the inner perimeter of the future construction, in order to prepare the making of the floor. After this, the sediment was beaten with a mallet for an as good as possible compaction of the inner area.

Preparing the wooden elements aimed to assure the structural strength of the house was the next step in the process of building operation. Thus, we proceeded to the preparation of 12 supporting posts, made of elm, oak and beech. Taking into account the depth of the foundation trenches (-0.50 m) and of the post holes (-0.30 m), the supporting posts have dimensions of approximately 2.80 m in length with a diameter between 7-10 cm (after barking). To prevent their degradation, the bark was removed of the trunks and the bottom of the posts, that was to be fixed in the post holes, was coated with loess mixed with water,

Figure 10: The north corner post (without bark and plastered with clay). Sultana-Malu Roşu experiment.

then left to dry (Fig. 10).

The stabilization of the 12 main posts was achieved by placing them into the post holes and by filling the holes with a layer of clean sediment, without the addition of other materials, finally through the compaction of the sediment with a mallet.

In order to stabilize the future twined perimeter of the wall, midway between the main posts were introduced intermediate upright posts, with diameters between 5-7 cm, made of locust, carob, and mulberry (Fig. 8, 12). Their fixation was performed directly in the foundation trenches, by depositing a part of the sediment resulted from the excavation of the foundation trenches and post holes (ca. 40%). Also, to recreate accurately the filling specific for the Kodjadermen-Gumelnița-Karanovo VI foundation trenches, it was decided to bring archaeological sediment (containing fragments of pottery, animal bones, pieces of burnt wattle and daub, stones, etc.) from the old excavations led by C. Isăcescu (1984a, 1984b) at the archaeological site of Sultana-Malu Roşu (Fig. 11). The amount brought and deposited in the foundation trenches was 1.4 cubic meters (representing ca. 50% of the total filling) and, after deposition, it was compacted manually with the mallet. The presence of numerous artefacts in the composition of the filling plays a stabilizing role, to increase the bearing capacity of the ground and to reduce the subsidence. The filling was done up to 0.15 metres below the ground level.

In parallel with these operations, the elements necessary for the boarding of the walls were prepared, by stripping of the leaves from branches and rods of mulberry, locust tree, and willow species. The next step was their twinning, horizontally by the vertical supporting posts, thus achieving a wattle-like structure (Fig. 12). This gives the wall rigidity and strength, but also creates the basis on which the clay will be put.

Twinning the wattle structure of the walls began at 0.15 metres below the ground level, so that the base of the walls to be sited in the foundation trenches (Fig. 13). The fixing of the branches and rods was achieved by their straining and by tying them with hemp strings, strips of leather, or willow bark kept in brine. The three binding methods were inspired both by archaeological discoveries and ethnographic examples available. For the upper part of the wattle structure of the walls (ca. 20 cm) we used thicker branches able to support the loading of the truss structure of the roof, resulting thus an equivalent of a perimeter belt. This gives the structure a greater strength and a solid enough platform for the longitudinal beams that will support the weight of the roof (Table 2).

In the same time, on the north-eastern and respectively the south-eastern sides of the house two circular windows were made, approximately in a central position, close to the supporting posts. Also, on the north-western side, the future entrance into the house was traced (length: 1.70 m; width: 0.60 m), marked by two door posts stuck vertically directly into the filling of the foundation trench (Fig. 8). In the trench,

Figure 11: Detail of the north-eastern foundation trench with archaeological sediment filling. Sultana-Malu Roşu experiment.

Table 1: The typology of the raw materials as well as the quantities used in Sultana-Malu Roşu experiment.

Type	Species / Materials	Element used	Quantity ≈	Purpose
vegetal	oak (*Quercus pedunculifora*)	trunk	3.2 m^3	supporting posts
				frame
	beech (*Fagus sylvatica*)\	trunk		supporting posts
	elm (*Ulmus carpinifolia*)	trunk		supporting posts
				frame
				sill
	carob tree (*Ceratonia siliqua*)	trunk		intermediate posts
				tie rod
				joist
	locust tree (*Robinia pseudoacacia*)	trunk		intermediate posts
				tie rod
				pole
		branches		net
	mulberry (*Morus nigra*)	branches		net
	willow (*Salix babylonica L.*)	trunk		intermediate posts
				pole
		branches		net
		bark	6 kg	binding and fixing
	reed (*Phragmites australis*)	stems and leaves	10 m^3	roof
	wheat (*Triticum aestivum*)	strain	300 kg	clay preparation
	hemp (*Cannabis sativa*)	fibre	10 kg	binding and fixing
	Spontaneous herbaceous plants (*Setaria glauca, Sorghum halepense, Melica uniflora, Poa bulbosa, Andropogon ischaemum, Stipa capillata, Agrostis stolonifera*)	stems and leaves	250 kg	clay preparation
animal	domestic pig (*Sus scrofa domesticus*)	skin	1 kg	binding and fixing
geologic	loess	-	9 m^3	clay preparation
	sand	-	1 m^3	clay preparation
	red clay	-	2 kg	painting and decorating
	white clay	-	0.5 kg	painting and decorating
others	water	-	4500 l	clay preparation
	archaeological sediment with potsherds, animal bones, building materials, etc.	-	200 kg	filling of foundation trenches

between the two posts, an internal threshold was made of a halved elm trunk (length: 0.70 m; width: 0.25 m).

In the making of the roof a double-sloping system was utilized with an angle of inclination at 25 degree (Fig. 6). Initially, two transversal joists were fixed on the internal part of each of the long sides of the house.

The joining areas of the beams were realized on surfaces of 20-30 cm. The beams were fixed between them and by the twelve supporting posts, by binding with hemp strings, strips of leather or willow bark (Fig.

Figure 12: The wooden structure of the experimental building from Sultana-Malu Roşu (North view).

12). The structure was completed with two oblique rafters placed on the twelve supporting posts and fixed by them through simple bounding. The trusses obtained supported (and were supplementary joined by) a ridge beam made of a thin trunk of locust tree (7-10 cm in diameter) of which length exceeded by one meter the length of the house (Table 2).

The fixing of the rafters by the ridge beam was made in 'X' shaped form (Fig. 12). Along the twelve supporting posts, between the rafters, we put six tie rods, and on their central part we put short vertical props (with their end 'V' shaped) sustaining the meeting point between the rafters (Fig. 12, 15). Even if there are no archaeological discoveries attesting the utilization of such a structural system, its logic, the excellent structural stability, and the easiness of building, determined us to use this system. Our decision was straightened by the discovery of some wall traces inclined towards exterior. If this is a result of lateral pressure generated by the roof structure under the weight of snow, the tie rods are the optimal solution to stabilize the structure.

The joining of different structural elements (posts, tie rods, rafters, props, and ridge beam) was realized through bounding and by tying them with hemp string, strips of leather or willow bark kept in brine (Fig. 14). These fixing techniques were utilized in different points of the building to allow us to observe their behaviour in time.

Figure 13: The south-western corner and wall structure sited in the foundation trenches. Sultana-Malu Roşu experiment.

The next step was to realize the boarding of the roof of which function was to support the reed sheaves. It was realized as a wattle of thicker willow and locust tree branches (2 to 4 cm in diameter) with variable length, placed between rafters, in ten lines (five on each side) (Table 2). The fixing of these elements was realized with similar methods as for other parts of the building.

The next step was to prepare the clay for daubing the walls. This operation was realized close to the house and all its steps were made manually.

Figure 14: Detail of the wall structure fixed with willow bark. Sultana -Malu Roşu experiment.

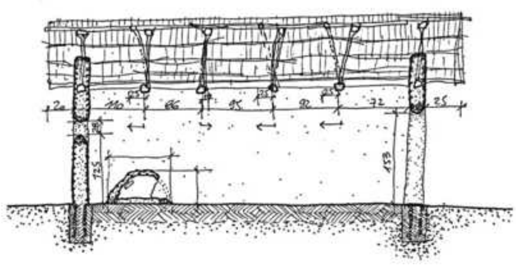

Figure 15: Cross section of the reconstructed prehistoric building in Sultana-Malu Roşu experiment.

To verify archaeologically known situations from different Kodjadermen-Gumelniţa-Karanovo VI settlements including Sultana-Malu Roşu, especially from a micro-morphological perspective (Haită, 2001), we decided to utilize more 'recipes' for the preparation of the clay.

The main 'recipe' utilized was the classical one, based on a mixture of clay with wheat chaff and straw. We used also some herbaceous plants from the spontaneous vegetation of the area, especially wild gramineae (Table 1). The adobe resulted was of good quality, similar to that made with wheat straw only. This combination of materials was used for daubing the south-eastern, north-eastern and north-western walls.

For the south-western wall we prepared a mixture of loess and chopped twigs and dried leaves of willow and mulberry. The resulted adobe was homogeneous and it behaved well both when built and later. Instead, utilizing dried chopped reed leaves results an adobe of poor quality, finally this 'recipe' being abandoned.

Along with mixtures with plant species we tried to mix the clay with ash and sand, two easily available materials for us and also for the prehistoric communities. Utilizing the ash did not give spectacular results. However, the mixture of loess and sand, in various proportions, gave a high quality adobe, used for the final finishing of the external walls.

The daubing of the walls was realized by throwing balls of clay by hand, from a distance of approximately one meter, in order to realize a better connection with the wattle structure of the wall (Fig. 16). The operation was done in stages, the walls being raised gradually, by 0.20-0.40 metres at once, after that being allowed to air. Initially, we started to daub the walls from the foundation trenches, more precisely from 0.15 metre bellow the ground level, where the wattle structure of the walls is beginning (Fig. 17). However, the difficulties put by the realization of these portions, convinced us to use this technique only for the north-eastern side of the building. For the remaining sides, the foundation trenches were filled up to the ground level, the daubing of the walls being realized from this level. The base of the walls was thickened to give them more strength.

Figure 16: Balls of clay used for daubing of the walls. Sultana-Malu Roşu experiment.

The building of the walls continued until reached the level of the supporting beams. We took into consideration the preservation of some empty spaces for ventilation, reason for which the walls were not built to reach the rafters. The corners of the building were rounded off and where the wattle was asymmetrical completions were made until a more plane surface was obtained.

The two triangles on the short (north-western and south-eastern) sides of the house formed as a result of assembling the rafters and claws were daubed with clay to the top, to the ridge beam of the roof (Fig. 5).

In the same time with the raising of the walls we started the arranging of the floor and of the interior of the house. Previously, we put additional sediment compacted with a mallet. The floor was made of clay (60%) mixed with sand (40%) and water, without adding any vegetal remains. We realized three successive layers of clay, thick of 5-9 cm each, and after each step the clay was left to dry. The last one was realized after assembling the reed on the roof.

Inside the house, in the eastern corner, we decided to raise a domestic oven, built on the ground level (Fig. 19). The oven had a circular outline (78 x 68 cm.) and a height of 45 cm. The structure of the oven was made of 12 poles stuck in the ground and a wattle-like net made of willow and locust

Table 2: The species and quantities used for the wood structure of the experimental building from Sultana-Malu Roşu.

Building Parts	Constructive elements	Quantity used (pieces)	Species used	Size		Building side
				Length (m)	Diameter (cm)	
Structure	supporting posts	12	oak (*Quercus pedunculifora*)	2.80	10	NE
			elm (*Ulmus carpinifolia*)	2.80	7.2	NE
			beech (*Fagus sylvatica*fag	2.80	9	NE
			elm (*Ulmus carpinifolia*)	2.80	10	NE
			elm (*Ulmus carpinifolia*)	2.80	8.5	NE
			oak (*Quercus pedunculifora*)	2.80	9.3	NE
			elm (*Ulmus carpinifolia*)	2.80	10	SW
			beech (*Fagus sylvatica*)	2.80	8.3	SW
			elm (*Ulmus carpinifolia*)	2.80	9.5	SW
			elm (*Ulmus carpinifolia*)	2.80	8.4	SW
			oak (*Quercus pedunculifora*)	2.80	7	SW
			elm (*Ulmus carpinifolia*)	2.80	9.6	SW
	intermediate posts	17	carob tree (*Ceratonia siliqua*)	2.50	7	NW
			carob tree (*Ceratonia siliqua*)	2.70	7.5	NW
			locust tree (*Robinia pseudoacacia*)	2.40	7.3	NW
			locust tree (*Robinia pseudoacacia*)	2.60	6.9	NW
			locust tree (*Robinia pseudoacacia*)	2.10	6.8	NE
			mulberry (*Morus nigra*)	1.95	5	NE
			mulberry (*Morus nigra*)	2.10	5.2	NE
			mulberry (*Morus nigra*)	1.90	5.5	NE
			locust tree (*Robinia pseudoacacia*)	2.70	7	SE
			carob tree (*Ceratonia siliqua*)	2.20	6.8	SE
			carob tree (*Ceratonia siliqua*)	2.50	7	SE
			locust tree (*Robinia pseudoacacia*)	2.80	6.5	SE
			mulberry (*Morus nigra*)	1.95	5.2	SW
			mulberry (*Morus nigra*)	2.20	5	SW
			locust tree (*Robinia pseudoacacia*)	2.60	6.3	SW
			locust tree (*Robinia pseudoacacia*)	2.70	7	SW
			locust tree (*Robinia pseudoacacia*)	2.30	5.9	SW
Roof	lateral beams	2	locust tree (*Robinia pseudoacacia*)	5.62	6.9	NE
			locust tree (*Robinia pseudoacacia*)	5.65	7.3	SW
	ridge beam	1	locust tree (*Robinia pseudoacacia*)	5.69	8.2	central
	tie rod	6	elm (*Ulmus carpinifolia*)	4.01	7.4	SW-NE
			elm (*Ulmus carpinifolia*)	3.80	7.5	SW-NE
			elm (*Ulmus carpinifolia*)	3.84	8.2	SW-NE
			carob tree (*Ceratonia siliqua*)	3.92	7.8	SW-NE
			carob tree (*Ceratonia siliqua*)	3.78	7.2	SW-NE
			elm (*Ulmus carpinifolia*)	4.00	7.9	SW-NE
	truss frame	12	elm (*Ulmus carpinifolia*)	2.56	8.2	SW
			elm (*Ulmus carpinifolia*)	2.60	6.9	SW
			elm (*Ulmus carpinifolia*)	2.50	7.1	SW
			elm (*Ulmus carpinifolia*)	2.68	8.0	SW
			carob tree (*Ceratonia siliqua*)	2.59	6.9	SW
			carob tree (*Ceratonia siliqua*)	2.57	7.3	SW
			elm (*Ulmus carpinifolia*)	2.70	7.5	NE
			elm (*Ulmus carpinifolia*)	2.73	8.2	NE
			oak (*Quercus pedunculifora*)	2.71	7.8	NE
			elm (*Ulmus carpinifolia*)	2.69	7.9	NE
			elm (*Ulmus carpinifolia*)	2.67	7.6	NE
			oak (*Quercus pedunculifora*)	2.70	7.2	NE
	pole	6	locust tree (*Robinia pseudoacacia*)	0.81	5.2	central
			willow (*Salix babylonica L.*)	0.85	5.4	central
			locust tree (*Robinia pseudoacacia*)	0.92	6.1	central
			locust tree (*Robinia pseudoacacia*)	0.85	5.9	central
			willow (*Salix babylonica L.*)	0.90	5.2	central
			willow (*Salix babylonica L.*)	0.87	5.5	central

tree branches fixed by straining (Fig. 18). The daubing with clay of the oven was made concomitant with the making of the floor. On the oven's back side, an evacuation hole was made for the smoke.

The next step was to roof the house with reed *(Phragmites australis).* The length of the reed stems at harvesting was 1.90 to 2.20 metres. The reed was harvested still at the beginning of the project and left to (partially) dry. After that, the reed was tied up in sheaves of 15 to 20 cm in diameter each, obtaining finally a number of 130 sheaves. The sheaves were put in two layers, with the top of the plants upwards.

To better fix the sheaves and to avoid the settling of the roof, we added supplementary branches of willow, consolidating thus the boarding of the roof.

The sheaves were tied up by the boarding of the roof and rafters with hemp strings, with the help of a wooden knitting needle, in conformity with known traditional techniques.

The last building phase was the finishing off the walls, both interior and exterior (Fig. 19). To perform this, the surface of the walls was wetted for a better catching of the finishing.

As we already shown, the finishing daub was a mixing of loess (40%) with sand (60%) and water. This proved to be the best combination because, after drying, no cracks or fissures were recorded. On some parts of the walls, on the south-western and south-eastern sides, we tested the same recipe but with different ratios of loess and sand (60% loess and 40% sand; 50% loess and 50% sand). The results were unsatisfactorily in this case as, after drying, numerous cracks and fissures appeared.

Figure 17: Detail with the daubing of the north-eastern wall. Sultana-Malu Roşu experiment.

Figure 18: The wooden structure of the oven. Sultana-Malu Roşu experiment.

The evaluation of the degradation level. The repairing process

Figure 19: Inside view of the experimental building from Sultana-Malu Roşu.

One year after the building of the house, in 2011, we made a first evaluation of how it behaved. Our analysis was directed especially towards the evaluation of the status of the structural strength of the building, by following different construction elements. Also, we analyzed the behaviour of the external walls of the house. The interior of the house was not insisted upon, and it will be evaluated on a next phase, planned for 2012.

Thus, in terms of infrastructure it has been observed that the foundation system performed favourably, with the exception of a slight subsidence on the south-eastern side (Fig. 20).

In the case of the vertical supporting structure it has been observed that the posts supporting the walls were not significantly distorted from their original state. The south-eastern wall let down slightly due to foundation' subsidence and at the base of the walls cracks were observed in the final layer of clay (Fig. 20).

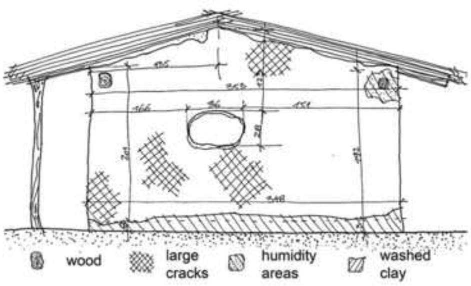

Figure 20: Degradation level of the south-eastern side. Sultana-Malu Roşu experiment.

The roof resisted well to its own weight load, to snow and wind. There were observed inclinations of the trusses of the roof perpendicularly on their plan, with deviations of up to 25 cm on a horizontal plan (Fig. 23). Also, two secondary beams are curved due to their small section and because of the pressure by the short props located at the intersection of the rafters. As regards the cover of the roof, the reed compacted as result of its drying and the loss of initial weight. It was observed in some areas, especially on the southern side, the sliding down the slope of the reed layer, due to foundation's subsidence of the

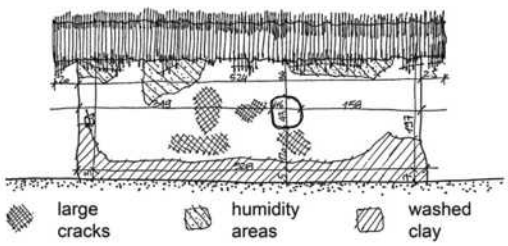

Figure 21: Degradation level of the north-eastern side. Sultana-Malu Roşu experiment.

building (Fig. 20). Also, we observed the flattening of the roof due to snow loading.

In the case of the walls, we found visible degradations of the clay layer on the outside part of the walls: large cracks due to a fast drying under direct sunlight, moisture stains from the soil moisture, clay washed at the ground level because of high humidity and weathering (including the long lasting of the snow near the walls) and finally, wood exposed to weathering due to falling of the protective clay (Figs. 20, 21, 22).

These degradations are results of climatic factors (rain, snow, wind, huge variations of temperature, sun) but also of how different sides are oriented (degree of sunlight received, wind directions), the differentiated clay recipes used for daubing the walls, and the humidity in the cold season.

Beyond these minor degradations, the walls behaved well from hygro-thermic point of view, securing inside the house a

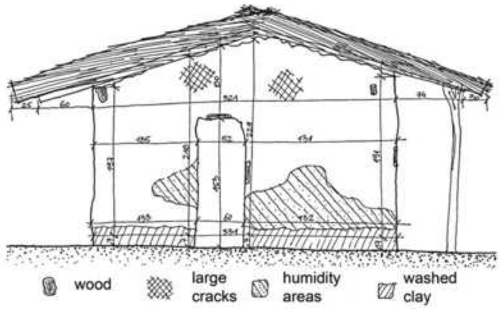

Figure 22: Degradation level of the north-western side. Sultana-Malu Roşu experiment.

temperature above 0°C in the winter and considerably cooler temperatures than outside in the summer. Also, the envelopment assured a favourable ventilation of the internal space, keeping the humidity at a comfortable level.

Taking into account these minor degradations suffered by the building, we proceeded to the repairing of the affected areas. Initially we removed the layer of clay detached of the walls and replaced it with a thin layer of clay (loess 60%, sand 40%) mixed with chopped straw. To succeed in this operation the walls were intensively wetted both before and after daubing. This operation had the role of completing and filling the extant huge cracks on the walls, as well as to complete the base of the external part of the walls. On the north-eastern side we tested two new recipes of clay (loess 30% and sand 70%, without vegetal remains; loess 40%, sand 40% and vegetal remains 20%) on portions of 50 cm each. For the entire reparation process we used 0.5 cubic metres of loess, 0.7 cubic metres of sand and 300 litres of water.

We mention that the south-western side was not repaired because we aim to have a witness of the annual degradations suffered by the house along all the five years of the project.

As regards the roof, we pushed the reeds in their initial position, and we tied the sheaves to the opposite rafter of the truss, to prevent their sliding in the future. Also, taking into account the loss of the initial weight of the reed due to drying, we added new reed sheaves to counteract for the compression of the initial layer. Thus, we added 40 sheaves of reed, 1.9 to 2.5 metres in length, and 10 to 15 cm in diameter, totalizing ca. 2 cubic metres.

Figure 23: View of the south-eastern side of the experimental building from Sultana-Malu Roşu.

The decoration process

Also, in 2011, after repairing the house, the project team decided to decorate the external walls of the building. For this operation, we added on the external walls a final smooth layer of clay with much sand,

Figure 24: View of the north-western side of the experimental building from Sultana-Malu Roşu.

as a preparatory layer for dying. After drying we proceeded to the painting of the north-western, north-eastern and south-eastern walls (Fig. 23, 24, 25). The south-western side was left unpainted as it is object of a separate study, as shown in the previous subchapter.

To paint the walls, we utilized red clay and white clay diluted with water. We used

Figure 25: View of the north-eastern side of the experimental building from Sultana-Malu Roşu.

a quantity of 2 kg of red clay diluted with ca. 10 litres of water, and 0.5 kg of white clay diluted with ca. 2 litres of water. The painting was realised both by hand and with the brush. Also, for the outlines, we used graphite bars, directly applied on the surface of the walls.

Based on the archaeological data related to painted walls fragments from Sultana-Malu Roşu site, it was decided to paint different decorations on each side. Thus, on the south-eastern side we painted a spiral motif (Fig. 23), on the north-eastern side a banded motif and on the north-western side rectilinear and spiral motifs combined with the pattern from the 'bowl with tulips', discovered at Sultana-Malu Roşu. In the case of all three walls, the decoration was conceived and integrated taking into account the already existing construction elements (windows and entrance). The painted motifs are inspired by decorations on pottery found at the site of Sultana-Malu Roşu (Fig. 26).

DISCUSSIONS AND CONCLUSIONS

As we shown at the beginning of this paper, *The Experimental Archaeology & Architecture Project* is not the first experimental archaeology project in the Balkans, similar projects being recorded in the recent past (Bankoff and Winter, 1979; Stevanović, 1996, 1997; Cotiugă and Cotoi, 2004; Gheorghiu, 2005, 2008, 2009; Monah et al., 2005; László and Cotiugă, 2008; Cotiugă, 2009).

Figure 26: The 'bowl with tulips' discovered at Sultana-Malu Roşu (different scales). Its decoration inspired us in painting the north-eastern and north-western sides of the experimental building.

Without any doubt, these experiments help us to achieve a better understanding of prehistoric lifeways and in the same time, they are a way to complete the archaeological data. As Shaffer tells us, "[a] *reconstruction is only as good as the excavated evidence upon which it is based"* (Shaffer, 1984, 48).

On the other hand, the experiments permit us to verify and evaluate the current hypotheses about prehistoric houses, especially regarding the construction techniques and architectonical solutions utilized and applied by people 6000 years ago. Also, the experiments can contribute to the birth of new hypotheses and interpretative equations.

The new experiment: final remarks

The building activity in 2010 resulted into a house with rectangular plan, with one room, oriented NW-SE. The prehistoric building system applied was that of houses with foundation trenches, made in wattle and daub technique, a type specific for the Eneolithic communities from the Balkans.

Table 3: The final dimensions of the experimental building from Sultana-Malu Roşu.

Length of the house at the ground level (m)	Side			
	SE	NE	NW	SW
	3.48	5.28	3.31	5.33

The building was initially planned to have 5 meters in length and 3 meters in width, dimensions fitting into the typology of the Kodjadermen-Gumelnița-Karanovo VI houses of small dimensions. However, during the building and facing processes, the house dimensions surpassed the planned dimensions, mainly because of the structural elements built and the necessity to add supplementary clay for finishing the walls. So, the final dimensions of the house at the ground level are presented in the Table 3.

The building has a maximum height of 2.29 m., and the walls have an average thickness of 0.20-0.25 m., variations owing to the modality of construction. In this regard, it has to be reminded that, despite our efforts for obtaining uniform and regular walls, their final outline was irregular because of the way the boarding of the walls deformed following the processes of balling the clay and later, the drying of the clay.

The roof, through the applied technical solutions, became larger than its fingerprint at soil, as follows:

- the south-eastern side, with 0.20 meters in length;
- the north-eastern side, with 0.60 meters in length;
- the north-western side, with 0.25 meters in length;
- the south-western side, with 0.74 meters in length.

The evaluation made after one year demonstrates that the building behaved very well, despite of the lower temperatures and high precipitations during the winter, specific for the temperate-continental climate of Romania. Under these conditions, the repairing work was minimal, both from point of view of the raw materials utilized, and of the ratio between time and labour.

The comparison of our results with those of other experimental projects from the Balkans – Cucuteni (Cotiugă and Cotoi, 2004), Opovo (Stevanović, 1996, 1997) and Vădastra (Gheorghiu, 2009) – from the perspective of the utilized raw materials shows on average similar quantities of raw materials (Table 4); some small differentiations are present due to the dimensions of the realized buildings. However, we can not ignore the fact that in most of the cases, the quantities of raw materials used in the experiments are not integrally published.

To resume, the project offered new data regarding the buildings specific to the Kodjadermen-Gumelnița-Karanovo VI culture, and please put allowed instead of permitted an evaluation of the building techniques and architectural solutions utilized by these communities.

The archaeologist imagination: interpretation settings

The archaeological interpretation is a complex issue since, due to temporal depth; we must confront social formations of an unknown organisation and structure. In a sense, archaeology might be reckoned as being liberated from literary sources and living informants, suggesting that archaeology rather should explore the possibilities of a sociology of material culture, a vital topic that only recently begun to be discussed in the social sciences (Fahlander 2001, 1-2).

As we have shown at the beginning of this article, the interpretive process of prehistoric archaeological discoveries, for which complementary sources of information are lacking, and the archaeological excavation most often offers us only fragments of data, like the pieces of a puzzle, can be risky. In these circumstances, the archaeologist's imagination is becoming very precious, and sometimes even indispensable, without any negative connotation associated. Albert Einstein's assertion made on an interview: "[the] *imagination ... is more important than knowledge. Knowledge is limited. Imagination encircles the world*" (Viereck 1929, 17), is true for the field of archaeology as well. However, we have to be careful when appealing to the imagination, as the step from a prudent use of the imagination to imposture is very small.

Despite the apparent freedom of theorizing that prehistoric discoveries offer, the archaeologist is constrained and limited by the existing data, which leads inevitably, not infrequently, to speculative hypothesis, exaggerated or unrealistic, based heavily on the imagination or ignorance of the researcher. How an archaeologist is interpreting a discovery is determined by several factors, directly or indirectly. The perception of the reality (both present and past), the vision on an archaeological topic, the experience of the archaeologist exercising this approach (the interpretation) and the cognitive ability and individual discernment, all work on how various issues raised frequently by archaeologists are approached, and this is directly reflected in the way the archaeological discourse is conceived.

Returning to our subject, we can find the existence of a consistent bibliographic background on prehistoric constructions in general and in particular those attributed to the Kodjadermen-Gumelnița-Karanovo VI culture, which can induce the impression that we know a lot of things about them.

Figure 27: Prehistoric house reconstructed in the new experiment from Sultana-Malu Roşu (North view).

However, this assumption is in a good deal false, the existing interpretations being formal and generalizing, based on an unjustified arrogance of the archaeologists, because there are still many untreated aspects and questions about these issues (Bailey, 2005, 90-92).

The experimental archaeology, despite its imitative nature, in order to verify techniques, procedures and processes and then to evaluate theories and assumptions made on the basis of archaeological excavations (Asher, 1961; Reynolds, 1999, Mathieu, 2002; Cavulli and Gheorghiu, 2008), makes a major contribution to the knowledge and understanding of the past. Thus, besides the numerous technical data that come to fill the gaps in areas of archaeological excavation results, the "*experimental archaeology also includes learning by doing*" (Shea et al., 2002, 60). This technical, practical, experience, opens for the archaeologist a new perspective of understanding the design and construction processes, which can be a helpful element (and perhaps even necessary) in the interpretive process. On the other hand, this process of reconstruction of past realities leads to a personal experience, of sensory and emotional character, the archaeologist becoming more close to his/her subject (Gheorghiu, 2008, 168, 174-175), thus facilitating further the implementation of a high quality interpretive approach.

Moving forward

This paper intends to bring attention to the importance of the concept of experiment applied to archaeology and especially to the

Table 4: The comparison between the results of the experimental projects from Balkans.

Experiment	Dimensions (m)	Water (l)	Clay (m^3)	Reed (m^3)	Wood (m^3)	Straw (kg)
Cucuteni	7 x 4	4380	10	?	1.5	1000
Opovo	8 x 4	?	12	?	0.95	?
Sultana	5.33 x 3.48	4500	9	10	3.2	550
Vădastra	6 x 35	5000	12	?	?	600

interpretative possibilities the experimental archaeology offers about the prehistoric past, so devoid of complementary sources of information. On the other part, we intended to offer a reflexive point of view about how archaeologists interpret the past.

Finally, we point to the fact that the Sultana experiment offered us both the chance to evaluate, at a technical level, the hypotheses advanced about the Eneolithic architecture from the Balkans and, to experiment, at a practical level, how a building is made, fact which will help us in the process of interpretation of archaeological discoveries.

The project will continue in the following years and we hope that it will offer new interesting data regarding the building techniques and architectonical solutions utilized by the Kodjadermen-Gumelnița-Karanovo VI communities.

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