

Controversies and comments regarding some fortifications and construction techniques with burnt materials from southwestern Romania

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Abstract: In southwestern Romania (Dolj County) were investigated, over the years, through systematic digging three fortified settlements around which exists a controversy, especially in the last two decades. This controversy regards the way these fortification structures were conceived and then elevated. Long surveys pointed out the existent component in each defensive structure of some burnt construction materials (adobe bricks and clay soil that was used as filling / emplecton). Regarding the fortifications planning, specialized literature defines two different positions: 1. construction materials were first burnt, in special places designed for this, preliminary to the building in the defense belt; 2. construction materials were used to build forts, and then burnt *in situ*, because of a military conflict or (hard to say) a major cataclysm. Observation obtained on a *de visu* field research determined an overwhelming predominance of burnt bricks (even though at different temperatures, judging from the scale of red) and burnt emplecton clay soil. Thermal and composition analysis on the samples taken on different occasions (even though less than it should have been from two sites) give valuable clues to clarify the following debate, which until the documentation will be rigorously published could remain still open.

Key-Words: Constructions technique; Fortified settlements with burnt construction materials; Adobe burnt or dried bricks; Burnt emplecton; Combustion installations; Thermal and composition analysis.

1 Introduction

In the last three decades systematic archeological field researches from southwestern Romania, Dolj

County brought to light and into the scientific circuit numerous information regarding fortified settlements from III-IV centuries BC [1].

Besides the significant and substantial archaeological deposits involved, meaning an intense and active living, one of the main issues is conceiving and developing the fortification structures themselves.

Still we have to notice that these forts didn't surround completely those settlements, but only a side of them, that was linked to the fields (erosion witnesses), while the other two sides were naturally abrupt.

None of the settlements we will talk about identified re-

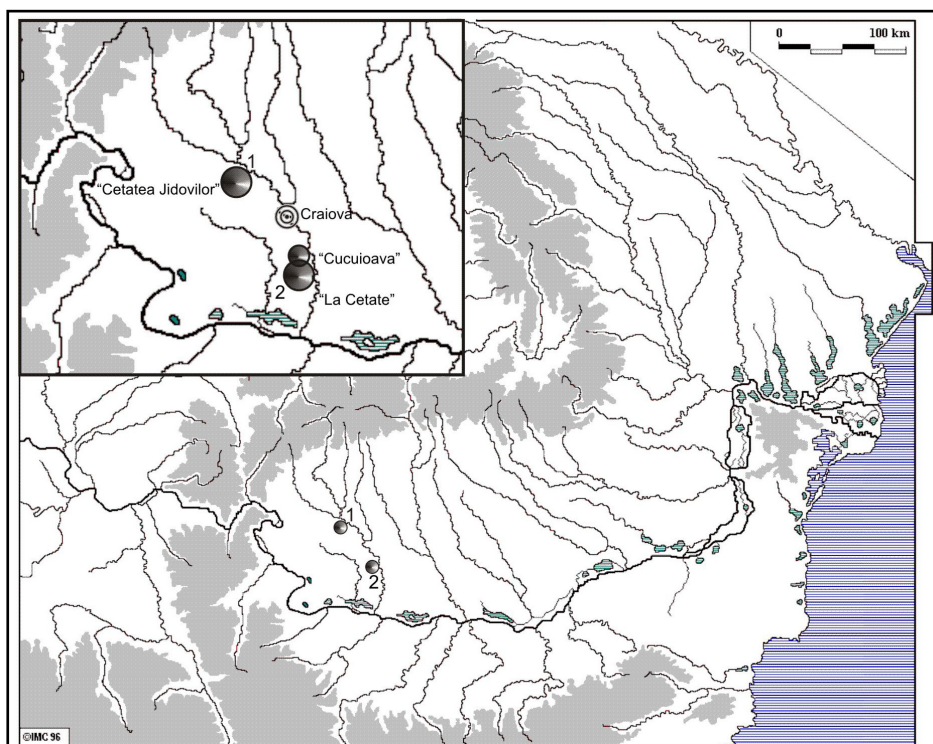


Figure 1: Excavated settlements with burnt materials fortifications of southwestern Romania

mains that could allow us to think of them as fortifying tries on the abrupt sides. Of course that lanes were subjected to quick erosion, and therefore shifted position, withdrawing inside the settlements decreasing their surface. There is no support to make direct observations to confirm the presence of fortified settlements in abrupt areas, but their existence cannot be excluded. Lacking any fortifying elements on the abrupt sides, as noticed in other places and times [2], the remaining ruins of kept forts of Coțofenii din Dos (“Cetatea Jidovilor”), Bâzdâna-Calopăr (“La Cetate” and “Cucuioava - Între Vii”), could have been, to those who developed them, less military and more (simultaneously) of a prestige significance [3], designed to define and take possession of the settlement area and surroundings [4].

In Romanian archaeology for the last two decades exists an interesting controversy, regarding the mentioned sites (and others I will refer only in passing). Unfortunately, so far the documents and materials to prove this have not yet been published or have been partially [5] published (Fig.1).

2. Short history research

The first fortified getic settlement, containing burnt construction materials (adobe bricks and emplecton from clay soil), was known through the German archeologist C. Schuchhardt [6], at the end of first World War (1918).

Starting with the early ‘80s were initiated systematic excavations in the same “Cetatea Jidovilor” settlement, Coțofenii din Dos com., Dolj county, and a year later began also those from “La Cetate”, Bâzdâna village, Calopăr com., same county. In each of these investigations have continued over ten years. The documentation established for each of them is extremely rich and consistent, but the publications related to them are still unequal in size and substance (only the settlement from “Cetatea Jidovilor” was presented [7] through a large excavation report). Both of them, considering the interesting field research results, deserve to have dedicated monographs. Between 2005-2009, despite of the lack of adequate funding, several surveys were made in the fortified settlement at “Cucuioava – Între Vii”, located at short distance from “La Cetate” (between the last two mentioned sites it is a distance of approx. 1.5 km in a straight line). Also by surface research two other settlements were identified (Voita and Botoșești Paia, Dolj county), whose fortifications consisted too of burned building materials. Several other, than the author of the study (M. Babeș) to which I will refer brings into question, were better known previously or only sporadically [8]. For the present discussion, however, only those listed above

are actually relevant and are dated in 4th-3rd centuries BC. It remains to note that at “Cucuioava – Între Vii” in the fortification cut through several trenches were not found any adobe bricks (burned or unburned), but there was a mass of burned red clayey soil, with a width of about 2.5 m, similar in structure to those found at Coțofenii din Dos (3.5-4 m) or Bâzdâna “La Cetate” (2.80-3.20 m).

3. Considerations, interpretations, positions

During the field research and publication of their results, two major and different positions emerged, considering how those fortifications were designed and accomplished (especially the one from Coțofenii din Dos). Certainly in the present contribution these can not be presented in detail, but rather at the general reasons and conclusions.

3.1. The wall with two adobe bricks paraments and the filling (emplecton) between these was built of unburnt construction materials, only dried outdoors, and then was burnt in the intention to destroy it or only by an unfortunate major event [9]. Hence the explanation for some bricks were more burned, slightly burned or “crude”.

3.2. The fortification was designed from the beginning, and then erected of previously preburned construction materials. Afterwards the materials were raised as a fortification on the present location. The authors of the systematic excavations argue, nevertheless, that in the interior of the settlement they have identified areas where building materials in question have been subjected to combustion process, the so-called “Kilns” feature. Batches obtained here were then transported by one for establishing the masonry [10]. Between the well burnt bricks, low burnt bricks have been mixed, and sometimes were used also dried (unburned) bricks. Batches technological process was in fact not carefully monitored.

Unfortunately, the placement of the archeological surveys performed by C. Schuchhardt could be identified only in theory. On the other hand, in relation with the conducted surveys that could not be identified than hypothetically, conclusions seem enthusiastic more likely. It was considered that the wall was made of blocks of clay (Lehmkuhen) that after a great fire, result of dacian – roman war, looked like bricks. He noticed, also, that the fortification wasn’t fully burnt, but on alternate portions. Later, in an other article [11], he specified that it was about adobe bricks that were initially dried outside (in open air), and became red because of the fire in the fortification, the remaining parts measured up to 60 m each. All that remains to ask ourselves today is how he could establish

such a rigorous measurement of the specific segments of the fortification, if the archaeological excavations took place only in 10 days of actual work.

The most solid adherent of the first conception (M. Babeş) published an accurate full general and particular study [12], that made different observations regarding recorded situations in other fortified settlements, that used burnt materials or even in the interior of the Coţofenii din Dos site [13]. M. Babeş resumes the ideas of C. Schuchhardt, but in a much more elaborate way, showing that a side of the fortification isn't burnt (the area called "mound", which he considers to be decisive [124] and extends this conclusion to the entire area of the defensive structure. He states that because it doesn't exist a binder (mortar) between the adobe bricks the conclusion is the same as the one above, with the existence of "raw" / "crude" bricks between the ruins of the wall [15]. On the other hand, in order to "eliminate" the proposed possibility due to the field researches in the '80, he rejects the idea that construction materials were pre-burnt in Coţofenii din Dos site (the so called sector 3), claiming that the structure from there is a heavily burnt earth and wood fortification, which closed a small portion of the settlement area [16].

His critic and original ideation relating directly to worksite observations [17], as well as commenting the published documentation (making sometimes even text and expression analysis) or verbally related information, are part of the conception that a fortification made of pre-burnt materials is not admissible because there is no model / patern in south or east European area, there for there is no such model [18]. He makes analogies referring to (Heuneburg, Seuthopolis, Olynth, etc.) considering we deal with imitation of a construction technique coming from the Greek-Hellenistic world, such as using dried adobe bricks. Of course, this could be a good argument, but allow me to make a remark here that before the models existed there was always an innovation or invention that later became or not a "prototype."

Most of his analysis and conclusions rests on the existence at Coţofenii din Dos of a central area of the fortification (about 30 m long) where burnt bricks and emplecton are absent, and their place was taken (according to the excavations authors) of an imitation of the paraments and

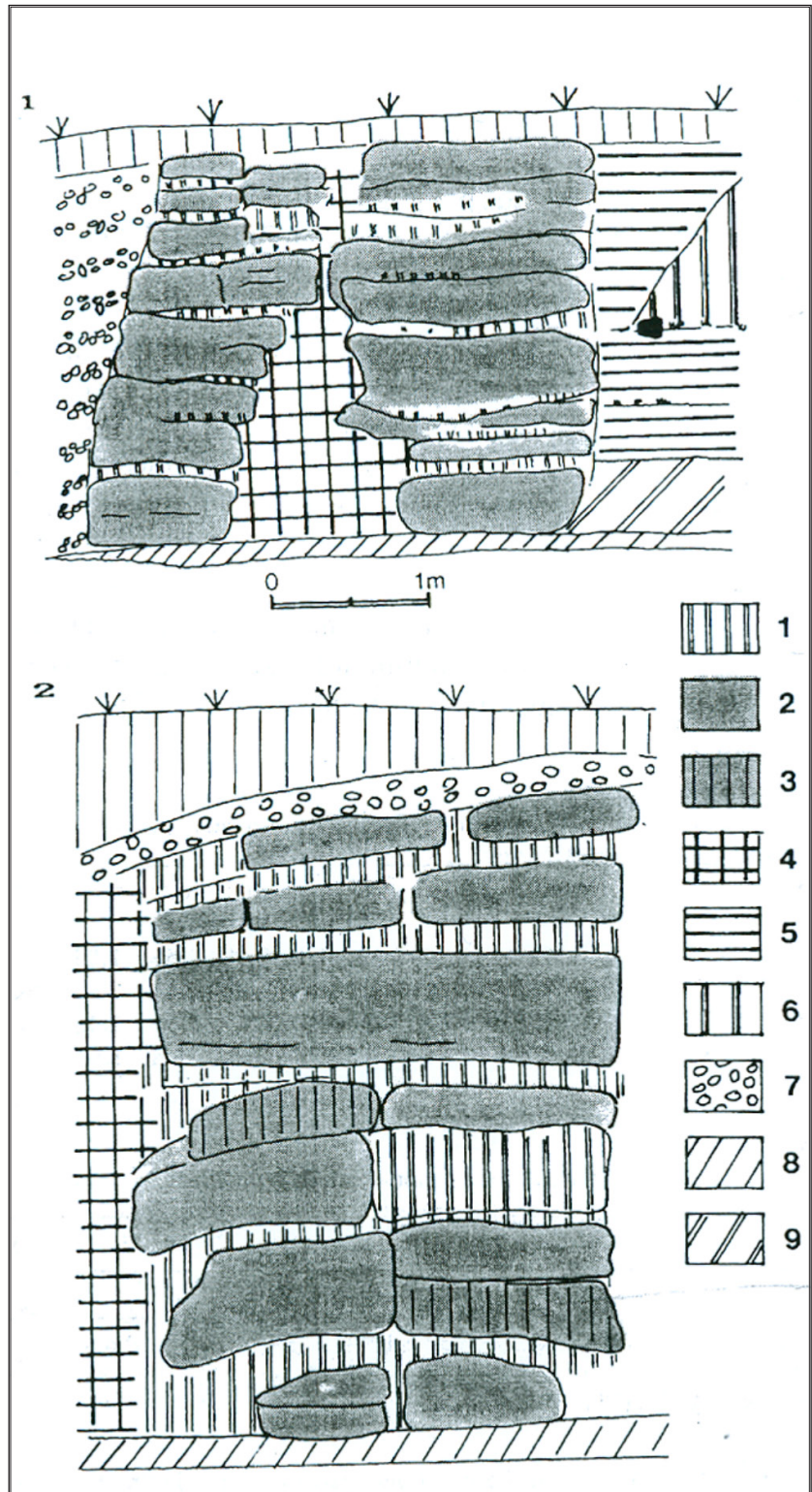


Figure 2: Coţofenii din Dos. Profile sketch of the raw adobe brick paraments in the "mound" area (after M. Babeş, *Despre fortificațiile „Cetății Jidovilor“ de la Coţofenii din Dos*, SCIVA 48, 1997, 3, 208-211, fig. 4)..



Figure 3: Coțofenii din Dos, unpublished survey 2009, excavations V.V. Zirra, Olimpia Bratu and Al. Bratu; interior (down) and exterior (above) burnt brick paraments and *diatonos* (left) between them.



Figure 4: View of the interior burnt brick parament, (trench X/2002)

emplecton consisting of clay and beaten earth. M. Babeș considers that this area is an important proof for establishing of the entire fortifications with “crude” adobe bricks and unburned emplecton, both of them subject thereafter to combustion, as a result of events difficult to disentangle [19].

The situation in Bâzdâna “La Cetate” is in many respects similar to that in the Coțofenii din Dos site. Instead, in all trenches that sectioned the fortification, the enormous majority of adobe bricks (either from the inner or outer parament) are burned from yellow-brick to brick-red colours, while the emplecton mass of clay is always deep red. Only by exception, one can speak of unburned bricks, probably just dried in open air, and which in some places mix with those obviously burned. The proportion between the burned and unburned is overwhelming in favor of those first ones [20]. The situation in Coțofenii din Dos (“Cetatea Jidovilor”) is basically the same, if we exclude the central area, where obviously we are dealing with an unusual situation.

No doubt, that a short description and some comments are necessary. In the central area of the “Coțofenii din Dos” fortification, where the route changes position, the antique constructors developed a “mound” of beaten earth, probably used as a central point of observation. This oval structure looked from above, has a diameter of 20-30 m and a remarkable consistency. It was build from alternative layers from different types of soil which in time turned into some kind of “monolith resembling to a block of cement” [21]. The mixture of layers contained residuals of materials from a previous habitation as well as burnt or not burnt bricks and

“yellow-green blocks of soil, similar to bricks but joined together by black soil”. The interior and exterior “paraments” on this area are made of soil, and between them is a brown compact clay soil, used as emplecton. The existence of the residual burnt bricks suggests a subsequent report towards the raising of the brick wall, after a partial destruction of the wall caused by an unspecified conflict. Besides, we can observe that the brick wall protecting the site, after being used as such, was seized at some point in time by an earth valum [22]. Regarding the recorded situation in this area, M. Babeș claims that the “paraments” were made of adobe dried bricks of two different sizes. In order to support this idea he published two little profile sketches (without

mentioning the section or cassettes **Fig. 2**) which he drew when visiting “Cetatea Jidovilor” in 1986 [23]. In fact, the excavation authors’ remarks are the same but without “seeing” so clearly this kind of structure [24]. Even if we admit that M. Babeş issued a solid hypothesis we can’t extend it to the entire fortification (approximately 250 m long). In fact it is more about the exception that makes the rule, especially when probably it is about an ulterior intervention after the bricks and burnt emplecton wall were erected.



Figure 5: Contemporary adobe bricks exposed for drying in open air in the yard of a local.

The direct observations made during the excavations, as well as the rich plans’ documents speak clearly, undoubtedly even, of the definite prevalence of the burnt construction materials, whether it’s bricks or emplecton. The color of the burnt bricks is different most of the times but it doesn’t eliminate the fact that they were burnt. Coțofenii din Dos fortification as well as Bâzdâna “La Cetate” have considerable thickness (3.5-4m, and 2.80-3.20 m), and the kept height reaches almost 1.2-1.5 m (**Fig. 3-4**). Therefore the idea that the temperature of burning from top to bottom after raising the wall was high enough to flush red the bricks and the emplecton seems more fictional than anything else. Even if these fortifications, as M. Babeş believes, were accompanied by a lateral and/or superimposed wooden structure of the “paraments” [25], the lack of oxygen inside the defensive barrier structure, during an intentional or accidental fire, could have hardly turn red by heating the interior (core) of the defensive structures.



Figure 6: Contemporary wooden mold for formatting adobe bricks. Utensil used by the same local.

If the exceptions presented honestly (as M. Babeş noted himself) by the excavation authors’ are seen as rules and the hypothesis and conclusions are made on the same assumption, I’m afraid that that we are far from the possible truth that the archeological research tries to reconstruct. My opinion is that we have to take into consideration the observations and documents gathered through the years regarding the specified period, keeping in mind, of course, the facts that don’t combine easy with reaching a general concept.

4. Kilns / ovens or burnt valum

To admit the use of previously burnt materials for building fortifications leads to the question: where did this process

that required a lot of effort, a good quantity of fuel and a good, not perfect working technique, took place. Despite the efforts made to detect the place where the burning installations were, no residuals were found inside or outside Bâzdâna (“La Cetate” and “Cucuioava”) sites. At Coțofenii din Dos the situation is more interesting and instructive.

In the third sector of “Cetatea Jidovilor”, systematic archeological research pointed out the existence of a strong burnt structure, large in size (north-south oriented and placed over a previously inhabited area), and trapezoidal in form [26] (approximately 50 m in length, 2-3 m from the base, 3-4 m in the upper side and a depth of 1.2-1.8 m). In the upper side of this settlement were noticed compact residuals of a burnt platform where the bricks (**Fig. 5-6**) were placed for burning by the very hot air which came through the circulation and reverberation holes. Under this platform (0.25-0.40 m thick) was the fireplace of these *sui generis* kilns / ovens in which went the fuel (**Fig. 7**). In the same time, in the kilns went a quantity of some sort of clay soil, and through direct burning turned into burnt filling material as the emplecton. It is likely that after developing a batch of bricks and emplecton, the burning installation used was destroyed in order to take the burnt material from

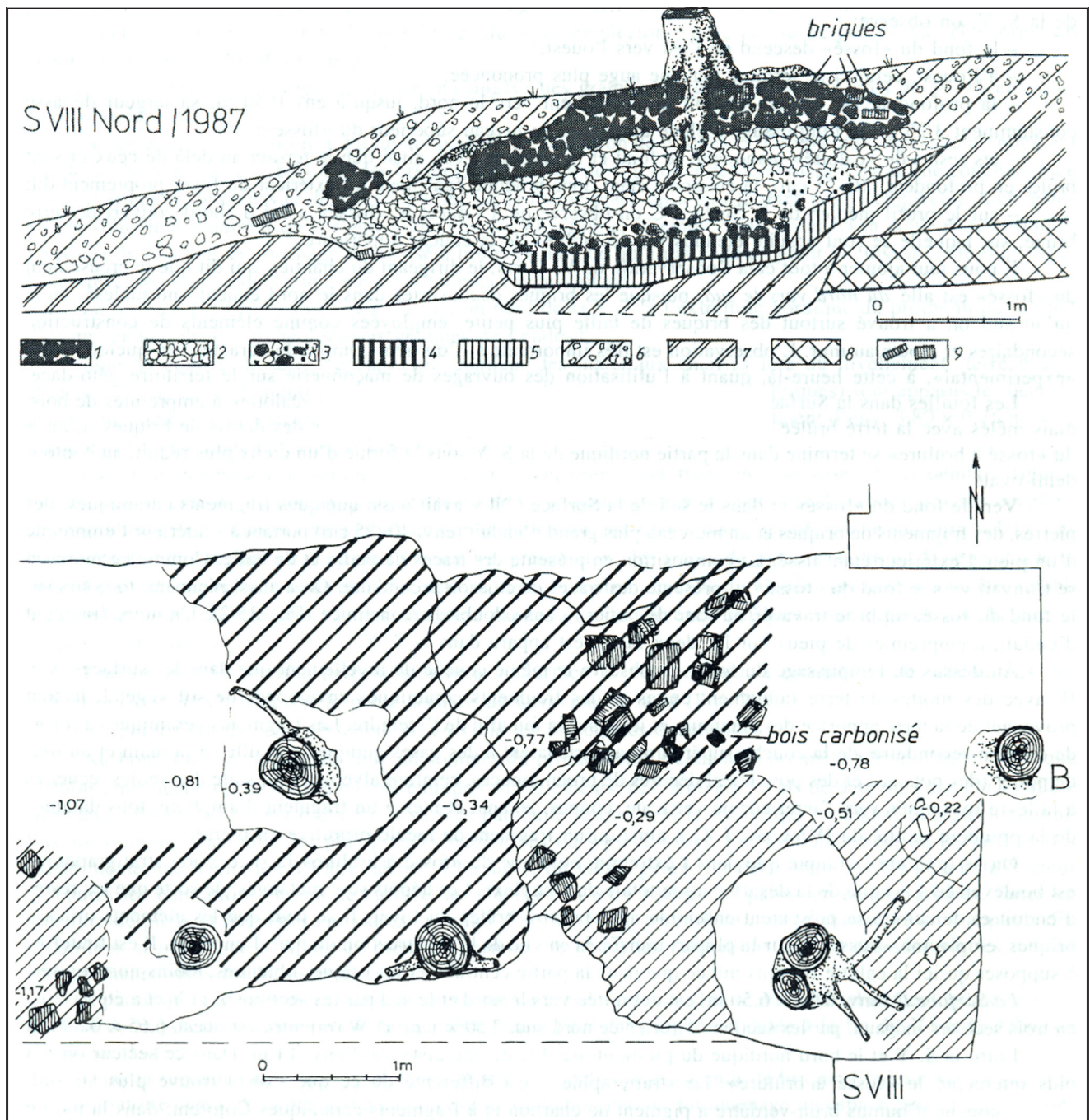


Figure 7: Coțofenii din Dos, sector 3, profile of trench VIII/1987 North (above) and plan of A surface (below). Remains of the combustion installation (kiln), after N. Conovici, Le secteur 3. “Fours” in VI. Zirra et alii, „La station gétique fortifiée de «Cetatea Jidovilor» (Coțofenii din Dos, dép. de Dolj)“, Dacia N.S. XXXVII, București 1993, 104-112, fig. 24-25.

the source and then, possibly, rebuild.

Anyway, the normal usage of such a burning structure implied constructing near a different “oven batteries”, so that in time it reached that considerable size. Of course, the kept elements do not provide explicit information of the way the adjacent and successive burning installation worked. Analyzing the situation interpreted and described above, M. Babeș questions “the way the construction was imagined and how the oven worked”, claiming that the

arch (platform) has discontinuous parts and couldn’t have beard the weight of the bricks placed on it for burning [27]. However, it would have been surprising that after some intense usage of such facilities that they remain still, or that the passing centuries wouldn’t have damaging consequences over the structure. In conclusion, M. Babeș considers that we have to deal with of burnt soil valum structure from top, bottom and side, after the intentional fire of the wooden shell and “core of mix twigs and vegetal materials”, entire or adobe fragments and household waste

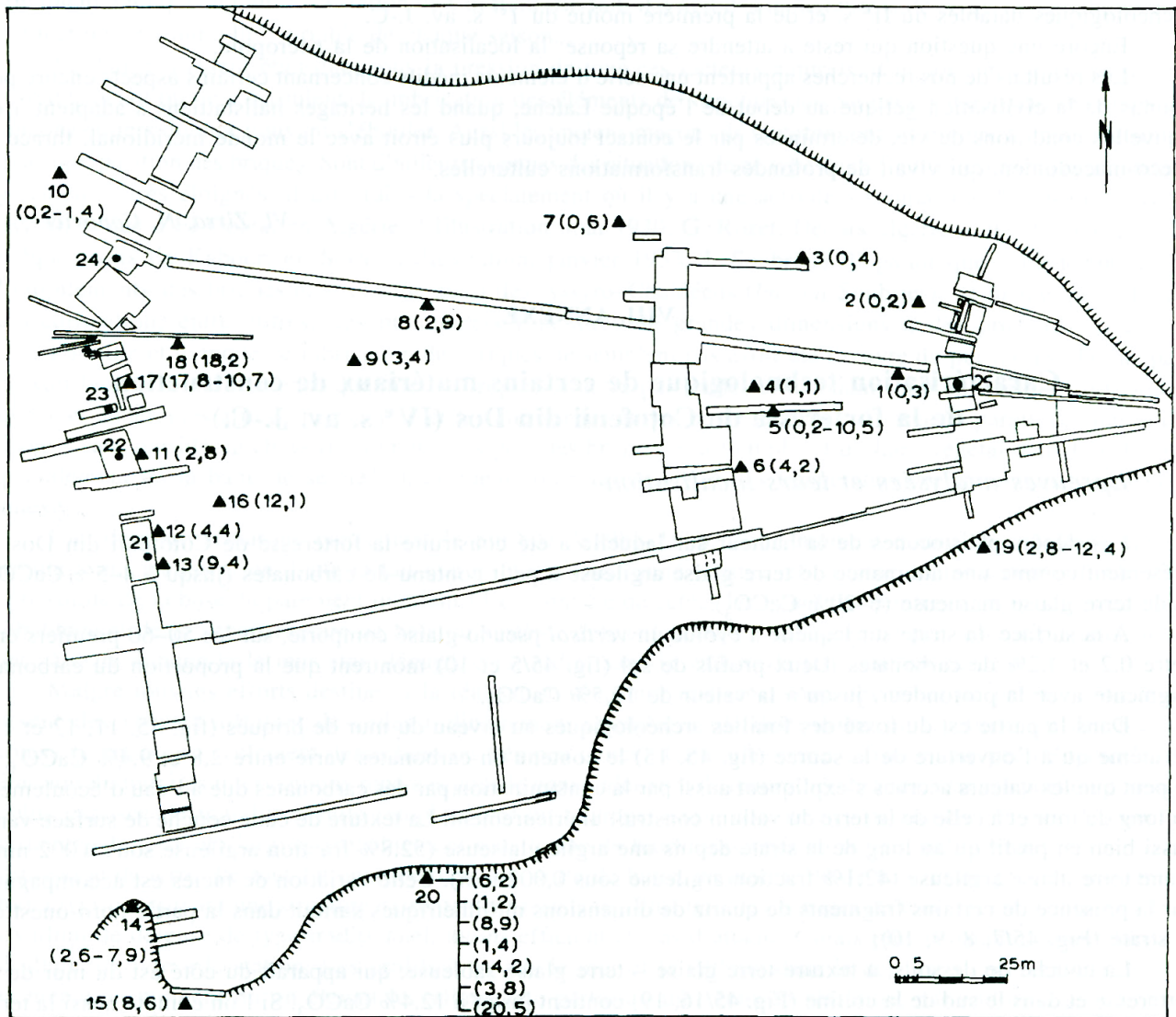


Figure 8. Collecting map of the lithological and archaeological samples at “Cetatea Jidovilor”, Coțofenii din Dos, Dolj county, Romania, after Gh. Găță, Caractérisation technologique de certains matériaux de construction de la forteresse de Coțofenii din Dos in VI. Zirra et alii, „La station gétiqee fortifiée de «Cetatea Jidovilor» (Coțofenii din Dos, dép. de Dolj)“, Dacia N.S. XXXVII, București 1993, 148, fig. 45.

as a “result of war conflicts” [28]. I have to point out, the same as in the case of the burnt brick wall from sector 1 (the brick wall) of the site, that is highly improbable that after an intentional fire, the remains of the structure, imagined by M. Babeș to be a fortification line, would burn so intensely on the entire length, depth and thickness. In any case the lack of oxygen would prevent this thing to happen inside the structure.

5. Testimony of the physico-chemical analysis

So far on the construction materials originating in sites such Coțofenii din Dos and Bâzdâna “La Cetate” were made a series of tests, in the attempt to find out new, measurable data on these. Overall the data series that we have available provides quite different results. However, some analysis

results have common trends. Anyway, we have no reason to doubt the reliability of the performed tests, even if for archaeologists the explanation, description or concepts of the involved methods are not easy to understand.

The first analysis were performed by Dr. Gh. Găță (Bucharest Institute of Pedology) in the late ‘80s and published in the extensive excavation report on the Coțofenii din Dos fortified settlement [29]. The quantity and diversity of analyzed materials is far superior in comparison with the following test series (Fig. 8). The author of analysis tried to identify the sources of raw materials (acquiring various soil samples from the area), as well as the correlation of the visible colour (identified on the Munsell scale) with the porosity index. Macro and microscopic analysis, heating of different samples

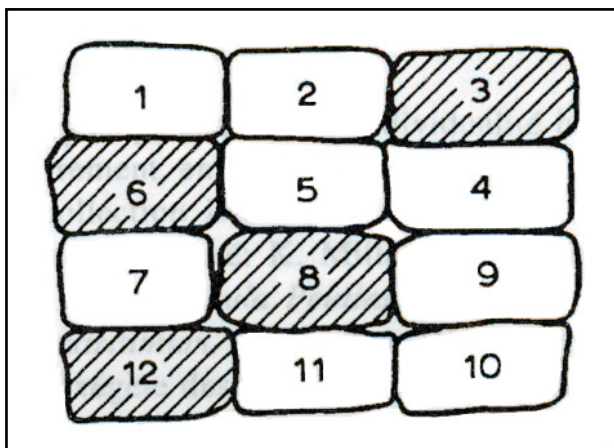


Figure 9. Sketch of an adobe bricks group from de Coțofenii din Dos fortification, B Surface, eastern parament. Samples 3, 6, 8, 12 are fired above 400-450^o C, and do not present the absorption band of infrared beams of 3697 cm⁻¹, after Gh. Gățã in Vl. Zirra et alii, „La station gétique fortifiée de «Cetatea Jidovilor» (Coțofenii din Dos, dép. de Dolj)“, *Dacia* N.S. XXXVII, București 1993, 157, fig. 54.



Figure 10: View of the interior burnt brick parament, (trench IX/2002). Sampling of the brick fragment and (emplecton) fired clay come from this spot.

at various levels of controlled temperature in relation to soil samples coming from probable sources for the construction materials preparation, conducted to a combustion temperature scale for building materials at hand for the local protohistoric masons.

Therefore, Gh. Gățã proposed conclusions can be summarized in the following issues and interpretations [30]:

a. the provenience sources of raw materials are different, clayey and marly clay; the combustion temperature of the clay soil mass who played the role of emplecton between the wall paraments are usually higher than those defined

for the adjacent adobe bricks (540-770 °C);

b. the vast majority of the adobe bricks are burned, even though there are variations in temperature between outside and inside of them (friable bricks are fired at about 380 ± 15 °C) and the maximum temperature to which they have been subjected rarely exceeds 600 °C (in this instance the bricks are compact and there is almost no difference between their inside and outside color);

c. the combustion temperature analysis of a group of 12 adjacent brickwork (**Fig. 9**) revealed that there are significant variations in temperature between several such units superposed or juxtaposed;

d. the differences in combustion temperature and porosity of the materials used for establishing the fortification are leading together to the idea that the material used as emplecton was brought at a time in relatively small batches and deposited between the paraments, and the bricks, at their turn were pre-burned elsewhere and also come from a series of batches, then placed one above another in the fortification paraments;

e. important variations in the firing temperature of the emplecton type material or variations in combustion temperature of the bricks could be rather explained by the lack of exigency in the preparation of these materials.

The assumption that the fortification was constituted by “crude” materials, dried outdoors, and then burned intentionally or accidentally is difficult to sustain [31].

A significant exception in this respect can be taken into account in the central area of the fortification, where the burnt brick paraments and the fired emplecton are replaced with dried / “crude” bricks and beaten soil layers of different colours.

The next set of analysis was performed by Dr. K. Kritsotakis (Central Roman-Germanic Museum – RGZM – Mainz laboratories) on “two samples of each type of “brick” (1A and 1B for type I, 2A and 2B for type II)” [32]. From the expertise cited by M. Babeș, based on the mineralogical and thermodifferential analysis carried out by the Mainz expert [33], it results that the material comes from different sources and that was not fired, fact supported also by the presence of organic substances in the bricks. In other words we are dealing with “air-dried adobe bricks”

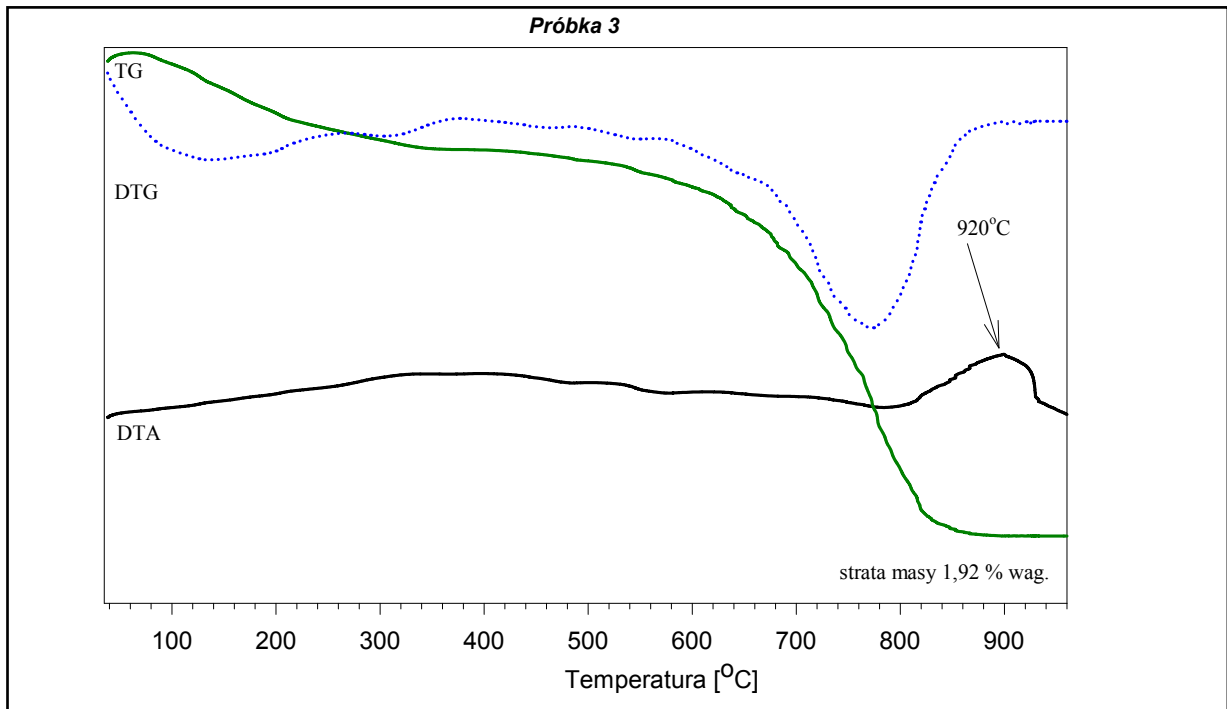


Figure 11. Thermogram of brick (sample 3), Bâzdâna-Calopăr, “La Cetate” fortified settlement, after H. Stoksik’s report.

(luftgetrocknete Lehmziegel), and the thin “melting films” (Schmelzüberzüge) are showing a subsequent exposure to heat, leading to their formation.” [15].

The latest set of composition and thermal analysis was performed by professor Henryk Stoksik from the Academy of Fine Arts in Wrocław, to the end of 2010 year [34]. It

is about two samples originating this time from Bâzdâna “La Cetate” [35], one of burned brick and the other one of emplecton type material, immediately adjacent to the first sample (S IX/2002, **Fig. 10**). The samples were examined through the methods of macroscopic analysis in the passing light, X - Ray diffraction analysis and derivatography analysis.

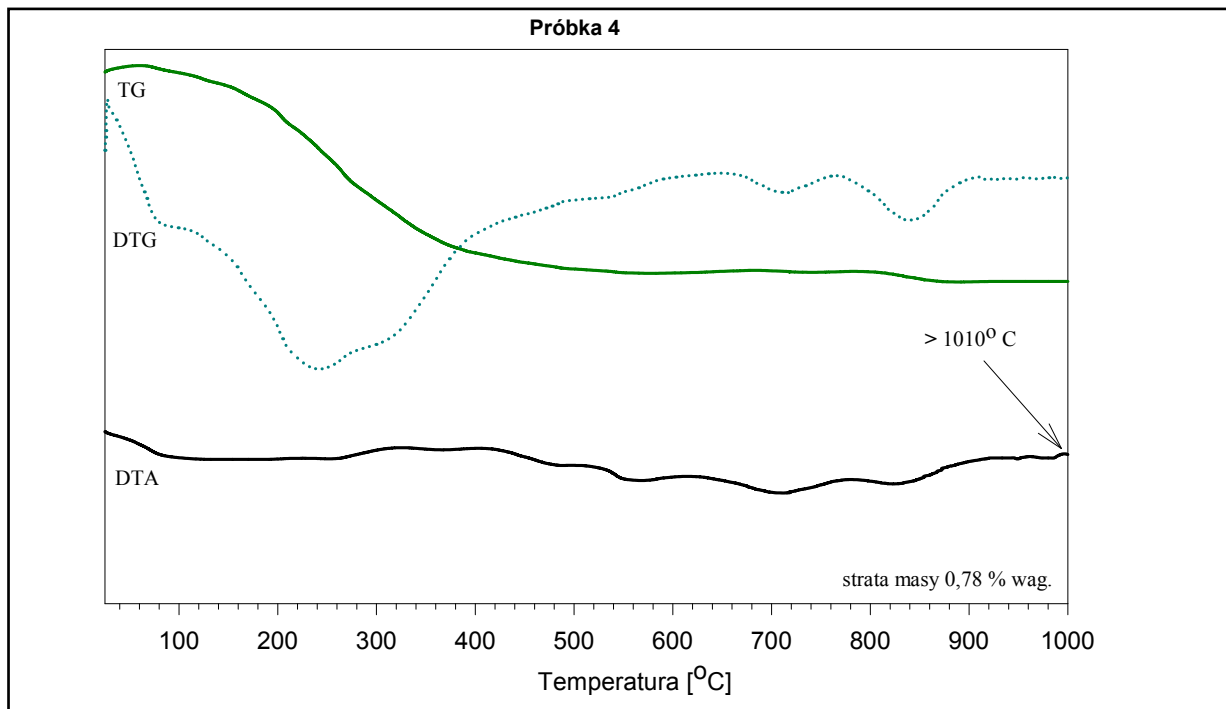


Figure 12. Thermogram of fired clay (sample 4), Bâzdâna-Calopăr, “La Cetate” fortified settlement, after H. Stoksik’s report.

Following the mentioned analysis, H. Stoksik reached the following conclusions:

“Specialist microscopic, X-Ray and derivatography analyses of two ceramic artefacts selected to be tested in a form of the brick (sample 3) and the fired clay (sample 4) [...] allowed to determine that to manufacture the brick it has been used very plastic clay, ferruginous and weakened by various intentional mineral admixtures of sharp-angled quartz grains and quartz aggregates. The brick body (sample 3) was also composed of aggregates of calcium carbonates with features of calcite and sporadically pyroxene. In the fired clay (sample 4) it was also identified, like in the sample 3, sharp-angled quartz grains and sporadically feldspars. Dark brown colouring of the clay is connected with high contents of the iron compounds.

The results of X - Ray diffraction analysis have proved existence of the identified microscopically similar mineral phases of quartz, anorthite, hematite and muscovite. Additionally, in the fired clay (sample 4) the potassium feldspar – orthoclase has been found which was not identified in the brick (sample 3). Occurrence of the same mineral phases in both analysed samples, i.e. the brick and the fired clay may suggest that tested clay has been used as a raw clayey material to produce a brick.

Based on the derivatography analysis one may conclude that tested brick was exposed to temperature of 920° C (**Fig. 11**). Thermogram of the fired clay indicates a temperature of about 1050 °C (**Fig. 12**) that is significantly higher than the tested brick. Confirmation of that fact is the decreased porosity of the fired clay compared to porosity of the brick proved by the microscopic tests and lack of active phases in the fired clay at temperature about 1050° C in relation to the brick tested by derivatography method. Absence of thermal transformations of the feldspars in the fired clay proved by the microscopic and X-Ray analyses indicates however that tested clay was not a subject of heat treatment above 1100 °C”.

4 Conclusions

Summarizing, it can be seen that the composition and thermal analysis refers to samples taken from two sites with burned construction materials fortifications. The amount of examined samples from the two sites is obviously unequal which advises to appropriate caution in their comparison. For the first and last set of performed analysis we know accurately the places from where samples were selected, while for the second analysis group

the conditions of sample collection was not published until now. Considering the first and last analysis group it is clear that both the bricks and burned emplecton were definitely fired at considerable high temperatures, even though the appreciation of the the combustion temperatures differ significantly. It remains to ask whether this statement is due to different analysis procedures or to variable technological process on which the building materials were subjected. Either way, one fact is clear enough and repeated: between the burning temperature of the bricks and emplecton - according to the first and last set of analysis - there is a significant difference, remarked by both experts. A confirmed situation of this nature for the sites at Coțofenii din Dos and Bâzdâna “La Cetate”, strongly suggests that the materials used to raise the two fortifications were burned elsewhere, and then brought in order to constitute the fortifications.

ACKNOWLEDGMENT

This paper is supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number SOP HRD/89/1.5/S/59758.

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- [13] M. Babeș, *op. cit.*, 199-236.
- [14] M. Babeș, *op. cit.*, 206-212, 234-235. He considers that the number of raw bricks is highly superior to those 10% accepted by the authors of 1980's excavations'. Of course this is only his opinion, but he doesn't show what he's relying on..
- [15] *idem*, *op. cit.*, 224-226, 230.
- [16] *idem*, *op. cit.*, 205-212.
- [17] *idem*, *op. cit.*, 212-226; E. Moscalu, *op. cit.*, 339-348.
- [18] *idem*, *op. cit.*, 205-212.
- [19] *idem*, *op. cit.*, 235. The opinion of M. Babeș that Bâzdâna "La Cetate" fortification was made of "raw" bricks, is also without support.
- [20] Vl. Zirra et alii, *op. cit.*, 97-98.
- [21] *eiusdem*, *op. cit.*, 86; a similar situation, but much smaller in size, was observed at area B/1987-1988.
- [22] *eiusdem*, *op. cit.*, 98.
- [23] M. Babeș, *op. cit.*, 208-211, fig. 4.
- [24] It is curious how the team of researchers (4-5 specialists) didn't notice the details that M. Babeș **considers to be unequivocally observational** facts. However, I have to say that the records of the plans or profiles are always at some extent subjective, in other words this kind of documents represent an interpretation connected to the conceiving and understanding excavation realities.
- [25] M. Babeș, *op. cit.*, *passim*.
- [26] N. Conovici, în Vl. Zirra et alii, *op. cit.*, 104-112.
- [27] M. Babeș, *op. cit.*, 222.
- [28] *Idem*, *op. cit.*, 225.
- [29] Gh. Gâță, Caractérisation technologique de certains matériaux de construction de la forteresse de Coțofenii din Dos in Vl. Zirra et alii, „La station gétique fortifiée de «Cetatea Jidovilor» (Coțofenii din Dos, dép. de Dolj)“, *Dacia* N.S. XXXVII, București 1993, 147-157.
- [30] *Idem*, *op. cit.*, 157.
- [31] *ibidem*.
- [32] M. Babeș, *op. cit.*, 208 and reference 21.
- [33] Quotation of K. Kritsotakis report in M. Babeș, *op. cit.*, 208-209.
- [34] H. Stoksik, Specialist analysis of two selected ceramic artefacts from Romania (unpublished report, 9 pp).
- [35] Unfortunately the available analysis funds were reduced quite small. I hope in future to be surveyed other samples too for a more thorough and accurate comparison between the burnt materials from Bâzdâna and Coțofenii din Dos.