Roman Stonework: An Archaeological Experiment

Cuvinte cheie: experiment, sculptură, epocă romană
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Rezumat

În vara anului 2007, în curtea Muzeului de Istorie din Gherla (jud. Cluj) am desfăşurat un mic experiment arheologic, împreună cu sculptorul din localitatea Beclean, Mureşan Ioan (2). Folosindu-ne de sursele bibliografice cunoscute şi de experienţa sculptorului am încercat recrearea procesului de sculptare a unui altar cu inscripţie votivă din tuf vulcanic de Dej. După cunoştinţele noastre un astfel de experiment încă nu s-a desfăşurat în Dacia sau dacă s-a încercat sculptarea unor piese sculpturale romane, s-a făcut în marmură sau calcar, nu în tuf vulcanic, însă niciodată sub forma unui experiment bine documentat. Premisa acestei acţiuni o constituia depistarea tehnicilor celor mai simple şi eficiente precum şi observarea modului în care se comportă tuful vulcanic de Dej, atât de intens utilizat de către meşterii lapicizi din Dacia Porolissensis, în procesul de sculptare. Ne interesa să identificăm şi dificultăţile cu care se confrunta un lapicid când lucra cu un astfel de material.

Am folosit o gamă largă de unelte, dintre care menţionăm: tesla, ciocanul, dalte de diferite tipuri şi dimensiuni.

Concluziile desprinse în timpul experimentului sunt următoarele :

- tuful vulcanic de Dej este o piatră dură, foarte incomodă pentru sculptura fină. Astfel, materia primă se pretează cu predilecţie pentru blocuri masive de genul corpului de altar sau bucăţi mari, desprinse ce puteau fi folosite la stelele funerare.
- pentru a eficientiza procesul piatra trebuia mereu udată cu apă pentru înmuiere
- gravarea literelor se poate face de oricine în cazul în care nu se respectă o anumită distanţa şi dimensiuni ale literelor, însă dacă se iau în calcul aceste detalii este necesar cu certitudine experienţa unui meşter profesionist. Sculptarea frontonului necesită cunoştinţe în plus faţă de cele necesare gravării literelor, se foloseşte dalta subţire iar pentru respectarea modelajului trebuie ca meşterul să cunoască foarte bine ce tip de decor vegetal doreşte să facă. Foarte probabil îşi schiţa pe un desen ce urma să facă.
- timpul necesar pentru a face o piesă de calitate ar fi în jur de 14 ore dacă procesul este complet
- nu se va putea face o piesă absolut identică în tuf vulcanic de Dej deoarece consistenţa rocii diferă chiar dacă provine din acelaşi bloc de piatră, iar unele bucăţi prezintă asperităţi sau goluri care îngreunează sculptura
- cu certitudine, piesele de dimensiuni mai mici se puteau sculpta fie în apropierea carierei, fie într-un atelier amenajat în aer liber. În ceea ce priveşte sculptatul în interior se pretează doar în locuri bine aerisite şi cu luminozitate ridicată
- este evident faptul că în timpul iernii era extrem de greu a sculpta acest tip de piatră dată fiind capacitatea pietrei de a susţine umezeala.

Rezultatele sunt extrem de interesante şi confirmă o serie de teorii asupra modalităţii de cioplire şi realizare a sculpturilor romane din provincia Dacia Porolissensis.

In summer 2007, in the courtyard of the History Museum from Gherla[1], Cluj County, I made an archaeological experiment, together with a sculptor form Beclean, Mureşan Ioan[2]. Using the bibliography we know for the moment[3] and the sculptor`s experience, I tried the recreation of the sculpting process of an altar with votive inscription in volcanic tuff from Dej.

Considering our knowledge, such a kind of experiment it hasn't been yet carried on in Romania, or if this kind of experiments was already done, these were made in marble or in limestone rock, not in volcanic tuff. Considering the fact that these kinds of experiments, in a very well documented form, were never published, we considered to make known the process and the results of the archaeological experiment.

The primary idea for this action was the identification of the simplest and the most efficient techniques for sculpting the volcanic tuff from Dej. In the same time, we wanted to see how this kind of rock is behaving during the process of sculpting, considering the wide use of the tuff by the stonemasons from Dacia Porolissensis. I was particularly interested to identify the difficulties of a stoneworker in roman era when he was working with this kind of rock.

Before the experiment I made several incomes in the neighbour towns and villages from Gherla, where there are even nowadays rock carrier exploitations. These rock carriers are supposed to be sources used by the Romans. I collected some specific information about the rock exploitations, I photographed the extraction points and, in some cases, I took some samples for petrography analysis.

The only method I was able to use for the research of the lithic raw material of different monuments from the Roman *Lapidarium* at History Museum from Gherla, was to search the present day carriers and to compare the raw materials and the rock used for different sculptures. I noticed that the monuments from the above mentioned *lapidarium* are made from local stone. Considering the existing bibliography[4], I made several petrography tests on a few stones coming from the Gherla roman *castrum*. V. Wollmann, in his studies, did not managed to identify in, or around Gherla, a specific rock exploitation point in the roman period[5]. He took samples from about 6 pieces, considering the published catalogue: no. 6, no. 38, no. 54, no. 82, no. 90, no. 97. It must be specified from the beginning, that the results of the laboratory investigations of the selected samples, witch are related with the petrography, mineralogical and paleontological, without a specific criteria, can be classified only as relative.

There are at least two factors witch make one to keep certain reserves on the conclusions coming from this kind of research. First, is the altered quality, on variable proportions, of the petrographic sample. The sample is always collected from the surface at a specific moment, that means the sample has a contact with the air. Second, most of the samples are coming from pieces of epigraphic nature. This kind of monuments could have been made from rocks imported or brought from far away.

The laboratory operations consisted of the study of the samples with a polarizing microscope, a classical method in the mineralogical research, used even today with very precise results.

Today, there are other methods for determining the rock material, but the precision of the sections did not required the more elaborated methods. Until now, the archaeological investigations from Romania rarely demanded such kind of specific analysis, and only rarely and in special conditions were used.

For the petrography analysis on these pieces, I contacted for help PhD geologist Marcel Benea, researcher and professor at the Geology Cathedra on the Faculty of Biology and Geography from Babeş-Bolyai University, to whom I thank for all the support. Based on my own analysis, with his help, we concluded that his results match those of our tests. Thus, we concluded that one of the possible rock-exploiting areas around ancient Gherla was the quarry of Orman, situated at about 10 km north of Gherla. We have to consider also the fact that stone was a building material used for roads and military and civilian buildings around the *castrum*, therefore the Romans had to extract considerable quantities of stone in the area. Traces of exploitation can still be seen today, but one cannot be certain that these have roman origins (Fig. 1/a,b). The documentation regarding the technical procedures used in the roman period to open a quarry and to dislodge the blocks from the surrounding rock is very poor, compared to the area and intensity of the exploitation.

The questions regarding a local sculpture-workshop have been answered recently, and the starting point of our experiment was a very good one. L. Ţeposu-Marinescu considers as certain the existence of a stone-masonry-workshop in Gherla, in the immediate vicinity of the *castrum* or inside its perimeter[6], fact later confirmed by the studies I conducted in this area.

The block of stone existing in the courtyard of the museum (fig 2/a) was intended to be used to pave a sidewalk. First, we took a sample which was analyzed, and the results showed that this is volcanic tuff from Dej, from the Orman area. Its dimensions are 120 cm high, 60 cm wide and 50 cm high.

The experiment lasted for two days. The conclusions are extremely interesting. I wish to highlight that we used tools identical to those appearing in the biographical sources: adze with sharp/pointy tip of different types (fig 1/c) – used to dislodge the stone blocks with the help of the pointy tip, of two types with a pointy tip and with a concave tip, by hammering. Although limestone and sandstone have no special breaking properties, the dislodging of the blocks requires a certain direction, a certain angle and a certain force of hitting. This kind of tools can be used to obtain a sharp angle or a small angle for smaller pieces. After dislodging a piece of appropriate size, the edges have been cleaned to obtain a rectangular contour. This requires some experience, so that a rectangular block as large as possible might be produced with a minimum of effort and material loss. The sharp chisel (fig. 1/d) was mainly used in the first phase, to draw up the area of the sculptural relief. The "claw"-chisel was

used to retouch the main form (fig. 1/e). The flat chisel is necessary to model the relief and to mark the edges, or to draw the lines separating some details (fig. 1/f). Scrapers (fig. 1/g) – used in the same way, to finish the places where other tools cannot be used.

Extremely important are the hammers – *malleus* (fig. 1/h) of different sizes and with different uses, both in the quarries and for sculpture.

The artist made a research regarding the best and most efficient methods for this kind of experiment.

The first step was preparing the block of stone, smoothening out the field where the inscription would be drawn (fig. 2/a). It followed the drawing of the pediment of the capital (fig. 2/b), the tracing of the rows from the epigraphic field and the arrangement of the monument`s base. The base of the altar is 20 cm high, marked by a moulding, which separates it from the field of the inscription. The epigraphic field is 80 cm high and 60 cm wide. The pediment is 20 cm high. It has a triangular shape and two acroteria on the sides, 20 cm high each. Inside was carved a flower with 8 petals and two acanthus-leaves, a decoration specific for the altars from Dacia Porolissensis (fig. 2/b).

Then we did the actual sculpting of the letters in the epigraphic field (fig. 2/c). We chose standard letter-dimensions, like those appearing on the stella of Brissenus, at Gherla[8]. The text has been divided into five rows, with a spacing of about 3 cm between. A simple chisel can be used for this. The letters have been marked on the field of the relief and carved out afterwards, to keep the dimensions and the spacing between them (fig 2/d). It was important to determine the speed of the sculpting by a professional artist and the most comfortable way to do it. For this, the stone block was leaned, for a better efficiency. During the sculpting, the rock was kept wet. At the end, the piece was painted.

The conclusions drawn during the experiment are:

- The volcanic tuff from Dej is a hard rock, very inappropriate for fine sculptures. Therefore, this material is good for large blocks, such as the body of the altar, or for large, dislodged pieces, which could be used for *stellas*.

- In order to be more efficient, the rock had to be watered constantly, to soak up.

- Anyone could have done the sculpting of the letters if the distance between the letters and their dimensions do not have to be the same, but in order to meet these requirements, the experience of a professional artist is certainly needed. The sculpting of the pediment requires special knowledges, compared to the sculpting of the letters, a thin chisel must be used, and in order to accurately reproduce the ornamentation, the sculptor must know exactly the vegetal decoration he wants to use. Probably, the sculptor used to make a sketch.

- The time necessary to produce a piece of good quality is about 14 hours.

- A certain piece cannot be perfectly reproduced in Dej volcanic tuff, because the consistency of the rock is different even in case of rocks originating in the same block, and some pieces have thicker or shallower parts, which make it harder to sculpt the rock.

- It is certain that the smaller pieces could have been sculpted close to the quarry or in a workshop outdoors. For indoors sculpting, a well ventilated an illuminated place was necessary.

- During winter, it was extremely difficult to sculpt this kind of rock, due to its ability to sustain moist.

The experiment realized at Gherla confirmed the suppositions regarding the methods of the roman sculpture in Dacia Porolissensis province. Also, we have a better idea about the procedures of artistic processing of the Dej volcanic tuff. Certainly, the sculptors of the province had specific knowledge about the fastest and most efficient way to create sculptural monuments.

Such actions of experimental archaeology will enrich and clarify a series of knowledges regarding the roman sculpture in Dacia, which have not yet been demonstrated, and will open new horizons in understanding the condition and the role of the stone-sculptors.

Radu Iustinian Zăgreanu

Note / *Notes*

1. Supported by the manager of the History Museum from Gherla, Mihai Meşter, to whom I thanks with this occasion

2. Born 19.12.1956, Vad, jud.Cluj; Studies: 1984-1987 Popular School of Art Bistriţa, Section Paint; 1981-1983 Popular School of Art Bistriţa, Section Theatre; 1976-1980 „Liviu Rebreanu" Lyceum, Section. 1978-1987 studied wood carving; Profession: cutter and polisher in stone. Personal exhibitions in: Beclean, Bistriţa, Bucharest - National Theatre

3. **Blagg 1976,** p. 152-172; **Jockey 1998** p. 153-177

4. **Wollmann 1996**, p. 442 and followings

5. **Wollmann 1996**, p. 442

6. **Ţeposu-Marinescu 1974**, p. 419

7. **Zăgreanu 2007**, p. 266

8. **Protase 1968**, p. 339

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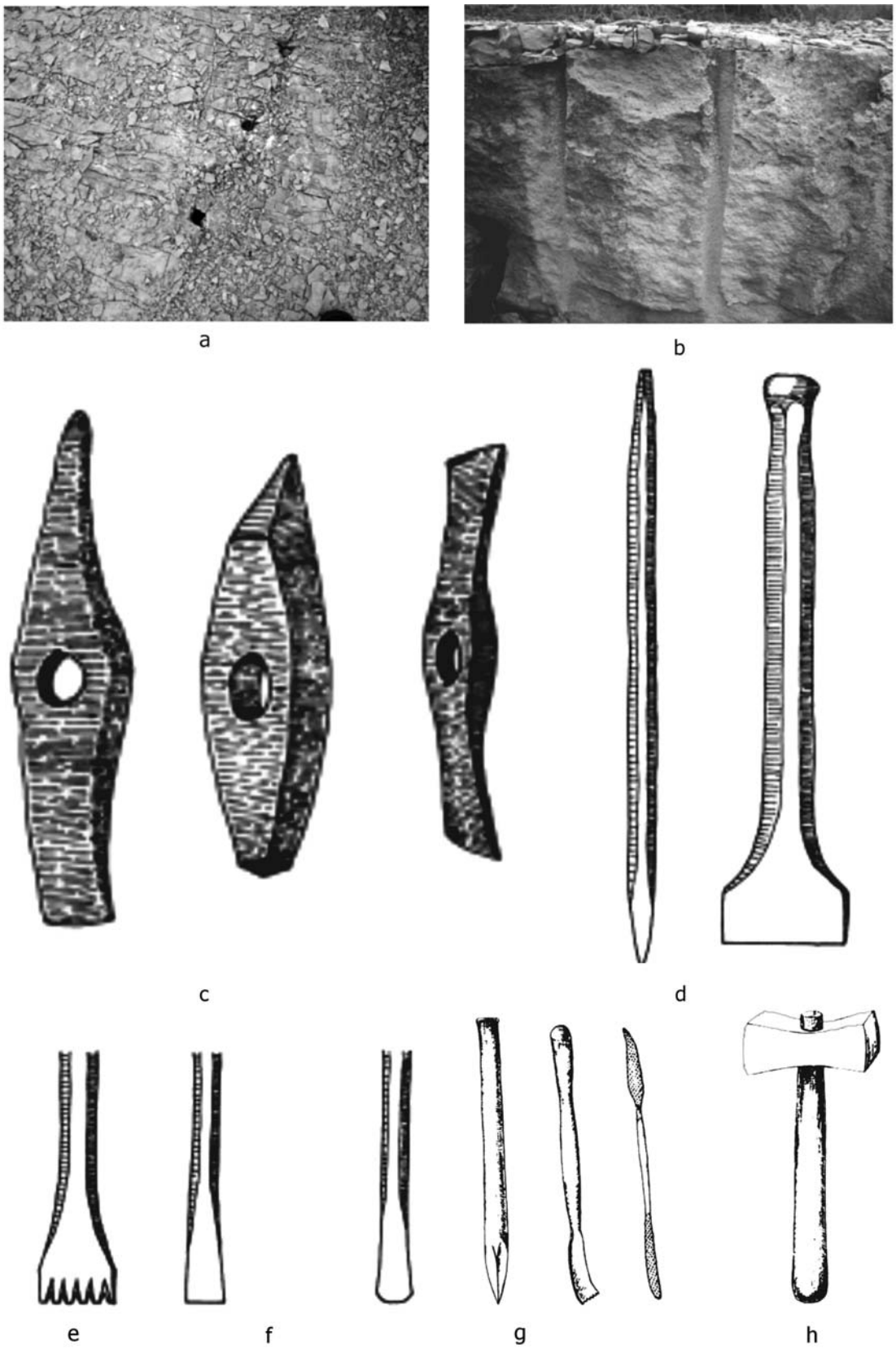
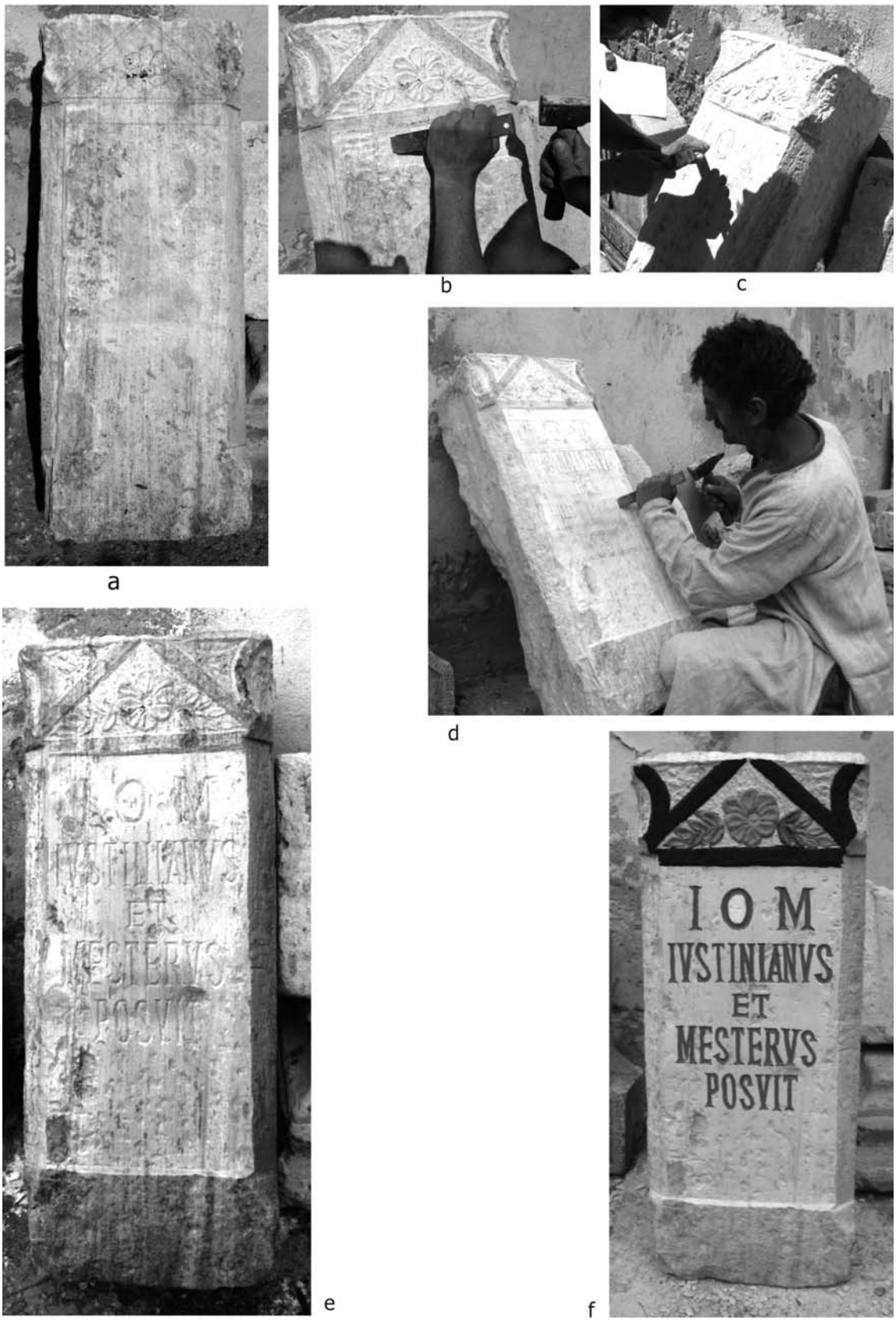


Planşa 1 / *Plate 1*



Planşa 2 / *Plate 2*