

NOT JUST STONE: LITHIC MATERIAL FROM TROESMIS – LOCAL RESOURCES AND IMPORTS

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Abstract: The present paper will focus on the case of ancient *Troesmis* (Turcoaia, Tulcea County) on the Danube, legionary fortress of *legio V Macedonica* and later Roman *municipium*, surrounded by a constellation of rural settlements of different level of wealth. The area is now dominated by two fortifications dated to the Late Roman and Middle-Byzantine period respectively. Within the last five years several stone samples from *Troesmis* have been analyzed in order to clarify their provenance. The state of research of the site, with little archaeological investigation, makes this kind of analysis very valuable for the use of stone in vast quantities is a defining feature of the material culture of the Roman provinces. Samples have been taken from building material of the late fortifications and the re-used earlier monuments.

The results show that local limestone from the quarries in the middle of the province *Moesia inferior* (so-called Babadag area) but also from the ones along the Danube, to the south, were used. Imported crafts from *Asia minor* used to work, besides the imported marble, in this local stone as well. Further detailed studies have shown that the stones for the filling of the walls came from the granite and limestone quarries in the neighbourhood of *Troesmis* itself.

These observations are pointing out the awareness on the available stone material in the near area, within the province. Further was possible to realize that the ancient crafts were able to distinguish between the different kinds of limestone and to choose those best suitable for their different purposes, even within the fortification.

Keywords: *Troesmis*, stone, building material, limestone, geology, import, marble, *Asia minor*.

In the specialized literature it is a well-known fact that, in terms of fortifications and sculpture, the northern part of the province of *Moesia inferior* and later *Scythia minor* was marked by the use of Babadag limestones and the lack of local marble sources. Therefore, the need for such precious material had to be covered through imports.

The state of research regarding the lithic materials in Antiquity used for both construction and sculpture is very different in Romania and Bulgaria, the two modern states on the territory of which the ancient provinces existed¹. It should be pointed out that, in the region between the Danube and the Black Sea, the most visible and archaeologically investigated sites date from the 4th century to the 6th/7th century or to the 10th-13th century. It is a state of the research that will not change in the near future.

During the last five years, a special - still ongoing - study was dedicated to the provenance of the different stones used for monuments and in building activities in the area of ancient *Troesmis*. Over the 2010-2013 period, the stone material and the mortars were also sampled and analyzed².

The building materials are of great importance to *Troesmis*, i.e. both the ancient site and its surroundings and in the present paper I only refer to the lithic material. The building materials are, however, not just stones and, thanks to them and their usage as *spolia*, we learn the most on the early

¹ For Romania there is no up-to-date synthesis on the matter; for Bulgaria see Petrova, Ivanov 2008; Biernacki *et alii* 2015.

² For the investigations of local stones, including those within the *Troesmis*-project, I am indebted to the geologist Albert Baltres from the Geological Institute of Romania. The marble provenance is still under study by Judit Zoeldfoeldi from the Institute of Materials Testing, University of Stuttgart, Germany and Heinrich Taubald, from the Chair of Isotope Geochemistry, University of Tübingen, Germany.

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settlements in the area dating back to the 2nd-3rd century AD. The practice of reusing earlier stone blocks, cut into regular shapes, is a quite common feature of the building activities in the Late Roman period and beyond. Detailed observations on the place and way of reuse within the building provide information on the organization of the building site, possible repairs, and workflow.

The extent of the quarrying activity in the Antiquity in the *Troesmis* area and the question on the large-scale local granite exploitation remain open. Granites are found only in the embleton of the Late Roman and Byzantine fortification walls. The industrial quarrying of building materials, granites in particular, started after 1877 and further ranks among the main activities in the region³.

Until 1877, the region between the Danube and the Black Sea (called Dobrudja) was part of the Ottoman Empire. During the 18th and the 20th century, the area surrounding *Troesmis* witnessed several military conflicts and raised interest not only due to its strategic location on the Danube, but also to the natural resources, especially wood and stone⁴.

In the 1860s, the French engineer Desire More, a rayah of the Ottoman Empire, had the authorization to quarry limestone and granite from Iglîța and settle a so-called modern farm in the region near to the two fortresses dominating the landscape. We know that the fortifications were the main 'quarrying' places for already cut-into-shape limestone slabs⁵.

In the following, I am going to focus mainly on the Late Roman fortifications, *i.e.* the so-called Eastern Fortification (**fig. 1**). In 1860, D. More started his quarrying works, the southern side being the area closest to the Danube and, thus, facilitating the shipment of blocks⁶.

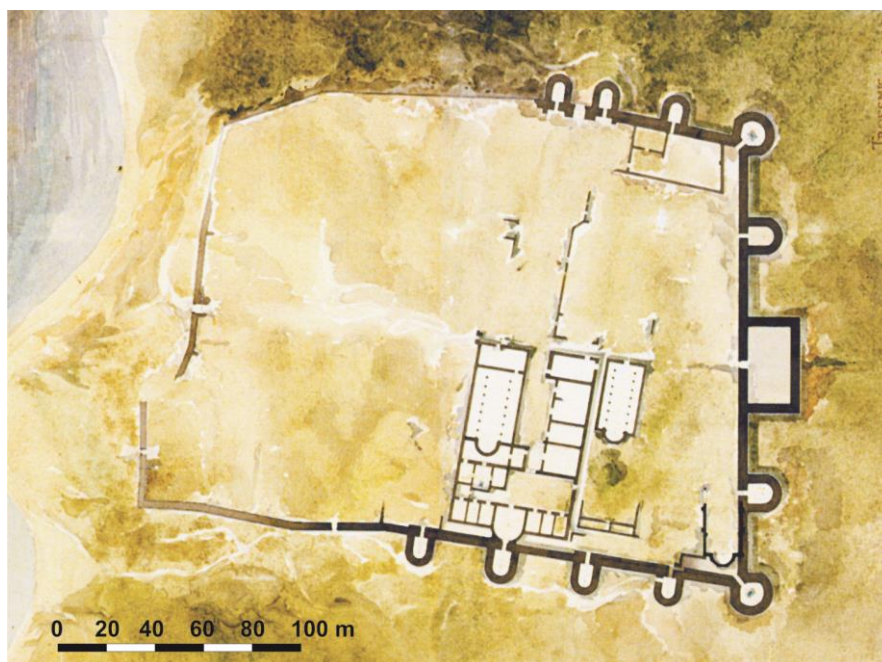


Fig. 1: *Troesmis* - Eastern fortification at 1865 on the aqua-relle by A. Baudry

³ Ionescu 1904; Velea 2009; Velea 2012. - cf. here **fig. 3**.

⁴ We find the place (otherwise known to be a hamlet called Iglîța, not existing any longer since 1944) marked on the maps of the Ottoman Empire from 1794 (Laurie & Whittle, London, a *New Map of Turkey in Europe divided into all its provinces*, drawn chiefly from the maps published by the Imperial Academy of St. Petersburg) and 1795 (W. Faden, London, *European Dominions of the Ottomans, or Turkey in Europe*). At the end of the 19th century, several specialised craftsmen from Northern Italy came to work in the quarries and turned the craftsmanship of working granite into one of the characteristics of the region. Today, industrial quarries are still active in the region, but only a few stonemasons working granite are left.

⁵ Peters 1867; More 1882; Alexandrescu *et alii* (eds.) 2016, chapter 4.

⁶ Boissière 1867; Desjardins 1868a; Desjardins 1868b; More 1882.

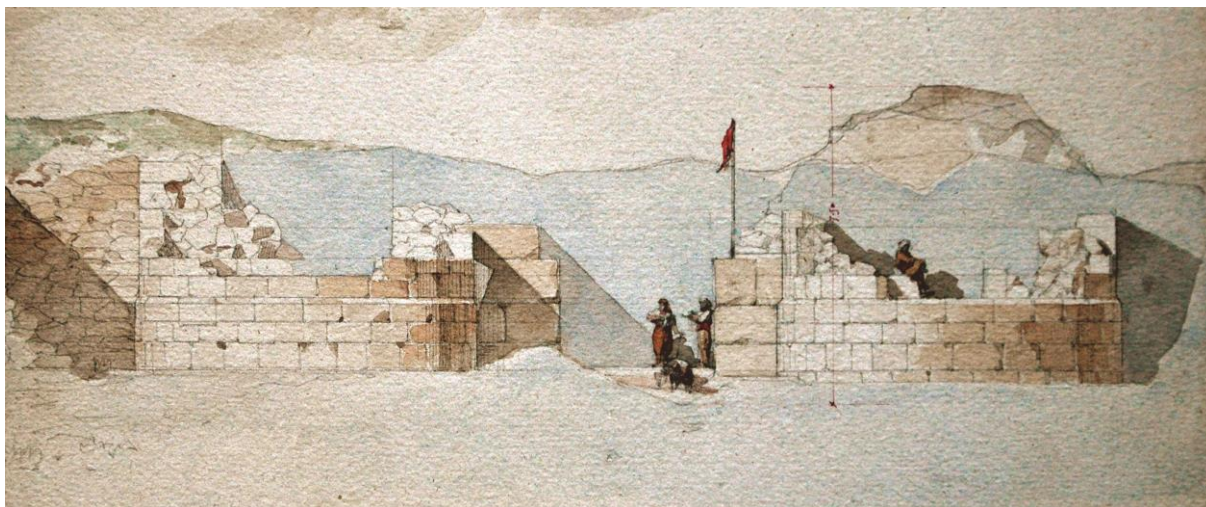


Fig. 2: *Troesmis* - Detail of the main gate at 1865 on the aquarelle by A. Baudry. The indicated height is 7.5 m.

The scholars in the 19th century and early 20th century showed a keen interest in inscriptions⁷. But the French mission in July 1865 proved to be the most important from an archaeological perspective. This could be established only in the last years, as I had the chance to find not only several original drawings of Ambroise Baudry, the architect of the mission, but also a part of his notes, most probably a draft of his intended synthetic report⁸. The architect was sent only as an auxiliary to the mission and was paid by the emperor himself. From Baudry's notes we can assume that his employer got a report and the requested illustration. However, this seemed to be of no interest to a broader audience and therefore remained unpublished.

Only during the (re)evaluation of the archival material it became clear that the main goal of that mission was first of all to find further inscriptions, and secondly, to provide a complete plan of a Roman fortification. The attitude of the French scholars towards the results of the mission, which did not manage to find much new epigraphical material, was the reason behind the different versions of the plan of the fortification, culminating - for the very illustrative purpose - with its almost three-dimensional restitution⁹.

If our approach to the different ancient settlements in the *Troesmis* area started from the A.S. Ștefan's results of his study on the aerial photographs¹⁰, in case of the Eastern fortification and its state of preservation in the 19th century, we are relying very much on the notes and drawings of A. Baudry. This statement may be appreciated by looking at



Fig. 3: Stonemason tools for granite - kit used 2012 by Cortel Iulian in Greci, Tulcea county (photo by the author).

⁷ see previous note; Crosnier-Leconte, Volait 1998; Alexandrescu 2013.

⁸ Alexandrescu *et alii* (eds.) 2016, chapter 4.

⁹ Crosnier-Leconte, Volait 1998, 41, fig. 23 ; on that matter see the new results in Alexandrescu *et alii* (eds.) 2016.

¹⁰ see above the contribution of Alexandrescu, Gugl.

the **fig. 8** featuring the present state of the first U-shaped tower (T4) on the east side of the fortress. One of Baudry's aquarelles (**fig. 2**) depicts the main gate on the west side, as documented in July 1865, preserved, at that time, at a height of about 7 meters. Today, the information on this part of the fortification is indispensable, but also not verifiable any longer, for the towers were demolished or reduced to the emblecton.

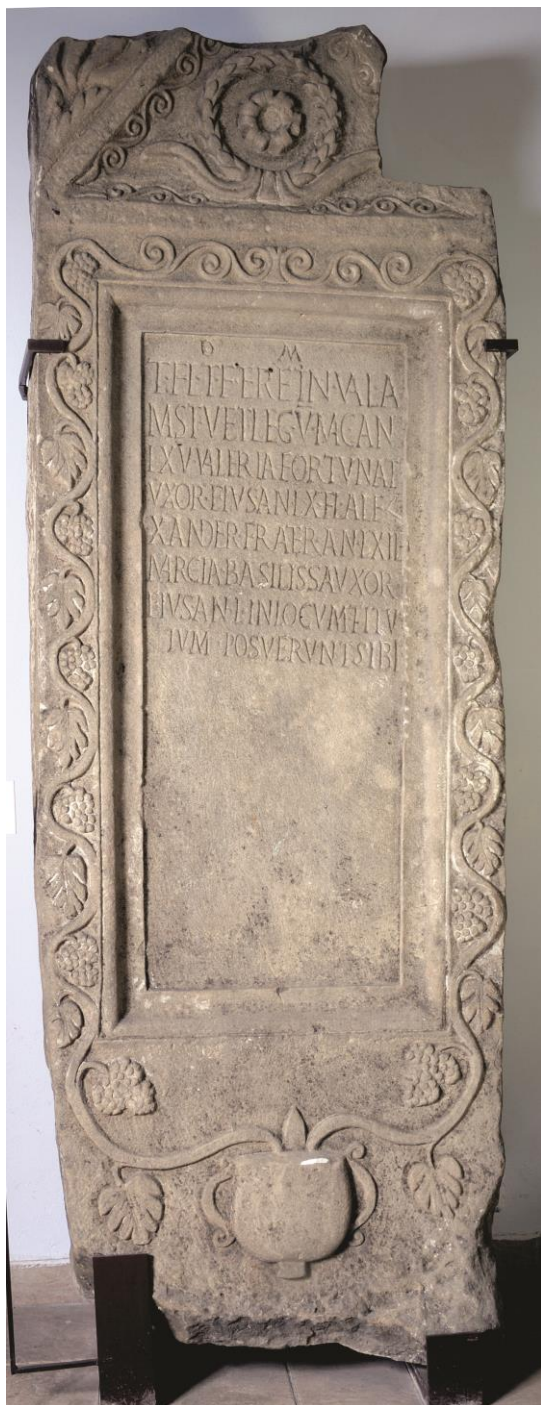


Fig. 4: Funerary stela from *Troesmis* (ISM V no. 184), reused in the Eastern fortification (photo by the author).



Fig. 5: Funerary stela reused as threshold in the *Halmyris* fortification(photo by the author).

The Eastern fortification had a facing of limestone ashlars, still recognizable today on very few places. The towers and the main gate were made of large slabs, while the curtain was made of small ashlars. The inner faces of the towers and curtain were made of small-sized stones. This observation also offers the reason for the different state of preservation of several blocks bearing inscriptions. Large-scale gravestones (about or over 2 meter in height) were either reused as such (**fig. 4**) or cut into suitable three fragments. Good analogies are known from the fortification in *Halmyris* (**fig. 5**)¹¹. The only hint for the provenance from the same initial monument is offered by the inscription (like ISM V no. 201 - **fig. 6**).



Fig. 6: *Troesmis* - blocks cut into shape as trapezoidal ashlars from a previous funerary inscription (ISM V no. 201)

The Eastern fortification in *Troesmis* finds good analogies in the province and not only. The dangers from the end of the third century and beyond determined a quite intensive and conscious fortification activity in the region, as well as the suitable logistics for repairs. The use of U- or horseshoe-shaped towers, as well as their association with fan-shaped towers (as corner tower) and with large rectangular towers was recognized as very popular in the region. The large rectangular tower flanked by two U-shaped towers was usually protecting the sides of the fortification without natural defense¹².

¹¹ Zahariade, Alexandrescu 2011, cat.no. 19, 21, 25, 26, 32, 33, 151. See also Conrad 2007.

¹² see Ștefan 1973; Ștefan 1974; Ștefan 1984; Apostol 2012.

The general plan was obviously adapted to the specifics of the terrain, but the knowledge of the defensive potential of particular shapes and dimensions of towers and especially of the locally and regionally available building materials to be used was essential for achieving the best assemblage for the chosen location.

The fortification in *Capidava* is an example of repaired fortification wall (end of the 3rd-4th century AD) and also gives an idea about the difficulties of excavating such sites¹³.

Specialized craftsmen were assumed to organize the supply with building materials as well as the construction activities and afterwards the constant repairs and maintenance. In some places with identified quarrying activity in the Antiquity¹⁴. However, observations on the used materials, the way of building and repairs have not always been systematically published for the fortifications investigated up to now.

One further common characteristic of the fortifications from the 4th-6th century is the use of *spolia*, i.e. previously used building materials from the neighborhoods of the construction site or more remote sites. In *Troesmis*, besides stone, bricks and architectural ceramics seemed to have also been reused. Occasional examples bearing legionary stamps of *legio V Macedonica*, of *I Italica* and of the *classis Flavia Moesica* were found in the area of the late Roman and Byzantine fortifications as well as in the emplecton of the walls.

Among the reused stone blocks, only those bearing inscriptions were recorded or mentioned and eventually saved from further reuse in modern times. There is a mention in Baudry's notes about other *spolia* such as column shafts and architectural stones. Even if recognized as belonging to earlier buildings, those *spolia* were not documented. We can add to the list the *spolia* used in the emplecton of the walls of the fortifications or of the buildings inside the precincts. Besides small fragments of limestone, possible rests from the monuments cut for the facing of the wall, there are fragments of statues or reliefs and also of stone vessels¹⁵.

In the northern part of the province, especially in its western area, marble was imported, being quite a rare material during the 1st and the 3rd century A.D. However, what mattered in case of reuse was the shape of the rather thin slabs. This was the case of two rather unknown examples from *Troesmis* (found during the 1865 campaign and brought to France), the one, a fragment of a marble votive slab for Mithras being of no interest at the time of discovery, as it did not bear any inscription. The second example (ISM V no. 147) is a fragment of a dedicatory inscription, cut into a Thasos marble slab. Thasos and Paros seem to have been the main sources for the marble used for sculpture and architectural decoration in the area of *Troesmis*¹⁶.

The exact finding spot of the *spolia* is rarely mentioned. In *Troesmis*, votive altars and gravestones from the earlier settlements (legionary fortress, civil and military *vici*, *municipium*, etc.) were reused for the southern side of the Eastern fortification and the gate and towers of the Western fortification. I was able to recover information on the finding area (**fig. 7**) for only 21 out of the over 80 epigraphs. In most fortunate cases, there is a general difference made in the documentation regarding provenance between the Eastern and the Western fortification.

¹³ e.g. Florescu 1935-1936, with eloquent illustration on the matter.

¹⁴ see Florescu 1936; Florescu 1961; Rădulescu 1972; Biernacki, Skoczylas 2002; Petrova, Ivanov 2008.

¹⁵ For an overview of the documented situations and of the *in situ* observed examples see Alexandrescu *et alii* (eds.) 2016.

¹⁶ A first presentation of the results of marble provenance analyses for monuments found in the *Troesmis* area was J. Zöldföldi - C.-G. Alexandrescu - H. Taubald, *Provenance Analyses of Marble Used in the Ancient Site of Troesmis (Turcoaia, Tulcea County, RO) and its Territorium (1st – 4th century A.D.)*, 11th International Conference of the Association for the Study of Marble & Other Stones In Antiquity (ASMOSIA), Split, 2015.

The finding area, *i.e.* the U-shaped tower (T 4) on the eastern side of the Eastern fortification, is known for one block¹⁷, the famous inscription mentioning the L. Licinius Clemens, veteran of the legion, *quinguennalis canabensium et decurio Troesmensium*. The stone slab was cut into shape for its reuse as were other blocks that are still *in situ* in T 4 (fig. 8) and were most probably ordered in this shape from the quarry¹⁸.

In the case of a single gravestone (ISM V no. 196 - fig. 10) it was possible to recollect information on the finding spot in the northern wall of the Western fortification, more precisely in the large tower (fig. 9)¹⁹. Additional interest show the two blocks of white limestone - established to be cut in a Sarmatian limestone with *Nubecularia* originating in Southern Dobrudja, which are now in the ditch in front of the fortification and were initially build up next to this gravestone.



Fig. 9: ISM V no. 196 - finding spot in the Western Fortification (a), with detail of the inscription *in situ* (b)(© archive of the Archaeological Institute V.Pârvan).

¹⁷ ISM V no. 158; Vulpe 1953.

¹⁸ An argument for this statement offers the quarry from Cernavodă - Florescu 1936; see also Russell 2013, chapters 5 and 6. The area of Babadag - where the blocks from *Troesmis* came from - is still in use as quarry and therefore the probability to find ancient quarry places similar to those in Cernavodă is unlikely.

¹⁹ Alexandrescu 2016.



Fig. 10: ISM V no. 196 (photos by the author).

It goes without saying that the information on the finding and reusing spot can be quite valuable. Detailed observations on the use of *spolia* for these building activities are rare. When available, they offer insight into what one may call “workflow” in the third century A.D. and beyond. For example, at the northern gate of the *Halmyris* fortress, funerary monuments were placed on the threshold and the interior faces of the U-shaped towers, while votive altars were walled in on both sides of the inner gate²⁰.

The most plausible explanations for the different uses are the source of stone, the shape of blocks, and the progress in the building activity. All recycled monuments seem to have been at least one century old by the time of their reuse.

Provenance of stone

The fortifications in the northern part of the province such as *Halmyris*, *Troesmis*, and *Noviodunum* largely used a sedimentary rock with the macroscopic appearance of rough, well-cemented, yellowish brown sedimentary stone, conventionally called Babadag or Codru limestone. It was also sporadically used in *Dinogetia*, *Aegyssus* and *Ibida*.

²⁰ Zahariade, Alexandrescu 2011, 17-20.

In the northern part of Dobruja, this rock was employed as a building material for strongholds in Roman times, but was also mainly used for building monuments like sarcophagi, gravestones, votive altars, etc. In *Troesmis*, this rock was at least employed for building the walls and towers of the eastern fortress. The preserved remains of the outer parts of two towers and the curtain between these consist of few rows of carefully shaped, large blocks (1-2 m long and 0.3-0.4 m high), with flat or profiled surfaces.

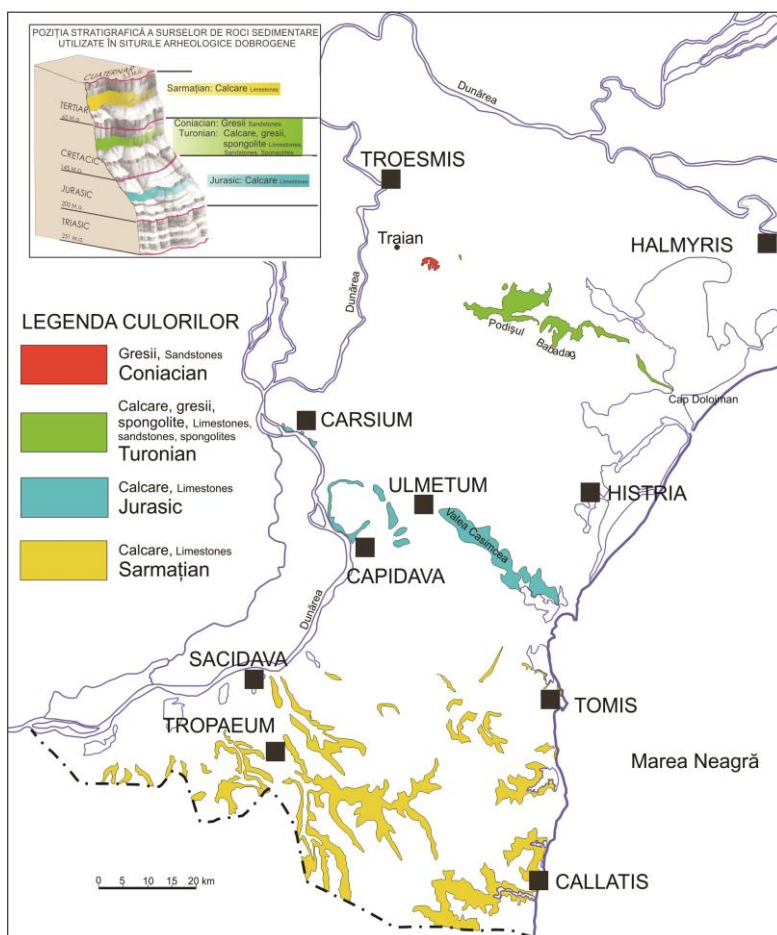


Fig. 11: Geological map with the stone sources used for the ancient sites within northern Dobruja (© A. Baltres).

The rocks were provided from a large supply district coincident with a geomorphic unit called Babadag Plateau (**fig. 11**). From here important volumes of stone were carried to many destinations, indicating an extended use in most North Dobruja sites, reaching also the southern part of *Histria*²¹.

In *Troesmis*, as far as we could analyze, the majority of early monuments used stone from the western side of the massif, the one closest to *Troesmis* (about 50-70 km away). Blocks for the curtain wall and towers of the Eastern fortification were brought from the same quarry (e.g. **fig. 12**). On the other side, for the Western fortification, there is evidence of building material brought from over 200 km far quarries in southern Dobruja, probably on the Danube - as the above-mentioned two blocks of Sarmatian limestone (see also **fig. 15**).

The provenance of the materials was established for a small amount of blocks and this is still an ongoing study²², not only for financial reasons, but also because the reused epigraphic monuments

²¹ Baltres 2011.

are kept in different locations. Some inscriptions were cut in blocks from the nearby source of Traian/Cerna (15-19 km), presenting a specific silification and chert lenses (fig. 13)²³.



Fig. 12: ISM no. 137 with thin section image of the chert from the Babadag quarries (by the author; microscope image by A. Baltres)



Fig. 13: ISM V no. 142 with thin section images with the chert details from the Traian/Cerna area (by the author; microscope images by A. Baltres)

Two main specific requirements were critical in the selection of these rocks for particular purposes: hardness and the possibility to cut large pieces of stone²⁴. Hardness reflects the degree of cementation and thus, the resistance to weathering. Weathering is a useful criterion in the differentiation of lithic materials from specific locations because not all rocks are amenable for carving monuments.

It is assumed that ancient quarries that were productive until the 4th century AD have long since disappeared from the landscape. They were buried some years after abandonment. On the other

²² The study was initiated in 2010 within the ArheoMedia-project, continued ever since and is now undertaken within the Troesmis-project by A. Baltres.

²³ e.g. ISM V no. 146, the honorary inscription for Tiberius Claudius Pompeianus, raised by a *centurio* of the *legio I Italica*.

²⁴ Baltres 2011.

hand, modern extraction in the largest known quarries destroyed all or almost all traces of ancient exploitation.

The know-how and logistics involved when supplying building material for fortifications were considerably larger for individual monuments. Even if the quarries in the Babadag area were still in use at the end of the 3rd century and during the 4th century, it is obvious that the already available slabs and ashlar in the construction area were put into work at first.

Bonding materials

In the case of the *Troesmis* project, one further aspect was considered: the used bonding materials. The 13 samples of mortars from the Eastern fortress, taken in order to try out this kind of investigation, showed that the composition was little different from one section to another.

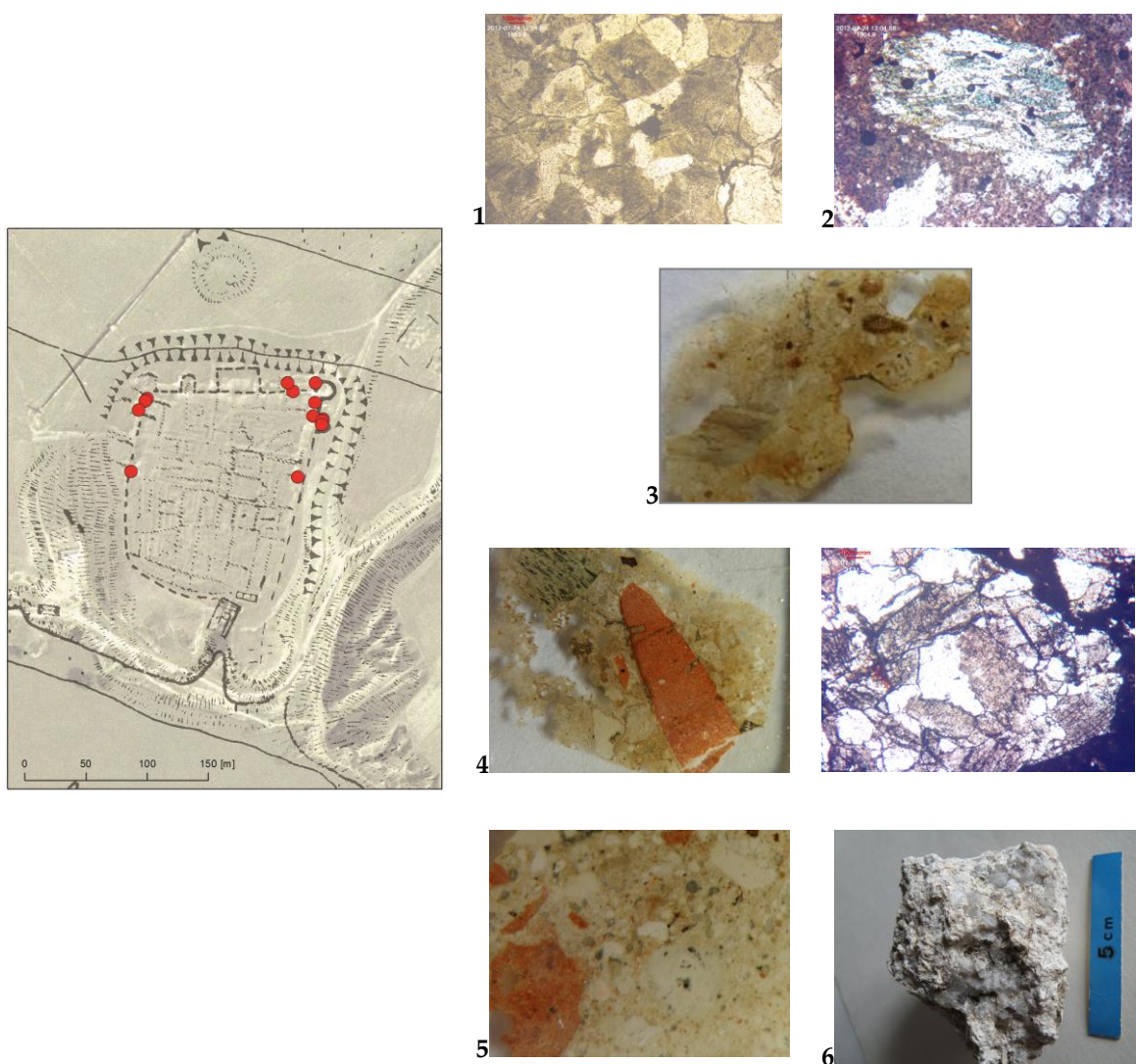


Fig. 14: *Troesmis* - Eastern fortification - samples of bonding materials (plan by C. Gugl; microscope images and photo by A. Baltres)

Two distinct types of bonding materials were recognized through thin section and microscope images (fig. 14). The first consists of a mixture of gravel and sand and now completely calcitized lime. The gravel and sand are of local origin, magmatic (e.g. the granites in fig. 14/1) and metamorphic rocks (eg

fig. 14/ 3 with a filita stone): granules or pebbles of 0.5-2 cm. Further added aggregates are usually brick debris. The white lime is brittle in few samples and quite hard in most samples. The example in **fig. 14/ 5** also presents small lumps of lime ('Kalkspatzen'). They ensured the resistance of the mortar, especially in exposed fortification walls. In one case, a fine ceramic sherd with muscovite was visible (**fig. 14/ 2**). The big ceramic/brick fragments (of 2.5 cm at most) are quite rare (**fig. 14/ 3-5**).

The quality of mortars in the Eastern fortification is also indirectly proven by the testimonials of different persons making excavations here and complaining about the hard mortar and difficulties in extracting the blocks of the wall facing from the mortar bed.

The second type of bonding material, exemplified by only one sample in the Eastern fortification (**fig. 14/6**), consisted of abundant lime and sand, with a druse - without ceramics - and belonged to an interior wall not exposed to weathering.

The common characteristics of the analyzed mortar samples and the comparison with the samples from *Capidava* and *Halmyris* make plausible the assumption that we deal with a single building phase of the fortification walls of the Eastern fortification in *Troesmis*.

The situation is quite different for the Western fortification. The recipe of the mortars vary and the use of crushed stones and stone chips is common, especially of the stones used in the same area of the wall and established to be of different provenance. Ironically, the samples have been taken 2011 from one of the very few archaeologically investigated areas in this fortification. 2012 the archival materials regarding the finding spot of ISM V no. 196 illustrate the very same place²⁵.

Two examples of bonding material (**fig. 15/a and b**) contain sedimentary stones as aggregate - presenting the characteristic fossils: *Nubecularia* (Sarmatian age) and *Trocholina* (inferior Cretacic age). This way is proven that for the building of the Western fortification the bonding materials were prepared using the available stone (crushed or chips) from each section of the fortification wall/ building site, like the two blocks form the southern Dobruja (from where Cretaceous calcarenites and Sarmatian limestones were shipped up to *Troesmis*).

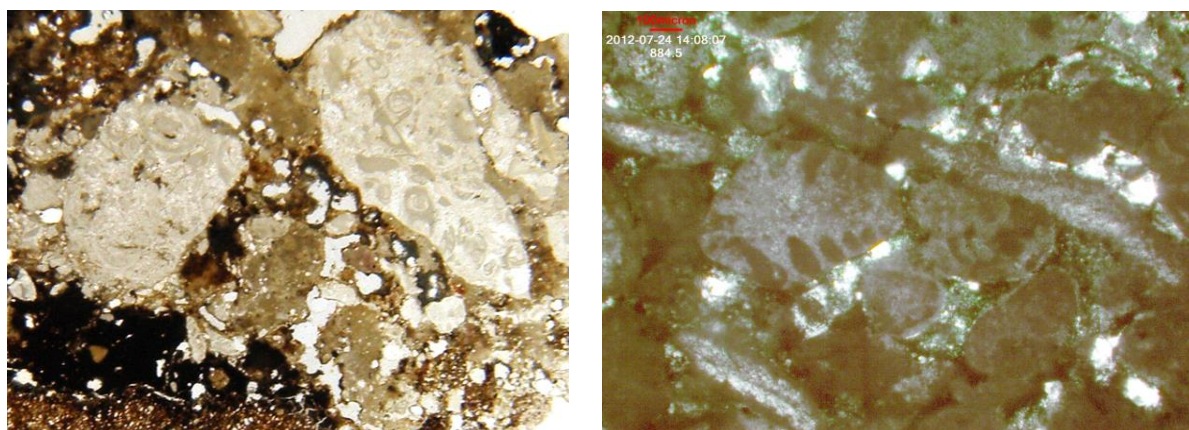


Fig. 15: Bonding materials from the blocks from the finding spot of ISM V no. 196 (© A. Baltres)..

Similar investigations are rather rare in the region of interest. The fortifications of *Histria*, *Dinogetia*, *Enisala* and *Păcuiul lui Soare* are a few such examples²⁶, but the approach was from case to case different as well as the dating and characteristics of the sites. Nevertheless, both the state of preservation of the walls and the state of the research of the site are of importance. In order to make possible more detailed considerations or even comparative studies between fortifications from the same region or with similar dating, systematic survey, sampling and suitable analyses are necessary.

²⁵ Alexandrescu 2016.

²⁶ Baltres, Avram 2002-2003; Baltres, Stancu 2011; Baltres 2011; Baltres, Bîrzescu 2013.

After five years of intense projects in and around *Troesmis*, we can review the important steps taken in the research of the site and its development and economics during different periods. The further research will focus on local resources, their use and administration, also including the building materials (especially stone and building and architectural ceramics), their provenance, manufacture techniques and different uses as well as environmental factors and changes that affected or may affect them.

The results are expected to also provide valuable hints on the economic interactions of the settlements in the *Troesmis* area and at regional and provincial levels and eventually on the administered territory and/or specialized trade.

The interdisciplinary studies and discussions of archaeologists, architects and geologists prove to be an important step towards understanding observable, specific details. Theoretically, it should be a decisive step in the research plan of an ancient site, especially nowadays when the popular trend among politicians is to reconstruct and experiment with ancient ruins. This comes together with a rush of building activity and sometimes ends, in the long run, with irreparable, damage of ancient sites.

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